International Competition for the Architectural Design Concept for the Tuchkov Buyan Park in Saint Petersburg

Competition Brief

FEBRUARY 2020

STRELKA KB · uia · ISOCARP INSTITUTE Centre for Urban Excellence · IFLA INTERNATIONAL FEDERATION OF LANDSCAPE ARCHITECTS · ASSOCIATION OF LANDSCAPE ARCHITECTS OF RUSSIA

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Elena Nikolaevna Chartoriyskaya
Ivan Aleksandrovich Serebritsky
Nikolay Viktorovich Linchenko
Oleg Sergeevich Romanov
Ruben Andranikovich Terteryan
Valery Evgenyevich Uskov
Vladimir Anatolyevich Grigoryev
Vladimir Kuzmich Linov
Vladimir Aleksandrovich Reunov

Technical committee

Anna Magomedovna Katkhanova
Boudewijn Almekinders
Darren Barker
Igor Leonidovich Pasechnik
Ilya Aleksandrovich Filimonov
Ivan Tomovic
Johan Vlug
Margarita Sergeeva Stieglitz
Nadezhda Alievna Kerimova
Oleg Vyacheslavovich Pachenkov
Polina Feliksovna Agakhanyants
Rawad Choubassi
Victoria Vasilyevna Kalinina
Vanessa Propach
Yuri Konstantinovich Bakey
Yana Anatolyevna Golubeva

Resident engagement and sociocultural research

Fedor Denisovich Veselov
Mikhail Lazarevich Lurie
Olga Sergeevna Mnishko
Oleg Vyacheslavovich Pachenkov

Consultants

Barker Langham Limited
Berkentriplex B.V.
Systematica S.r.l. Limited Liability Company
Turner & Townsend
Werner Sobek Moskwa LLC
Werner Sobek Green Technologies GmbH

Competition operator

KB Strelka

The additional comments made by jury members during the session will be added to the Brief in an appendix

In memoriam
of Valery Anatolyevich Nefedov

Transforming the site of the former 'Applied Chemistry' Russian Science Centre into a new park could be an important step in overcoming stereotypes when vacant lots need to be built up after industrial use. A park instead of industrial buildings is a new vision for the future of the city. People have long since grown accustomed to this around the world.[1]

Valery Anatolyevich Nefedov
(20 May 1949 – 29 January 2017),

Doctor of Architecture and professor of urban studies and urban environment design at Saint Petersburg State Architecture and Construction University (SPBGASU), lecturer at Saint Petersburg State University and Saint Petersburg State Forestry University, Distinguished Higher Education Worker of the Russian Federation.

1. From 'How to Give the City Back to the People,' Moscow: 21st Century Art, 2015

Contents

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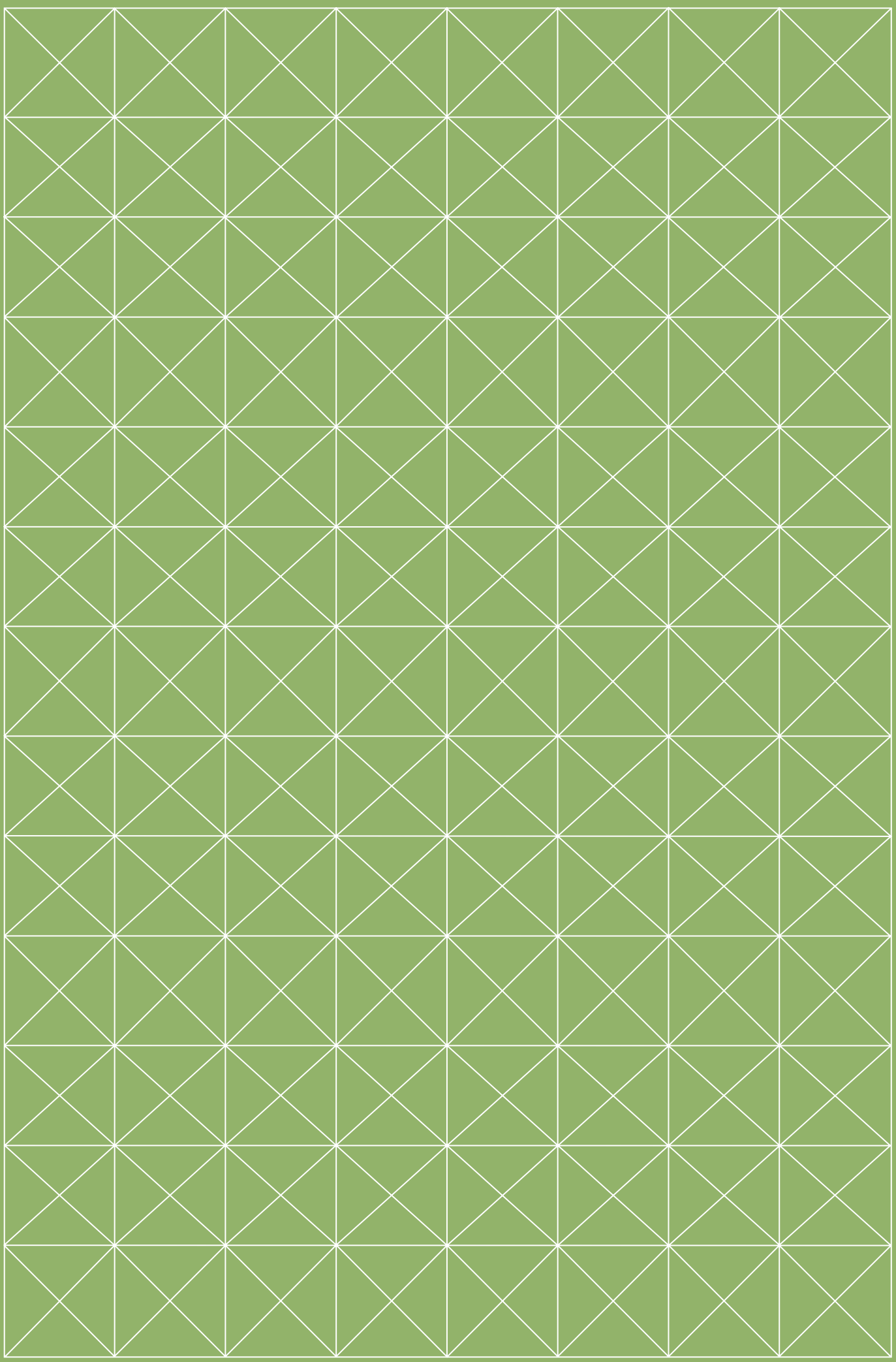
Introduction



About the competition
Competition schedule

5 February

Competition starts. Begin developing competition proposals

17 February

Competitors visit the project area

8 May

Submit competition proposals

28–29 May

Jury session. Selection of a winner and two finalists

3–6 June

Competition results announced

About the competition
General terms[1]

Competition

A LANDSCAPE ARCHITECTURAL CONCEPT OF THE PARK AND ADJACENT PUBLIC SPACES

The subject of the competition is the development of a landscape architectural concept for the park, embankment, square, and adjacent streets. The concept must include landscape and urban planning designs and meet the requirements set in the brief.

Competition type

SINGLE-STAGE, INTERNATIONAL

This international competition is a single-stage, restricted project competition open to architects and landscape designers from all countries. Any landscape architect, architect or urban planning firm acting individually or within a multidisciplinary team shall be eligible for participation in the competition.

Evaluation process

PERFORMED BY THE JURY

The jury will evaluate and rank the entries in order to allocate 3 prizes to the top 3 projects. Equal rankings will not be given. The first prize will be named the winner of the competition.

International jury

RUSSIAN AND INTERNATIONAL EXPERTS AS WELL AS REPRESENTATIVES OF THE GOVERNMENT OF SAINT PETERSBURG

The jury will approve the brief before the launch of the competition, approve the text of the answers to competitors' questions, evaluate entries and landscape architectural concepts on the basis of the evaluation criteria set in the brief, rank the competitors and allocate the 3 prizes.

Technical committee

PUBLIC FIGURES OF SAINT PETERSBURG AS WELL AS RUSSIAN AND INTERNATIONAL SPECIALISTS AND PROFESSIONALS

The technical committee prepared the competition brief and all documents the competitors will receive. The technical committee will judge the entries for fulfillment of the conditions and requirements, and make a report with the results of their examination for the jury.

Remuneration

HONORARIUM OF USD 60,000 TO EACH COMPETITOR

Eight competitors will each receive USD 60,000. The top three prizes, totalling USD 100,000 will be distributed as follows:

First prize: USD 50,000;

Second prize: USD 30,000;

Third prize: USD 20,000.

All amounts are indicated without VAT.

1. Detailed information is provided in 'Preliminary selection of consultants and competition rules.'
2. The International Union of Architects (UIA).
3. The UNESCO Standard Regulations for International Competitions in Architecture and Town Planning.
4. The UIA Competition Guide.

Project implementation

THE WINNER WILL BE INVITED TO REALISE THEIR PROJECT

The project shall be implemented in accordance with the winning project. The winner is to be contracted to implement the concept. Since this is a public project, all the contract agreements for implementation, design documentation, and construction supervision are concluded in accordance with the current legislation of the Russian Federation.

Author's rights and copyright

BELONG TO THE PARTICIPANTS

The Competitors retain the exclusive rights to the design concept. Without prejudice to the above, each of the Competitors grants the Organizer and the Operator the rights to use the design concept (reproduction, public display, broadcast, translation, etc.) immediately upon submission of its design proposal.

Anonymity

DESIGN CONCEPTS ARE PROVIDED ANONYMOUSLY FOR EXAMINATION BY THE JURY

The design proposal shall be submitted anonymously and will be evaluated anonymously. Projects shall not include any reference to the identity of its author(s). Any project that violates the requirement of anonymity will be excluded from the evaluation process by the jury.

Competition language

RUSSIAN, ENGLISH

All competition documents are provided in both English and Russian. In the case of discrepancy between the Russian and English texts, the English version shall prevail. In order to ensure anonymity, all submissions must be in English. Russian versions of the appendices can be provided for informational purposes.

Endorsement

APPROVED BY THE INTERNATIONAL UNION OF ARCHITECTS (UIA)[2]

This competition is endorsed by the International Union of Architects (UIA) and will be conducted according to the UNESCO Standard Regulations for International Competitions in Architecture and Town Planning and the UIA best practice recommendations stated in the UIA Competition Guide.[4]

About the competition
International jury

Voting jury

Boris Mikhailovich Kirikov

Architectural historian, Art History PhD, Honored Cultural Worker of Russia, Russia

Didier Vancutsem

Member of the Board of Directors of the International Society for City and Regional Planners (ISOCARP Institute), Germany

Francesco Bandarin

Former UNESCO Assistant Director-General for Culture and professor of urban planning and conservation at the Institute of Architecture of Venice (IUAV), Italy

Ken Smith

Landscape architect, urban planner, founder of Ken Smith Workshop, USA

Oleg Sergeevich Romanov

Honored Architect of the Russian Federation, president of the Saint Petersburg Union of Architects, Russia

Patrick Blanc

Botanist at the French National Centre for Scientific Research, inventor of the modern vertical hydroponic garden, France

Sergey Enverovich Tchoban

Member of the Union of Architects of Russia and the Union of Artists of Russia, member of the Union of German Architects (BDA), member of the Moscow branch of the International Academy of Architecture and honorary member of the Russian Academy of Arts, Russia

Vladimir Anatolyevich Grigoryev

Chief Architect of Saint Petersburg, Chairman of the Committee for Urban Planning and Architecture, Russia

Advisory jury

Elena Olegovna Stieglitz

Director of the Legacy of Baron Stieglitz Foundation, author of the idea and organiser of the Imperial Gardens of Russia Festival, member of the Association of Landscape Architects of Saint Petersburg (SPBO-LA), member of the Guardian Council for Historical Gardens and Parks, Member of the Society for Russian Manor House Studies (OIRU), Russia

Martin Rein-Cano

Landscape architect, co-founder and managing partner of Topotek 1, Germany

Stefan Rotzler

Landscape architect, representative of the International Union of Architects (UIA), Switzerland

Giovanna Carnevali

PhD Architect, strategic designer consultant, executive director of urban planning in NEOM, Saudi Arabia, Italy

Irene Djao-Rakitine

Landscape architect, director of Djao-Rakitine Ltd, Mayor's Design Advocate at Mayor of London, United Kingdom

Lawrence Barth

Professor of urbanism at the Graduate School of the Architecture Association, London, alternate representative of the UIA, United Kingdom

Yuri Isayevich Zemtsov

Member of the Russian Academy of Architecture and Construction Sciences of the International Academy of Architecture, Russia

About the competition
Technical committee

Experts

PARK USERS

Oleg Vyacheslavovich Pachenkov

Project team leader, UP center of urban humanities, European University, St. Petersburg

PARK PROGRAMMING

Darren Barker

Owner and director of Barker Langham

URBAN CONTEXT

Yana Anatolyevna Golubeva

Member of the International Society for City and Regional Planners (ISOCARP), architect/urbanist at MLA+ International Design Bureau

TRANSPORT

Rawad Choubassi

Director and board member of Systematica

LANDSCAPE

Boudewijn Almekinders

Landscape architect, teacher at Van Hall Larenstein University of Applied Sciences, teacher at Technische Universiteit Delft, co-founder of OKRA bureau

Johan Vlug

Landscape architect, urban designer, founder of VLUGP bureau, leading lecturer at Van Hall Larenstein University of Applied Sciences

CONSTRUCTION AND ENGINEERING SYSTEMS

Ivan Tomovic

General manager of Werner Sobek Moskwa

ECOLOGY

Polina Feliksovna Agakhanyants

Scientific Associate at the Institute for the Design of Applied Ecology and Hygiene, project coordinator at the ECOM Centre, Docent at the National Research University of Information Technology, Mechanics and Optics

Reviewers

CULTURAL HERITAGE

Igor Leonidovich Pasechnik

General Director and co-owner of Spetsrestavratsiya Research and Design Institute

Victoria Vasilyevna Kalinina

Deputy director general, head of the Department of Transport Infrastructure Development at Stroyproekt Engineering Group

Nadezhda Alievna Kerimova

Landscape architect, Associate Professor of the Saint Petersburg State University of Architecture and Civil Engineering, lecturer at the Landscape Design Department of the International School of Design (Saint Petersburg)

SUSTAINABLE DEVELOPMENT

Vanessa Propach

Sustainability consultant at Werner Sobek Green Technologies

Anna Magomedovna Katkahnova

Urban development policy advisor to the Chairman of the Committee for Architecture and Urban Development of the Government of Saint Petersburg

Ilya Aleksandrovich Filimonov

Professor of the Moscow branch of the International Academy of Architecture, member of the Committee on Urban Studies, Urban Planning and Architecture of the Russian Guild of Managers and Developers, board member of the Union of Architects of Saint Petersburg

Margarita Sergeevna Stieglitz

Professor at the Department of Art Studies at the Saint Petersburg Stieglitz State Academy of Art and Design, corresponding member of the Union of Architects of Saint Petersburg, member of the Council of the National Committee of the ICOMOS, member of the Presidium of the Saint Petersburg branch of the All-Russian Society for the Protection of Monuments of History and Culture, member of the Council for the Protection of Cultural Heritage under the Government of Saint Petersburg

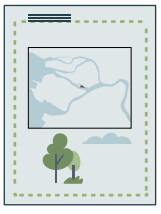
Yuri Konstantinovich Bakey

Director and chief urban developer of the State Research and Planning Centre of the Master Plan of Saint Petersburg

Structure, contents and requirements for competition proposals

Presentation boards — 6 boards

- A0-format boards;
- portrait orientation;
- PDF format;
- 300 dpi.

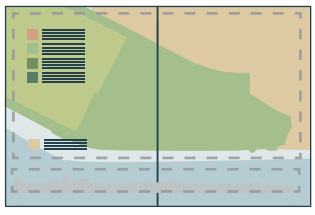


BOARD 1:

Integration of the park in the city building context and justification of the concept.

Contents:

1. Project slogan
2. Placement of the territory in the city building context, including within the structure of green and public spaces in the central part of the city;
3. Maps of transportation and pedestrian connections, both on the territory and with its surroundings;
4. Planning principles of the project.

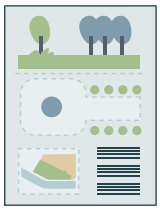


BOARDS 2 AND 3:

Architectural and planning organisation of the territory (fragment of general plan), landscape and elevation from the Malaya Neva.

Contents:

1. Architectural and planning organisation of the territory (fragment of general plan), landscape (scale 1:500), including:
   - concept scope;
   - primary and additional entrances;
   - pedestrian zones, approach roads and service access;
   - hardscape elements;
   - landscape solutions and softscape elements;
   - improvement elements;
   - service and utilities buildings;
   - relief of the territory;
   - other elements, as determined by the competitor.
2. Elevation from the Malaya Neva (scale 1:500).

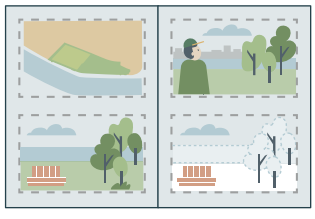


BOARD 4:

General plan, individual sections and elevations of the plot, buildings and fragments.

Contents:

1. General plan (scale 1:2000)
2. Longitudinal and transverse sections of the plot, cutting through key areas and buildings (scale: 1:500, 1:1000, 1:2000);
3. Elevations (scale: 1:500, 1:1000, 1:2000);
4. Architectural planning solutions for key park buildings, including section of embankment and foundation plinth (scale: 1:50, 1:100, 1:200);
5. Fragments of the general plan that show unique zones of the park (scale: 1:50, 1:100, 1:200).



BOARDS 5 AND 6:

Perspective drawings of the park based on photos of the project area (no less than 4 images).

Contents:

1. Bird's-eye view;
2. Main scenic vistas, at eye level;
3. Images of year-round use of the park, including during winter.

Album

- A3-format booklet;
- landscape orientation;
- no more than 15 pages;
- PDF format;
- 300 dpi.

COVER:

- Project slogan

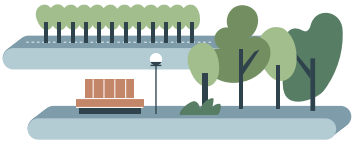
SECTIONS:

1. Introduction:
   - Description of the conceptual vision and principles of the project.
   - Main architectural and planning solutions and capital improvement elements.
2. Users:
   - Solutions for comfortably accommodating a large number of visitors and solutions for even distribution of visitor load.
   - Scenarios for activities in the park.
3. Park programming:
   - Solutions for placing all elements for the park's service and functional model.
   - Solutions providing for year-round use of the territory, especially during autumn, winter and spring.
   - Phased realisation of the project.
4. Landscape:
   - Solutions for greening the territory, including a vegetation plan and list of plantings used.
   - Relief solutions.
   - Solutions for decoration and seasonal appearance of the park.
   - Softscape typology.
5. Cultural heritage:
   - Solutions for integrating the territory into the city's existing historical context.
   - Solutions for forming visual connections between the park territory and its surroundings.
6. Urban context:
   - Solutions for integrating the territory into the surrounding urban design context: structure of green territories and public spaces.
   - Project planning principles.
7. Transport:
   - Solutions for organising transit, cycling and pedestrian traffic.
8. Construction and engineering solutions:
   - Drainage solutions on the territory.
   - Description and scheme of significant engineering and technical solutions and solutions for using existing concrete foundations.
9. Ecology:
   - Solutions for reducing the negative impact of the existing ecological situation on the park's functioning.
   - Solutions for waste management on the park territory.
   - Solutions for creating a sustainable natural-anthropogenic system for the park.
10. Sustainable development:
    - Lighting solutions.
    - Material and hardscape solutions.
    - Accessibility solutions for visitors with limited mobility.
11. Other materials, at the judgment of the competitor.

Video

No more than 3 minutes in length.

Model

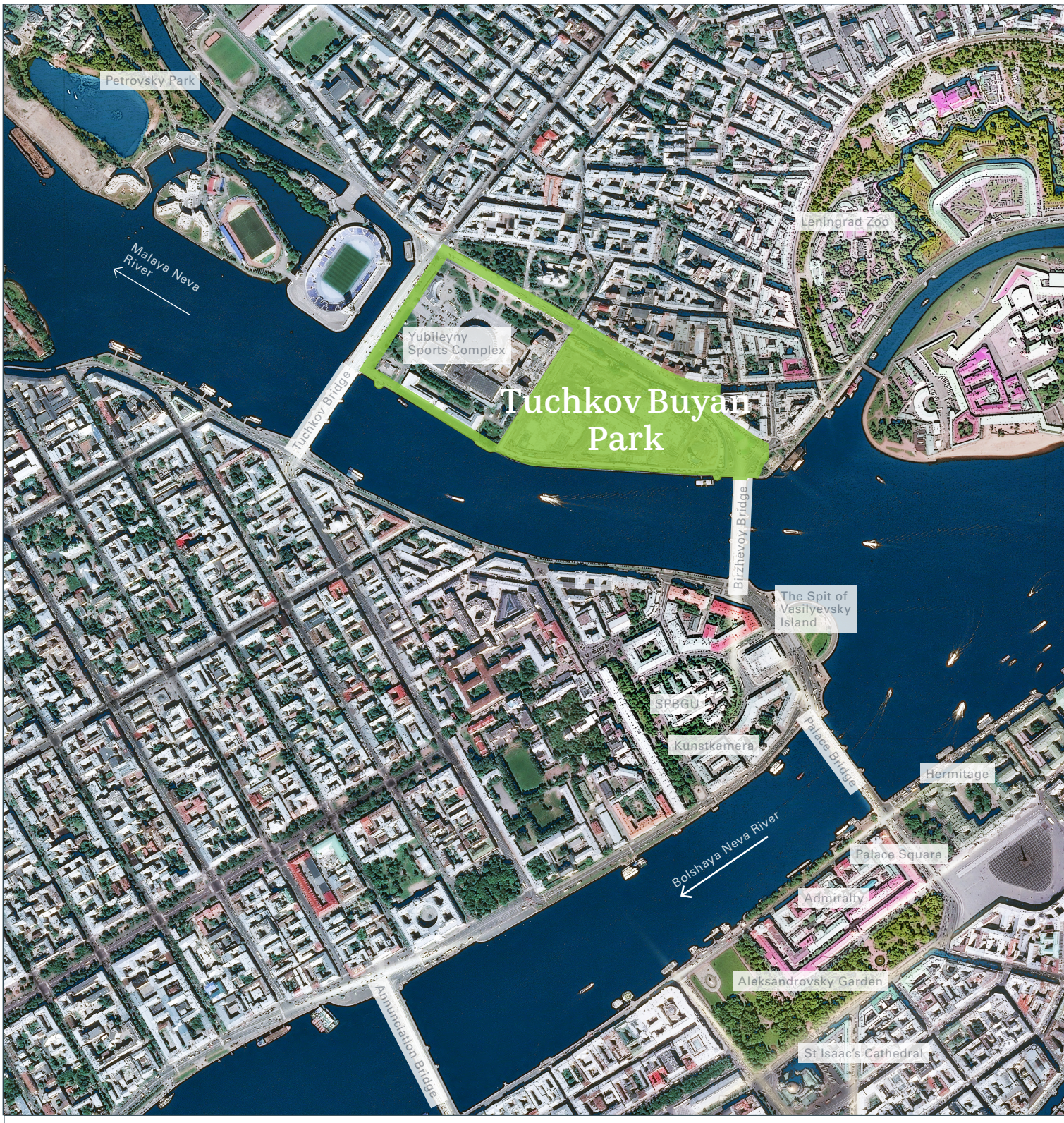


Model of the park within the concept scope (1:1000).

Documents

Signed declaration of authorship, signed contract with the competitor, completed specification table.

Concept Scope



Concept Scope

The project area is located in the Petrogradsky District of Saint Petersburg and is part of the 'Historic Centre of Saint Petersburg and Related Groups of Monuments,' added to the UNESCO World Heritage List in 1990. The city's main landmarks are within walking distance of the plot: Peter and Paul Fortress, the Spit of Vasilyevsky Island, the Hermitage and the Admiralty.

Located in the protected

UNESCO

historical city centre

7.8 million

potential visitors per year

70 %

of visitors are Saint Petersburg residents

1.5 hours –

average length of visit to the park

5 min.

to Peter and Paul Fortress

Visible from the windows of the

Hermitage

About Tuchkov Buyan Park

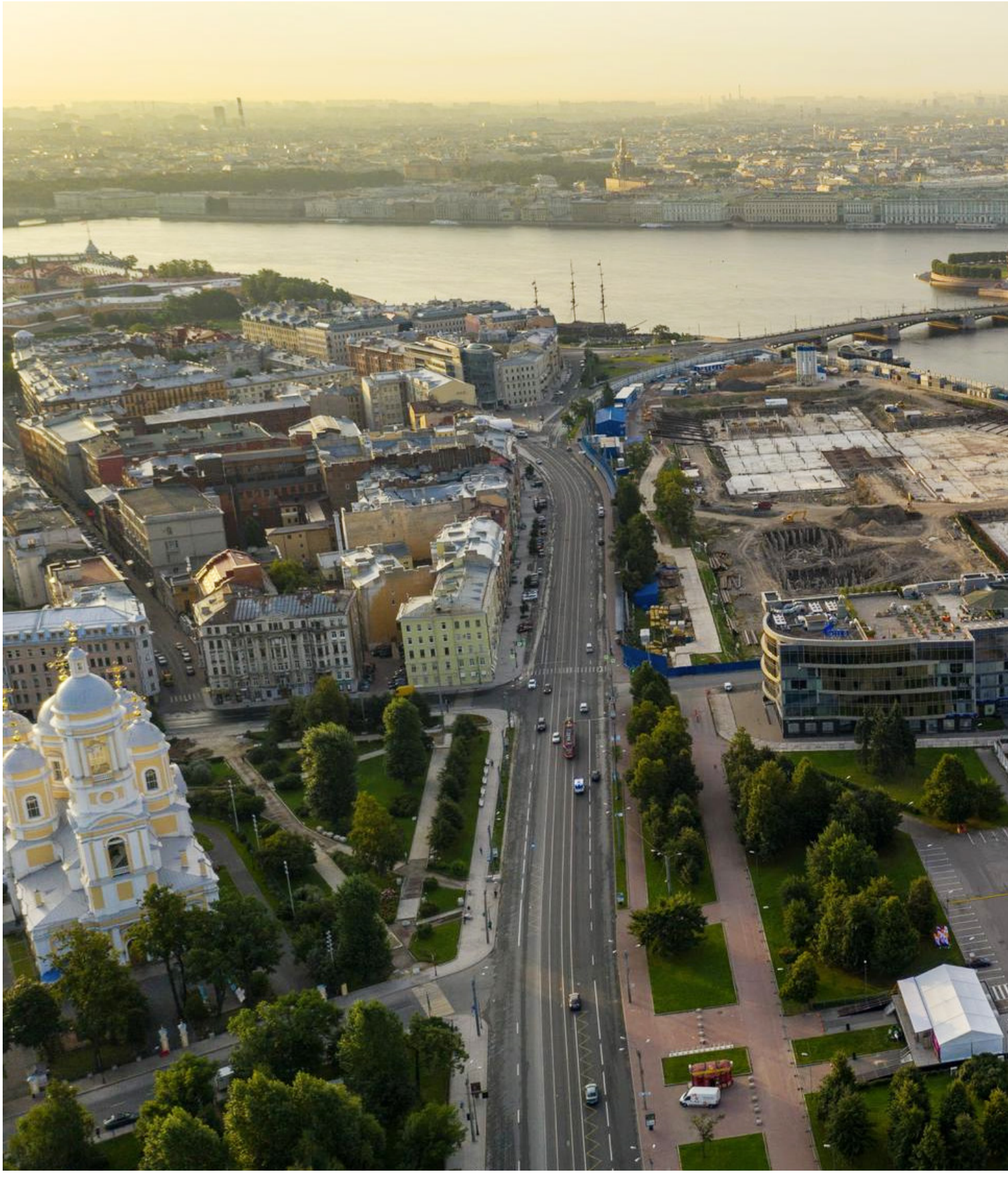


Photo: Delovoy Peterburg, Mikhail Tikhonov

15 min.
from the city's major landmarks

16.6 ha
concept scope area

1 km
length of new embankment

A green island in the historical center

The place where Tuchkov Buyan will be built was a small, picturesque island on the Malaya Neva until the mid-20th century, and although it was located in the very centre of Saint Petersburg, the land was historically used for commercial purposes: at first, there were hemp and wine warehouses, and later, the Institute of Applied Chemistry was opened. Now it is a wasteland in the heart of a historical city that has been hidden by a high fence for nearly a decade. While plans for construction on the plot were developed, thousands of Saint Petersburg residents signed a petition calling for the creation of a park here. Their dream is starting to come true: on the territory of the former island.

The realisation of such a project in the very centre of the city creates a unique opportunity for Saint Petersburg. The new park will be located just steps from the northern capital's major landmarks. It will not change the classical vista; instead, it will allow visitors to see it with fresh eyes. Residents and visitors to the city will be able to see Peter and Paul Fortress, the ensemble of the Spit of Vasilievsky Island, the mirror of the Neva and its embankments in a new way from Tuchkov Buyan Park. The project is destined for worldwide success, as it is not merely a park, but a park with a view of Saint Petersburg.

Saint Petersburg residents are passionate about the architecture of the historical centre, so the park must organically blend into the surrounding urban environment. However, it cannot be archaic or derivative in content. Tuchkov Buyan Park combines traditionalism of outer form with innovative content, setting a new bar of quality and comfort for public spaces across the city.

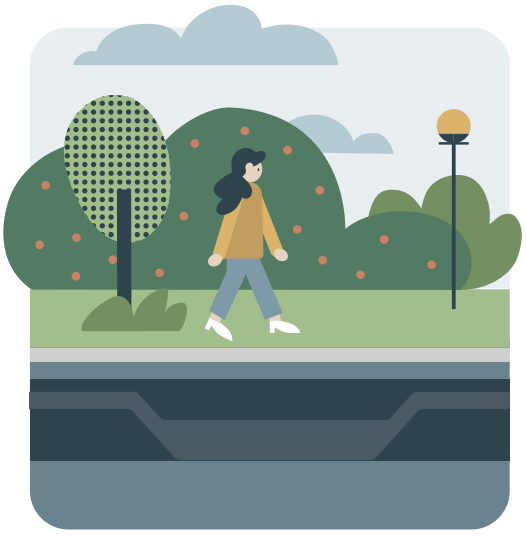
In Saint Petersburg's regular historical parks, nature is made subordinate to human will and plays a more decorative role. However, Tuchkov Buyan must be a new kind of park, where contemporary principles of green architecture and sustainable development put greenery at the forefront. Regardless of its modest size, this place must become a full-fledged park that gives residents and guests of the city the ability to relax away from the hustle and bustle of the megapolis and feel connected with nature. There should be a lot of green here, and not buildings — exquisite landscape solutions, rather than architectural attractions.

The Tuchkov Buyan park should be not only a highlight urban landmark, but a starting point for long-term changes that will craft Saint Petersburg's image as a contemporary and comfortable green city, ready to lead in sustainable development among the other capital cities of North-Eastern Europe.

Five key challenges

1 Seamlessly integrate the park into the context of Saint Petersburg's historical centre

In the design process, it is important to remember that the appearance of Tuchkov Buyan should account for the historical and architectural context without creating dissonance with its surroundings. The view of the future park from the opposite bank of the Neva plays the most important role: it should seamlessly integrate into the panorama of the Petrograd Side from the Hermitage, the Spit of Vasilyevsky Island and Makarov embankment.

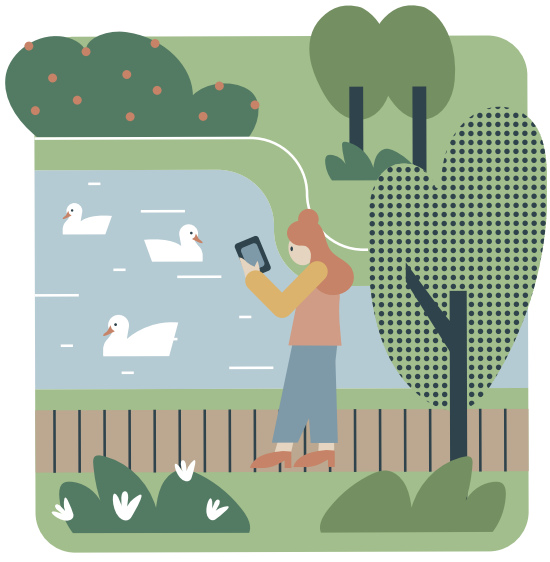


2 Repurpose concrete foundations from unrealised projects

When the decision was made to create Tuchkov Buyan Park, the construction of the Judicial Quarter had already begun on its future site. By the time construction was stopped, more than 60% of the plot's area was occupied by the concrete foundations of future buildings. Competition participants must figure out how to re-imagine these structures from an architectural perspective and logically use them to place park functional zones, services and create landscape solutions.

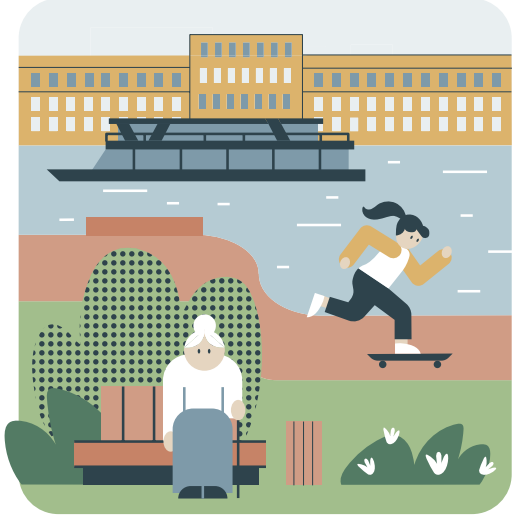
3 Create a sustainable park ecosystem from scratch

The historical landscape and natural ecosystem of the project area were destroyed back in the 19th century when wine warehouses were built there. Currently, the territory of the future park is a lifeless wasteland. Competition participants will need to develop landscape solutions for the whole territory as well as how to form a sustainable ecosystem for the new park on a site where dense construction was underway just several years before.



4 Connect the park with green areas in the city centre

The new Tuchkov Buyan Park should be a key node in the green framework of Saint Petersburg. An important task for designers will be the design of convenient cycling and pedestrian connections between the park and surrounding green zones: Petrovsky Park and Prince Vladimir and Uspensky Gardens from the west, and Aleksandrovsky Park and the green zone around the Peter and Paul Fortress from the east. It is no less important to provide comfortable pedestrian routes via the river, to the Spit of Vasilyevsky Island, Winter Palace Garden and to Aleksandrovsky Garden.



5 Find a compromise between the interests of many different visitors

A new park created in the centre of the city will unavoidably attract various categories of visitors. For residents of the Petrograd Side, it will be a local park, while tourists and Petersburg residents from other districts will visit it as a new landmark. The combination of such factors as a relatively small park area and high interest from various categories of users could lead to an excess anthropogenic load on Tuchkov Buyan, and even to conflicts between visitors. In working on spatial zoning and sociocultural programming for the park, designers must account for these risks and find a balance between the interests of its diverse user base.

Park positioning

Nature plays the leading role in the park, so priority should be given to landscape zones. Minimal construction is allowed for essential park utilities.

GREENERY

The park should have both intimate spaces that allow for quiet retreat as well as spaces for communication and social interactions.

PRIVACY

The park should offer opportunities for various types of leisure appropriate for the city centre, but priority should be given to a quiet, peaceful recreation.

ACTIVE LEISURE

The park should maintain a balance between traditional appearances and innovative content: from the outside, Tuchkov Buyan should organically blend into the historical panorama of the city, while offering visitors a new quality of space and experience inside.

TRADITION

Tuchkov Buyan should offer calm and shelter from the hectic urban atmosphere, but it should also provide openness, freedom of movement both around and through the park, and convenient connections with the main transit walking paths around the city.

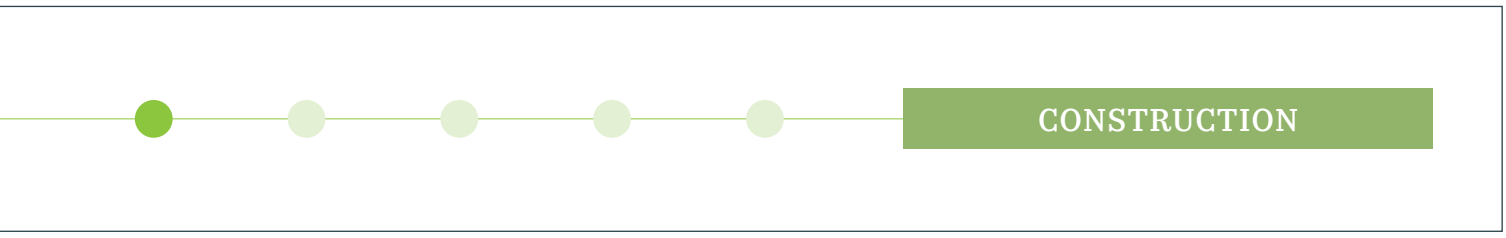
PERMEABILITY

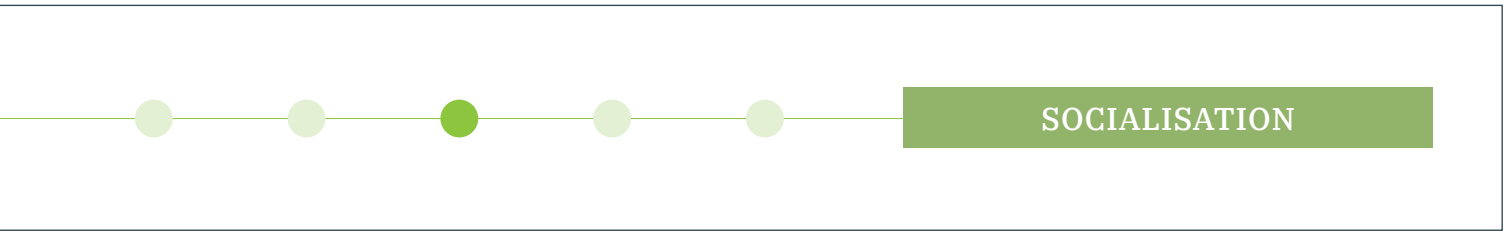
The park should meet the user demand for contemporary culture as the center of Saint Petersburg has already enough of classical cultural institutions.

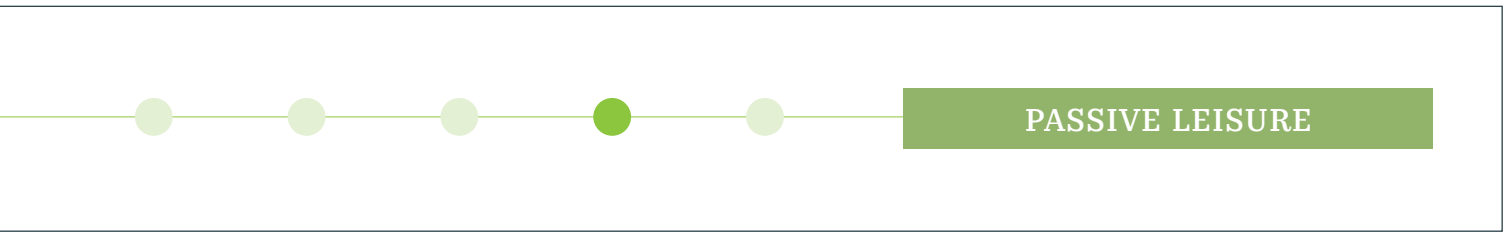
CLASSICAL CULTURE

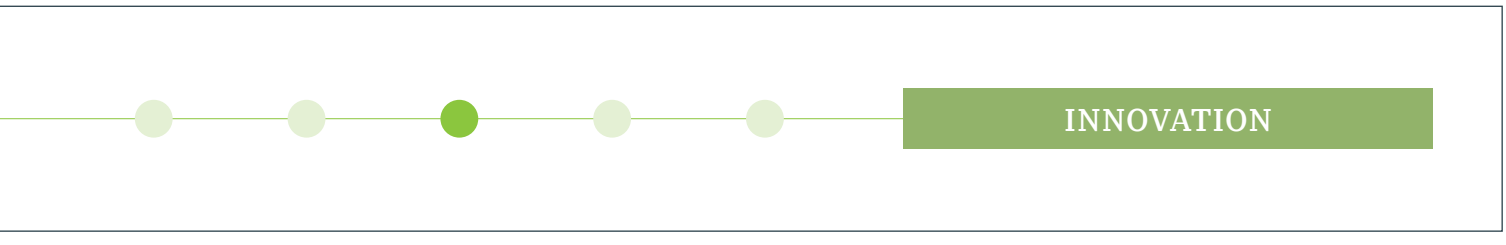
Tuchkov Buyan should not become a park dominated by commercial elements: it is an accessible, democratic place open to all categories of users.

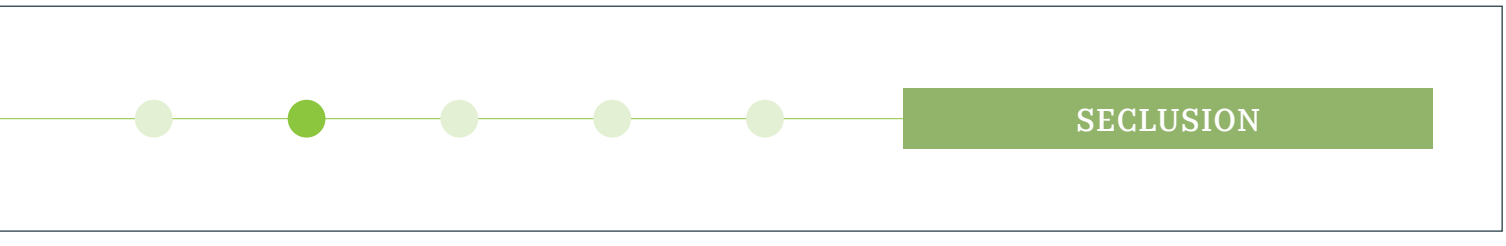
COMMERCIAL SERVICES

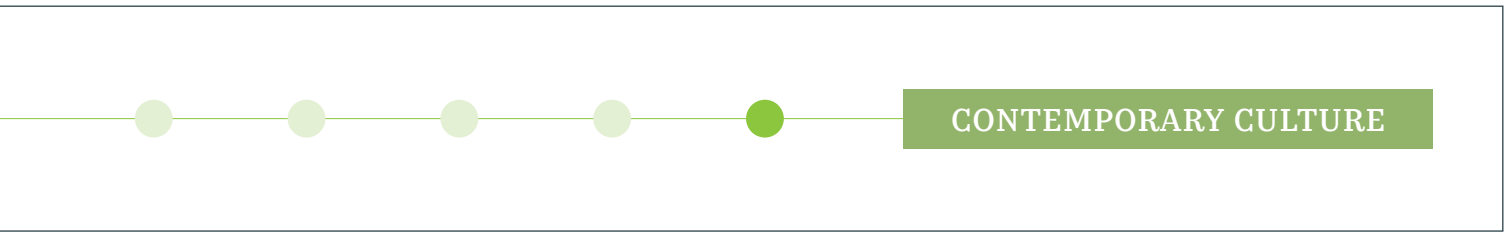

CONSTRUCTION

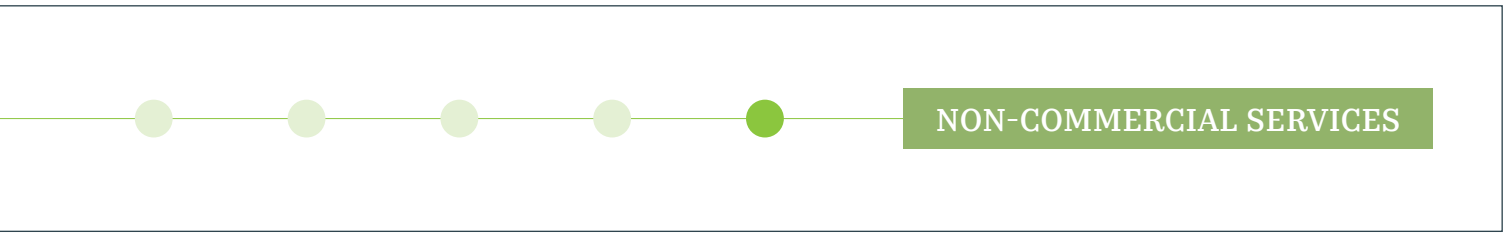

SOCIALISATION


PASSIVE LEISURE

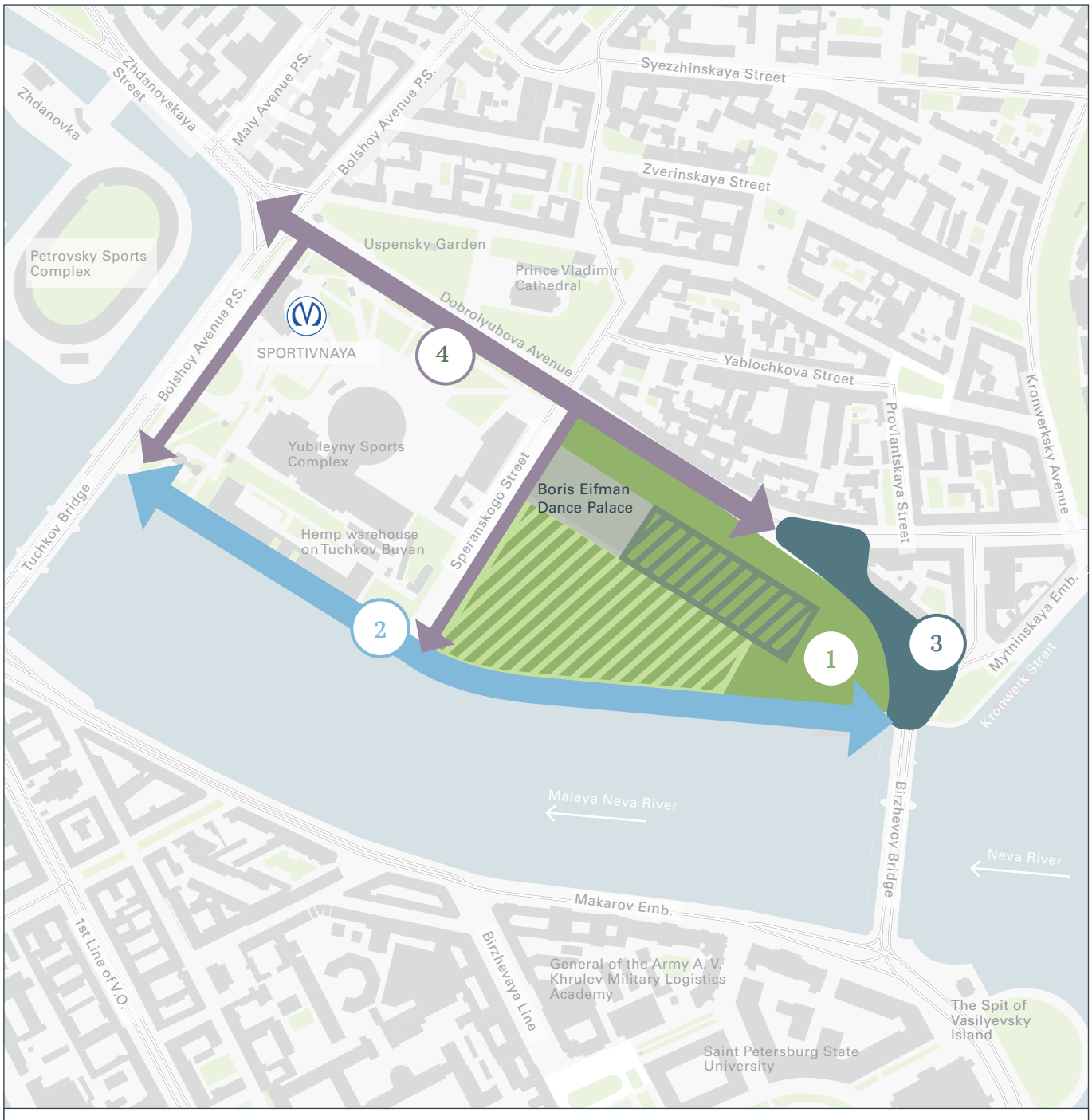

INNOVATION


SECLUSION


CONTEMPORARY CULTURE


NON-COMMERCIAL SERVICES

Competition subject
4 project elements



The overall concept scope area is 16.6 ha. The territory encompasses four elements: the park, embankment, square and adjacent streets. Competition proposals should concentrate primarily on the park; however, other elements also demand detailed development.

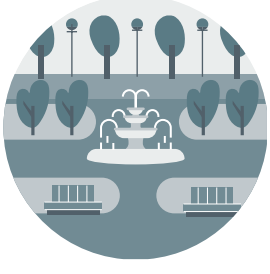
1. PARK

A landscape with a sustainable ecosystem in an urban environment. It is proposed to create diverse green zones, provide a view of the historical surroundings, and include park services such as multifunctional spaces and basic utilities infrastructure.

The territory features foundation plinth and a 540-space underground parking for park visitors. The existing foundation plinth and underground parking roof should be used optimally: for placing park functional zones, park services and creating landscape solutions. The underground portion of the parking is not part of the competition subject. The Boris Eifman Dance Palace will also be located on the park territory. Its form-based and architectural solutions are not part of the competition subject.

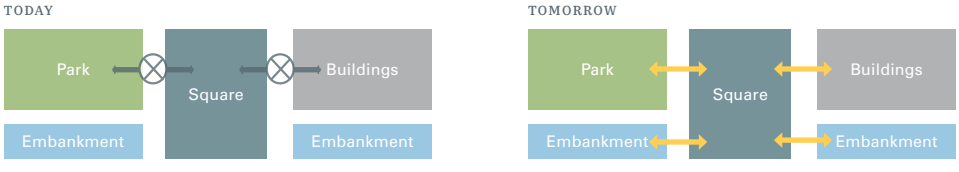
2. EMBANKMENT

A new 1km pedestrian route, from Birzhevoy Bridge to Tuchkov Bridge. It is proposed to build water access points, viewing platforms, riverside leisure areas and a pier for river transportation.



3. ACADEMIC LIKHACHEV SQUARE

One of the main entrances to the territory which connects the park with existing walking routes. This area can either be part of the park or a stand-alone territory, while providing safe and comfortable pedestrian connections between the park and its surroundings.



4. ADJACENT STREETS: DOBROLYUBOVA AVENUE, SPERANSKOGO STREET AND THE PEDESTRIAN PART OF BOLSHOY AVENUE OF THE PETROGRAD SIDE

The streets that provide connections between the park and surrounding neighbourhoods. It is proposed to expand pedestrian transit areas, create spaces for summer terraces and build entrances to the park.

— 2 —

Users

Requirements and recommendations

Propose a solution oriented toward a large number of visitors. The park should support a proposed load of up to 8 million visitors per year.

Provide an even distribution of the load across the whole territory. The park should harmoniously combine both recreational and transit functionality, all while being a centre of attraction and a meeting place for visitors of various social and age groups.

Design solutions should respond to the demands of the park's key users and allow them to peacefully coexist. It is especially important to account for the demands and desires of Saint Petersburg residents, from whom the demand for the park originally came. Its central location and the heavy flow of tourists in Saint Petersburg should not result in a design oriented toward the demands of mass tourists.

Provide for a wide variety of activities and pastimes in the park. It is important to account for the difference in interests and length of stay among different groups of users.

It is recommended to create a park whose chief value is its landscape, not its services. Residents want to see lots of greenery and intricate landscape solutions here, not architectural attractions for tour groups.

It is important to create a balance between locations for event programming and places for quiet leisure. It is recommended to propose a relatively intimate scale for proposed events, and their locations should be scattered around the territory.

It is necessary to account for the park's usage in city-wide events. It is especially important to provide for the park's safe, sustainable functioning on days that attract considerable crowds, such as the "Scarlet Sails" (a citywide celebration during the White Nights) or stadium events.

Present-day attitude toward the territory

> Today, when the territory in question is a construction site behind a tall blue fence, the urban community is ambivalent about this place. On the one hand, the current state of this place irritates them, and on the other hand, they think highly of its unique potential.

‘Blue fence’

When people reflect on the current status of the site, they most often describe it as a place that has long been excluded from active city life. The blue (construction) fence became the main symbolic feature of the site, which for Saint Petersburg’s residents gives rise to solely negative emotions. Many of them do not know what has been happening behind the fence all these years.

Central location and the historical and architectural context

Residents of Saint Petersburg highly appreciate the potential of this site. Although the history of this place is of little interest, its surroundings give it value. Both experts and residents highlight its centrality, as well as the significance and uniqueness of this place in terms of the historical and architectural environment.

A place with exceptional views

For citizens, the location of the future park is extremely desirable both in terms of the views that can be seen from it, as well as the views of it from the most important points in the centre — from the Hermitage, the Spit of Vasilyevsky Island and from Makarov Embankment. The exceptional location of this place, surrounded by the main views of the city’s architectural symbols and sites, is actualised precisely in the imagery of the future park, which should preserve and highlight this value.

Unique vacant space in the city centre

In the central part of Saint Petersburg, there are no other vacant territories of this size where a new park could be built. Citizens understand that this site is very attractive to developers but they want this place to be developed as a public space. Both experts and residents are opposed to major construction on this site and want to see more greenery there.

Build a park instead of the Judicial Quarter

In 2013, signatures were collected for a petition entitled ‘Build a Park Instead of the Judicial Quarter,’ addressed to the governor of Saint Petersburg. It was the first step towards creating a park on the site of the demolished Institute of Applied Chemistry.

17,308

Saint Petersburg residents signed the petition

Historical identity

Although this area is in the very centre of the city, this place does not have a well-established identity in the eyes of the city's residents. Until recently, information about the history of this part of the city was known only by a narrow circle of local historians. However, after it was announced that Tuchkov Buyan Park would be created, Saint Petersburg's residents became interested in this topic and began to discuss the historical significance of this territory.

Mokrushi

HISTORY

At the beginning of the 18th century, the part of the city where the park will be constructed was called Mokrushi (marshland) due to it being a lowland that would flood even with the slightest rise of the Neva River.

ENVIRONMENT

The toponym of Mokrushi (marshland) went out of active usage as far back as in the 19th century, so it is unknown to present-day Petersburgers. Even among experts, only local historians know this toponym.

ATTITUDE

The toponym of Mokrushi is of great interest for the residents of St. Petersburg along with other key elements of the local identity that in this particular case has to do with the swamp where Peter the Great founded his capital.

Tuchkov Buyan

HISTORY

Warehouses were located in this part of the city in the 18th – 19th centuries. 'Buyan' was the name for the hithe on a small island and the storage facilities adjacent to it where unloaded goads were stored. Initially the warehouse building, built in 1772 and still standing, and the harbour's adjacent areas were called Penkov Buyan. Later Buyan acquired the name Tuchkov in honour of the bridge built here, and the bridge itself got its name in honour of the construction contractor Tuchkov.

ENVIRONMENT

The park is not being designed on Tuchkov Buyan but rather on the territory of the former Vatny ('cotton') Island which is located nearby. By the middle of the 20th century, the waterways between the islands and the shore were filled in and therefore both names (Tuchkov Buyan and Vatny Island) went out of active usage and until recently were known only to local historians. The word 'Tuchkov' though is well known to residents of Saint Petersburg thanks to Tuchkov Bridge, which is located a bit further downstream.

ATTITUDE

The long-forgotten toponym Tuchkov Buyan suddenly gained renewed relevance when the Saint Petersburg government held a vote in 2019 among the city's residents on how to name the new park. The name 'Tuchkov Buyan' was the winner, having received 27% of the vote. Many residents like that the historical toponym was chosen as the park's name. But there are also people who do not like the word 'buyan'. In modern Russian, it is not used in its old meaning (hithe) but more often it is used to refer to a disorderly person, or it brings up misplaced associations with the fabled Buyan island, featured in folklore and 'The Tale of Tsar Saltan' by Alexander Pushkin.

Tree nursery

HISTORY

In the late 19th — early 20th centuries, in the area between Tuchkov Buyan and Aleksandrovsky Avenue (present day Dobrolyubova Avenue) there was a city tree nursery where flowers and trees were grown, which were then used in landscaping public spaces of Saint Petersburg.

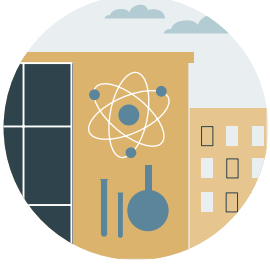
ENVIRONMENT

Until recently, the general public did not know that a tree nursery had been located here. However, after the plans to create the park were announced, the nursery began to be written about in local media.

ATTITUDE

Many residents of Saint Petersburg, having learned the history of the tree nursery near Tuchkov Buyan, think the new park can support historical continuity in the development of this area as a 'green island.' Creating a natural park in this location in particular is seen as a way to pay tribute to the city's landscaping traditions, since it was from this tree nursery that grown trees were then transported throughout the city.

State Institute of Applied Chemistry (GIPH)



HISTORY

The Russian Institute of Applied Chemistry was established in 1919 and the buildings of the wine warehouse on Vatny Island were handed over to it. In the 1960s – 1970s new buildings were built for the State Institute of Applied Chemistry on the adjacent territory. The institute, among other things, worked on aviation fuel and other harmful chemicals. The institute was functioning until the early 2010s, when it was moved outside of the city limits. In 2012 the buildings of GIPH were demolished by VTB Development, which was planning to construct the Europe Embankment residential complex in their place.

ENVIRONMENT

That the State Institute of Applied Chemistry, which had worked with hazardous chemicals, had until recently been located on the site where the new Tuchkov Buyan Park will be built is known by many city residents since many people who worked or had been to the Institute live in Saint Petersburg.

Out of all the historical stages of the territory under consideration, the operation of GIPH is best known among citizens.

ATTITUDE

Back in Soviet times, there were many rumours regarding the dangerous chemical compounds in the GIPH labs. However, the local residents and the experts alike were against pulling down the heritage warehouse buildings of the 19th century. The Institute's buildings were demolished anyhow, and subsequent reclamation was carried out on the soil contaminated with chemicals. Some urban eco-activists are still concerned that plots of toxic soil remain on this territory and call for an independent environmental assessment. But in spite of the ongoing debate, the majority of citizens believe that the contaminated soil has been entirely removed from the future park's territory, so the area no longer poses a threat to people.

Unrealised plans of creating a Central Park

HISTORY

In the 1940s, the chief architect of Leningrad, Nikolay Baranov, gave consideration to the area between Dobrolyubova Avenue and the Neva River as an ideal place where the green core of the new Central Park[1] could be located. He proposed creating a park axis that would stretch from the Kronverk and the Peter and Paul Fortress until the end of the Petrovsky Island with a total area of about 200 hectares. The project was not implemented.

ENVIRONMENT

The project to create a Central Park was well known among specialists — architects and urban planners — but most present-day Petersburgers have not heard of it. However, since the professional community returned to this idea each time the city's master plan was reviewed and a new one was developed (every few decades), the citizens who follow urban issues are familiar with the ideas of Nikolay Baranov.

ATTITUDE

Many experts consider the project to create Tuchkov Buyan Park as a return to the ideas of Nikolay Baranov and see this project as the long-awaited realisation of one of the key elements of the city's green framework. Baranov's project to develop park areas is likewise decidedly popular among the residents of Saint Petersburg.

Unrealised projects (Embankment of Europe, Judicial Quarter)

HISTORY

In 2007, the Embankment of Europe residential district construction project on the site of the buildings of the State Institute of Applied Chemistry was widely discussed. The project included the Boris Eifman Dance Palace and an esplanade with a boulevard as a part of the quarter that was open to the public. In 2012 it was decided at the federal level to cancel the construction of this project and to replace it with the Judicial Quarter for the Supreme Court of the Russian Federation. In the summer of 2019, at which point a concrete parking lot and the foundations for buildings and for the Dance Palace were already in place on the territory of the future Judicial Quarter, the decision was made to cancel the construction of the Judicial Quarter and to create a new park on this site. The site in question has been surrounded by a blue construction fence since 2008 and is off-limits to the public.

ENVIRONMENT

The fate of the site in question has already been actively discussed by experts, journalists and citizens for more than 10 years. City activists and residents of the Petrogradsky district, where the construction site is located, have been particularly interested in the proposed projects.

ATTITUDE

City residents favourably viewed the demolition of the GIPH buildings and the remediation of contaminated soil, but were critical of both development projects. For Petersburgers, the blue construction fence became a symbol of the loss of this area. Throughout the years of unsuccessful attempts to implement development projects on this territory, experts and urban activists have repeatedly proposed to create an urban park on this site. These proposals have always received strong support from citizens, while the decision to stop the construction of the Judicial Quarter and announce a competition for the concept of the new park was embraced as the materialisation of the long-standing dreams of Saint Petersburg's residents.

1. For more information, see picture on 81 page 'Panorama of the central city park. Project. Authors — Baranov, Guryev, Ageeva, 1948'

Park users

1. The local community (Petrogradsky Island residents, in part – Vasilyevsky Island residents)

The park under design is located in a densely populated residential area, so its residents will use Tuchkov Buyan Park as a 'park within walking distance' with the corresponding usage scenarios: approximately 50,000 people live within a 15-minute walk to the park. The local community uses the park most intensively, including making daily visits to it. Therefore, as a user category they have the greatest interest in the future park. For this reason, their interests should not be infringed upon and the scenarios of passing time and their needs should be taken into account — especially where they intersect with the needs of the other categories of users.

VISIT TIME

They can be present on the territory at almost any time of the day; in particular, certain categories of local residents can be distributed in time as follows:

- school-age children and teenagers: mainly in the afternoon;
- parents with preschool children: any time of the day;
- the elderly: any time of the day.

VISIT SEASONALITY

- year-round

Tuchkov Buyan Park is a park which serves as a point of attraction on a citywide scale. Therefore, the park's visitors will include both local residents and guests to Saint Petersburg. In terms of the 'spatial relationship' to the park, the following main types of visitors can be identified.

2. Saint Petersburg residents from other districts

The central location of the park, the views opening up from it, as well as good transport accessibility (two metro stations within walking distance) will inevitably lead to the fact that residents from all over the city will also use the park. In addition, about 12,000 jobs are located in the vicinity of the park, and about 50,000 students attend universities whose buildings are within walking distance of the site in question. These categories of citizens can visit the park after work / classes, whereas for other Petersburgers, a more typical behavioural model is to visit the park on weekends.

VISIT TIME

- working people: transit flows in the morning and evening: from Sportivnaya metro station to the Spit of Vasilyevsky Island and inward to the Petrogradsky district (Bolshoy Avenue, Bolshaya Pushkarskaya Street, Maly Avenue);
- students: can be here starting from weekday afternoons; their visit is not in transit, but will require meeting their needs which they will turn into various scenarios (staying, relaxing, admiring, active leisure, activities by the water);
- on weekends, the following visitors from Saint Petersburg's other districts can be expected here: people who are more interested in meaningful leisure than in purely recreational and ecological leisure (enjoying the scenery, going for a walk, content-related activities such as education, performances, and music, playgrounds, unobtrusive sports venues);
- Boris Eifman Dance Palace visitors before and after the afternoon and evening performances.

VISIT SEASONALITY

- year-round with a rise in activity in the warmer months.

3. Tourists

The new park will become one of Saint Petersburg's new attractions and will inevitably catch the attention of tourists. Within a 15-minute walk from the park there are about 1,400 hotel rooms. In addition, the future park is located near public spaces that are popular among tourists such as the Peter and Paul Fortress, the Spit of Vasilyevsky Island, and Palace Square. It is possible that tourists will visit Tuchkov Buyan Park only once in their lifetime. However, during the high season their numbers may dominate among the total number of visitors.

VISIT TIME

- mainly during the day; to a lesser extent, in the mornings and evenings.

VISIT SEASONALITY

- year-round, but in the greatest numbers during high season (May — September) and on school holidays (January, approx. 10 days in March, and approx. 10 days in October).

User requirements

> **Among the identified requirements regarding the design and services in the future park, there are both those that have unanimous support and those that are regarded as a potential possibility or a bold experiment.**

Landscape and greenery

Since the abundance of greenery is regarded as one of the key values of the future park, users have been keen to make known their needs and suggestions in this area.

- A variety of greenery: trees (including mature trees), bushes, 'natural' lawns, etc.;
- The possibility to have direct contact with nature (lawns on which you can sit, play, and have picnics);
- Use of evergreen plants (so that the park will be green in autumn and winter too);
- Green hedgerows to shield the park from the street noise of Dobrolyubova Avenue;
- Landscaping of streets and squares that are adjacent to the park;
- Use of unusual landscaping techniques: vertical landscaping and green roofs of buildings.

Connection with water

Although Saint Petersburg is occasionally called the 'Venice of the North,' access to water in the central part of the city is limited to the ability to look at the rivers and canals from high granite embankments. This limitation gives rise to the request for new forms of waterfront space planning in the park.

- Observation points and viewing platforms for observing the river and the banks across the river;
- Design and infrastructure elements that give direct access to water (for example: steps, a platform next to the water);
- The use of water in the park as a landscape element (modern fountains, ponds, streams, rain gardens, etc.);
- The creation of a continuous cycling and pedestrian path going from the park to the neighbouring embankments: across Tuchkov and Birzhevoy Bridges, to Petrovsky Island and Mytninskaya Embankment respectively.

Food services

Recommendations and interests in the development of food services vary by age group. Teenagers and students are considerably more active users of food services and have more requests and proposals, while other age groups are less vocal in this regard.

- Cheap bakery and pastry shops in the park;
- Location of food service points mainly around the perimeter of the park closer to the streets, embankment and Dance Palace;
- Mobile healthy food outlets;
- Cafés and restaurants, the use of mobile services and facilities in a pop-up format;
- Location of mobile points with drinks: cold drinks in the summer and hot drinks in winter/autumn/spring.

Event programming and infrastructure

Opinions on what the event programming of the park should look like also differ among different categories of residents who can't always choose between the option of a quiet park for contemplation and relaxation by the water and the option of a meaningful event-driven space, where it's not only quiet and beautiful, but also interesting. However, some demands are shared by all categories of users.

- Unconventional playgrounds with a unique design and unique equipment for children of all ages;
- An intimate music/theatre space with an amphitheatre for the audience, to be used by the Dance Palace as well;
- The possibility to hold educational events (lectures, master classes, etc.) without creating permanent structures;
- An area for temporary exhibitions;
- Space for holding small festivals.

Winter activities

Open public spaces that operate year-round are important for Saint Petersburg with its climate. Warm weather lasts about 4–5 months per year and there are around 75 sunny days per year. Wind and rain are typical, and in the winter months the low temperatures can make outings in the park uncomfortable. For this reason, many of the wishes and proposals of users are related to the creation of conditions for visiting the park in the cold season.

- Opportunities for walking and active movement in the park in the winter-time (for example, a linear ice rink);
- Provision of amusement facilities in the winter (for example, winter slopes for sliding, including for adults);
- Rental points for winter sports equipment (Finnish sledding, ice skates);
- Pavilions with hot drinks;
- Heated toilet facilities;
- Good lighting in the evening;
- Heated benches.

Objectionable activities

Different categories of users expressed not only their wishes, but also general concerns about which elements in Tuchkov Buyan Park they consider undesirable or inappropriate.

SPORTS

Most users are in agreement that in an iconic central park, which Tuchkov Buyan is to become, there should not be a particular emphasis on sports. Special sports facilities and sports grounds should not be built there. Many users noted that a large cluster of sports facilities at the Yubileyny Stadium is directly adjacent to the park, so there is no need to make additional sports venues. This restriction does not apply to sports associated with moving around the park's territory (running, Nordic walking, bicycles).

AMUSEMENT ATTRACTIONS AND MASS EVENTS

Residents of Saint Petersburg believe that Tuchkov Buyan should by no means become an amusement park or a location for mass events causing a man-induced impact on the softscape. Open-air film screenings are acceptable only in small temporary open-air venues for a public of dozens or hundreds of people.

INFRASTRUCTURE FOR MASS TOURISM

Residents of Saint Petersburg believe that the park should not become a destination for mass bus tourism. Accordingly, it should not have infrastructure oriented to mass tourism (for example, parking for sightseeing buses). Therefore, residents of Saint Petersburg are skeptical of the idea of an iconic wow site that could become a destination for mass bus tourism. However, these restrictions should by no means apply to individual tourists who can spend time in the park in the same way as Petersburgers (for example, going here after visiting the Peter and Paul Fortress or on the way from the Spit of Vasilyevsky Island).

— 3 —

Park Programming

Requirements and recommendations

Propose a solution that accounts for all elements of the park's service and functional model.

No less than 70% of Tuchkov Buyan's total area inclusive of the foundation plinth and the underground parking roof should be devoted to softscape.

The recommended gross area of park buildings and structures is approximately 6,000 m^2, excluding the Boris Eifman Dance Palace and the 540-space underground parking. Deviations from the recommended gross area by more than 20% must be justified. The gross area of each single item is a recommendation.

Include elements of design and infrastructure that facilitate contact with water: provide direct water access to the Malaya Neva river; include fountains and other hydro-technical utilities in the park landscape.

Design solutions must create opportunities to organically combine elements of event programming with the main function of quiet leisure in nature: spaces and infrastructures should be included for both outdoor and indoor small-scale entertainment and educational events, as well as temporary exhibits and installations.

Design solutions should create opportunities for those types of active leisure appropriate for a park in the city centre (for example, integrating a playful landscape for visitors of all ages into the park).

The park should be dynamic and open to changes and development through multifunctional, temporary sites and buildings that can change their functionality, size and configuration over the course of a day, week, season or long term to serve programming needs or the desires of visitors.

Propose solutions that provide for year-round use of the park, taking into account Saint Petersburg's climate and the specific project area. One of the most important tasks of the competition is the development of scenarios for the life of the park and the creation of comfortable conditions for visitors to the park at any time of year, especially in the time between seasons (autumn and spring) and in the colder months.

Use the existing landscape and constructions (foundation plinth) of the territory as logically as possible. The foundation plinth can be utilised for placing park functional zones, park services and/or landscape solutions.

It is necessary to account for the need to provide for visitors' safety, including anti-terrorist measures.

Examine the potential for staged realisation so that the park can open to visitors in parts. This will allow for the territory to be more quickly integrated into the life of the city and avoid a one-time mass influx of visitors that could damage the landscape. The first phase should include the area adjacent to the Boris Eifman Dance Palace scheduled to open in 2021-2022.

The economic feasibility and cost-effectiveness of design solutions must be accounted for:

- The overall projected cost of realising the park should not exceed 6 billion rubles, including VAT. This sum includes construction work and excludes design work and investigation;
- It is recommended to calculate the cost-effectiveness of proposed solutions based on the potential for subsequent use, operating costs and possibilities for generating revenue;
- The project is not designed to provide a return on investments. However, the proposed solutions may offer a way to cover some of the operating costs of the park.

Service model

> The service model was developed based on an analysis of the demands of users, the garden and park traditions of Saint Petersburg, the surrounding context and the positions of Saint Petersburg experts. The park must be year-round, so it is necessary to provide services that can attract visitors at any time of year – especially autumn, winter and spring.

ACTIVE RECREATION

- Playful landscape[1]
- Yoga
- Dance
- Running
- Table tennis
- Petanque
- Ice skating
- Sledding
- ~~Standard playground~~
- ~~Playrooms~~
- ~~Field sports~~
- ~~Gym exercise~~
- ~~Water sports~~
- ~~Dog runs~~

PASSIVE RECREATION

- Nature walks
- Water access
- Appreciation of nature and city views
- Relaxing on the lawn
- Relaxing in the amphitheatre
- Sitting on benches and other small architectural forms
- Small lectures, master-classes
- Glasshouse tours
- Temporary exhibits
- Temporary artworks, installations
- ~~Visiting landmarks~~
- ~~Permanent art object~~
- ~~Group tours~~

FOOD SERVICE

- Quick snacks in a cafe/coffee shop/ bakery
- Street food at a food market
- Street food at a kiosk
- Picnic without open flame
- Drinking fountain
- ~~Sit-down meals~~
- ~~Local food as a tourist attraction~~
- ~~Haute cuisine~~

RETAIL

- Purchasing park souvenirs
- Purchasing plants in the glasshouse
- ~~Extended shopping~~
- ~~Markets~~

1. Active leisure space for all ages.
2. The installation of signage for interesting nearby objects or other green spaces in the city can reduce the average visit length in the park. This will help lower the recreational load on the park, which is predicted to be high (see ‘Visitorship’).

EVENTS

- Small events
- ✕ Festivals, mass events
- ✕ Official ceremonies
- ✕ Unofficial ceremonies
- ✕ Private events
- ✕ Business events

HYGIENE

- Toilets
- Parenting rooms

WAYFINDING

- Info centre
- Maps
- Signage for park locations
- Signage for locations outside the park[2]

ACCESSIBILITY[3]

- Entrances
- Pedestrian crossings
- Cycle paths
- Cycle parking
- Public transit stops
- Metro station
- Pier
- Taxi ranks
- ✕ Added parking[4]
- ✕ Tour bus parking

SAFETY

- Meeting points
- Guard patrols
- Guard posts
- Video surveillance
- Notification system

IT INFRASTRUCTURE

- Electrical outlets
- Wi-Fi

MEDICAL HELP

- First aid

STORAGE

- Lost-and-found
- Storage lockers

LIGHTING

- Streetlights
- Decorative illumination

REFUSE

- Rubbish bins
- Recycling

3. For more details, see 'Transport.'
4. In addition to existing parking.

● Part of the service model
✕ Not envisaged in the park

Concept scope

№	NAME OF THE TERRITORY	AREA, ha
Concept scope[1]		**16.6**
1	Tuchkov Buyan Park	9.9
	Foundation plinth	4.2
	Underground parking roof	2.0
	Undeveloped territory	3.7
2	Embankment	2.0
3	Academic Likhachev Square	1.6
4	Adjacent streets: Dobrolyubova Avenue, Speranskogo Street and pedestrian section of Bolshoy Avenue of the Petrograd Side	3.1

Concept scope
the territory for which competitors must present design proposal

16.6 ha
Concept scope area

Tuchkov Buyan Park
key element of the competition concept for which a detailed functional model is presented in the brief

9.9 ha
Tuchkov Buyan Park area

Area of consideration[2]
area that can be included in the concept to enhance connectivity and comprehensive territorial development

1. The footprint area of the Boris Eifman Dance Palace is not included in the concept scope. Its form-based and architectural solutions are not part of the competition subject.
2. For more information, see 'Urban context.'

Park functional model

Land use table[1]

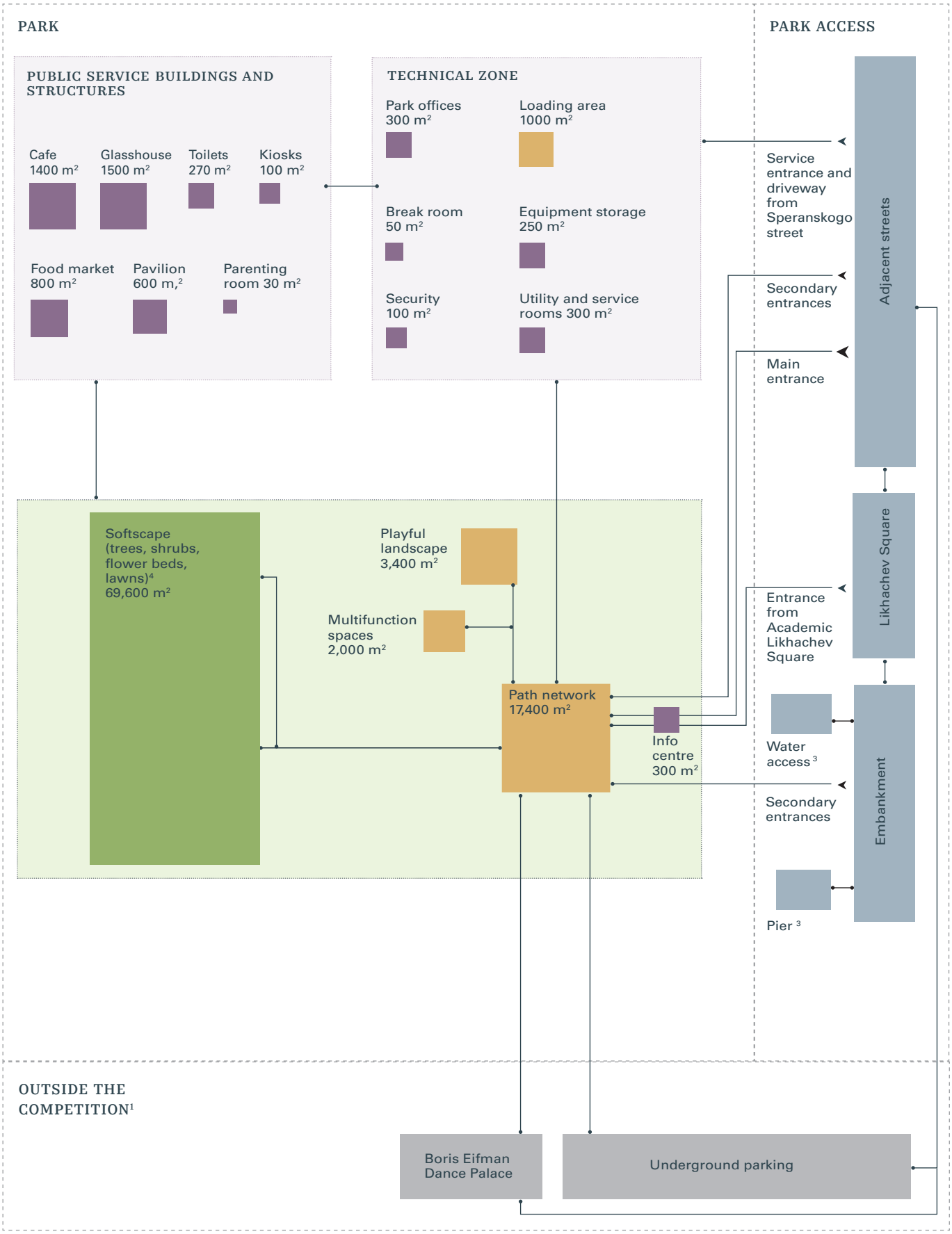
No less than 70% of Tuchkov Buyan's total area inclusive of the foundation plinth and the underground parking roof should be devoted to softscape. Footprint area of each item in the table below is a recommendation.

№	ZONE	FOOTPRINT AREA, m²	PERCENTAGE OF OVERALL PARK AREA, m²
	Park	99,400	100%
1	Softscape (trees, shrubs, flower beds, lawns)[4]	69,600	No less than 70%
2	Hardscape	23,800	24%
2.1	Path network and entrance areas	17,400	18%
2.2	Multifunction spaces	2,000	2%
2.3	Playful landscape (all-ages active leisure zone)	3,400	3%
2.4	Technical and maintenance spaces (loading area)	1,000	1%
3	Buildings and structures[1]	6,000	6%

Gross area recommendations for buildings and structures[1]

The recommended gross area for buildings and structures is 6,000 m², excluding the Boris Eifman Dance Palace and the 540-space underground parking. If deviating from the recommended gross area for buildings and structures by more than 20%, it is necessary to present a justification.
The gross area of each item in the table below is a recommendation.

№	ZONE	GROSS AREA, m²
3	Buildings and structures[2]	6,000
3.1	Event and educational spaces	2,100
3.1.1	Multifunction pavilion	600
3.1.2	Glasshouse	1,500
3.2	Food service	2,300
3.2.1	Restorants/cafes/bakeries/coffee shops	1,400
3.2.2	Food market	800
3.2.3	Kiosks	100
3.3	Basic services	600
3.3.1	Info centre	300
3.3.2	Toilets	270
3.3.3	Parenting room	30
3.4	Technical and maintenance spaces	1,000
3.4.1	Equipment storage	250
3.4.2	Guard post with first aid capability	100
3.4.3	Utility and service rooms	300
3.4.4	Park offices	300
3.4.5	Break room and changing room for personnel	50



1. The Boris Eifman Dance Palace and the 540-space underground parking (except for the roof) are not the subject of this competition and are not included in the total recommended gross area of buildings and structures (6,000 m2) specified in the functional model.
2. The areas listed in the table were determined based on Russian and international standards, expert recommendations, user demands, and projected visitorship.
3. The area of this element is left to the judgment of the competition participant.
4. For recommendations regarding spatial structure balance see ‘Landscape’, p. 63

Description of the park programme

> **It is necessary to propose a solution for including all the elements of the park's functional model and provide for both the convenience of functional connections and the efficiency of interaction between different parts of the park and the territory, both amongst themselves and with surrounding construction.**

Operating schedule

The park will be open year-round; therefore, it is important to facilitate its use in all weather conditions, especially during autumn, winter and spring. This includes proposing solutions that do not require for the park to be closed in order to dry out after the soil thaws, as often happens in Saint Petersburg's other parks.[1]

Safety

It is necessary to provide for visitor safety on the grounds of the park, including developing anti-terrorist measures. Safety during peak visiting times can be ensured by installing barriers around the perimeter of the grounds.

Softscape

No less than 70% of Tuchkov Buyan's total area inclusive of the foundation plinth and the underground parking roof should be devoted to softscape.

Trees and shrubbery

Provide an abundance of calm, quiet leisure areas. When placed next to roads, trees and shrubs serve as a buffer, protecting the park from noise and dirt. Requirements and recommendations regarding landscape planning are laid out in the 'Landscape' section.

Open green spaces (lawns)

The concept should provide for a system of open green spaces of diverse size, from small lawns for secluded quiet leisure to mid-size fields intended for social interaction. Large open spaces should be avoided in order not to create massive concentrations of people, and not to create locations for major events that are undesirable to visitors.

Lawns should be designed so they can be easily turned into skating rinks or other grounds for active winter sports (for example, sledding hills for adults and children) and have an area of 3,000–5,000 m^2.

Requirements and recommendations regarding landscape planning are laid out in the 'Landscape' section.

1. See also 'Ecology.'

Hardscape

Path network

The path network should add up to a multitude of varied routes, offering visitors a range of constantly changing vistas. Entrance zones must accent the entrances to the park and provide connections with the surrounding context. The path network should take into account Saint Petersburg's climatic conditions and be adapted for all user groups, including children, the elderly, and those with limited mobility. The path network should consider the intensity of visitor flow into the park from neighbouring streets and the embankment, all of which is explained in more detail in the 'Transport' section. The path network should cater for the visitors of the Boris Eifman Dance Palace, offering a comfortable routes towards the main entrance, the box office and the VIP entrance[2].

Multifunction spaces

Multifunction spaces provide flexibility in programming and variety of use scenarios: they should adapt to visitors' demands, which can change over the course of a day, week or year, and transform alongside the development of the park. Visitors are given the opportunity to set and change the programme as they see fit.

General list of multifunction spaces:

- 400-seat amphitheatre. The amphitheatre should be a fairly intimate space so as to prevent major events and festivals from being held there, per the wishes of residents. Still, it is recommended to equip the amphitheatre with all of the equipment necessary for hosting events.
- A space for permanent water structures (like fountains and other hydro-technical utilities) and/or temporary installations. It is not recommended to create artificial reservoirs, given the unique legal status of such objects and the difficulty of their continued use.
- Viewing platform

The size of each of these multifunction spaces is not fixed and depends on the participant's conceptual solution.

All-ages active leisure zone

A zone for active leisure designed for visitors of all ages and physical capacities should be carefully integrated into the park's landscape. The usual children's playgrounds and sports fields are replaced by play and interactive elements that fit in organically with the park landscape. Necessary components:

- Active leisure zone for children aged 0–4: 100–150 m^2
- Active leisure zone for children aged 5–9: 150–200 m^2
- Active leisure zone for children aged 10–14: 250–300 m^2
- Active leisure zone for visitors over the age of 14: 2,750–2,900 m^2

Play elements can be focused in one area of the park or distributed around the territory, depending on the participant's conceptual solution.

Technical and maintenance spaces

Technical and service spaces should provide convenient access to the park for service equipment, including contractors. It is necessary to provide for vehicle access, loading and unloading, cargo inspection and temporary storage. A service zone with areas for replaceable waste disposal units should be located no closer than 50m from gathering places for visitors (like walkways, pavilions and the amphitheatre).

2. See also 'Transport': for the location of the Boris Eifman Dance Palace entrances please see plan of 'Transport service of the territory' and 'Pedestrian and cycle accessibility.'

Buildings and structures

The recommended gross area for Buildings and Structures is 6,000 m2, excluding the Boris Eifman Dance Palace and the 540-space underground parking[1]. If deviating from the recommended gross area for Buildings and Structures by more than 20%, it is necessary to present a justification. The gross area of each item is a recommendation.

Event and educational spaces

MULTI-FUNCTIONAL PAVILION

The inner space of the pavilion should easily transform to suit various needs over the course of the day, week or year.

Use cases:

- Event space for up to 250 people, with a stage, audience, coat check, temporary snack bar, toilet, technical and storage areas, paths and corridors, with the capability to install two booths for interpreters. The event programme can be proposed by the visitors themselves, so all of these elements must be as simple to use as possible.
- The space should be easily divided into 5 spaces for 30–50 people each for school and university classes, as well as courses and master-classes for adults.

GLASSHOUSE

Aside from a space open to visitors, this includes a utilities area for plant care and a small flower shop. Participants must decide whether to design the glasshouse as a single, 1,500 m² space or provide for several glasshouses with passages between them, where visitors can take shelter in bad weather.

Food service

RESTORANT/ CAFÉS/BAKERIES/COFFEE SHOPS

FOOD MARKET

KIOSKS

Spaces should be designed for small, cosy and affordable establishments where visitors can grab a quick bite to eat. Insofar as residents would not like to feel surrounded by businesses everywhere in the park, it is recommended to concentrate all food service locations in a single place, providing convenient access to service areas in order to simplify logistics.

Basic services

INFO CENTRE

Aside from its own info centre, visitors have access to a storage space and a small souvenir shop.

TOILETS, INCLUDING ACCESSIBLE

Toilets can also feature folding baby changing tables.

PARENTING ROOMS

Technical and maintenance spaces

EQUIPMENT STORAGE

A space for storing maintenance and other park equipment. Needs convenient access to the park territory and a driveway.

GUARD POST WITH FIRST AID CAPABILITY

UTILITIES AND SERVICE ROOMS

Workshops, materials storage, and utilities service areas.

PARK OFFICE

Office for around 30 employees of the park administration.

BREAK ROOM AND CHANGING ROOM FOR PERSONNEL

1. The Boris Eifman Dance Palace and the 540-space underground parking (except for the roof) are not part of the competition subject.
2. See also ‘Sustainable development.’

Volume of visitors

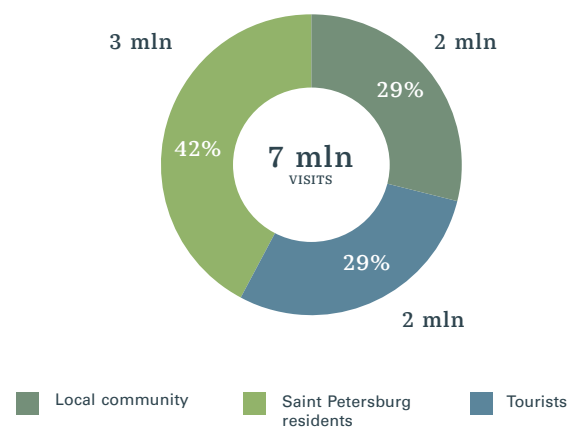
> **In designing the park, it is necessary to take the predicted visitor volume, its dynamics, the average length of visit, and the carrying capacity into account in order to create comfortable conditions for visitors.**

Based on data from anthropological research and analysis of visitorship in both Saint Petersburg's parks and other, similar spaces around the globe, a prediction of the park's visitor volume was created. In the design process, it is necessary to account for peak visitor volume, including during holidays in the city centre.

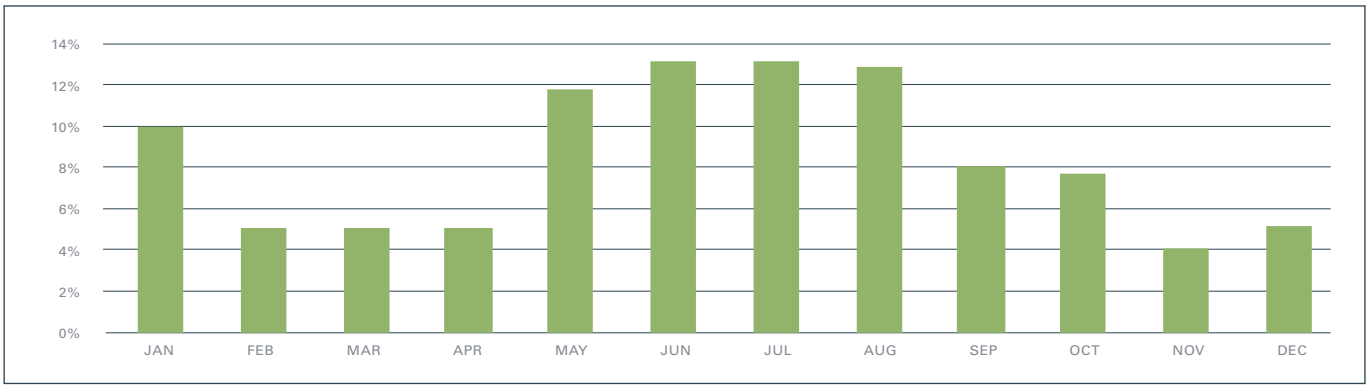
Various sections of the brief include requirements and recommendations targeted toward achieving year-round use (increasing climate comfort, closed buildings with warm contours, and others); however, the participant may propose additional solutions.

YEARLY VOLUME OF VISITORS (2024)	
Total visits	6,868,400 visits/year
DAILY VOLUME OF VISITORS (2024)	
Peak visitors[3]	43,700 people/day
Yearly average visitors	18,900 people/day
Off-peak visitors	11,000 people/day
AVERAGE LENGTH OF VISIT	
All Saint Petersburg residents	1.5 hours per visit
Tourists	0.5 hours per visit
CARRYING CAPACITY (2024)	
Total simultaneous visitors on peak days	4,600 people
Total simultaneous visitors on average	1,900 people

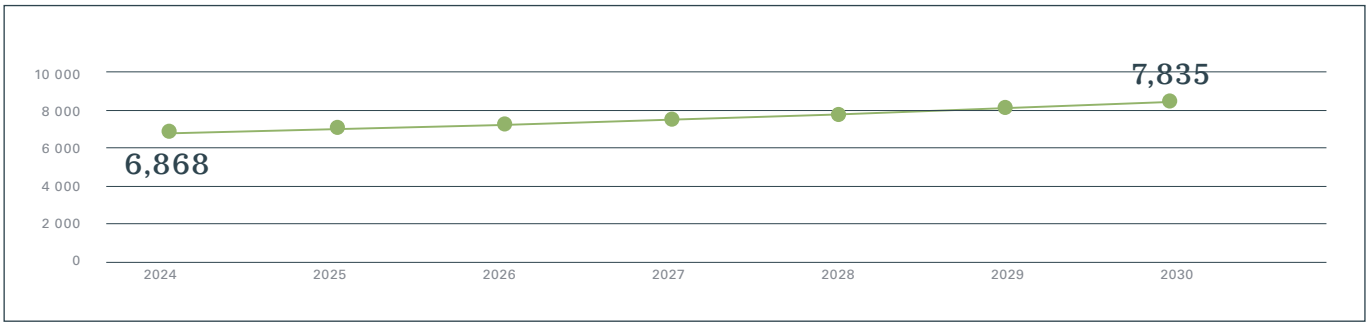
VOLUME BY TYPE OF VISITOR



SEASONALITY



ANNUAL VISITORSHIP GROWTH, thousands of visits



3. The indicated peak number of visitors takes place during summer weekends. Apart from peak days, the city hosts major holidays that attract Saint Petersburg residents and tourists to the city centre: New Years fireworks, Victory Day, and 'Scarlet Sails,' when more than 1.5 million people come to the Neva riverbank over the course of one night.

— 4 —

Landscape

Requirements and recommendations

The landscape concept of the future park aims to transform the challenges and limits of the lot into opportunities and advantages using innovative, unconventional solutions. The landscape plan should observe a balance between zones that interact with a unique urban context and lots that allow visitors to take shelter from the hustle and bustle of the megapolis. Thanks to the anthropogenic relief created by the sunken foundation raft and the lack of an existing landscape, there is a unique opportunity to create a park from scratch. Meanwhile, it is important to underscore the distinctive character of the city's northern climate and create a sustainable ecosystem that demands minimal care in urban conditions. In developing a landscape concept, it is important to not merely propose original solutions, but also observe the demands set forth by the context of a major megapolis and the land to be designed.

The park should become an exemplary work of worldwide landscape design.

The landscape design should highlight views of Saint Petersburg's historical panoramas and offer a variety of scenarios for visual interaction with the urban planning context.

70% of the park's territory should be dedicated to green spaces, created primarily using trees and shrubbery. A balance must be observed between types of spatial structures governed by the northern climate. An abundance of closed types of spatial structures (spaces that are almost entirely covered by a tree canopy) will help create the appearance of a park complex.

The designed softscape of various parts of the park should facilitate the realisation of the territorial functions described in the "Landscape Zoning" section. Strict adherence to the described plan is not required: participants can modify it according to their concept.

It is necessary to develop a vegetation plan that indicates the primary types of plantings. The choices of plantings for the future park should be grounded in the recommended assortment and meet the demands and principles for plant selection.

Preserve as many of the existing old trees on the lot as possible.

The softscape system should be designed with a view to a sustainable urban ecosystem that does not demand complex care.

It is strongly recommended to visualise the park's phased development in the competition concept, beginning with the initial stage to the final design state (with studies and visualisations of intermediate stages of the landscape's development).

In developing the concept for the park, it is important to anticipate the seasonal changes in the park's form.

It is recommended to use predominantly local flora (primarily trees, shrubbery, ground cover and other indigenous plantings) that are hardy enough to withstand intermittent negative influences (climatic cycles, infections, technogenic and anthropogenic influences, etc.).

A typology of plantings should be developed, with a distribution of species by quantity, composition and degree of usage in forming the landscape, taking into account that the predominant species will characterise the park as a whole.

In creating the relief, the embedment of existing concrete foundations should be taken into account. Filling them completely is not recommended. In addition, participants should approach the design of any elevated structures with care, taking Saint Petersburg's primarily flat relief into consideration.

Historical background

Originally the part of the Petrograd Side around Dobrolyubova Avenue used to be very green. Along the right bank of the Malaya Neva river next to its head there used to be a tree nursery. The 1948 master plan of Leningrad called for the transformation of the entire Tuchkov Buyan area into a green zone connecting Petrovsky and Alexandrovsky parks that had been laid out in the 19th century[1]. The park conglomerate project never came to fruition but Dobrolyubova Avenue was indeed lined with trees in the postwar decades and opposite the Prince Vladimir Cathedral, next to the Tuchkov Buyan building, there used to be a green area that partially survived the construction of the Yubileyny sports complex in 1967.

Boulevard on Dobrolyubova Avenue, "Leningrad. Planning and development 1945-1957", p. 153.

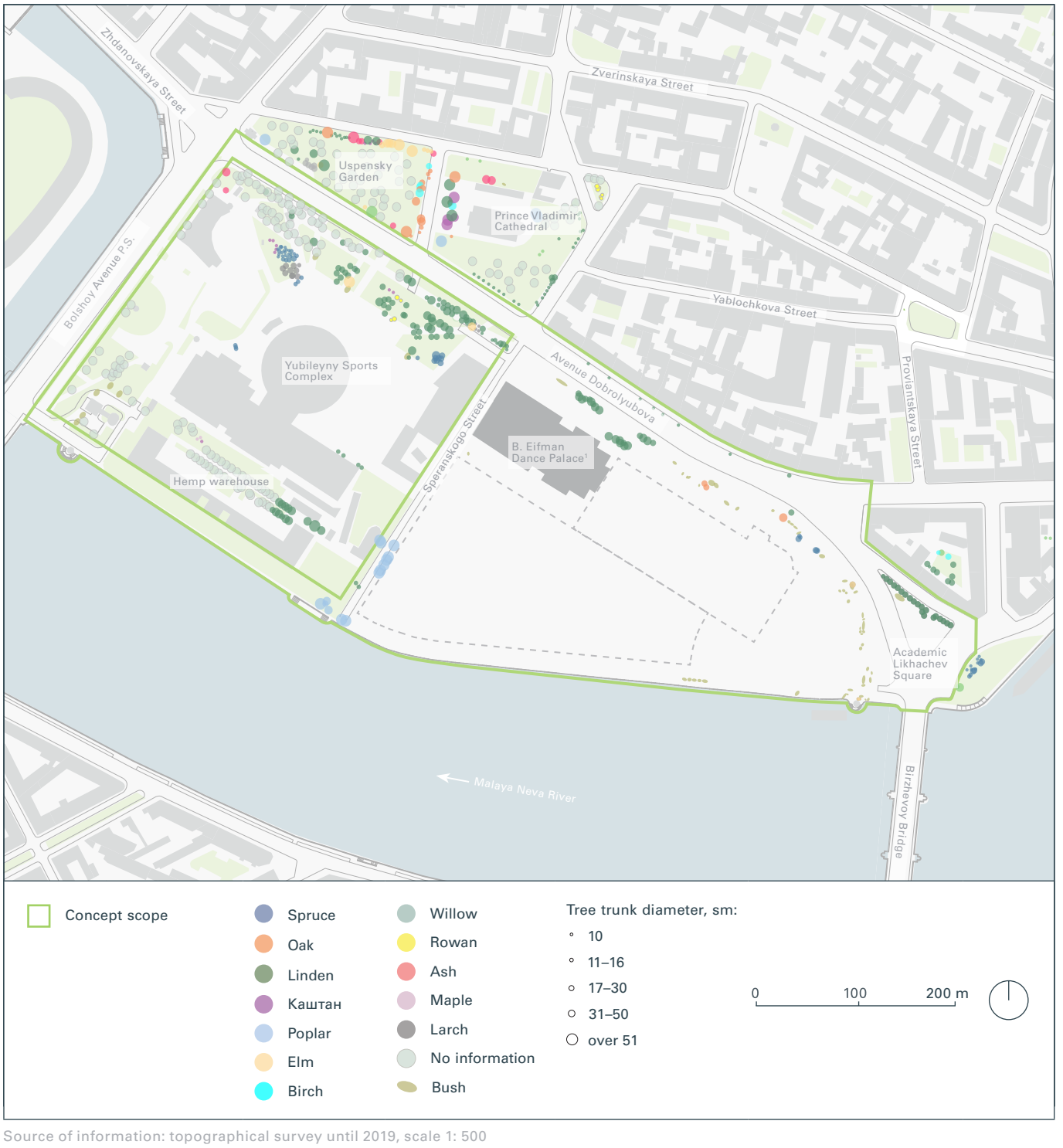
1. For more information, see picture on 81 page 'Panorama of the central city park. Project. Authors — Baranov, Guryev, Ageeva, 1948'

Dobrolyubova Avenue after asphalting, 1948
© Ministry of Culture of the Russian Federation / STATE CATALOG OF THE MUSEUM FUND RUSSIAN FEDERATION / GMI SPb

Dobrolyubova Avenue, 1953 from the book Leningrad. Views of the city. M. 1954
© IsoGiz

Existing situation

> The existing softscape after the start of construction work has been preserved along Dobrolyubova Avenue, Speranskogo Street and Academic Likhachev Square. It is vital to preserve the existing trees and blend them harmoniously into the park's spatial design.



Source of information: topographical survey until 2019, scale 1: 500

Landscape zoning
Landscape zoning plan

The project site is conventionally split into four areas with distinct landscape zones. A set of guidelines is provided for each zone on the basis of the impact of the Neva River, historical setting, existing underground structures, estimated area capacity, and functional programming. The concept design must respect the proposed zoning and the restrictions it implies. However, the plan is tentative rather than mandatory and may be modified by competition participants.

1. Park, including:
   - 1.1. Foundation plinth
   - 1.2. Underground parking roof
   - 1.3. Terrace
   - 1.4. Buffer zone
   - 1.5. Coulisse
2. Embankment
3. Likhachev Square
4. Adjacent streets: Dobrolyubova Avenue, Speranskogo Street, and the pedestrian part of Bolshoy Avenue P.S.

0 100 200 m

1. The Boris Eifman Dance Palace is not part of the competition subject.

Landscape zoning
Zone profiles

1. Park

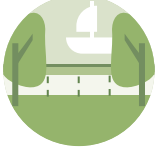
The park is conventionally split into five landscape zones, namely the foundation plinth, underground parking roof, terrace, green buffer, and coulisse.

1.1. FOUNDATION PLINTH

The sunken space made available by the existing foundation plinth should be reused with the greatest possible efficiency. The structures and the resulting elevation differences must be used for creating the park landscape, placing services, and functional programming. Its complete filling is not advised. The 6-metre-deep plinth may be used to create elevation differences between various closed and intimate spaces with artificial soils. More specifically, elevation differences are instrumental in forming dry, wind-sheltered environments.

1.2. UNDERGROUND PARKING ROOF

Softscaping solutions are preconditioned by the limited soil depth on the underground parking roof. This area is best suited for open or semi-open spaces such as lawns or meadows interspersed with dense or sparse shrubbery, formal flower beds and parterres, dry fountains, water bodies, and bioswales[1]. Artificial ground elevations of 1–1,5 metres are conceivable for clumps of small trees. The best solution is to use stress tolerant varieties such as meadow plants, flowering plants, mixed plant or tallgrass lawns, ground cover plants or shrubs, and flower beds.



1.3. TERRACE

The intersection of pedestrian routes coming from Birzhevoy Bridge and Mytninskaya Embankment is a logical choice for the main park entrance. Therefore, the area must facilitate intense human traffic and preferably provide view corridors towards nearby landmarks and iconic sights.

1.4. GREEN BUFFER

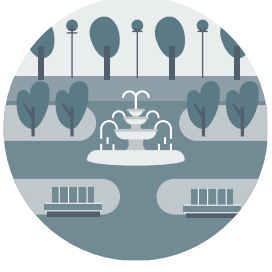
A green belt along Dobrolyubova Avenue is required to screen the park from the traffic and shelter it from noise, vehicle emissions, and dust. It is also instrumental to clearly define the boundaries of the recreational area. This solution calls for common Saint Petersburg varieties of pollution-resistant trees tolerant to drought, salinity, and shade. They may be protected from de-icing and other road chemicals by ground elevations.

1.5. COULISSE

A windbreak for the best part of the park. The suggested solution is to plant a multi-layer shelterbelt of wind-resistant trees tolerant to waterlogged grounds and flooding, conceivably on elevated grounds. The planting scheme must respect the landmark view corridors and panoramic views.

2. Embankment

The proximity to the Neva River exposes the park riverfront to strong winds and humidity. The embankment may suffer from high water levels and flooding. At the same time the embankment is designed to become an integral part of the pedestrian route from Birzhevoy Bridge to Tuchkov Bridge. Therefore, landmark view corridors and panoramic views must be respected and emphasised.



3. Academic Likhachev Square

This is one of the main entrances to the territory which connects the park with existing walking routes. This area can be either a part of the park or a stand-alone territory, while providing safe and comfortable pedestrian connections between the park and its surroundings. This area lends itself to a public garden or pocket park with a green belt screening the sidewalks from the wind and traffic while shaping the visual identity of the square that should reference the historical Saint Petersburg ensembles.

4. Adjacent streets

Creating green areas along the adjacent streets allows the park to expand and connect to the urban green grid. It is essential to make walking along these roads nice and comfortable, especially for local residents. To that end, the sidewalks and other pedestrian areas must be protected from traffic by a green buffer, preferably consisting of pollution resistant and drought tolerant trees.

1. Bioswales are landscaping features used to slow, collect, infiltrate, and filter stormwater through special soils and plants.

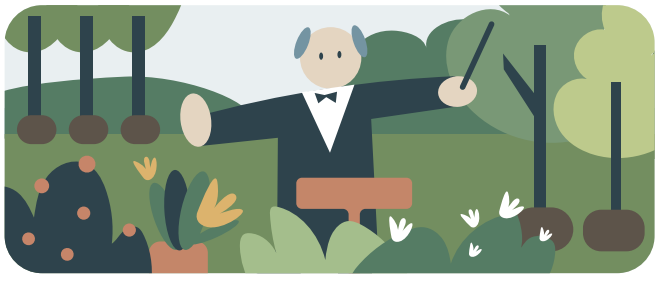
Guidelines for softscaping and plant selection

Local identity

It is important to emphasise the indigenous local species of Northwest Russia in plant selection in order to enhance the identity of the area[1]. The new park should become a showcase of an advanced ecological approach based on local plant communities in their natural habitat. With due maintenance and preservation, the elements of the ecosystem will tie together for better sustainability.

Plant communities

The selection of plant species must reflect site-specific combinations and rely on their structure in shaping new communities. These associations are instrumental to promote long-term and healthy interspecies relationships between plants and other elements of the ecosystem. The concept design must aim at soil enrichment, rehabilitation of soil-borne microflora, and biomass growth.



Diversity

A sustainable ecosystem in a fully developed park requires a harmony of plant varieties. The species should be selected on the basis of their size, planting schemes, growth rates, and their visual impact on the overall park design. It is recommended to use large trees. Visual diversity is accomplished through a combination of various planting categories, notably formal (architectural and urbanistic) and naturalistic (landscape and natural). Some of the planting has special uses, such as protection, water management, soil restoration, and ecosystem integration.

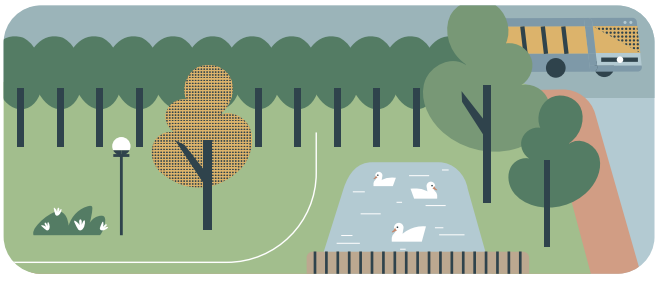
The concept design must include an overview of project plants with a breakdown by function (main variety, companion species, flowerers, and accent plants). It is important to bear in mind that the main variety shapes the image of the whole park. Competition participants must also identify the required species and their share in the overall plant design.

Microclimate and soils

The plants in the park must be tolerant to the climate pattern of the project site and look attractive during the whole year[2]. Saint Petersburg has unstable mild winters with frequent thaws, brief cool summers and high levels of ground and air humidity throughout the year as well as strong winds. The seasonal snow cover in parks and natural sites lasts 3/4 months. The growing period is less than 6 months, lasting from early May to early October. The considerable amount of rainfall provides enough water to make additional irrigation systems superfluous.

The concept design and softscaping solutions should take into account the following basic principles. However, they are advisable rather than mandatory.

In developing a concept for the park, selection of landscape solutions and vegetation species, several important principles should be taken into account. However, it is not necessary to follow them strictly.



Urban environment

Participants are encouraged to select plant varieties tolerant to urban conditions such as air pollution, shade, drought, and chemicals, with a preference for low maintenance species. A green belt must be provided to protect the park from noise, dust and vehicle emissions.

Attractive in all seasons

The image of the park transforms with the seasons. Landscape solutions facilitating the seasonal change of setting would help to break the monotony and avoid tedium.

Spatial structure balance

Closed spaces and multi-layered vegetation[3] are required to facilitate the sustainable and healthy development of park softscape while creating a comfortable environment. In these structures transparency and connectivity are provided under the canopies, above the level of visual corridors. Panoramic alleys and vistas are also instrumental in that respect. Open spaces play a key role in recreational activities but they do not allow for an escape from the visual and cognitive stress of urban settings.

In order to create a balanced habitat, participants are encouraged to combine various types of spatial structures while prioritising dense canopies and multi-layered planting including herbaceous cover, shrub, understory, and canopies. Recommended balance of spatial structures (percentage of the total area of the park softscape):

- 30–60% closed spaces (dense greenery/groves)
- 10–40% semi-open spaces (clumps, sparse greenery)
- 20–30% open spaces (lawns, meadows, event grounds, water bodies)

The spatial structure balance is determined by the project site specifics along with ecological, sanitary and hydrological requirements.

Landscape design heritage of Saint Petersburg

Participants are encouraged to draw on the strong landscape design traditions of Saint Petersburg[4] that feature panoramic views and vistas[5] focused on iconic landmarks, juxtapositions of diverse kinds of dense greenery, alleys with multiple rows of trees, green coulisses, picturesque lawns and borders infringed by dense shrubbery, and single trees.

1. For more details please see the chapter on Identity of the Northwest region flora in the Appendix.
2. Please see the chapter on Climate for more details.
3. For more details please see the chapter on spatial structures in the Appendix.
4. Please see the chapter on Heritage for more details.
5. A vista is a long, narrow view between rows of trees or other forms of green coulisses, closed by a focus point such as a building, a monument, a body of water, an unusual tree, etc.

— 5 —

Cultural Heritage

Requirements and recommendations

The design territory is included in the integral structure of the urban planning environment of the historical centre of Saint Petersburg. For more than three hundred years of the city's history, the layout, development and character of the functional use of the site have changed many times.

The designed park will ultimately be included in the system of historical open public spaces that define the appearance of the city.

In developing the park concept, it is necessary:

- to rely on the traditions of design and organisation of garden art objects in Saint Petersburg;
- to ensure the continuous development of sustainable composition techniques in planning and landscape design of the territory;
- to avoid direct quotation and inclusion of pseudo-historical elements.

The design territory is located within the boundaries of the 'Historical centre of Saint Petersburg and related groups of monuments' world heritage site. The main requirement in this relation is to preserve the outstanding universal value that became the ground for inclusion of the site in the UNESCO List.

Preservation and continuous development of the following features, ensuring the integrity of the historical and cultural landscape of the Neva banks, should become the key principles in development of the concept:

- availability of a system of parks and gardens opened to the river;
- availability of established embankments within the historical centre of Saint Petersburg and their individual character;
- unique characteristics of the terrain of the natural valley (elevation marks) and configuration of the Neva bed and its tributaries;
- formed views of historical architectural dominants;
- panoramic vistas, historical scale and character of development along the Neva banks;
- significant visibility depth of the river panoramas.

The project area is within the boundaries of the united protection zones of the cultural heritage sites located on the territory of Saint Petersburg.

This stipulates the following restrictions:

- the height of buildings and structures should not exceed 25 m;
- in developing the concept, it is necessary to ensure preservation of the valuable elements of the historical landscape and composition structure: existing views of Prince Vladimir Cathedral, panoramic perception of the Neva water area and Makarov Embankment from the coastal area within the boundaries of the design territory;
- placement of water (floating) objects is allowed at Tuchkov Bridge, in the cross-section of Speranskogo Street, at Birzhevoy Bridge.

The project area looks out on the Neva, part of the structure of the main urban space, which is distinguished by the compositional completeness of the river panoramas and perspective views. The site is visually connected with key architectural dominants: Prince Vladimir Cathedral, the ensembles of Peter and Paul Fortress and the Spit of Vasilyevsky Island. The designed park will become a part of the panorama of the Neva water area.

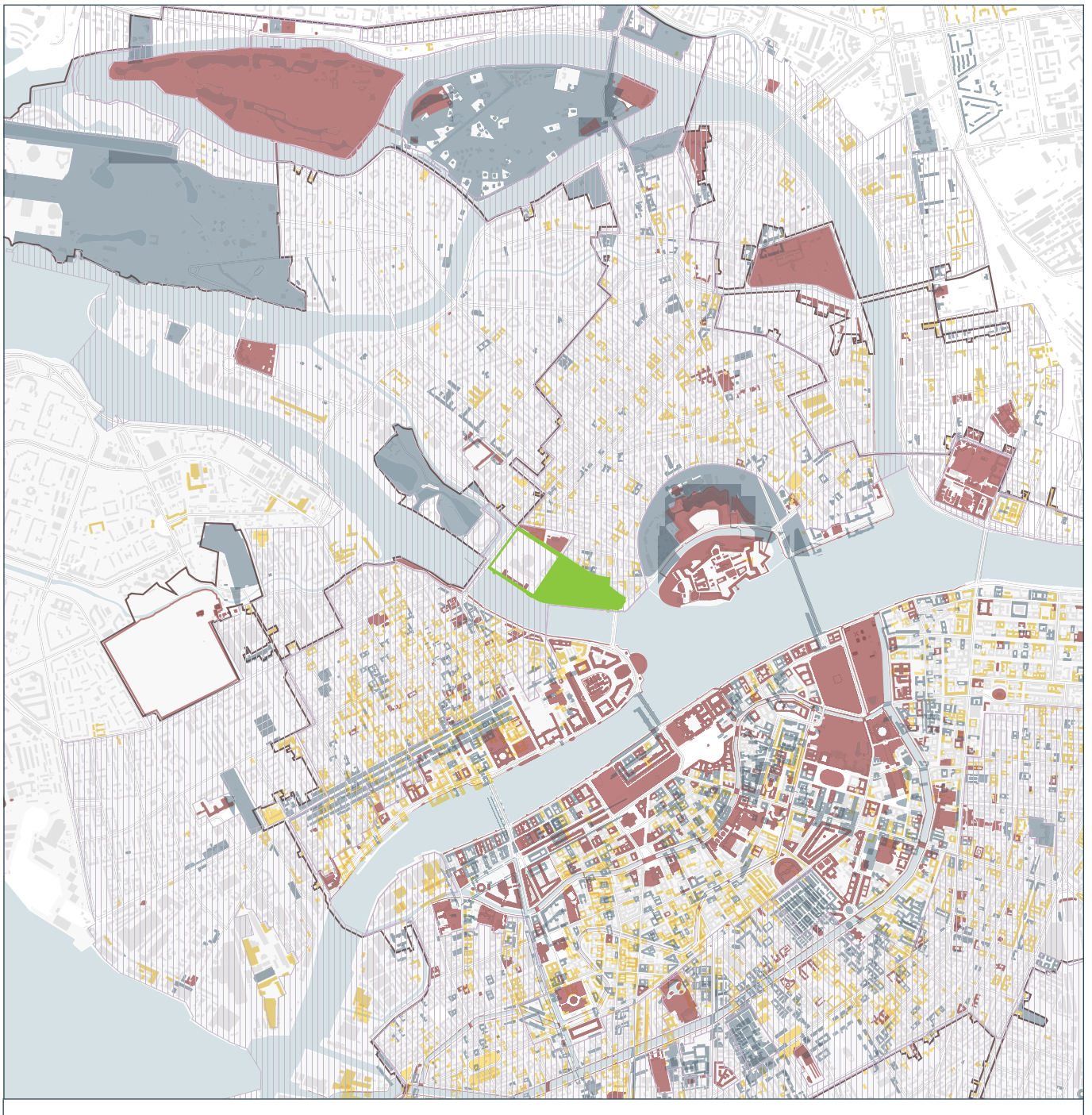
In developing the concept, it is necessary to ensure the compositional unity of the park zone with the established open spaces of the historical centre of Saint Petersburg, to provide for preservation of the visual perception of Prince Vladimir Cathedral from Makarov Embankment.

The granite embankment on the right bank of the Malaya Neva at the site between Tuchkov and Birzhevoy Bridges is not related to the historical appearance of Vatny Island and has no status as a cultural heritage site.

When designing a new embankment, it is necessary to adhere to the principles of design and accomplishment of the historical embankments of Saint Petersburg, including materials used and colour solutions. Descents to the water should be arranged by analogy with the descents arranged on the historical embankments of Saint Petersburg.

The territory of the federal cultural heritage site 'Tuchkov Buyan (Hemp warehouse on Tuchkov Buyan)' directly adjoins the embankment of the Malaya Neva. Today, the building of the former Hemp warehouse is not in use. In developing their concepts, participants can propose options for functional use of the monument and its inclusion in the planning solution of the designed park.

Cultural heritage sites



Concept scope

The territory of the UNESCO World Heritage Site 'Historic Centre of Saint Petersburg and Related Groups of Monuments' (component No. 540-001 Historic centre of Saint Petersburg)

Protection zones of cultural heritage located in the territory of Saint Petersburg

Cultural Heritage:

Federal significance

Regional significance

Identified objects

0 0,5 1 км

To compile a list of restrictions imposed on the territory, legislative documents were analysed. The project area is located within the main component of a UNESCO World Heritage Site, as well as within the compositionally completed spaces; however, the area itself is not a cultural heritage object.

- **The Law of St. Petersburg dated January 19, 2009 No. 820-7 'On the boundaries of the united zones of protection of cultural heritage sites located on the territory of St. Petersburg, land use regimes and requirements for urban planning regulations within the boundaries of these zones' (current version), Federal Law of June 25, 2002 No. 73-FZ 'On objects of cultural heritage (historical and cultural monuments) of the peoples of the Russian Federation.'**

  Valuable components of planning and landscape compositional structure.

  Components of historical landscape compositional structure:
  2.3. Panoramas.
  2.3.1. In the historical centre, panoramas, main sites and their viewing paths are under protection.

  The combinations of components of the historical urban landscape with accents and centrepieces against the sky are protected within a 9-kilometre visibility. Objects located beyond the 9-kilometre area lose the clarity of the silhouette and do not affect the visual perception of the panorama.
  2.3.2. Panoramas:
  a) from the mouth of the Bolshaya Neva and Malaya Neva rivers;
  b) panoramas of the water area of the Neva River. <...> Makarov Embankment between Birzhevoy and Tuchkov Bridges from the viewing path along the opposite bank of the Malaya Neva River, along Birzhevoy and Tuchkov bridges <...>.
  2.5. Compositionally completed spaces.
  2.5.1. Compositionally completed spaces form: rivers and canals with bridges and front buildings of embankments, areas with front buildings, avenues and streets with frontline buildings.

  Under protection: volumetric and spatial composition, dimensions of buildings, architectural designs of façades, greenery and landscaping system, objects of monumental art.
  2.5.2. The list of compositionally completed spaces:
  a) rivers and canals with bridges, frontline buildings of embankments: <...> the Malaya Neva River between Birzhevoy and Tuchkov bridges; <...>

- **The Convention for the Protection of the World Cultural and Natural Heritage, adopted on November 16, 1972 at the 17th Session of the UNESCO General Conference, was ratified by Decree of the Supreme Council of the USSR of March 9, 1988 No. 8595-XI.**
- **Guidelines for the implementation of the Convention concerning the Protection of World Cultural and Natural Heritage.**
- **Recommendation on historical urban landscapes, adopted on November 10, 2011 at the 36th Session of the UNESCO General Conference.**

  The area is located within the boundaries of the main component of the World Heritage Site — No. 540-001 'Historical Centre of Saint Petersburg.'
  It is important not to distort the outstanding universal significance of the historical centre, including the following parameters that are not allowed to change in the area: the configuration of the natural channel of the Neva River and its tributaries, the location and coastline of the islands of the Neva Delta, the depth of visibility of river panoramas and visual perspectives, the scale and nature of architectural development along the banks of the Neva River.

History of landscape gardening art in Saint Petersburg

The evolution of gardens and parks in Saint Petersburg has always been determined by the general course of national and world history, being inextricably linked with the economic and cultural development of Russia, its changing social aspirations and diverse artistic movements.

During all periods of its development, garden art was closely connected with architecture, owing to the direct interaction of landscape and architectural components of a garden ensemble and the transfer of the prevailing style trends from architecture and other visual arts. The measure of this interaction in different historical periods has been changing under the influence of various factors.

Changes occurred not only at the level of formal attributes of a particular style, decorative details or the layout of greened spaces. The attitude to the utilitarian component of landscape gardening complexes, their ideological content, and social essence has also been changing.

It is recommended to take into account the abundant heritage of landscape architecture of Saint Petersburg, known throughout the world. Pan-European traditions and characteristic features related to the particular climatic and historical conditions were reflected in it vividly.

They include:

- full or partial preservation of regular composition elements;
- a large number of open spaces with planar landscape elements (lawns, flower beds) or shrubbery, shading the architectural environment and contributing to the disclosure of panoramic views of the city;
- the lack of pronounced vertical accents in the terrain;
- a limited number of conifers and ornamental hardwoods;
- widespread use of decorative water components and objects;
- the historically evolved character of small architectural forms;
- composition of materials in use:
- metal, cast iron and forging; less often wood, granite, limestone.

Pavlovsky park. Engraving by A. Ukhtomsky from a painting by S. Shchedrin

First half of the XVIII century

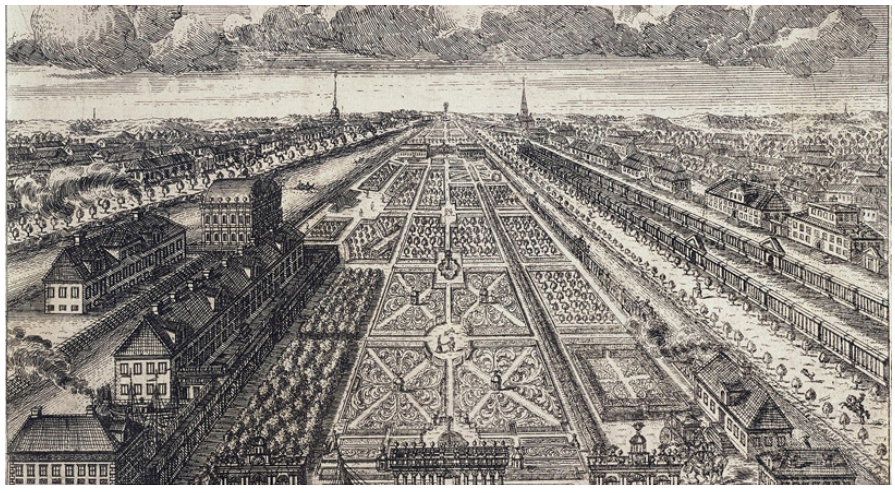
The upsurge in garden art associated with the construction of a new capital on the Neva banks. By the beginning of the 18th century, Russians were already experienced in creating landscape gardening compositions in Moscow. However, Moscow gardens of the 17th century were limited in size and rather simple in form. They only distantly corresponded to the architecture of palace buildings and did not form an integral and coherent spatial composition with them.

Saint Petersburg landscape gardening compositions developed according to new principles, reflecting the general cultural trends of the early 18th century as part of the regular style prevailing in Europe, in the spirit of Baroque art. The following features can be attributed to the leading manifestations of the European type of a regular palace and park ensemble that had formed by the end of the 17th century:

- The integrity of the whole composition, including the palace, adjacent open spaces and more remote forest park areas. The palace is the pronounced centrepiece of the entire ensemble. Everything is ruled by strict order, symmetry, balance, and consistency.

- Active transformation of the natural landscape and greenery. The regular garden turns into a direct continuation of the palace itself.
- The abundant inclusion of sculptural compositions, often having allegorical significance and enhancing the solemnity of the regular park.
- Attraction to curiosities and 'wonders,' such as specially trimmed trees, mazes, gazebos, illuminations, water amusement arcades, etc.

> The creation of extensive, regularly planned and richly decorated parks in the new capital in the Petrine era was an actual means of ideological influence, a way of introducing elements of a new secular culture



Summer Garden in 1716
© Alexey Fedorovich Zubov / Public Domain / Wikimedia / State Hermitage Museum

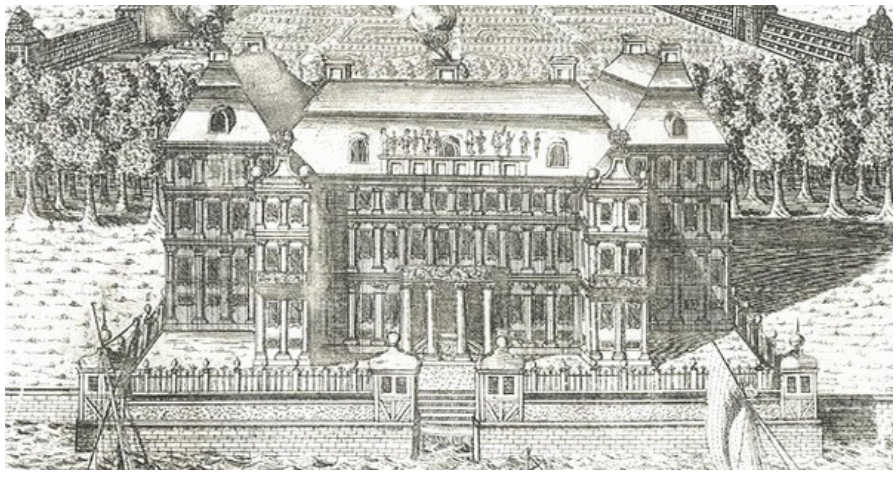
The functional significance of the regular parks of European royal residences was that they were the seat of the court, diplomatic receptions, holidays and carnivals, enchanting performances. Regular parks were treated as trappings of wealth not only of their owner, but also of the state.

In Russia, regular compositions of Petrine times also expressed the ideas of hierarchical order, solemnity and greatness, yet also had a number of fundamental differences. The emperor himself introduced features of a more realistic approach into the arrangement of regular parks. The creation of extensive, regularly planned and richly decorated parks in the new capital in the Petrine era was an actual means of ideological influence, a way of introducing elements of a new secular culture. It was in them that mass festivities were staged, since the palaces could not accommodate a large number of people. Parks made it possible to blend together a variety of art forms. They acquired the significance of a symbol of a new time, embodied the ongoing social changes.

Among the regular garden and park ensembles of the early 18th century, a special place belongs to the Summer Garden. It opens up a series of brilliant ensembles of the new capital and at the same time carries the features that characterise the transitional era in garden art.

The garden was laid in 1704—1706 and initially occupied only the northern part of the site, which is facing the Neva. The garden overlooked the river with a multi-columned gallery, which was set exactly along the main axis, directly by the water. It was also complemented by two other richly decorated pavilions that were leading to the river, symmetrically to the axis. These buildings connected the garden with the wide expanses of the Neva River, giving it a ceremonial and solemn air. Peter's Palace played a subordinate role in this composition, the garden ensemble that existed as if independently of it, had an independent value.

In 1717, Jean-Baptiste Alexandre Le Blond drew up a new plan for the Summer Garden, within which he introduced the necessary additions and improvements to its existing layout. The main achievement of this work was a broad urban development approach. The project was not limited to the narrow borders of the garden itself and included enormous adjoining territories, which subsequently occupied the Field of Mars, Mikhailovsky Palace and Garden, and Saint Michael's Castle. It was one of the first park systems in Russia that combined a number of large gardens, embankments, palaces, and canals.



Estate Of Menshikov
© Alexey Fedorovich Zubov / Public Domain / Wikimedia / State Hermitage Museu

> The garden was intended not only for walks — it was considered a place of communication, entertainment. A venue for a wide variety of ceremonies; diplomatic, educational and other activities.

As early as in the 1720s, the Summer Garden already sported the largest garden sculpture collection in Russia. It was a garden museum and garden school. The garden was intended not only for walks — it was considered a place of communication, entertainment. A venue for a wide variety of ceremonies; diplomatic, educational and other activities. The garden was taking a very noticeable place in everyday life of the whole circle of the royal court's close associates.

In the composition of the A.D. Menshikov estate on Vasilyevsky Island, from the same period as the Summer Garden, one of the most characteristic signs of early Saint Petersburg gardens — the presence of a long access canal to the palace from the coast — can be clearly noticed. The palace, constructed entirely of wood, was situated at the end of the canal and occupied a central position on the site. The main part of the garden was located behind it; alongside the channel, a wide main avenue formed a clear compositional axis terminating with the palace itself. This is one of the first examples of a developed symmetrical composition of a palace complex that later becomes common. It is also worth noting the large urban development role of this complex. A. D. Menshikov mapped out a road through the entire Vasilyevsky Island from the estate to the sea which later became the axis of the Bolshoy Avenue and predetermined the outline of the street network of this district.

Another of Saint Petersburg's oldest estates, Yekaterinhof, also had an access canal. The four manor palaces and gardens attached to them were very small in size and looked like architectural implantations into the natural landscape, designed to be viewed from the waterside. A similar orientation was extremely characteristic of Petrine's ensembles.

The Summer Garden, Menshikov's Garden on Vasilyevsky Island, as well as Yekaterinhof, are emblematic of a new type of gardening schools that introduced a regular layout. To an even greater extent this role was played by the ensembles on the southern coast of the Gulf of Finland — Peterhof, Strelna, and Oranienbaum.

Regular style techniques that had already found brilliant expression in Petrine residences of the first decades of the 18th century determined the general direction in the art of that time, regardless of the functional type of the garden or park: as a component of the general city ensemble, each garden and park was given great importance. This especially applied to gardens of religious and state institutions. Therefore, in the area between the buildings of the Alexander Nevsky Lavra and the river bank, a regularly planned garden took shape in the form of two symmetrical stalls with a complex pattern of wide alleys, longitudinal and transverse to the river. The main axis of the composition connected the entrance to the monastery with the embankment and pier. Such a link between the composition to the external environment was impossible for the monasteries of the 17th century, and bore, in fact, a completely secular character. In the urban context, the Alexander Nevsky Lavra Garden was regarded as a wide and greened city embankment, only partially isolated from the movement of carriages along the coast.

Founded at the beginning of the 18th century, the Sea and Land Hospitals also had regular gardens with canal porches and figured pools. It was supposed to tie them together with a central 'Hospital Perspective' and link it to the neighbouring square and street, 'which would open up from the Malaya Neva to the Bolshaya Neva river by a direct line to the Okhten church dome.'

The middle of the 18th century

> By the middle of the century, 'artistic' gardens had become fashionable, and not only large magnates, but also middle-class landowners sought to decorate their estates with the greatest brilliance, following, as far as possible, the example of the smart set

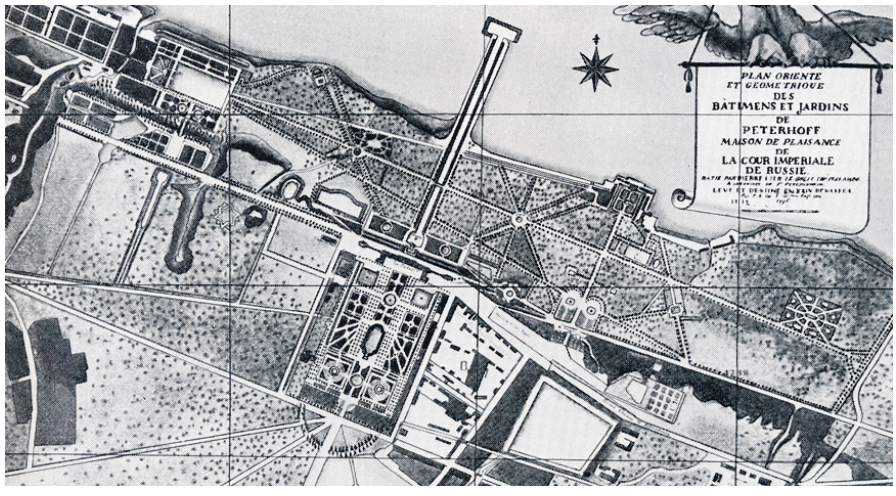
In the evolution of regular park making, some changes gradually took shape. Thus, gardening art was developing towards increasing complexity of planning schemes and enriching the techniques of decorating an entire ensemble.

The dynamic, expressive lines of the late Baroque era, gradually replaced the simpler and quieter contour characteristic of the gardens of the early 18th century. The compositional role of a palace as the absolute centrepiece of the ensemble was increasingly strengthened. Palaces' physical dimensions were increasing, and they were being decorated with more expensive materials. Numerous office buildings and outbuildings began to be placed in the same complex with the main house, forming a large front yard facing a drive or a garden (Tsarskoye Selo, Peterhof, etc.). The whole artistic decor of a garden also became more elegant, with marble, granite, ormolu, and cast metal being widely used.

The most important distinctive feature in the middle of the 18th century was the expansion of the circle of owners of gardens and parks. Previously, it was very narrow and consisted only of the tsar, his family, and a small number of top statesmen. Other owners of the estates did not pretend to create representative ensembles, confining themselves mainly to utilitarian tasks. By the middle of the century, 'artistic' gardens had become fashionable, and not only large magnates, but also middle-class land owners sought to decorate their estates with the greatest brilliance, following, as far as possible, the example of the smart set.

By the mid-18th century, a regular principle in architecture dominated over a small number of outstanding palace and park ensembles. The whole city started to be seen as a single ensemble, subordinated to one centre. It acquired a clear planning structure, in which the radial system was supplemented by semicircles of streets and canals, accompanied by green spots of gardens and parks. The view of the Admiralty spire connected and orchestrated the urban space from the Neva to the Fontanka.

In the second quarter of the 18th century, the active development of the Summer Garden ensemble and other downtown gardens was underway. Single compositions conceived in the days of Peter the Great had already been completed, while new elements were included in the ensemble, corresponding to already changed tastes. The territorial expansion of the entire central complex continued.



Peterhof in the middle of the XVIII century.

> At this time, the educational function of the first palace parks in St. Petersburg was further developed

In the 1740s —1750s, the construction of the stately homes of the nobility in the immediate vicinity of the centre of Saint Petersburg, especially along the banks of the Moyka and the Fontanka, proceeded on especially great scale. These plots of land were distributed as early as under Peter I, and by the middle of the century they were in most cases occupied by new palaces surrounded by artistically decorated gardens. The estates were relatively small, located on a flat topography, but had a rather diverse and expressive regular layout. Some of them were distinguished by their particularly magnificent decoration (the estates of Admiral Apraksin, Bestuzhev-Rumins, the Stroganovs' dacha, etc.). Estates of the new Saint Petersburg type were not fenced off from the street with plain fences, but on the contrary were opened with a front yard, increasingly acquiring the aspect of a European cour d'honneur. At the same time, the garden moved into the depths of the plot, but was often visible as a green background behind the low buildings of outbuildings and services.

In the 1760s, baroque was gradually replaced by classicism. The rationalistic and humanistic ideas behind this style exhibited themselves to the greatest extent in architecture. First developed in Ancient Greece and Rome, Italy, then in Renaissance art, the art system of classicism is based on the principles of harmony, sense of proportion and clarity.

Rejecting the principles of mature baroque, which no longer corresponded to social needs, classicism in Russia at first found support in Petrine architecture of the early 18th century. At this time, the educational function of the first palace parks in Saint Petersburg was further developed. The interest in 'utilitarian' objects, which in the era of Peter the Great were considered as important elements of the architectural ensemble, underwent another revival; on the contrary, the palaces themselves shrunk in size and in the richness of their decorative facades.

During this period, the overall image of a building impressed with the clarity and consistency of its façades, plans, and designs. Architects strived to make the forms more concise, clear, proportionate. They were attracted to strict straight lines, the harmony of the entire ensemble and its relation to the surrounding nature.

The centralised city planning that began in the 1760s, for the first time ever provided for urban beautification and landscaping, and the placement of new public areas. In Saint Petersburg, the devising of new plans for the development of the downtown area and the suburbs was undertaken. Since 1769, not only the width of the streets, but also the height of the houses erected on them was regulated, and mandatory paving, lighting, and greening of streets and squares were provided. The look of the central districts was determined by the strict perimeter development of the neighbourhoods, the uniformity of which was disrupted by large aristocratic estates. In these estates, palaces were usually located indented from the red line, surrounded by gardens, court and utility yards.

The fact that the city was facing the river, the location of the city centre and main buildings at the most beautiful and visible points, the care of the city's silhouette, the contrast of high-rise landmarks and relatively low ordinary buildings — all these became key principles of Saint Petersburg city planning. As they grew widespread, these principles were picked up by many architects who worked in the provinces.

Based on the complexity of baroque and proclaiming the triumph of natural qualities, harmony, and clarity in composition, the era of classicism at the same time gave rise to an outstandingly developed landscape park system. In the 1770s — 1780s, there occurred a rejection of the regular landscape style, in favour of a picturesque one.

Professional artists and art lovers who turned to the ancient era, while exploring the monuments of Greece and Rome and the cultural heritage of the Renaissance, actively promoted the idea of 'returning to nature,' to its simplicity and clarity.

Regular 'French' gardens were almost everywhere, remade into 'English' ones — that is, into landscape gardens, which were laid out as if in imitation of nature. Since nature 'avoids straight lines,' all regular strictly symmetrical constructions were rejected. Landscape parks should merge with the environment, with their borders being erased. Even the fence itself physically disappeared,

being replaced by a moat, a rampart. Views of ‘wild’ nature, as if continuing a park, were becoming an important component of its aesthetics.

However, park-making of the 1770 — 1790s did not merely represent a return to the simplicity and genuineness of nature. The most characteristic feature of the compositions of this period in the parks of Oranienbaum, Gatchina, Pavlovsk, Tsarskoye Selo and Old Peterhof was their ambiguity, the use of landscape, sculptural, architectural symbols, their tendency to Romanticism, and partly to the Enlightenment.

The tsar’s example was followed by their court nobles. In the 1770 — 1780s I.P. Yelagin developed one of the Neva Delta isles. He gave instructions to enclose the island with a dam, drain the wetlands and create a whole system of clearings, alleys and ponds with bridges. At the house of I.P. Yelagin, a large winter garden was laid out.

End of the 18th century

Park art of the last third of the 18th century was marked by the gradual formation of the national type of natural garden. The substitution of landscape style for the regular one was not complete or universal, though. The choice of the type of garden or park, their planning schemes, compositional methods, and methods of connecting architecture with natural, utilitarian and artistic principles depended on the wishes of an owner, fashion trends, and the taste of an architect or gardener. However, it was ultimately determined en masse by objective factors, such as the nature of the relief and soil, economic requirements, and social cultural trends.

While at the beginning of this stage there was a copying of European models for romantic landscape parks, theorists and practitioners of Russian art later developed unique techniques and principles for developing gardens and parks that met objective conditions. By the 1780 — 1790s, the benefits of a free and organic approach to garden planning became more pronounced. Gardens ceased to be mere decorations or small ordered plots of nature near a house, but expanded and covered all the manor buildings and became the natural environment of a palace ensemble, its spatial environment. Throughout the 18th century, parks were entirely intended to meet the needs of private owners, primarily the imperial family and nobles.

Until the mid-18th century, townspeople used natural groves for recreation. Petersburgers received regular access to the imperial gardens thanks to the decree of Elizabeth Petrovna in 1755, but their visits were limited and possible only subject to certain conditions.

Those close to the court followed the example of the royal family in this approach, as well. At the end of the 18th century, the public gained access to Yelagin Island on Sundays and holidays. Around the same time, the Tavrichesky Garden was opened to visitors.

Tavrichesky Garden
© Benjamin Patersen / Public domain / Wikimedia / State Hermitage Museum

First half of the 19th century

Park-building at the beginning of the 19th century was marked by a new rise primarily due to the achievements of the previous century, which resulted from continuity in the development of artistic ideas, the accumulation of practical skills and knowledge. Techniques that had already proved themselves earlier continued to be developed and gradually changed under the influence of new socio-economic conditions, historical events, and advances in art and urban planning.

In Saint Petersburg, brilliant architectural ensembles were completed during this period: the Admiralty building, Kazan Cathedral, Palace Square, Senate Square, and others. The central part of the city was turning into a complex and holistic composition, incorporating palaces, public buildings, squares, embankments, gardens, and vast expanses of water. Carlo di Giovanni Rossi paid great attention to the natural component of his ensembles, designing a square and gardens near the building of the Alexandrinsky Theatre and Vorontsov Palace on Sadovaya Street in order to combine the manor and city planning techniques in the most organic way. Now the ensemble approach to architectural design had reached its apex.

In these years, the ratio between the architectural and natural components in a park ensemble began to change, and not in favour of the former. Previously, a palace represented the absolute centrepiece of a park ensemble, with the entire planning arrangement of a park being subordinate to the main architectural structure and, as it were, extended by using its specific means. Now the composition of a park was again becoming more and more free, dispersed, and not constrained by symmetry.

The centre of a park and manor composition was often not a palace itself, but some natural component of the landscape: a pond, lawn, meadow, surrounded by architectural structures that interacted with each other through an open space (like Maslyany Meadow in the ensemble of Yelagin Island).

In the first half of the 19th century, the first public gardens emerged. In 1806 — 1833, Admiralteysky Boulevard (which quickly became ‘the public’s favourite promenade arcade’) was being laid out. At the turn of the 1820 — 1830s, Ekaterinhof became a public landscape park. In the late 1830s, the public Petrovsky Park was created on the island of the same name. At that time, the Stroganov Garden on the Black River, and the Garden of Count Bezborodko on the banks of the Neva were considered suburban; by the middle of the century, the latter had acquired recreational significance and had became a fashionable resort with pavilions catering drinking water and mineral baths, as well as an extensive entertainment programme for holiday-makers and those intended to improve their health. In the mid-19th century, by the efforts of city authorities, citizens were also given access to a part of the Yusupov Garden; also, Alexandrovsky Park was developed on the glacis of the Peter and Paul Fortress.

Alexandrovsky Park
© Public Domain

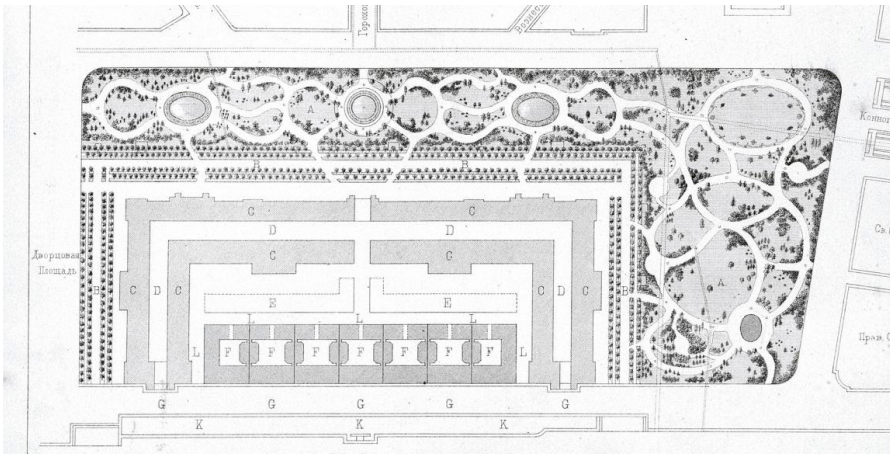
Second half of the 19th century

City gardens and squares in Saint Petersburg were located near large state institutions, near cathedrals, on the sites of former private estates. Thus, in the late 1870s, the Alexandrovsky Garden near the Admiralty was created. It was replete with a dense network of winding lanes. It included several large clean lawns and flower beds, and trees and shrubbery were placed freely—but more densely—along the garden’s edges. Regular ordinary plantings were located only directly along the façades of the Admiralty building.

At this time, active gardening in Saint Petersburg was also financed by private funds. In this fashion were arranged Rumyantsevsky Square, Ovsyannikovsky Garden, Nikolsky Square, Lomonosovsky Square, Prince Vladimir Square, Greek Square, Pushkin Square, and the Boulevard on Malaya Konyushennaya Street.

However, the public role in developing urban gardens and parks, which emerged and spread in the 19th century, did not immediately affect their appearances. For quite a long time, the ‘form’ of parks was much more conservative than their social essence and their changed functional content. Only by the end of the century did such signs of public green areas—such as the

enlargement of the composition scale, their accessibility (the presence of many entrances), high flow capacity, devices for entertainment and sports designed for a large number of people—begin to see adoption and gradually come to define these spaces.



Alexandrovsky Garden
© Public Domain / Wikimedia

20th century

> The Saint Petersburg-Leningrad landscaping scheme was included in the list of the best green belts in the world, along with the landscaping systems of many European cities

Following the October Revolution, former royal residences and estates of the nobility became the property of working-class people. The nature of their use became truly massive, while measures were taken to preserve and restore the artistic values of the ensembles.

The first post-revolutionary experience of green landscaping was the reconstruction of the Field of Mars. The existence of a parterre square on the Field of Mars predetermined the creation of a monument to the victims of the February Revolution. In the 1920s, a garden for the denizens of Leningrad was opened at the Winter Palace, at which a marvellous fence was transferred on January 9 to the new garden at the Narva outpost. In the 1930s, a square appeared on Troitskaya Square, and a garden was established near Smolny.

Multifunctional objects, which the Soviet Union led the world in creating over the course of the 20th century, can be united into a separate group of public gardens and parks. The development of this direction in park-making was facilitated by the creation of a park design workshop at the Ministry of Public Utilities of the RSFSR. The workshop developed park plans for numerous Soviet cities. Its work did not stop with formulating a methodology for designing gardens and parks of the multifunctional type, but the overall development perspectives for this area of landscape activities were also outlined. An example of a multifunctional park in the Saint Petersburg-Leningrad area is the park named after S. M. Kirov. Memorial landscape complexes, such as the Victory Parks on Moskovsky Avenue and Krestovsky Island, also constituted a special group.

As a result of urban system development, the arrangement of gardens and parks in the central districts and in residential areas has gained great importance. Urban planning of the 20th century has provided plentiful examples of creating unique landscape objects, the composition of which included historical parks, expanded and supplemented with innovative components. The Saint Petersburg-Leningrad landscaping scheme was included in the list of the best green belts in the world, alongside the landscaping systems of many European cities.

Historical background of the site

A group of islands, the site was urbanised as early as 1726 and was gradually merged with Petrogradsky Island. Historically, seaport facilities, warehouse, a tree nursery, a distillery, and the Institute of Applied Chemistry existed on the site. At various times, there were proposals to create a cultural and exhibition complex, a central park, a multifunctional complex and a Judicial Quarter quarter on the site; however, those plans were never implemented.

1706 — 1726

On Peterburgsky (now Petrogradsky) Island, the following development activities were carried out: east of the House of Peter the Great was a residential settlement for the nobles; on the southwestern tip of the island, in the mouth of the Malaya Neva, by 1706, a New Russian and Tatar settlement. On the territory of the New Russian settlement, the church of St. Nicholas 'on Mokrushi' (on the site of today's Prince Vladimir Cathedral). The name of the temple was due to the flooding tendencies of the surrounding area. The islands located along the right bank of the Malaya Neva were flooded and had a free outline.

The emergence of a group of islands occurred due to flooding: Tuchkov Island, Vatny Island, and several small islands. On Tuchkov Island, seaport facilities were located. Another name for Tuchkov Island — Penkoviy (Hemp) Buyan — is associated with its use.

Plan Of Saint Petersburg 1716 — 1717, Johann-Baptiste Homan
© Public Domain / Wikimedia

1730 — 1755

After the transfer of the city centre to Admiralteysky Island, the function of a quiet suburban outskirt was assigned to the territory of Peterburgsky Island. It was surrounded by gardens, and small wooden houses were located there. In the 1735 on Buyan Island, among other seaport facilities, wooden hemp storage facilities were built. They burned down in 1761.

In 1740 on Peterburgsky Island a stone temple was to be erected, though the works were not completed at that time. It was finished in 1789 and consecrated in the name of Saint Prince Vladimir, to become known as the Prince St. Vladimir's Cathedral.

Plan of Saint Petersburg engraving by Tardieu. 1753.
© Johann Homann / Public Domain / Wikimedia / State Hermitage Museum

1760 — 1800s

A crossing from the Temple Square to Tuchkov Buyan — Buyanny Bridge— was constructed. It survived until the middle of the 20th century.

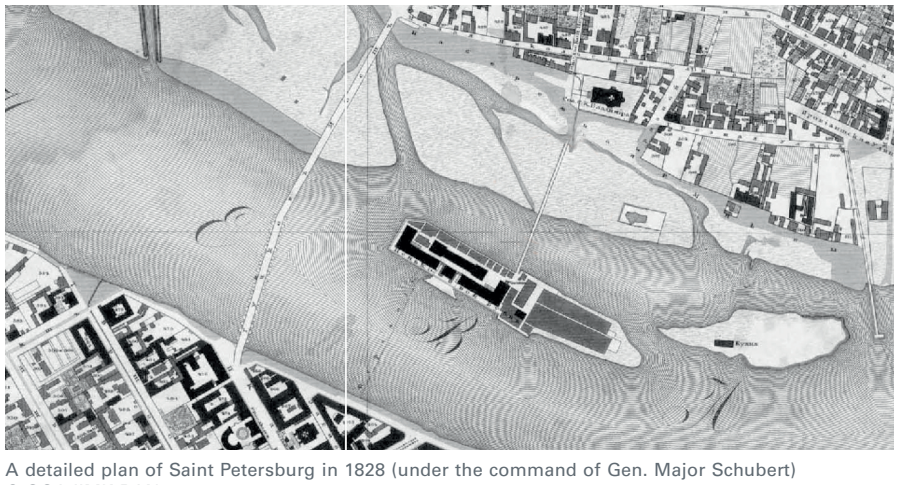
Atlas of Saint Petersburg, 1798. Archive: TSGIA SPb, Fund No. 513, Inventory No.168, Item No. 319

On Tuchkov Buyan Island, a stone building of hemp warehouse was erected, which has survived with certain alterations until the present day.[1]

Hemp warehouse on Tuchkov Buyan

1830s

In the draft layout of Peterburgsky Island dating back to the 1830s, it was supposed to join the coastal islands, streamlining the planning structure of the settlement, abutting Bolshoy Avenue and moving Buyan Bridge in line with the avenue. The bridge was moved by 1831.



A detailed plan of Saint Petersburg in 1828 (under the command of Gen. Major Schubert)

1. For more information, see 'Cultural Heritage,' subsection 'Hemp warehouse on Tuchkov Buyan'.

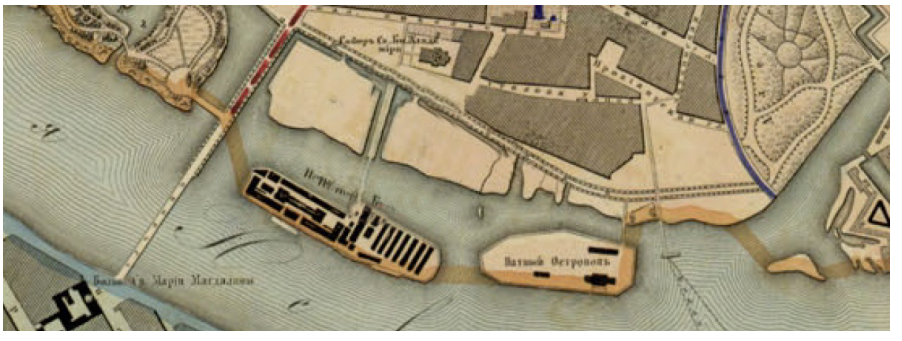
1840—1860s

The first urban transformations of the area date back to the mid-19th century and are associated with the laying of Alexandrovsky Avenue (now Dobrolyubova Avenue) from its origin in 1844 — 1845 at Alexandrovsky Park to Tuchkov Bridge (along the embankment of the Zhdanovka River). According to map-making sources, in 1840 the development was underway on Tuchkov Buyan Island, where new store buildings appeared.

For a long time, Vatny Island stood practically undeveloped, though it was used for the needs of the commercial seaport, forming a single functional zone with Tuchkov Buyan: thus, in the 1820 — 1850s, 'the cookery of seafaring men' was located there.

By the 1860s, the territory of Tuchkov Buyan and Vatny Island was still used for seaport and storage functions. It received a new streamlined coastline and a regular layout; on Vatny Island, a mooring wall was arranged, with a bridge connecting the island with the bank.

On the plan of the Military Topographical Bureau of 1858 — 1860, the name 'Vatny Island' appeared for the first time, and the other three islands received their final boundaries that remained unchanged until the channels were filled up in the 20th century.



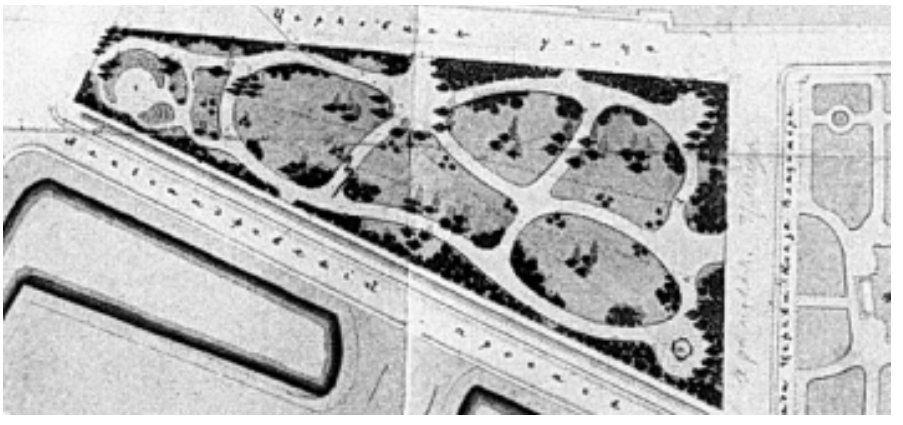
Plan of Saint Petersburg, 1858
© Public Domain

1870s

During this period, the formation of the urban space of the Malaya Neva was started. The spatial solution of new objects, the Tuchkov Buyan building and the Prince St.Vladimir's Cathedral, was devised with consideration of the special importance of these objects as urban centrepieces in the making of the right-bank panorama at the entrance to the Malaya Neva River. Along the left bank on Vasilyevsky Island, a line of development of the embankment was formed during this time period.

1876

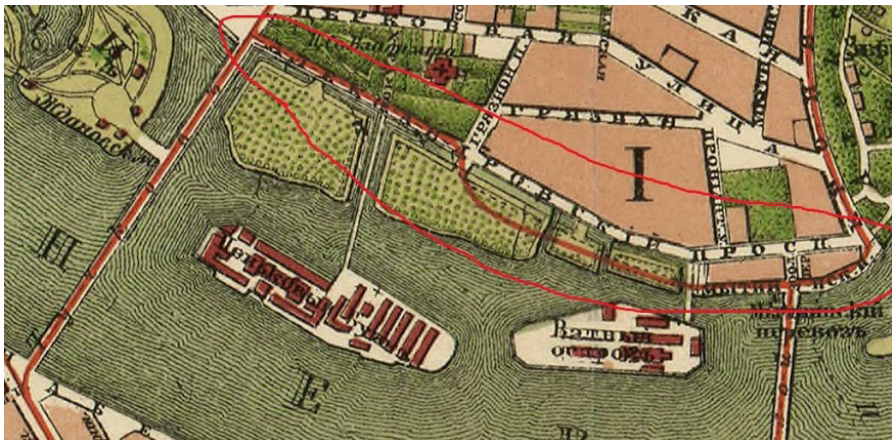
In the 1870s, by order of Emperor Alexander, the improvement of the territory adjacent to the Prince St.Vladimir's Cathedral began. A small landscape garden was arranged according to the project by architect N. P. Grebyonka, and an iron fence was installed around it. In 1876, a public garden was designed by the botanist E. L. Regel, also in the landscape spirit, with a fountain and a mound with a viewing platform.



E.L. Regel. The project of the Prince St.Vladimir's Park. 1875 (from the book 'Monuments of Architecture and History of Saint Petersburg. Petrogradsky district')
© ID «Kolo»

1880s

At the same time, a tree nursery was laid out on the riverbank islands along Alexandrovsky Avenue, supplying trees for the imperial gardens and parks. The riverbank strip and river islands within the adjacent territories retained their natural outlines. By the 1880s, the territories of the riverbank islands were regulated, with the river line being streamlined.



Plan of Saint Petersburg 1880
© Public Domain

The tree nursery consisted of three islands: the first and second ones were separated by a canal and a dam leading to Buyan, whereas a public garden was laid out on the third one. Along the perimeter of the islands, tall trees were growing. Trees, vegetables, flowers were grown in the nursery, with greenhouses located on its territory.

1890s

Starting since the 1890s, the territory became the venue for some major urban development projects that followed the idea of creating a riverbank front zone.

Along Alexandrovsky Avenue (today's Dobrolyubova Avenue) a unique (even by Saint Petersburg standards) mini-ensemble of several buildings was erected in the Art Nouveau style.

In this period, the islands began to join the mainland by backfilling the duct. Vatny Island remained cut off from the riverbank. In the years 1896 — 1897, a complex of wine warehouse and the building of a state-owned distillery were built on the territory of Vatny Island according to the project by architect R. R. Marfeld.

1905

The complex of the Second State Wine warehouse is an expressive example of industrial architecture; however, its function and typological features initially contradicted with the role of the area in the panorama of the Neva Delta. In 1902 — 1905, the dam of Tuchkov Bridge was expanded, a canal put between it. The nursery was filled up and a garden was built near the dam.

Second State Wine warehouse, 1900
© Public Domain

1910s

In the first decade of the 20th century, several architectural contests for the development of this part of the city were held. In the competition materials, the territory, including Vatny Island, was considered as a whole, with the avenue of the development of a city-wide centre here. However, the projects of the 1910s were never implemented.

Plan of Saint Petersburg, Schepansky, 1894

Further attempts to regulate the area were the subject of attention of the city authorities in 1911 — 1912. It was decided 'while leaving open the question of the use and paving of new streets' to petition for a change in 'plans for the settlement of Saint Petersburg in the sense of: 1) backfill shallows of the Malaya Neva River and the channel between Vatny Island, Penkov Buyan Island, and Mytninsky Garden and 2) establishing an embankment between Tuchkov and Birzhevoy Bridges. Thus, the territory of all the islands adjacent to the Peterburg Side would have obtained a new border, along the new embankment. In the plans dating back to the beginning of the 20th century, both Buyan and the islands of the tree nursery form a single whole with the 'mainland'; a separate position was occupied only by Vatny Island.

Due to the fact that there was distillation and other special equipment in the territory of the plant and warehouse built in 1896 — 1897, already in 1919 the building of the Government Wine Treatment warehouse on Vatny Island was transferred to the newly created Russian Institute of Applied Chemistry (since 1925 — the State Institute of Applied Chemistry [GIPH], from 1992 — FSUE RRC 'Applied Chemistry' [FGUP RNTS 'Prikladnaya Khimiya']). It gradually occupied the entire territory, currently restricted by the Malaya Neva embankment, Likhachev Square, Dobrolyubova Avenue and Speranskogo Street. For more than 80 years, GIPH was dealing with issues of the defence industry, by working with rocket fuels, refrigerants, etc.

Plan of Saint Petersburg, 1913

1930s

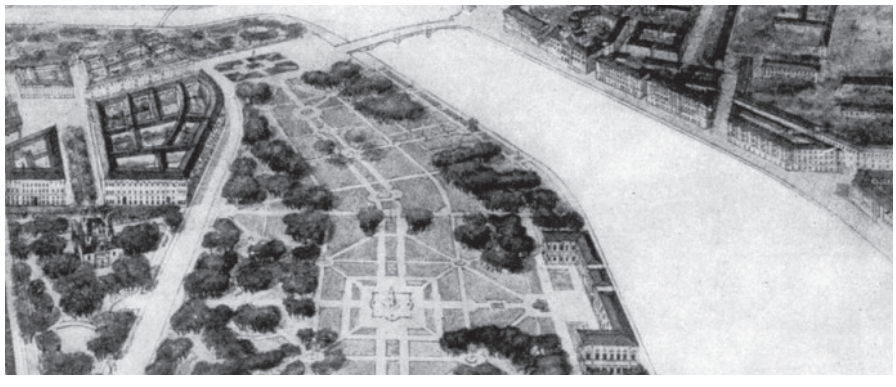
The accession of the territory of all islands to the mainland is nearing completion. In the 1934 plan, the territory of Vatny Island was still separated by a section of the extant channel from the Mytninskaya Embankment and square, but the process of filling the channel from the western side had already been completed.

Plan of Saint Petersburg, 1939
© Public Domain

1940s

The joining of Vatny Island with Petrogradsky Island and the construction of new buildings of the Institute of Applied Chemistry.

The Master Plan of Leningrad in 1948 (under the direction of architects N. V. Baranov, A. I. Naumov) provided for the transformation into a park zone of the entire territory along the embankment from the Peter and Paul Fortress to Petrovsky Island, but this project was ultimately not implemented.



Panorama of the central city park. Project. Authors — Baranov, Guryev, Ageeva, 1948
© Architecture and construction of Leningrad / Lenizdat, 1948

1960–1980s

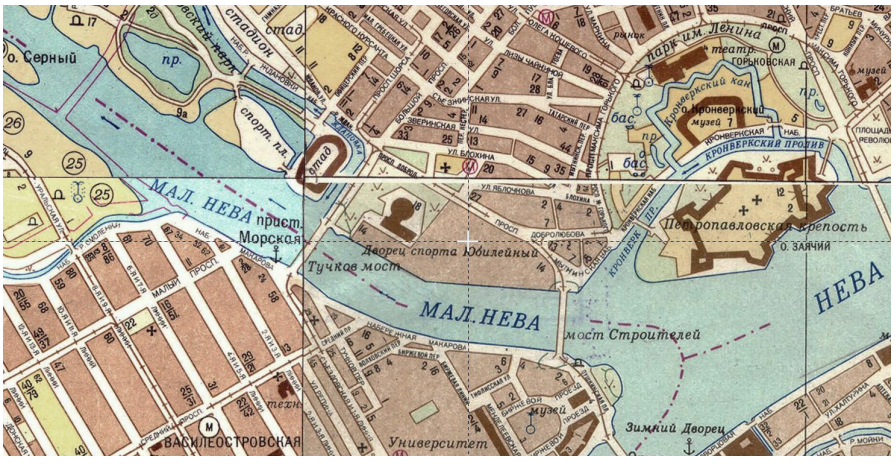
In 1960, the construction of Stroiteley Bridge (after 1989 — Birzhevoy Bridge) at the new site and the organisation of a bridge area laid the foundation for a new planning system. During this period, the reconstruction of historical buildings and the construction of new buildings of the State Institute of Applied Chemistry were carried out on the territory of the former Vatny Island. Construction of the Yubileyny Sports Palace to the west of the territory, improvement and landscaping of the site took place in 1967.

Construction of Stroiteley Bridge (Birzhevoy Bridge), 1959
© Peter C. Robertson / Robertson-Blau Archive

Dobrolyubova Avenue, the former building of the State Institute of Applied Chemistry

1985

In the Master Plan of 1985, the main ideas of the planning arrangement also kept following the previously completed urban development projects: the formation of the embankment and the extension of Talalikhina lane with the vista towards the river and the development of Vasilyevsky Island were assumed.



Plan of Leningrad (Saint Petersburg), 1988

2006

It was decided to move the Institute of Applied Chemistry away from the city centre and create a multifunctional complex, to be called the ‘Embankment of Europe.’ It was planned to build a multifunctional complex that would comprise an apartment building, a hotel, an office building, a shopping complex, and an engineering complex.

Photo: model for the project ‘Embankment of Europe,’ ‘GradMaket.’

2011–2012

Demolition of the buildings of the Institute of Applied Chemistry prior to the construction of the ‘Embankment of Europe’ multifunction complex.

Construction of new buildings of the Institute of Applied Chemistry
© Yandex.Panoramas

2012–2018 гг.

Cancellation of plans to build a multifunctional complex called ‘Embankment of Europe,’ holding a tender and a contest for the construction of the Judicial Quarter and the start of construction.

Project area, 2019.

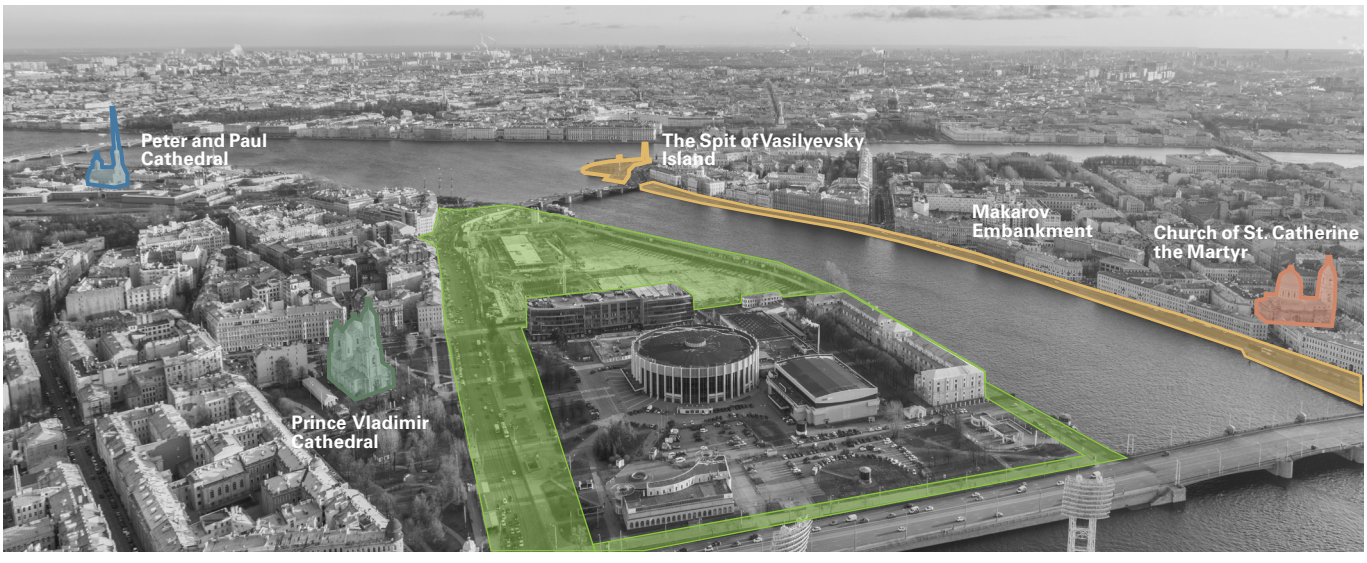
2019 г.

Following the publication of the contest for work on the construction of the Judicial Quarter, the residents of the city formed a petition against its construction signed by 17,308 people. A decision was made to lay out a park on the site.

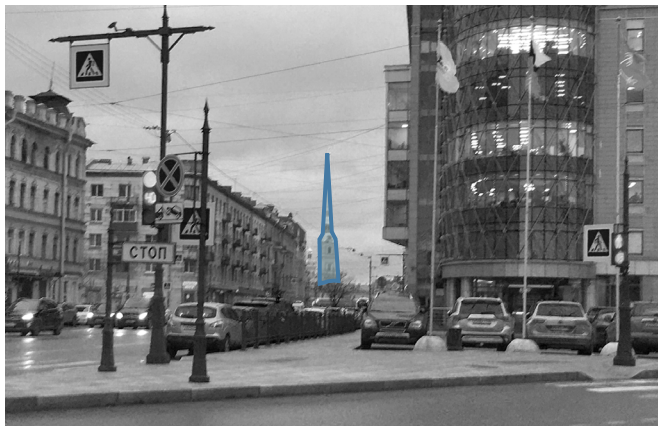
Viewpoint corridors

SCHEME OF THE VIEW CORRIDORS FROM THE TERRITORY

On the project territory, areas were revealed that open up views on the city centrepieces – cultural heritage sites. It is required to preserve the view corridors towards Prince Vladimir Cathedral, Makarov Embankment and other iconic city landmarks.



Prince Vladimir Cathedral



Peter and Paul Cathedral

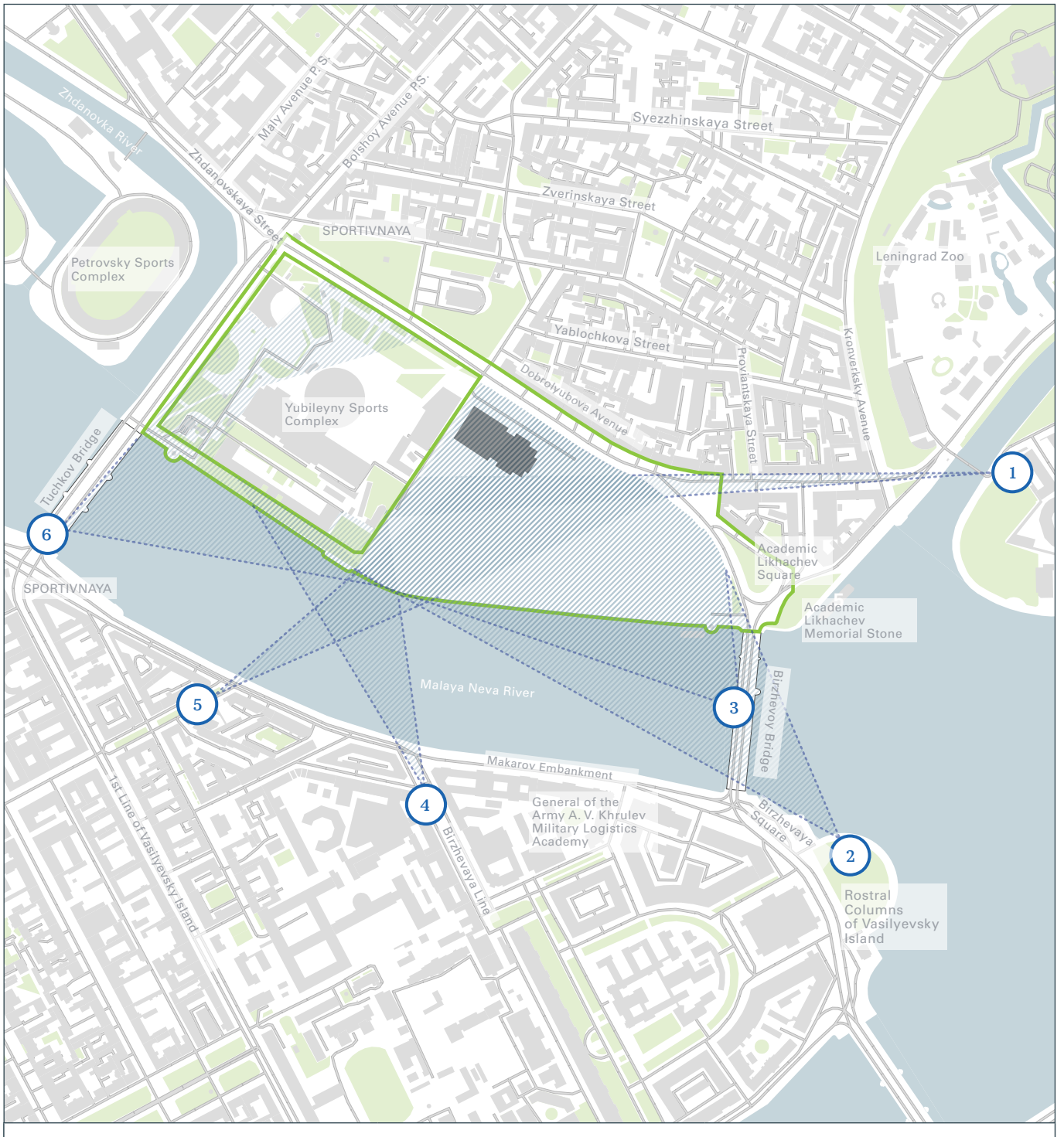
The Spit of Vasilyevsky Island

Church of St. Catherine the Martyr

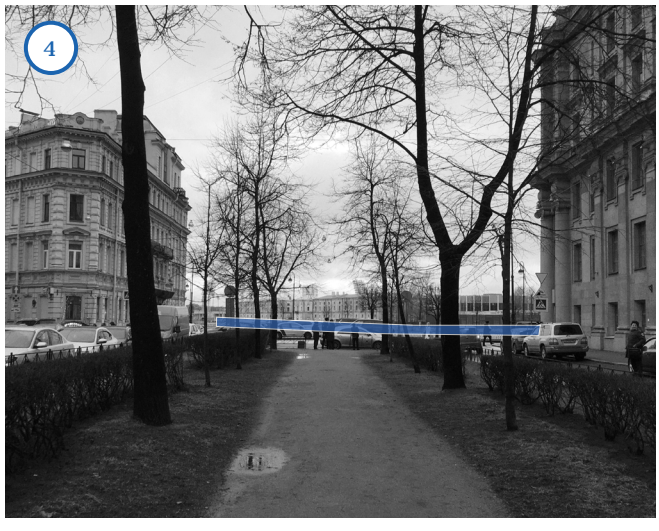
1. This scheme considers the location of the building of the B. Eifman Dance Palace under construction, but does not take into account the difference in terrain, including the foundation plinth of the Judicial Quarter.

Panoramic vistas

SCHEME OF PANORAMIC VISTAS



The design area is located in the downtown Neva water area. It is important to consider that the view of the park becomes a part of the Saint Petersburg panorama. The green front of the park will open up from the water, as well as from the bridges, streets and embankments of the opposite bank of the river.

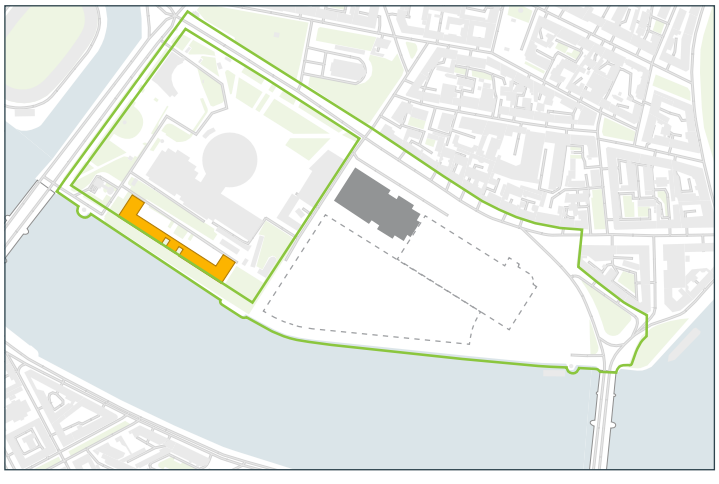


Hemp warehouse on Tuchkov Buyan

Adjoining the embankment, the Hemp warehouse buildings are an object of cultural heritage of federal significance. Today the buildings are not used in any way. Participants can offer functional filling and inclusion of the object in the planning decision for the park in accordance with the park concept.

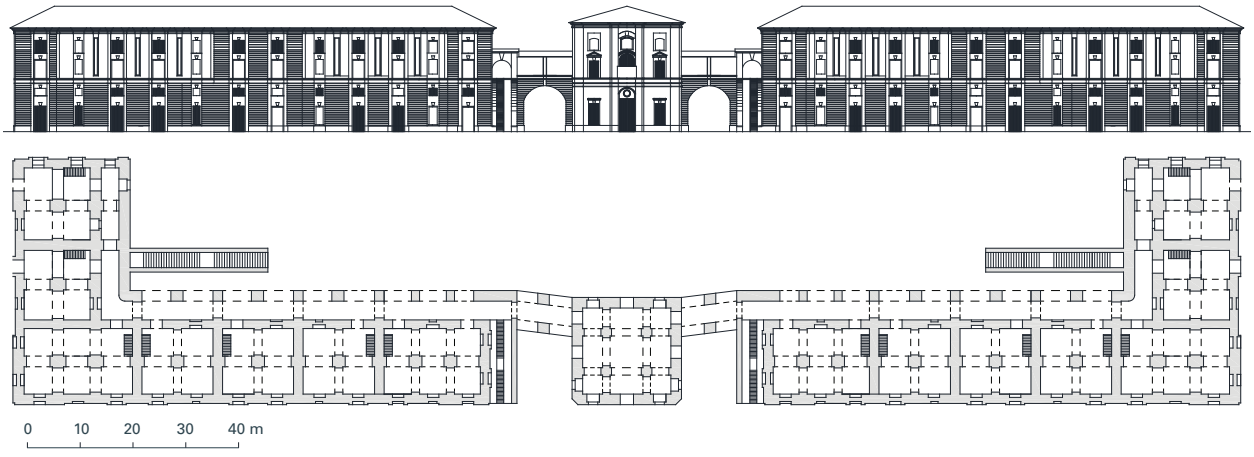
© Historical and cultural Internet portal «Encyclopedia of St. Petersburg»

© RGIA

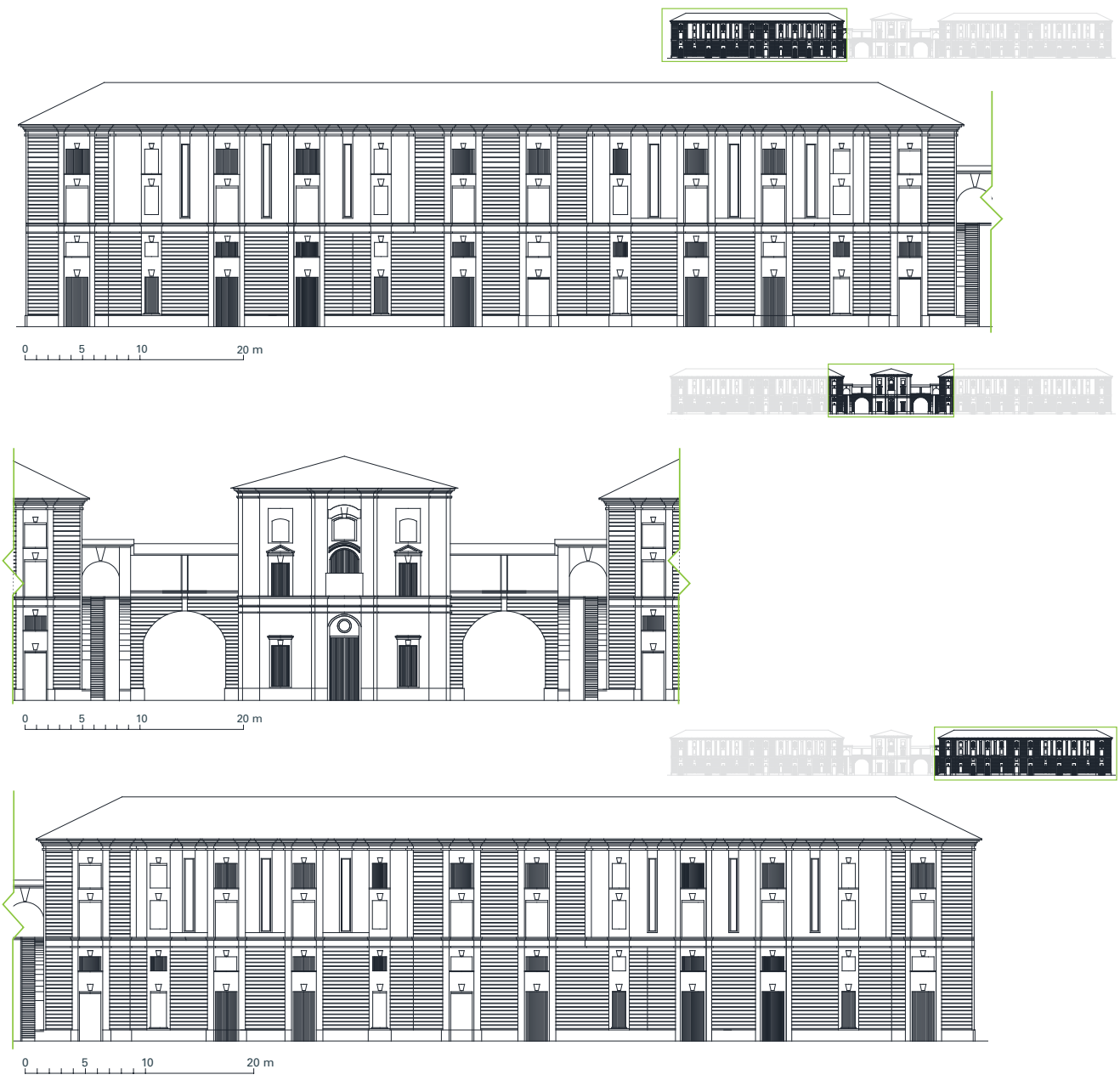


According to the project by military engineer M. A. Dedenev (1763), redesigned in 1764 by Antonio Rinaldi, there was erected a stone building of hemp barns that has survived with certain alterations up to this day. The warehouse largely retained their spatial composition. On the flanks of the central two-storey facility, hemp weighing rooms (rectangular buildings) are symmetrically located. According to the initial design, they were supposed to have two floors. However, during the construction process, each of the floors was further divided into two low-profile floors for purely utilitarian purposes. The name of the island, Tuchkov Buyan, was assigned to the warehouse building.

Plan and facades of Hemp warehouse on Tuchkov Buyan



Fragments of the facade of the building from the embankment



— 6 —

Urban context

Requirements and recommendations

The park is intended to increase the city's global competitiveness and serve as a starting point on the path to forming Saint Petersburg's image as a contemporary and comfortable green megapolis that leads in the field of sustainable development among the capital cities of North-Eastern Europe.

It is necessary to underscore the unique character of the territory and imbue it with a clearly expressed identity. The new park in the historical centre has city-wide meaning: the bank of the Malaya Neva will be returned to city residents as a world-class public space with recognisable Saint Petersburg character.

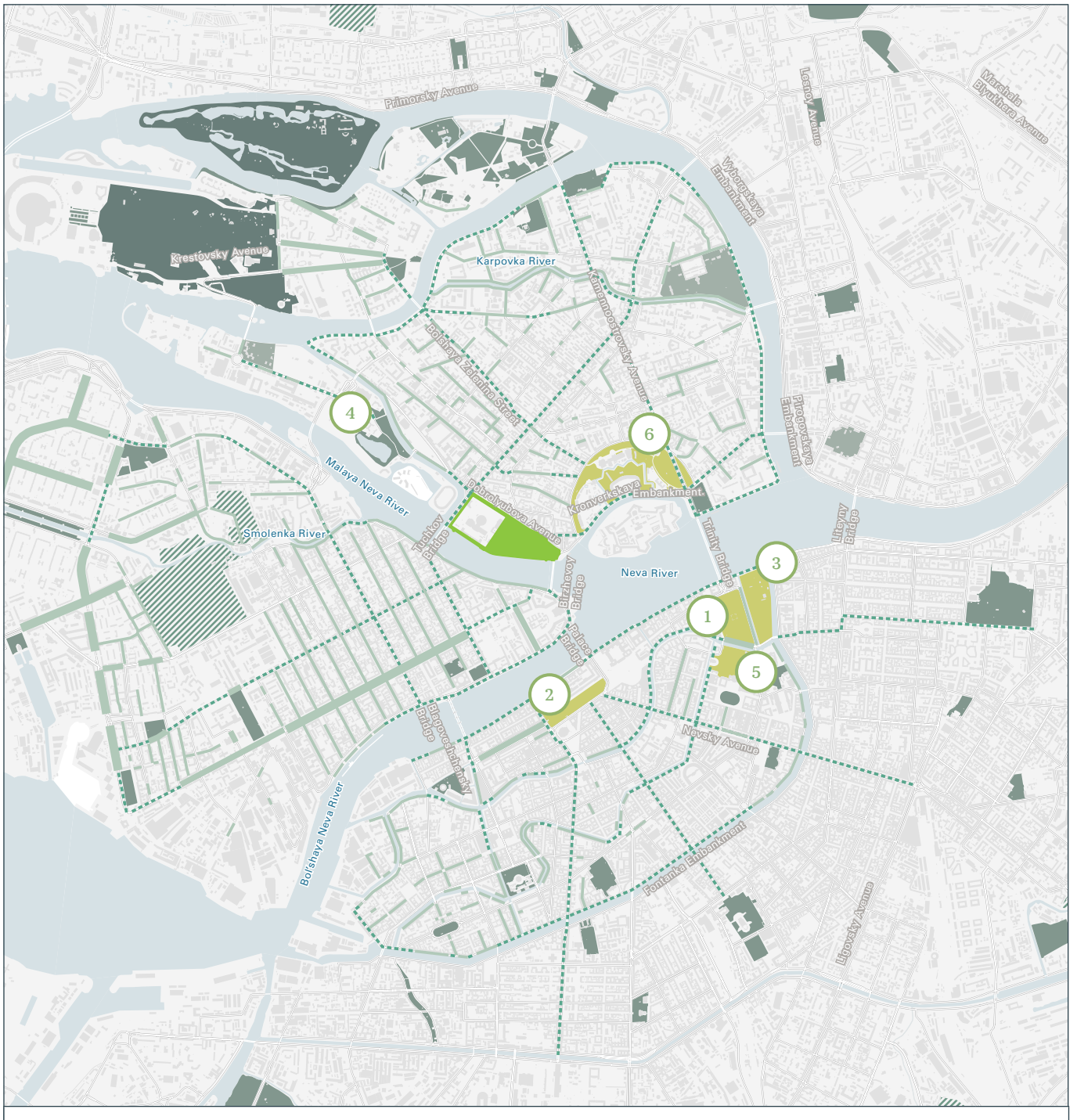
As part of the project, it is necessary to develop green connections with the central part of the city and the Petrograd Side: specifically, with Petrovsky Island, Knyaz-Vladimirsky and Assumption Gardens, the Aleksandrovsky and Petrovsky Parks, and other adjacent territories. It is recommended to design the green framework primarily using trees.

It is important to include the park territory in the active life of the city centre alongside neighbouring residential blocks, landmarks, universities, sports facilities and other centres of attraction.

Aside from the city-wide context, participants' conceptual proposals should account for the influence of sites located in direct proximity to the concept scope. One of the most important tasks is organising Speranskogo Street, where the Boris Eifman Dance Palace (currently under construction) and the Arena Hall business centre are both located.

The urban planning composition formed by Speranskogo Street, Boris Eifman Dance Palace and the Arena Hall business centre that were supposed to be hidden by the buildings of the Judicial district under the previous scheme, must be completed by either landscape or design solutions aligned with the concept of the park that plays the key role in the area.

Recreational framework of the city



- Concept scope
- City parks
- Regional parks and squares
- «Large parks of the centre»
- Cemeteries
- Large landscaped areas located in non-public areas
- Green areas of street corridors
- The axis of the urban natural-recreational structure: links between important public spaces and parks

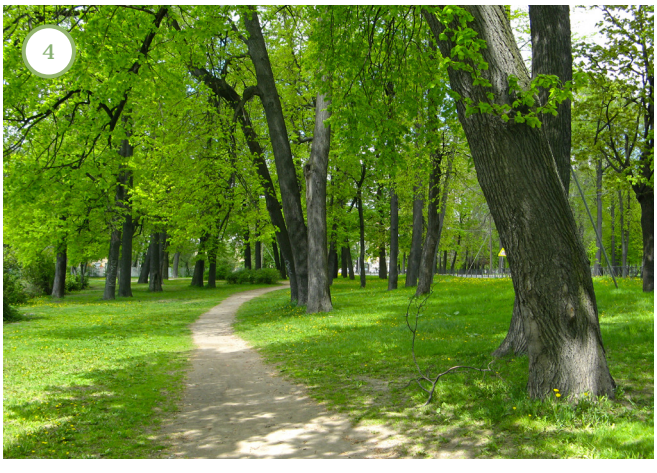
0 1 1.5 км

The new park will become an integral part of the green space network of Saint Petersburg. Integration of the park in the recreational framework of the city, its connection with the green spaces of the Petrogradsky district and its location in the system of central parks of Saint Petersburg — Aleksandrovsky Park, Summer Garden, Field of Mars, Mikhailovsky Garden, Aleksandrovsky Garden and Petrovsky Park — are particularly important in its design.

Field of Mars
© Andrew Shiva / Wikipedia / CC BY-SA 4.0

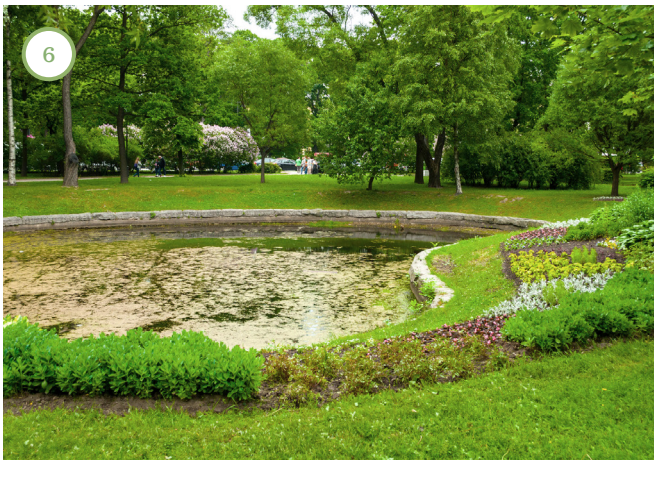
Aleksandrovsky Garden
© Maria Lupan / Unsplash

Summer Garden
© VLADIMIR LVP / Shutterstock



Petrovsky Park
© Yekaterina Borisova / CC BY-SA 4.0 / Wikimedia

Mikhailovsky Garden
© Mikhail Kolesov / Lori Photobank



Aleksandrovsky Park
© Zezelina Marina / Lori Photobank

Territory in the structure of Saint Petersburg

Saint Petersburg is the second largest city in Russia. It is located in the Neva Delta, and many of its districts are located on the islands between the river branches. The design territory is located in the historic centre of the city.

Petrograd Side

A historic district located on a group of islands in the northern part of the Neva Delta, between Malaya Neva and Bolshaya Nevka. The development of the territory at the early stages was connected with construction of the Peter and Paul Fortress and Kronwerk, as well as with the first city centre: a complex of public administrative and cultural facilities in Troitskaya Square. The largest and most popular parks of the city central part are located on Yelagin Island, Krestovsky Island and Kamenny Island, as well as Peter the Great Botanical Garden on Aptekarsky Island. In recent decades, active housing and business construction has been carried out on Krestovsky and Petrovsky Islands, and in the north-western part of Petrogradsky Island.

Vasilyevsky Island

An area between Bolshaya Neva and Malaya Neva, and the shore of the Gulf of Finland. Conditionally, the territory of the islands can be divided into five parts: area of pre-revolutionary building in the east (lines and the Spit of Vasilyevsky Island), belt of municipal and industrial enterprises, 'Gavan' (blocks of mixed pre-revolutionary, Stalin and Khrushchev buildings between Smolensk Cemetery and Kovsh Galernogo Farvatera), microdistricts of Soviet and post-Soviet buildings in the north-west and luvium territories cut off from the main part of the area by the Western highway speed diameter, which are currently being developed.

Admiralty Side

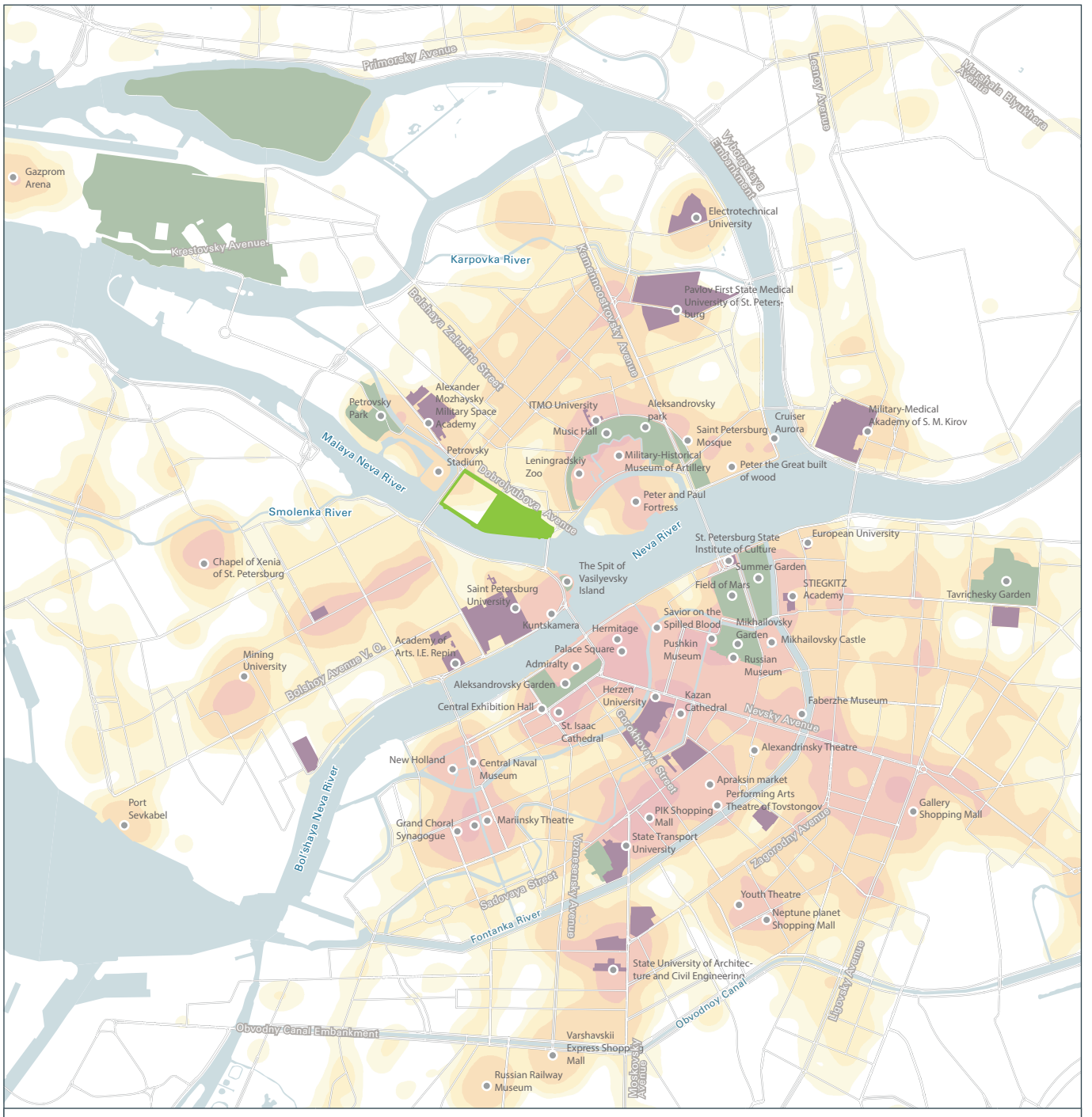
A part of the historical centre, where the largest number of valuable historical and cultural complexes and objects of tourist interest are concentrated, including the Hermitage, Admiralty, St. Isaac's and Kazan Cathedrals, Russian Museum, Mariinsky Theatre, the Summer Garden and New Holland Island. The planning structure of the district is based on the 'trident' of the streets converging to the tower of the Admiralty (Nevsky Avenue and Voznesensky Avenue, Gorokhovaya Street) and a number of arc connections, the role of which is played by the Moyka River, Fontanka River, Griboyedov Canal, Bolshaya and Malaya Morskaya Street, Kazanskaya Street, Sadovaya Street, and Zagorodny Avenue.

Vyborg Side

A historic district of Saint Petersburg, lying on the right bank of the Neva and Bolshaya Nevka. It is one of the old industrial districts of the city, named after the road to Vyborg that started here. Today, some of the former factory territories are being rebuilt into business centres and residential complexes. The key facilities of public importance in the district are the Finland Railway Station and the Military Medical Academy.

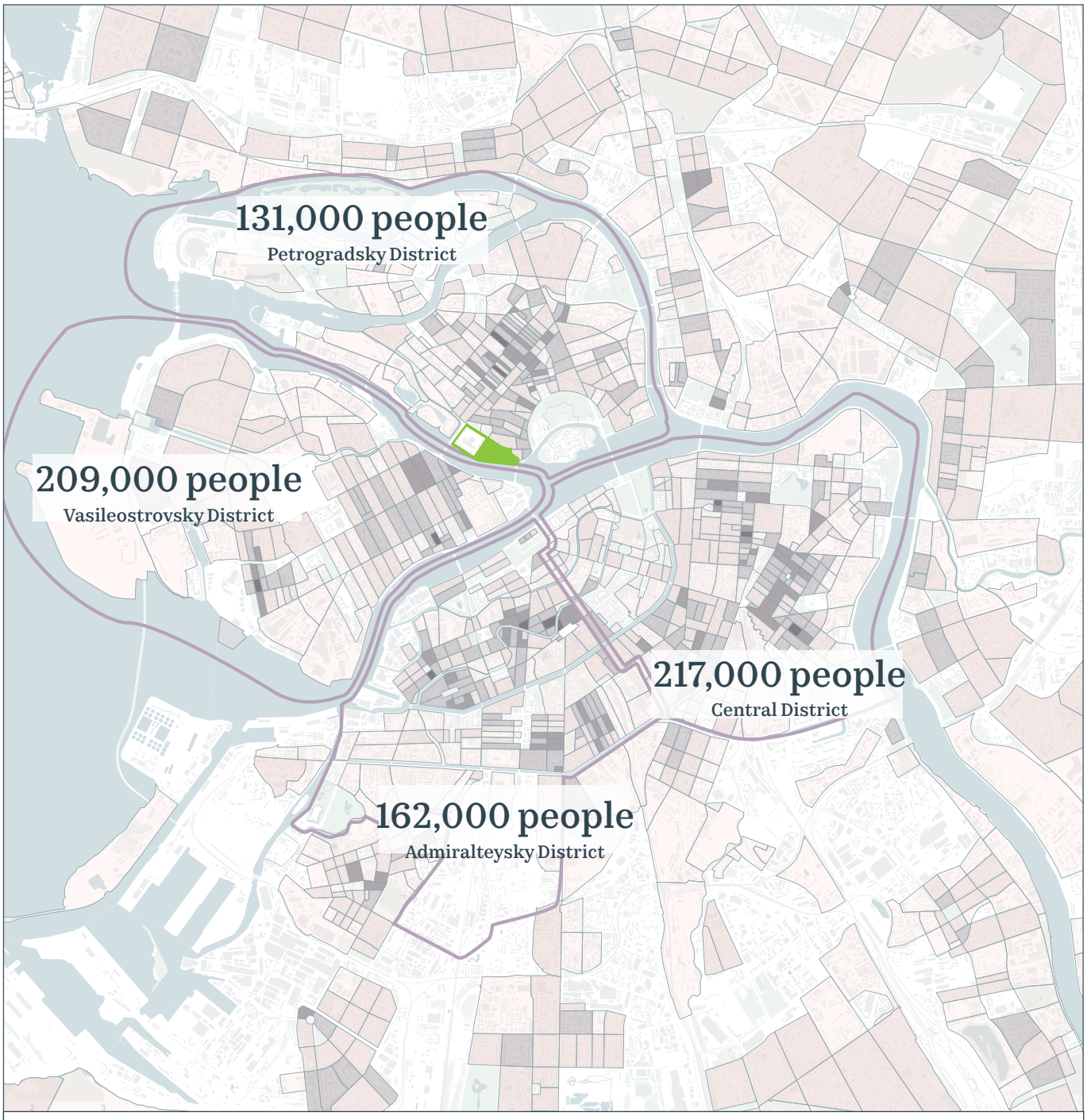
Centres of urban life

The territory of the future park is surrounded by areas of active urban life, including landmarks, iconic territories, public clusters, commercial and social business functions.



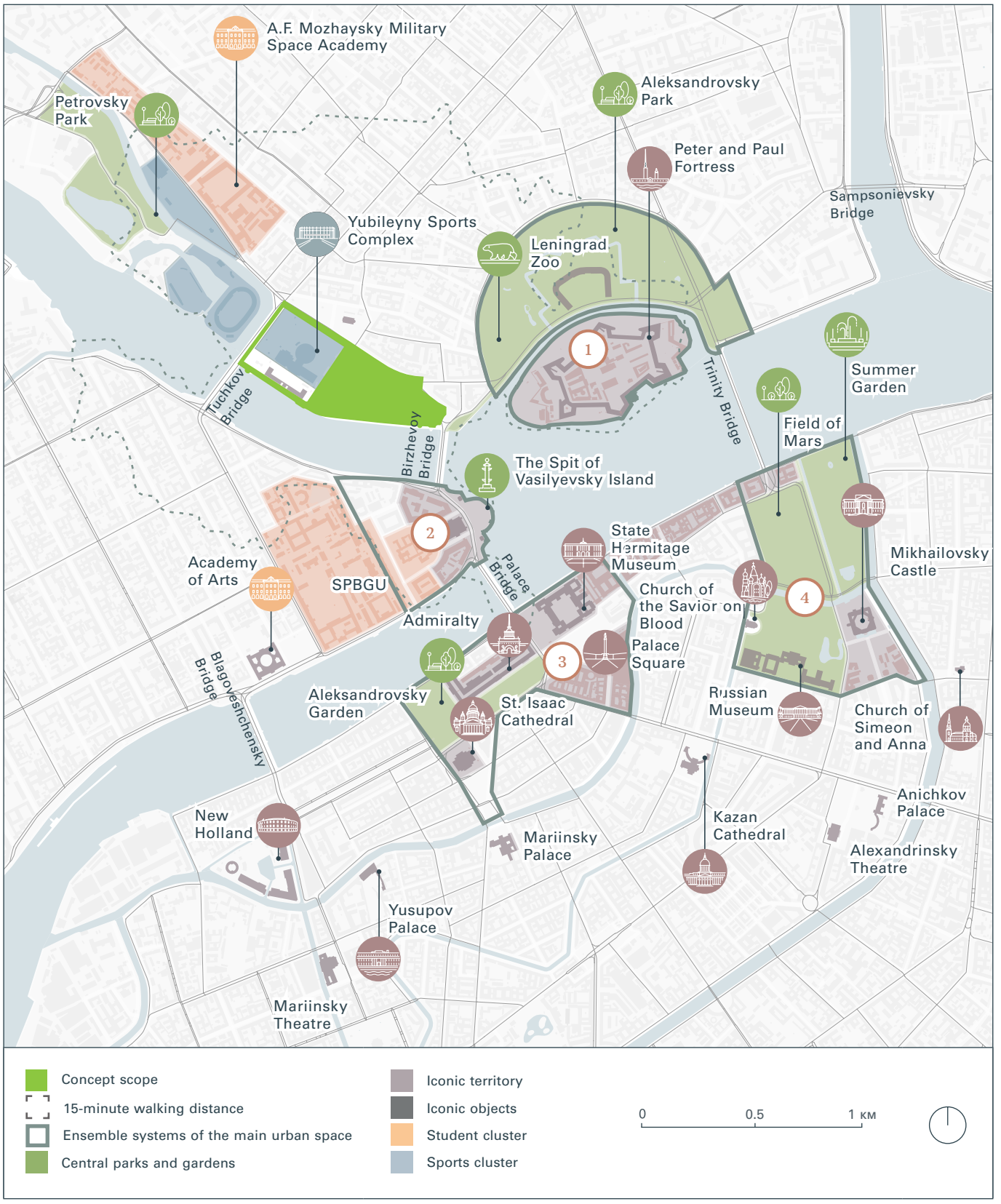
Population density[1]

The territory under consideration is located in the most densely populated part of Petrogradsky District. Residents of Petrogradsky and Vasileostrovsky districts will visit the park regularly. 90,000 people live within a 20-minute walking distance.



1. For more information about city population and its classifications by groups of ages, see 'Appendix,' subsection 'Stages of Saint Petersburg's development.'

Territory in the structure of the centre of Saint Petersburg



The design of the park should take into account the existing cultural and historical urban environment in order to create a single complex ensemble in the centre of Saint Petersburg. As an integral part of the system of public spaces in the central part of the city, Tuchkov Buyan will become an element of the social and urban fabric of Saint Petersburg.

15-MINUTE WALKING DISTANCE

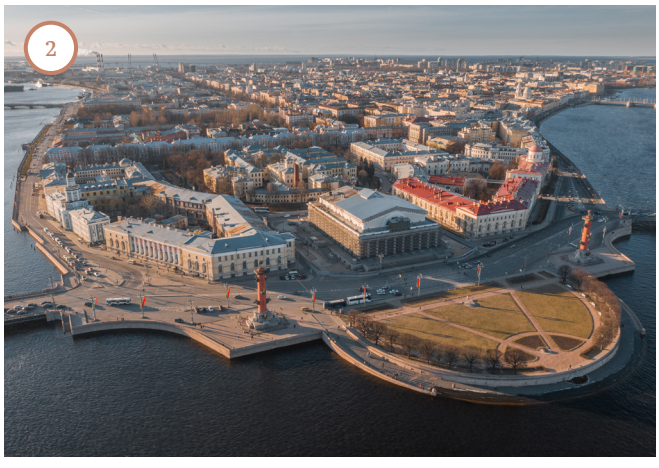
54,000 citizens

1,400 guest rooms

51,000 students
of urban universities

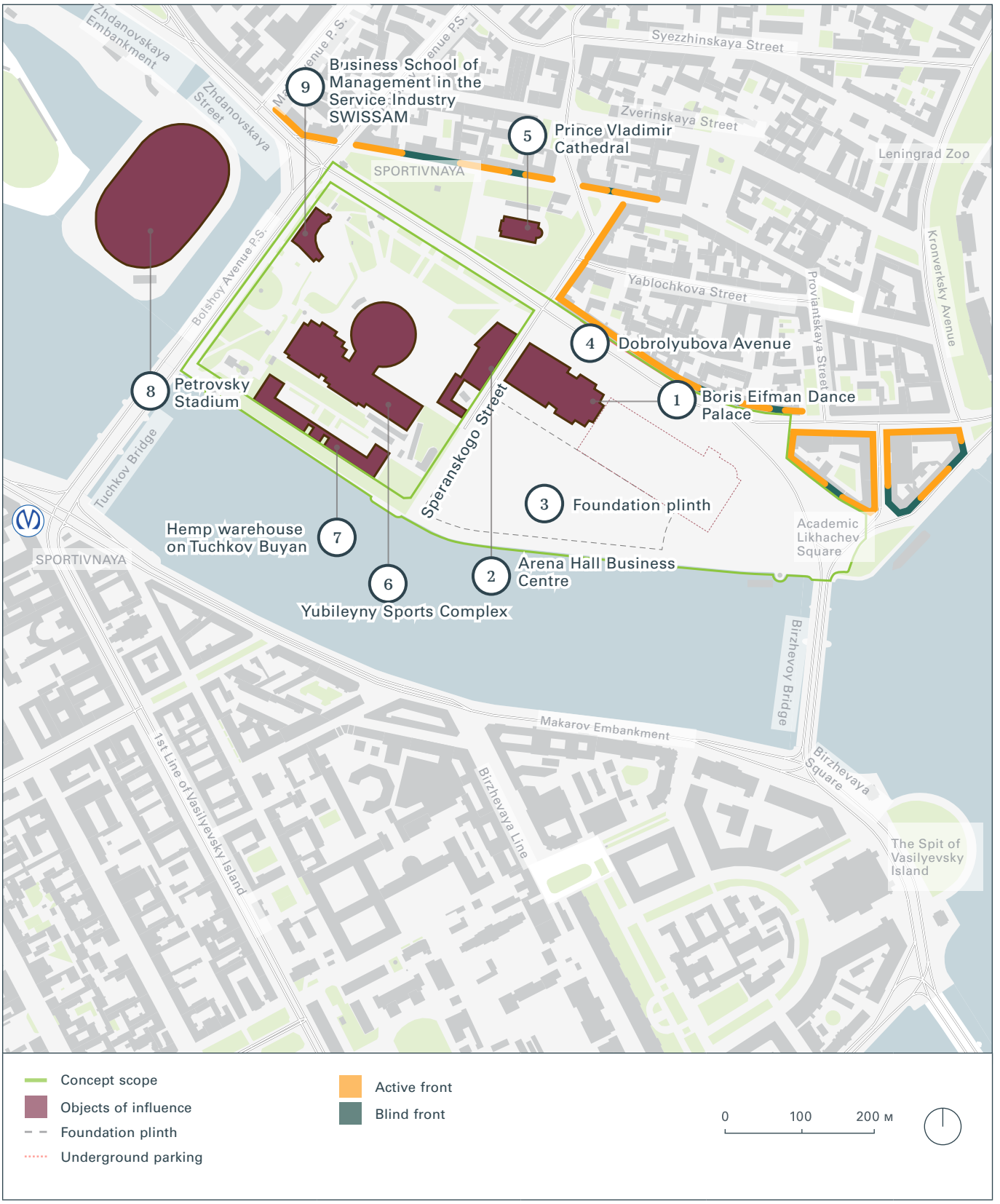
12,000 employees
of business centres

HISTORIC ENSEMBLES OF THE CITY CENTRE



Territory environment scheme

In addition to the municipal context, participants' conceptual proposals should take into account the influence of the facilities located within immediate proximity of the territory. One of the tasks is to complete the urban planning composition formed by Speranskogo Street, Boris Eifman Dance Palace and the Arena Hall Business Centre.



© Architectural Bureau SPEECH

Boris Eifman Dance Palace[1]

The 1500-seat Boris Eifman Dance Palace is currently under construction. Its planning and design are not the subject of this competition. However, participants should take into account the appearance of the building, its operation modes, and the access routes. The main entrance is located on the sotuh-eastern facade while the south-western side includes service facilities that are not designed to face the Malaya Neva river, notably the loading dock, underground parking entrance, and the VIP entrance. Participants need to propose a spatial or design solution able to shield the south-western facade.

© Nikolay I. / 2gis.ru

“Arena Hall” Business Centre

A six-storey business centre, lined with glazed aluminium structures, whose main facade looks out at the Yubileyny Sports Complex. The rear facade of the building is facing the park. In the basement there is a guarded parking for 87 cars.

Participants need to propose a spatial planning or landscape-architectural solution that will shield the south-eastern facade of the business centre.

Foundation plinth

The previous design on the site included buildings to be completed (Boris Eifman Dance Palace and underground parking) and buildings to be suspended (building of the Supreme Court, residential buildings and the Judicial Department). The territory of the future park is mainly a large pit with an already-installed foundation plinth and protective fence. The construction works did not affect only a small part of the territory near Academic Likhachev Square.

1. For more information, see «Boris Eifman Dance Palace» in Appendix page 197.

© Alexander Alekseev / Lori Photobank

Dobrolyubova Avenue

Has an active frontage. The functions on the first floors of the buildings will be in demand by visitors to the park. Participants should take into account the activity of the first floors of the surrounding neighbourhoods when designing the streets adjacent to the park.

© A.Savin / Wikimedia Commons

Prince Vladimir Cathedral [1]

Cultural heritage object of federal importance. The largest and the most attended Orthodox church of the Petrograd Side. In the design process, participants must take into account the view corridors to the facility and its specific mode of operation.

© panevin.ru

Yubileyny Sports Complex

One of the largest sports and entertainment sites in Saint Petersburg, accommodating up to 10,000 visitors. Musical concerts in Yubileyny are held 2–3 times a month. Seasons of ice shows and musicals, which last for 1–2 weeks, take place several times a year; at this time performances are held at a frequency of up to three times a day. Site operation mode and users should be taken into account when designing the park.

1. For more information, see 'Cultural Heritage,' subsections 'Historical background of the territory ', and 'View corridors'.

Penkoviye Sklady (Hemp warehouse on Tuchkov Buyan)[2]

A cultural heritage object of federal significance. The Military Space Cadet Corps was located in the building until 2011. Today, the building is not in use. Participants are recommended to propose possible functional content of the complex of buildings and inclusion of the facility in the future life of the park.

© Il'ya Olekhov / Lori Photobank

Petrovsky Stadium

Reserve stadium of the Zenit football club, which accommodates more than 20,000 spectators. On the days of matches, the nearest subway station (Sportivnaya) is closed in order to avoid crowds, and fans disperse to the neighbouring stations. Site operation mode and users should be taken into account when designing the park.

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Business School of Management in the Service Industry SWISSAM

Specialised higher education institution. Uses international methods for professional training within the hotel and restaurant industries. Courses are taught in English by Swiss specialists.

2. For more information, see the section «Cultural Heritage», subsections 'Historical background of the territory ' and 'Hemp warehouse on Tuchkov Buyan.'

— 7 —

Transport

Requirements and recommendations

It is not recommended to change the number of lanes or direction of traffic on the area to be analysed and designed. Any proposals that concern the existing traffic pattern require a justification of the viability and feasibility of the solutions and must preserve the capacity of all streets in the area of influence.

The transportation strategy should be developed in a way that allows to reach the park and the Dance Palace by car or taxi. The concept should provide for a drop-off/pick-up area, taxi stands, and an entrance to the underground parking as well as a loading dock for the Dance Palace and a service area for the park.

It is recommended to connect Tuchkov Bridge with Speranskogo Street by structurally isolating tram tracks on the stretch of Bolshoy Avenue of Petrograd Side from Tuchkov Bridge to Dobrolyubova Avenue in order to eliminate the left turn onto the new thoroughfare. It is also recommended to organise an additional right turn from Bolshoy Avenue of Petrograd Side onto Dobrolyubova Avenue, omitting signal control.

It is suggested that participants consider the possibility of priority lanes for public transit on the studied area, including on the section from Academic Likhachev Square to the Rostral Columns of Vasilyevsky Island, having organised additional transit stops if necessary.

A stop and short-term parking for tour and school buses is permitted near the park; however, including the territory in existing tourist bus routes is not recommended: mass tourism leads to increased recreational traffic and degradation of the landscape. Such a situation would be undesirable for Saint Petersburg residents.

Additional parking spaces on the project area are not necessary, as a 540-space underground car park is already under construction that will completely satisfy the demand for parking spaces.

The park should be integrated into the existing network of walking routes through the city centre by placing main and secondary entrances to conveniently and organically connect the territory with the surrounding districts and points of attraction. It is important to pay attention to the safety of pedestrian routes.

It is principally important to provide convenient access to the park from the metro, which the majority of visitors will use to reach the park. Convenient connections can cross the territory of the Yubileyny Sports Complex.

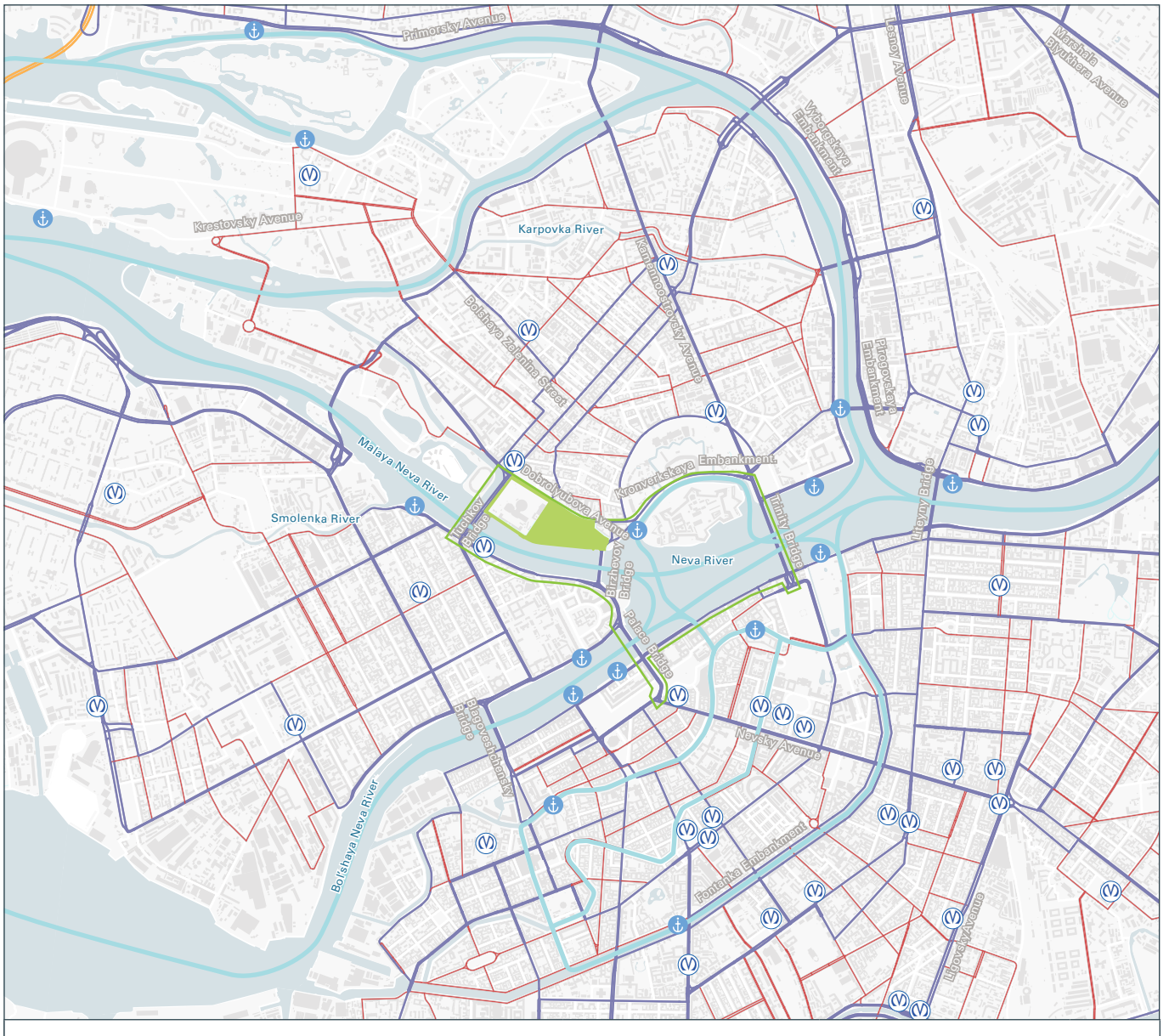
Cycling in the park is not anticipated. Cycle paths should be planned along Dobrolyubova Avenue, along with their connections to the city's planned cycling infrastructure.

Water transport must be considered as a recreational element, with integration into existing routes. Along the embankment, a city pier can be organised.

Transport and pedestrian/cycle accessibility

Transport framework of the city

> The territory is adjacent to a main thoroughfare, Dobrolyubova Avenue. Traffic flow in rush hours is about 2,000 units of motor transport. ‘Sportivnaya’ subway station is located 500 m from the park, with passenger traffic per month of 1,437,000 people. 15 public transport routes pass by the park along Dobrolyubova Avenue.



1. Any proposals that concern the existing traffic pattern require a justification of the viability and feasibility of the solutions and must preserve the capacity of all streets in the area of influence.

Pedestrian and cycle framework of the city

When designing the park, the participants need to provide for the development and strengthening of walking and bicycle links with surrounding districts. The system of pedestrian access to the park should take into account the existing and planned pedestrian routes, contribute to the creation of continuous pedestrian routes in the city centre, and provide comfortable access to the new park.

Transport service of the territory

Transport service of the territory

It is recommended to connect Tuchkov Bridge with Speranskogo Street by structurally isolating tram tracks on the stretch of Bolshoy Avenue on Petrograd Side from Tuchkov Bridge to Dobrolyubova Avenue in order to eliminate the left turn onto the new thoroughfare. It is also recommended to organise an additional right turn from Bolshoy Avenue of Petrograd Side onto Dobrolyubova Avenue, omitting signal control. These solutions will allow to reduce the load on the intersections of Dobrolyubova Avenue and to increase the transport accessibility of the territory.

Public transport

It is recommended to choose the subway as a priority way of transport access, hereby considering 'Sportivnaya' station, located 500 m from the park, as the main one.

Land public transport, represented on Dobrolyubova Avenue by 15 routes of buses, trolleybuses and trams, should be considered as auxiliary due to irregular traffic and traffic jams.

It is suggested that participants consider the possibility of priority lanes for public transit on the studied area, including on the section from Academic Likhachev Square to the Rostral Columns of Vasilyevsky Island, having organised additional transit stops if necessary.

Taxis can be considered as additional public transport. It is recommended to place the taxi stop on Speranskogo Street to avoid traffic slowdown on Dobrolyubova Avenue.

Private vehicles

On the territory there is underground parking for 540 parking stalls.

According to the calculation of the section 'Park programming,' there are 1,925 people in it at a time. This number of visitors requires 385 parking stalls.

The existing underground parking completely provides the park with the required parking stalls, and the remaining ones can be used as intercepting or district parking.

The site on Speranskogo Street is recommended as short-term parking for the pick-up/drop off of passengers of private vehicles, in order to avoid traffic slowdown on Dobrolyubova Avenue.

Water transport

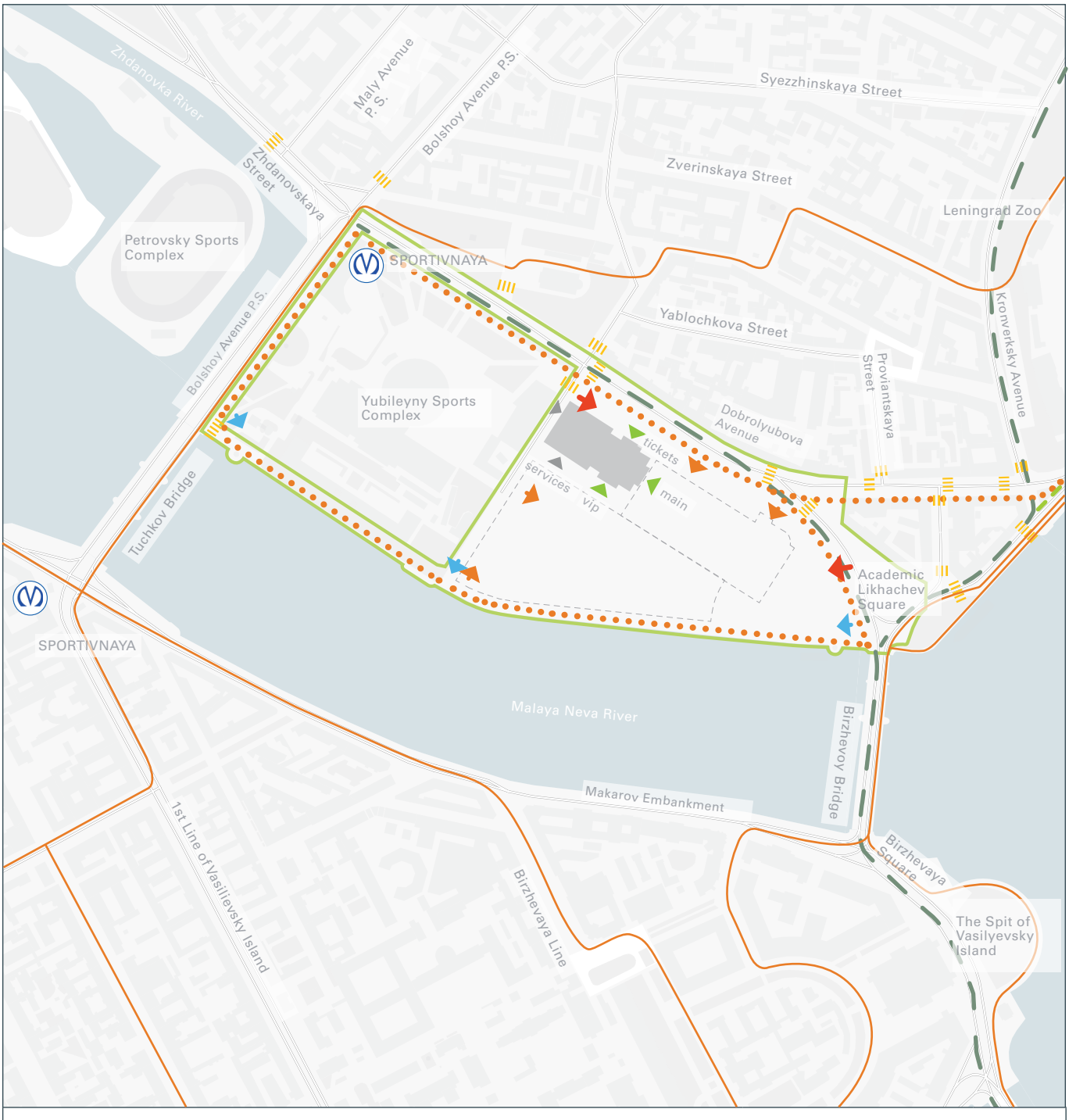
Water transport should be considered as recreational with integration into the existing routes. Along the embankment it is possible to organise the city berth with the following characteristics:

- It is allowed to locate the berth with a height not exceeding 4.1 m above the water level;
- The recommended dimensions of the universal berth for excursion and pleasure vessels (1-3 decks) and transport vessels like 'Meteor' are 10 x 90 m;
- The establishment of the berth on the territory is justified by its name: the river pier was called buyan in ancient times, it was located here during various historical periods.

Tourist transport

Consider the possibility of stopping and short-term parking of excursion and school buses, which does not interfere with the motor transport traffic on the main street. It is therefore not recommended to integrate the territory into existing tourist bus routes. Mass tourist flow will lead to excess of the recreational load and degradation of the landscape. Also, active visits of tourist groups to the park will adversely affect the residents of the district.

Pedestrian and cycle accessibility



Walking accessibility

Provide for the location of the main and secondary entrances to the park for its connection with the attraction objects and adjacent territories. It is required to ensure safe and comfortable walking accessibility of the park:

- entrance to the park from Academic Likhachev Square will receive guests of the park from Birzhevoy Bridge, Mytninskaya Embankment and Kronverkskaya Embankment, joining the park to the main pedestrian routes;
- entrance from the side of Dobrolyubova Avenue will be used by passengers of public transport;
- additional entrances from Dobrolyubova Avenue will provide the connection of the park and the adjacent residential district.

Within the park, the pedestrian route system should provide for various scenarios for use of services, including short, transit routes and long-term recreational routes with an overview of the surrounding historical buildings.

Embankment

The new embankment will create a pedestrian connection between Birzhevoy and Tuchkov bridges.
When designing it is recommended to provide for 3 main entrances to the embankment:

- from Birzhevoy Bridge;
- from Tuchkov Bridge;
- from Speranskogo Street.

The section of the embankment from Speranskogo Street to Birzhevoy Bridge can be integrated into the park.

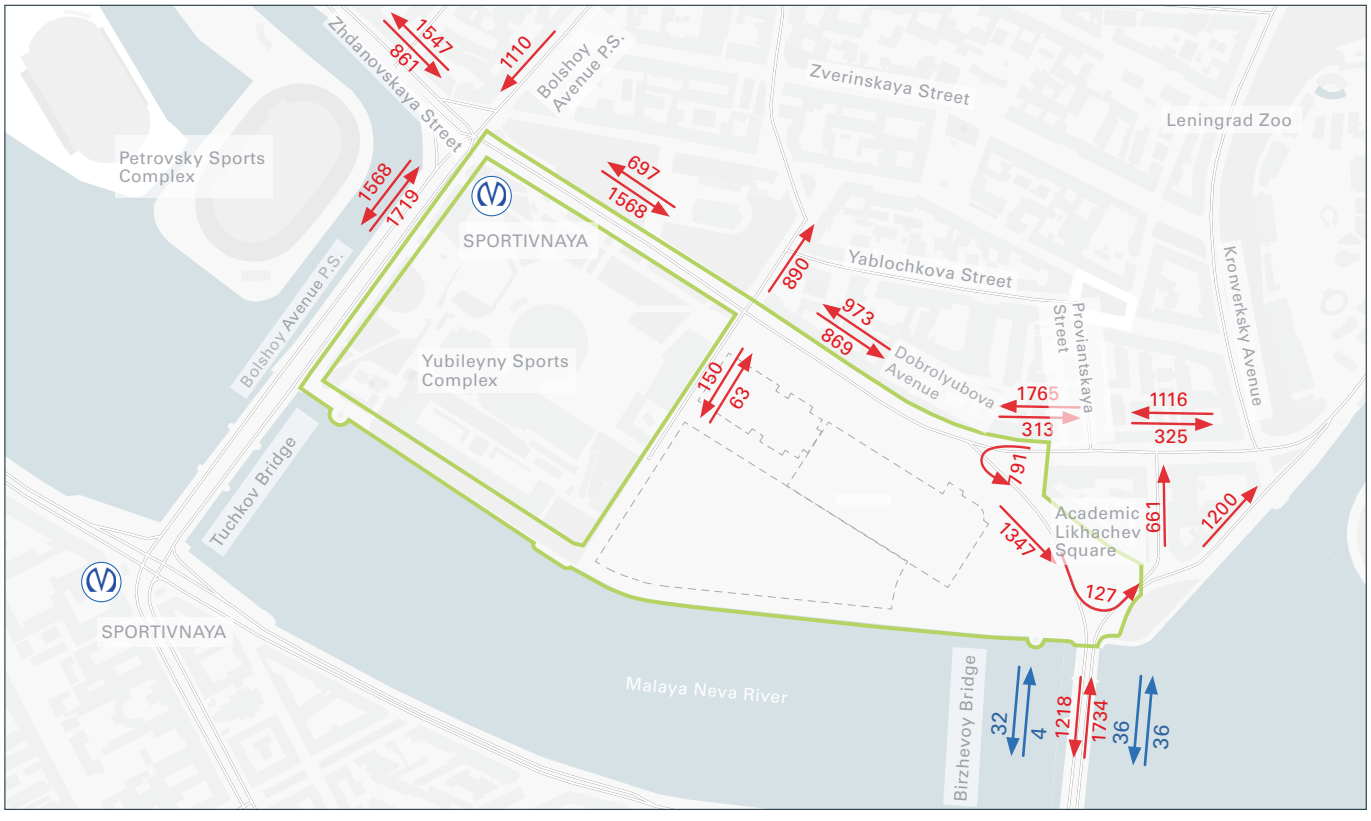
Bicycle Accessibility

Bicycle transport on the territory should be considered as transit, built into the planned bicycle frame of the city. The following is recommended:

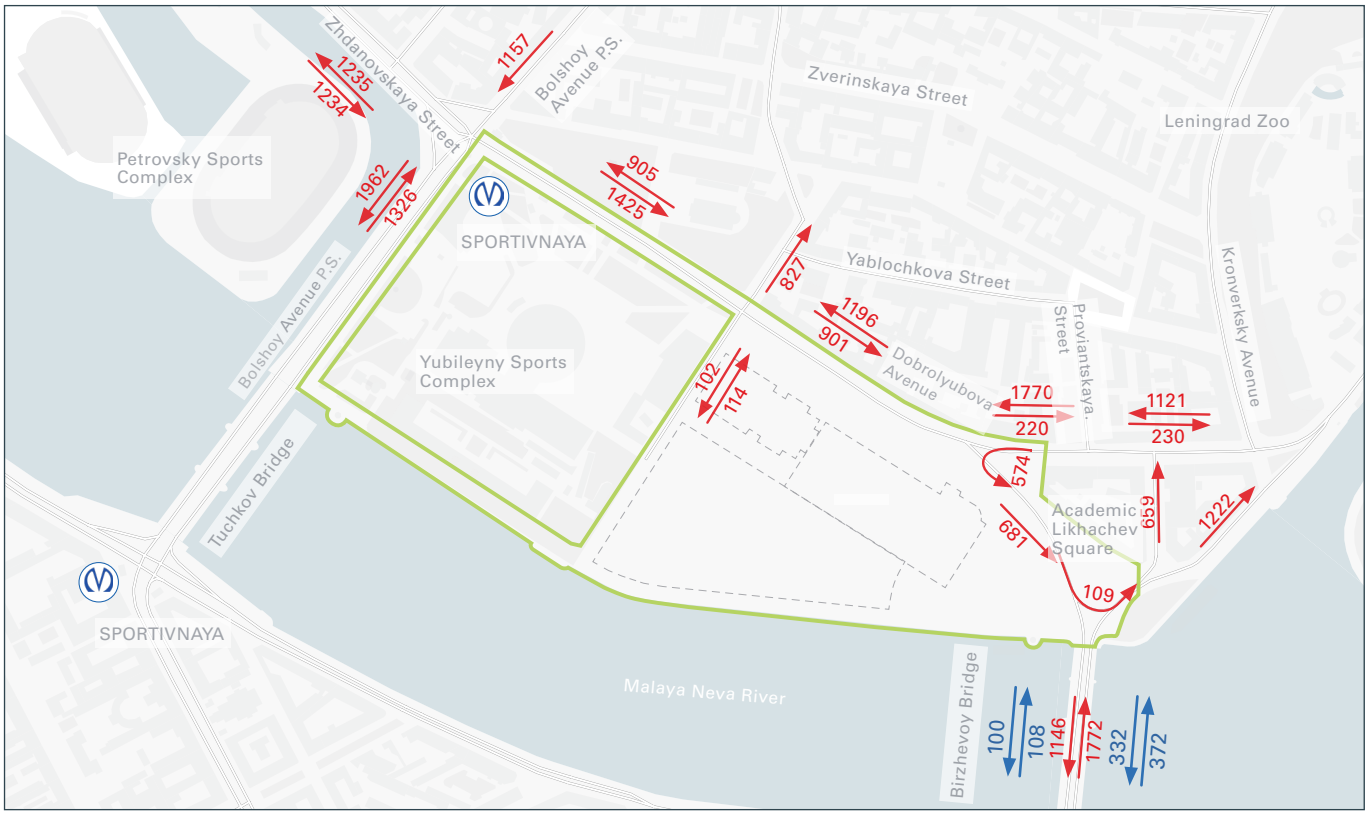
- location of a bicycle track on the territory of the park along Dobrolyubova Avenue;
- provision of bicycle infrastructure along the perimeter of the park, including bicycle parking and bicycle rental.

Traffic and pedestrian flow intensity

WEEKDAY MORNING



WEEKDAY EVENING



Academic Likhachev Square

WEEKEND EVENING

— 8 —

Structural and engineering systems

Requirements and recommendations

On the lot, there remain structures from the previous project: both scheduled for completion (the Boris Eifman Dance Palace and the underground parking) and whose construction was halted (the Supreme Court building, residential buildings and the Judicial Department). At the current time, the majority of the territory of the future park is a foundation pit with an already-installed concrete foundation and protection system. Only a relatively small fragment of the lot next to Academic Likhachev Square remains untouched by construction.

The existing concrete structures should be used as logically and efficiently as possible for creating the park landscape, placing services, and functional programming.

Participants should decide what to do with the sheet-pile wall: preserve or demolish it, in whole or in part. Any solution should be justified from the perspective of technical feasibility and cost-effectiveness.

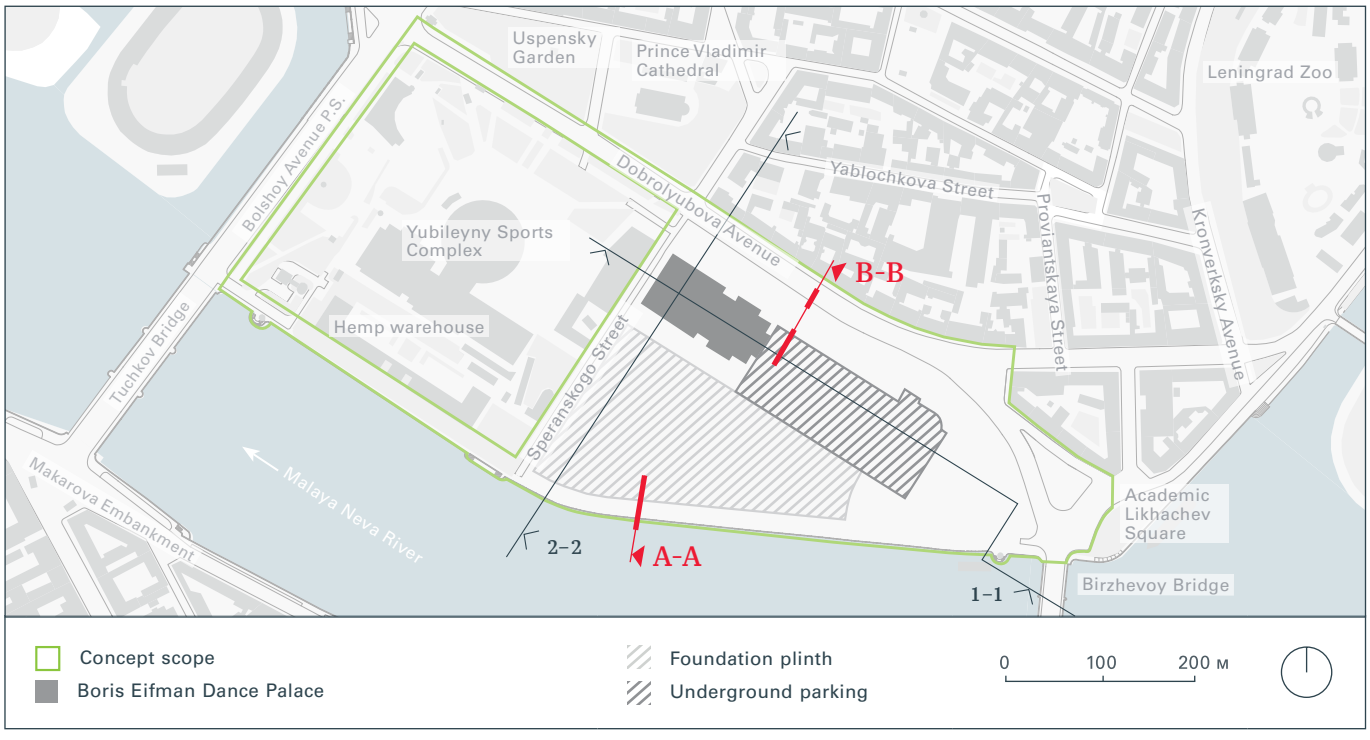
In the design process, it is necessary to account for the unique specifics of the structures and the permissible load of both existing foundations and the underground parking. In the event that the permissible load is exceeded, proposals for structural reinforcement should be presented.

Any interference with the structure of the existing embankment should be accompanied by a clear and detailed explanation of the proposed methodology and technical solutions that will ensure the structural integrity of the wall, as well as the economic feasibility of such a solution.

It is necessary to provide for an efficient drainage system and its connection to the existing urban infrastructure.

An effective drainage system for the park should be designed with considerations for the existing system for protecting the construction pit and restrictions imposed by the sewage tunnel.

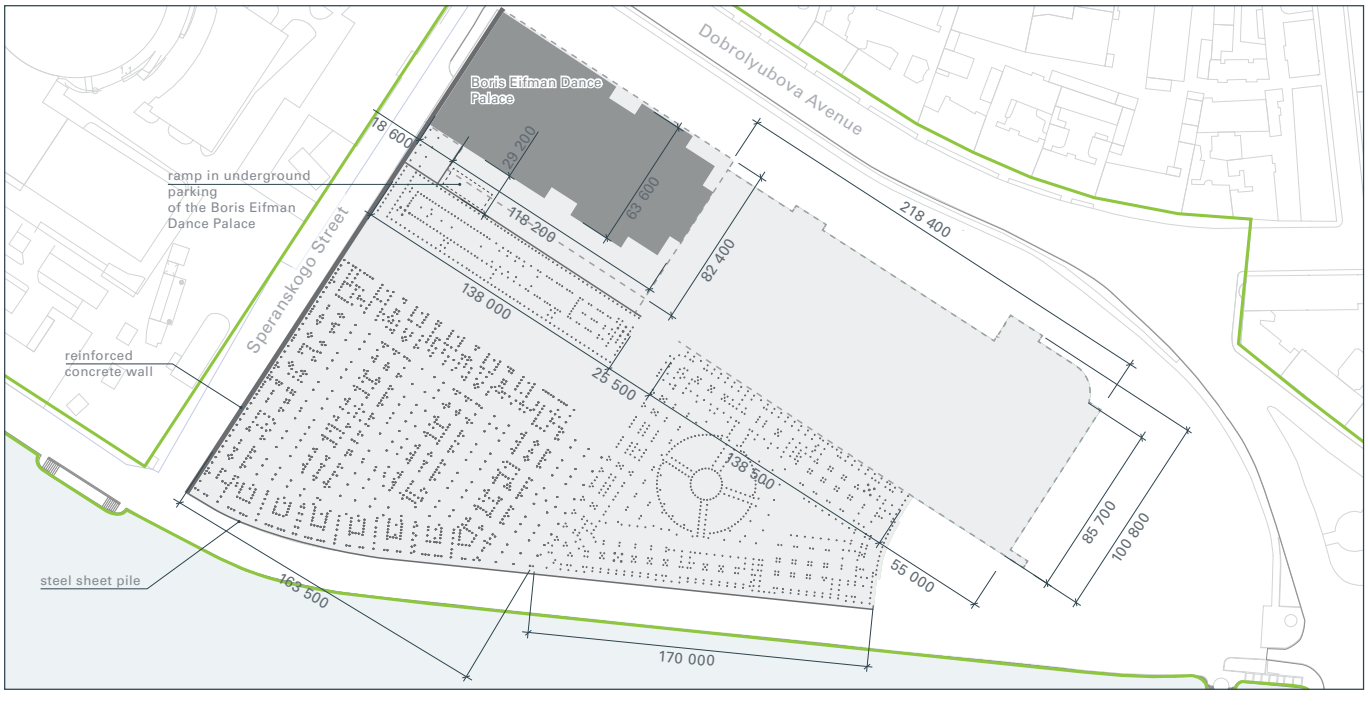
Present situation on the site



Geotechnical information

Prior to the installation of the foundation, the upper layers of the geotechnical profile of the site consisted of modern technological soil and water-saturated sands. Most of these two layers was excavated, and the foundation raft now lies in a thick layer of water-saturated soft clays.

The foundation raft is supported by a system of 18 to 20-metre-long piles, distributed below the stiffening walls and columns of the previously designed buildings. This specific feature should be taken into account when developing the concept, although the bearing capacity of the foundation system seems to be sufficient for any new possible loads of the park.

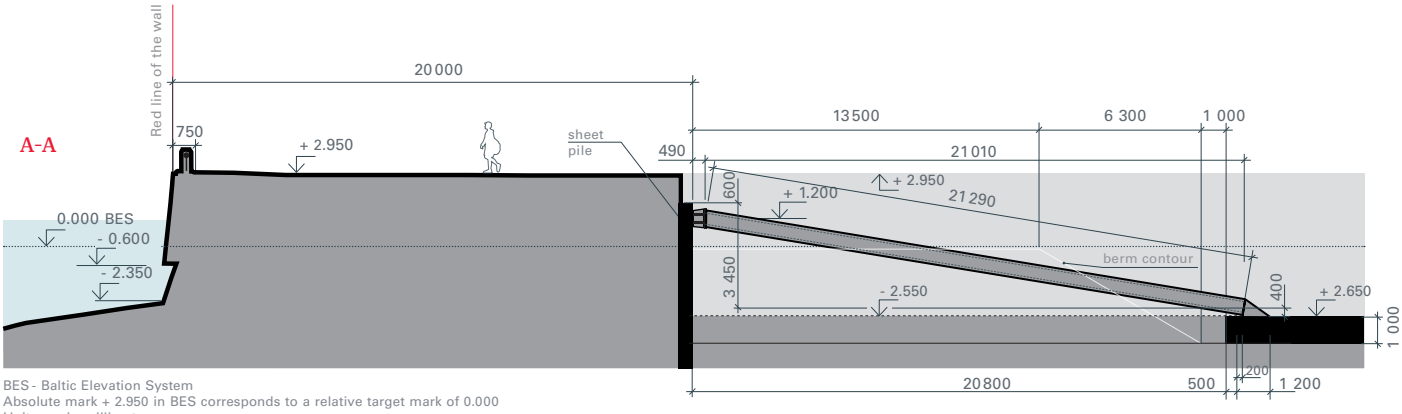


Units are in millimetres

Existing concrete foundations

Foundation plinth

The depth of the pit (from the top edge of the foundation raft) is approx. 6 m below the ground surface, i.e. approximately 3 m below the normal level of the Neva River (which is also the mark of the absolute 0.00 level). Along the perimeter, the pit is protected by a sheet pile wall (SPW) system, which has two functions: it maintains the stability of the pit during construction and protects it from groundwater. In the areas where the bearing capacity of a stand-alone SPW is sufficient, the sheet pile walls are free-standing, but in the most critical areas they are additionally supported by struts. Apart from stabilising the pit, the SPW protects the pit from groundwater. While the piles are in place, the SPW serves as a waterproof diaphragm between the park area and the surrounding soils. It is necessary to develop a way of dealing with the SPW (maintenance, partial or total removal, etc.), as well as demonstrate and prove the technical feasibility and economic efficiency of such a proposal.

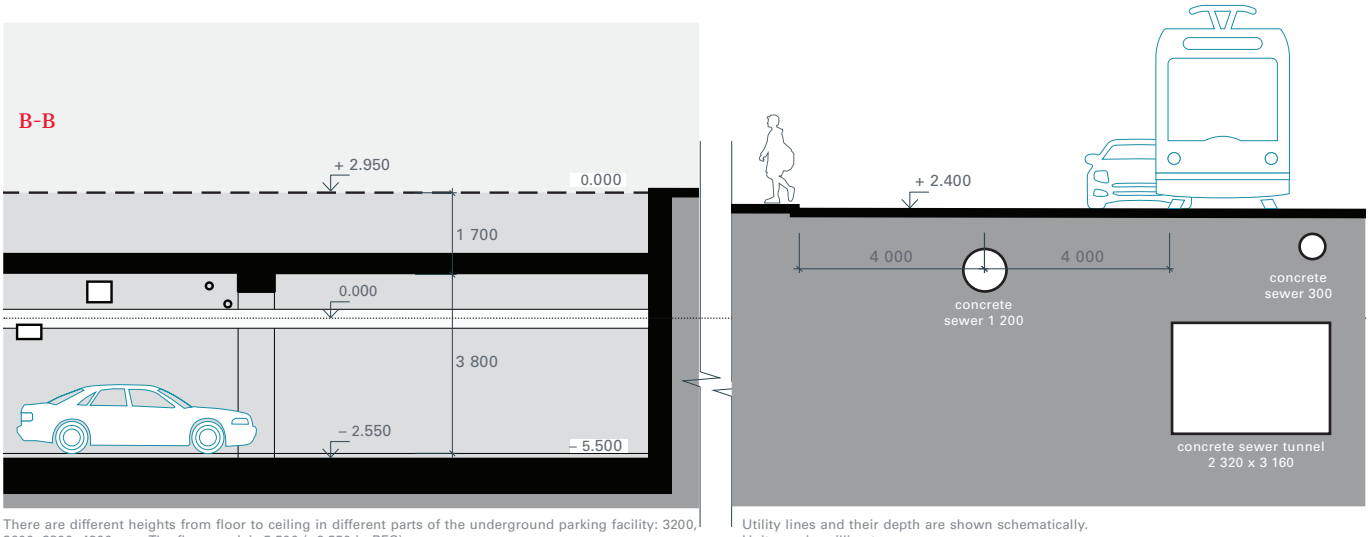


BES - Baltic Elevation System
Absolute mark + 2.950 in BES corresponds to a relative target mark of 0.000
Units are in millimetres

Underground parking

The single-level underground parking facility is under construction now, and after completion it will be used for its original purpose. The roof of the parking facility is at the (absolute) level of +2.950 and will serve as a podium for the planting part of the park area.

According to Russian construction codes, the roof of the underground parking facility should have been designed to carry a minimum of 30 kN/m2 of 'stylobate loads.' If the proposed loads exceed this value, proposals for interventions in the parking structure (reinforcement of the slab or columns, reconstruction, etc.) should be developed.

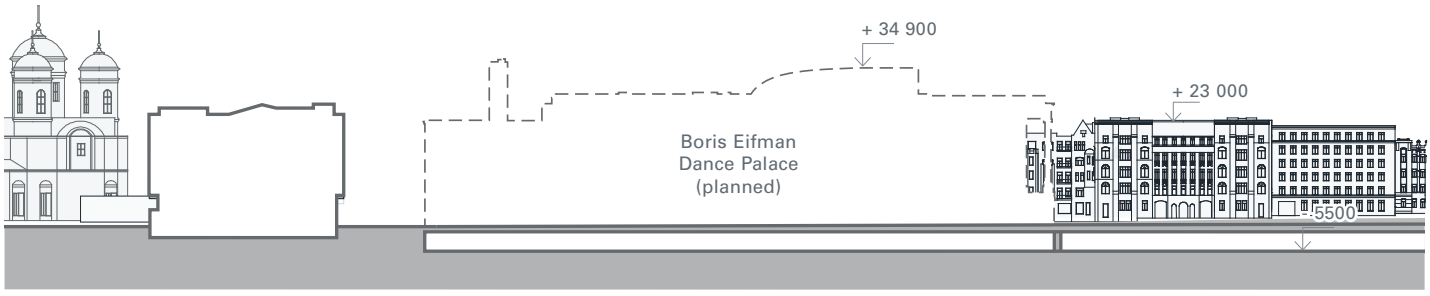


There are different heights from floor to ceiling in different parts of the underground parking facility: 3200, 3600, 3800, 4300 mm. The floor mark is 5.500 (- 2.550 in BES).

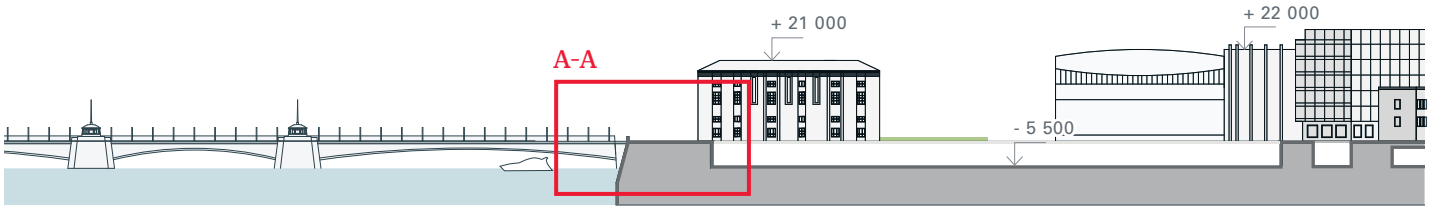
Utility lines and their depth are shown schematically.
Units are in millimetres

Sections and elevation

SECTION 1-1

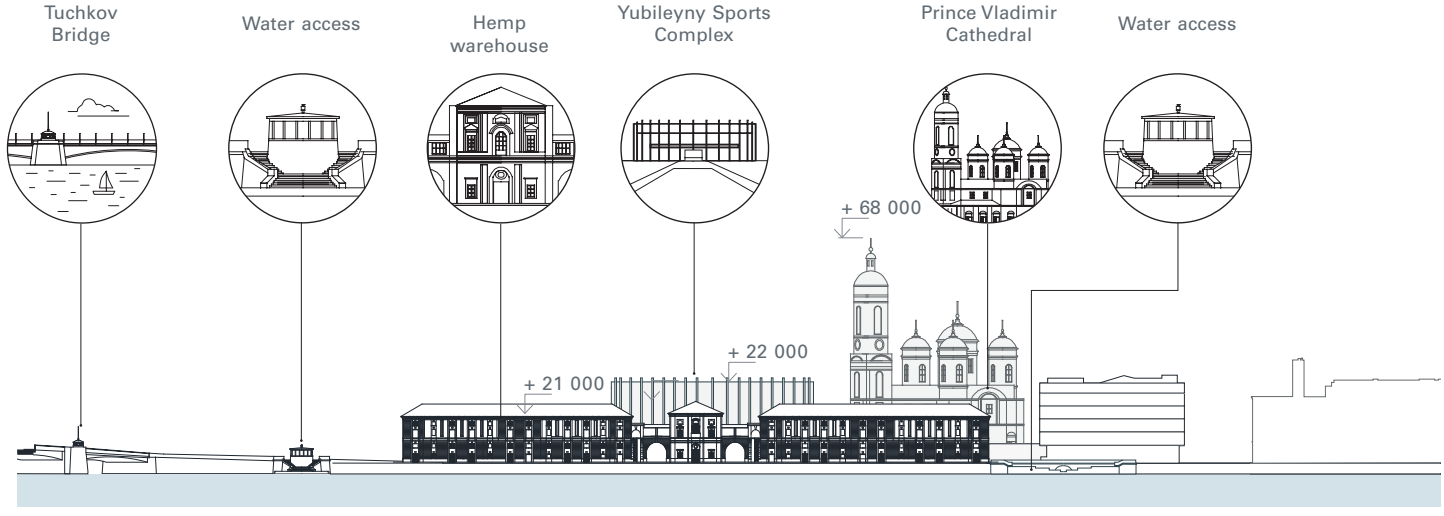


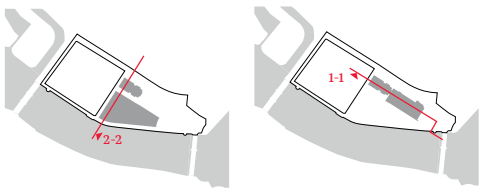
SECTION 2-2

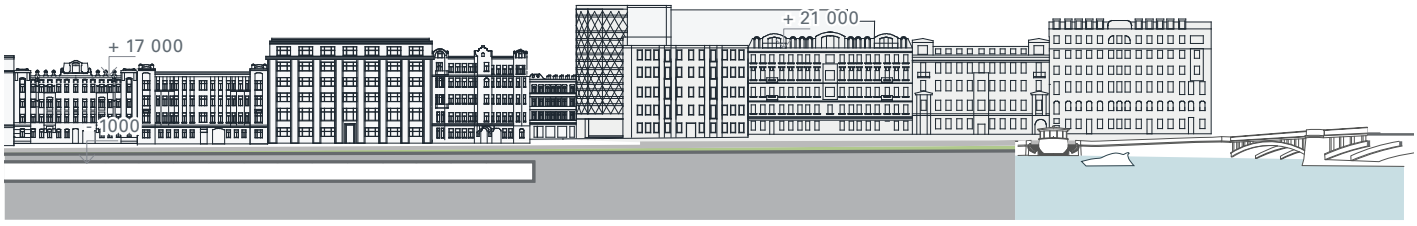


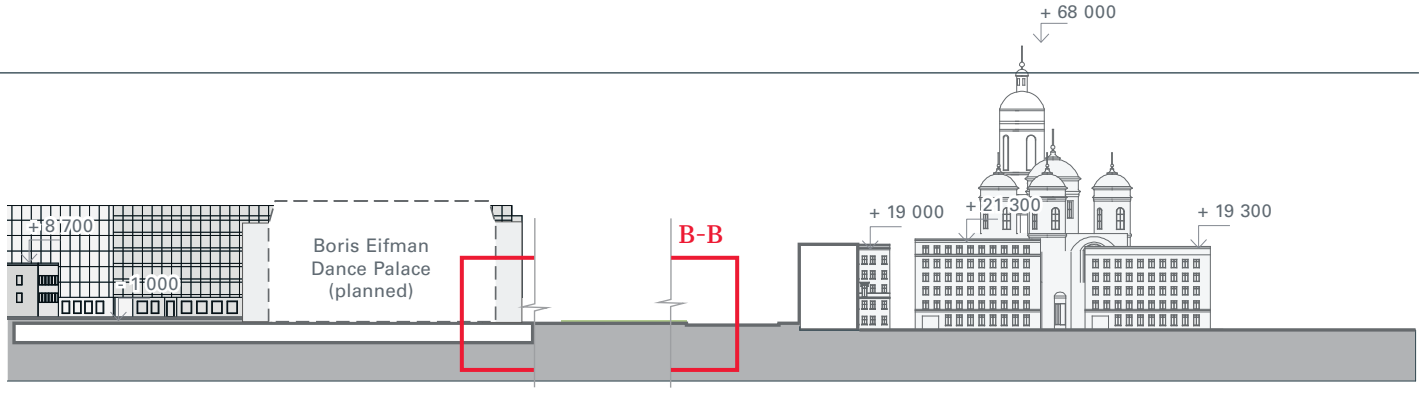
For detailed fragments AA and BB, see page 115

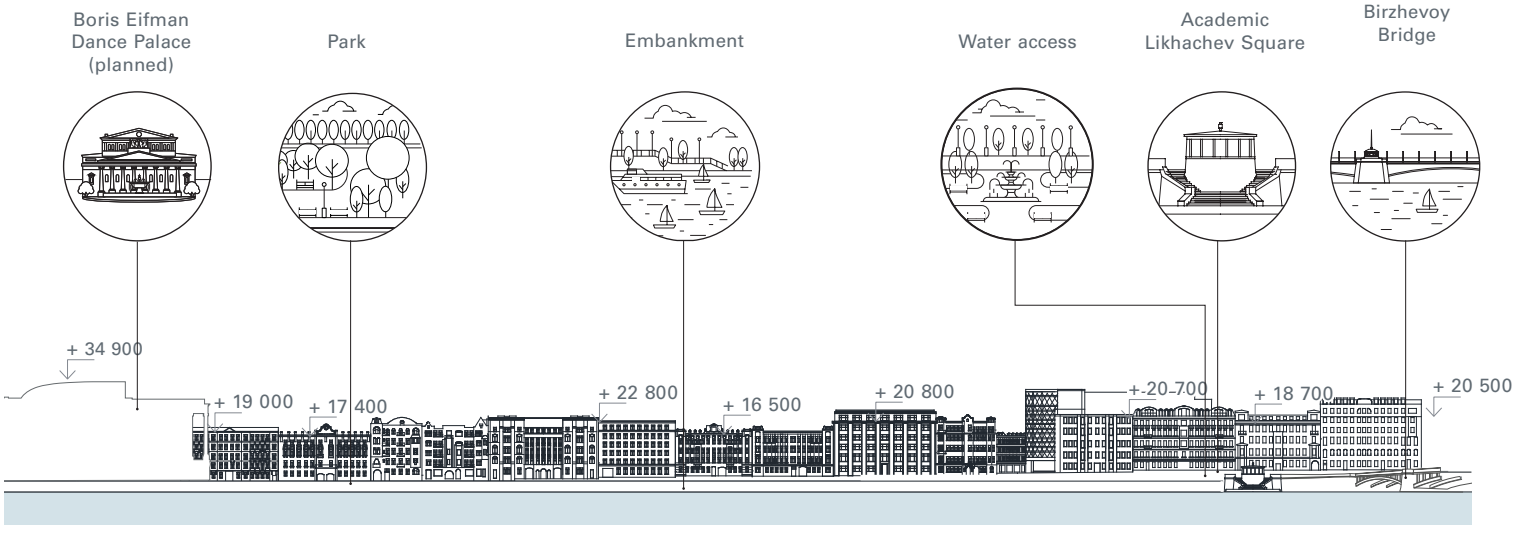
EMBANKMENT ELEVATION









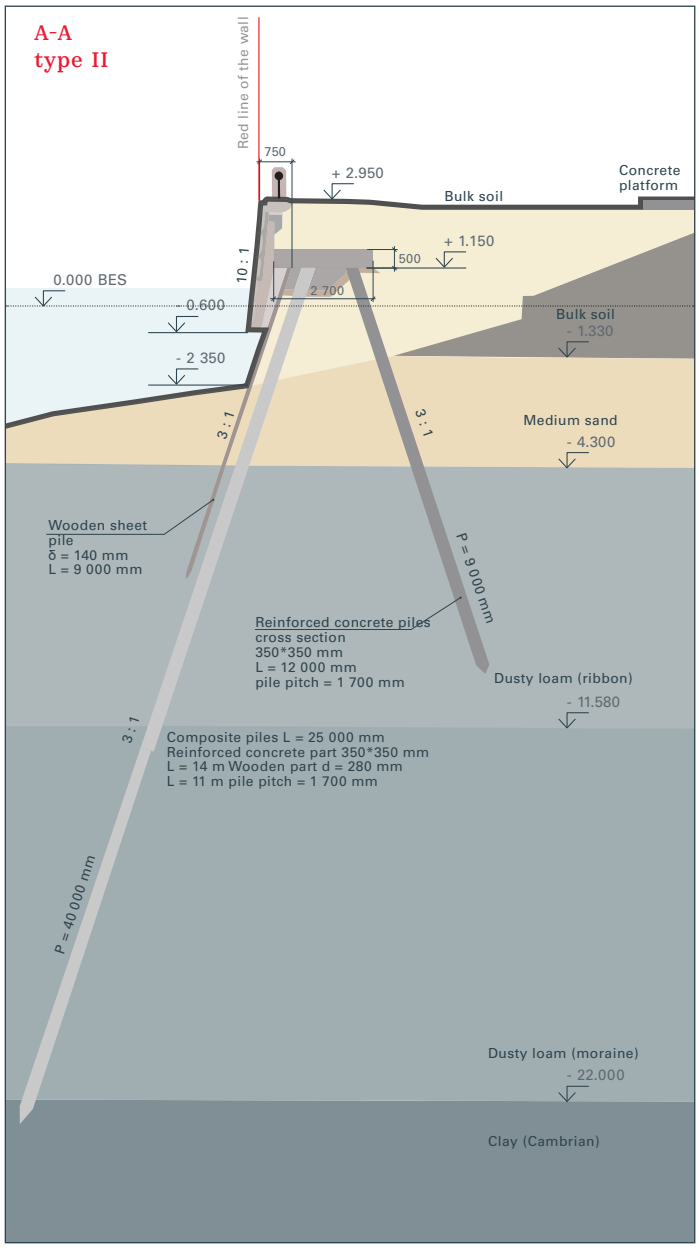


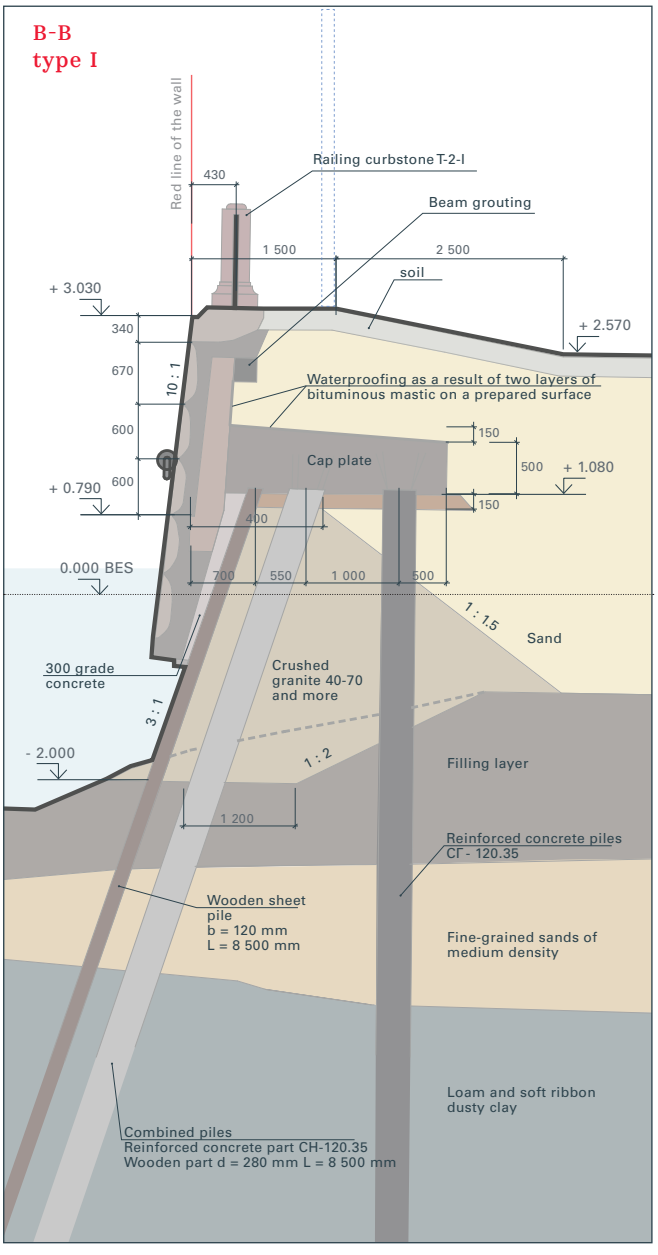
Academic Likhachev Sq.

Waterfront protection

The territory of the future park is directly adjacent to the Malaya Neva River and is protected from flooding by a waterfront protection wall. The upper edge of the wall is exactly 3 metres above the normal level of the Neva River and thus corresponds to the ground level of the future park. The waterfront protection wall was built 50 years ago. It is a combination of concrete and wooden piles and several layers of varied backfilled soils.

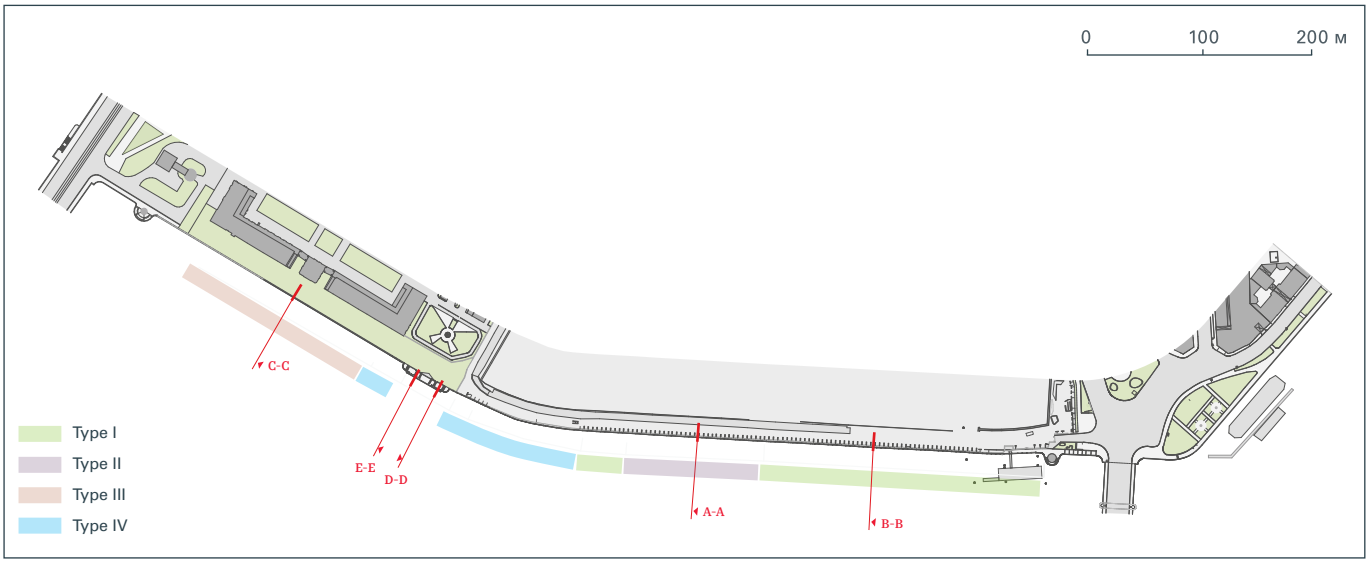
The waterfront protection wall extends along the entire length of the park's south border. Any intervention on this wall (for the sake of possible access to the river, installation of additional facilities and other project designs) needs to be accompanied by a clear and detailed explanation of the proposed methodology and technical solutions that will secure the structural integrity of the wall while maintaining the economic feasibility of the project.

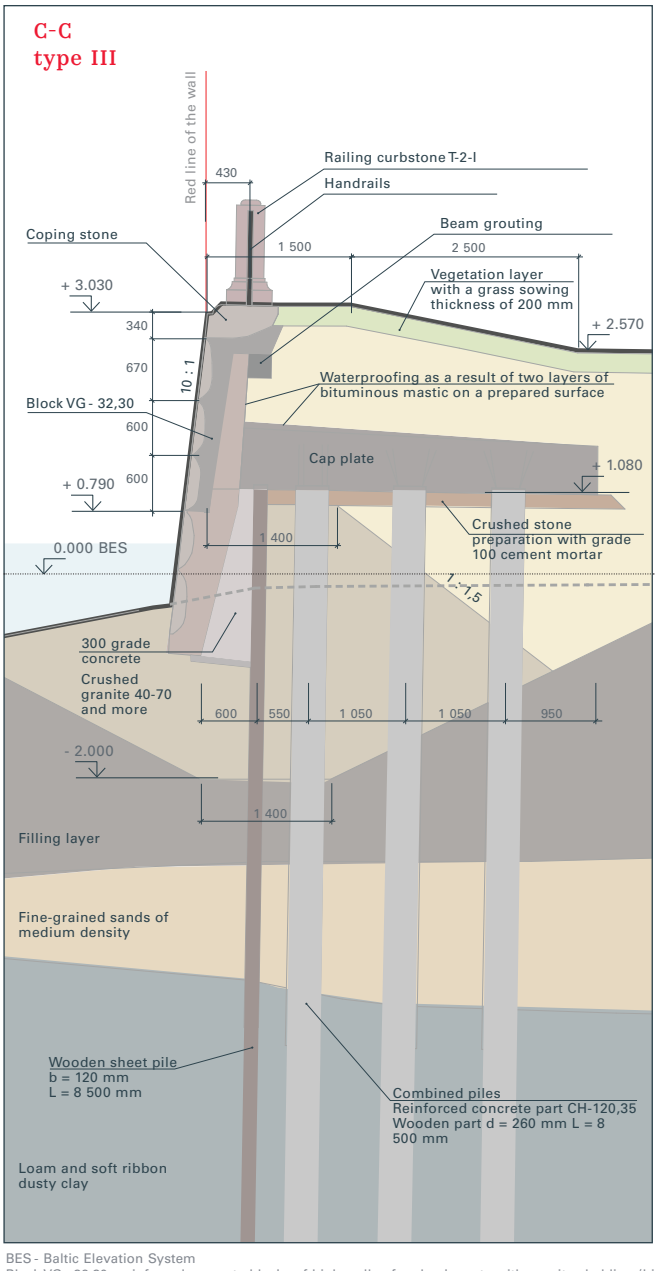


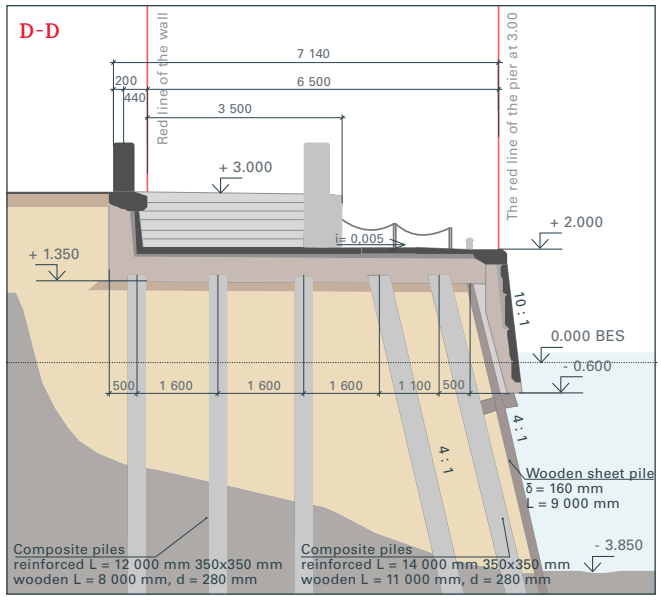


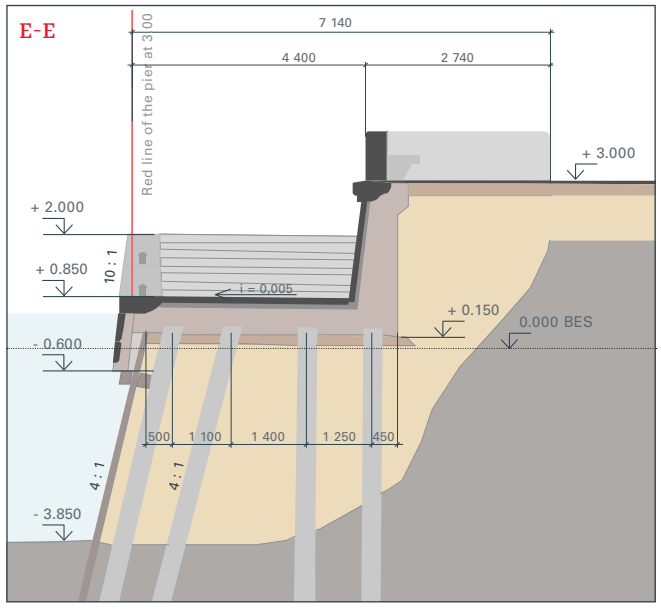
BES - Baltic Elevation System

EXISTING EMBANKMENT SITUATION DIAGRAM









BES - Baltic Elevation System
Block VG - 32,30 - reinforced concrete blocks of high walls of embankments with granite cladding (high - 320 mm, length - 300 mm) Units are in millimetres

City grids and MEP system

At the project site, there are buffer zones of the city sewage system pipeline, subway infrastructure facilities, and electric power facilities, and a combined zone of engineering networks. Participants must propose a feasible and efficient solution for connecting the park to the city grid in accordance with the requirements of existing engineering infrastructure zones.

A utility block is also intended to be located on the project site. Participants need to efficiently use its capabilities to connect non-stationary structures to electric networks. For all planned facilities in the park, participants need to provide basic explanations of the buildings' MEP systems (in the form of an explanatory note and/or basic schemes).

Participants also need to provide for the construction of an effective drainage system, taking into account that the territory has poor drainage and that a possible change in surface and underground runoff during construction could lead to the flooding of underground structures and territories.

RESTRICTIONS IN UTILITY INFRASTRUCTURE ZONES

TYPE OF RESTRICTION	CLEARANCE	ALLOWED	PROHIBITED
Buffer zone of subway infrastructure facilities	10 m	Laying underground utilities, planting shrubs and arranging lawns in the technical zone, as well as the development of an area 30 metres wide on both sides of the borders of the technical zone (upon agreement with the organisations designing and operating the subway)[2]	Construction of buildings, facilities and temporary structures, planting trees and shrubs, installation of a permanent fence, placement of parking lots[2]
Buffer zone of electric power facilities	5 m	Planting trees and shrubs is allowed (upon agreement with the network organisations)[3]	Placement of any structures within the passages and vehicular access to electric power facilities. Without obtaining approval: construction, overhaul, reconstruction or demolition of buildings and structures, planting and felling of trees and bushes[3]
Buffer zone of the city sewage system[5]: concrete sewer tunnel; household cast iron sewer; household concrete sewage	10 m 2,32 m x 3,16 m 0,4 m 1,2 m	Planting of bushes and trees at a distance further than 3 metres from the sewage system buffer zone	The construction of permanent or temporary buildings and structures without approval from the 'Wastewater Disposal Organisation'; arrangement of warehouses, landfills, parking lots of vehicles or construction machinery; raising by filling, or lowering by removing, the level of the ground surface (road surface); dealing with frozen soil using an impact method and driving long piles at a distance less than 15 metres from the axis of the networks[7] and sewage structures[6]

REQUIRED DISTANCES FROM UTILITY NETWORKS TO TREES AND SHRUBS[4]

COMBINED ZONE OF ENGINEERING NETWORKS	DISTANCES TO THE AXIS OF TREE TRUNK	DISTANCES TO THE AXIS OF SHRUBS
Underground networks:		
Gas pipeline, sewerage	1,5 m	—
Heating network (wall of the channel)	2,0 m	1,0 m
Water supply, drainage	2,0 m	—
Power cable and communication cable	2,0 m	0,7 m

When arranging plant implantations in an area with utility lines, it is necessary to propose ways to organise network maintenance and the prevention of its destruction by the plant root system.

1. Land Use and Development Rules. Appendix 4.
2. Rules for Determining the Borders of Technical and Buffer zones of the Subway. Saint Petersburg, 2018 and Sanitary Regulations and Norms 120.13330.2012 'Rulebook. Metropolitan [subway]. Revised Edition of the Construction Standards and Regulations 32-03-2003'.
3. Decree of the Government of the Russian Federation dated February 24, 2009 №160 'On the Procedure for Establishing Buffer Zones of Electric Grid Facilities and Special Conditions for the Use of Land Located within the Boundaries of Such Zones' (amended in 2018).
4. Set of rules (SP) 42.13330.2011. Urban planning. Urban development. Urban and rural planning and development. Part 9.5. The table is abridged.
5. Saint Petersburg law 'On the General Plan of Saint Petersburg' dated December 19, 2018. Appendix 6.
6. Decree on the approval of the Rules for the Use of Municipal Sewage Systems of Saint Petersburg and its Territorial Units. Clause 9.10.
7. See the network axes in the initial materials for competition participants, the 'Base' file.

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Ecology

Requirements and recommendations

In terms of ecology, the project's goal is to create and support a variety of natural anthropogenic ecosystems in the park, taking into consideration the city's environmental situation and the project area while also paying attention to the difficult hydrogeological conditions.

The components of the ecosystem in a megapolis are transformed, and the majority of them are subject to human influence. First and foremost, this concerns atmospheric air, water, soil, flora and fauna.

The project area has undergone changes as a result of the demolition of the State Institute of Applied Chemistry, the removal of polluted soil and subsoil, and the beginning of the Judicial Quarter construction. Today, the majority of the territory is occupied by engineering structures. There is a risk of toxic substances polluting the territory. To create a park competition participants must propose solutions:

- for creating a new soil layer, including measures for supporting its composition and characteristics;
- for creating diverse plant communities with indigenous species;
- for reducing the negative influence of the city's ecological situation on the park (noise, dirt, etc.).

The concept should include solutions that help minimise the negative effects of the urban environment, with its noise and dirt, on the park environment.

The design should consider legislative requirements to buffer zones and other zones with special conditions.

Attention should be devoted to the hydrogeological conditions of the territory to avoid engineering solutions that could lead to pollution or depletion of groundwater.

The concept is to be developed bearing in mind the ecological situation on the project area. The proposed system of water exchange and drainage should eliminate the risk of repeated pollution of the territory by subsoil waters.

It is recommended to develop a sustainable natural anthropogenic environment for the park and provide means to create and support a soil layer. Several 'ecosystem cores' may appear in the park that will allow for the creation and support of maximum biodiversity on the territory.

Current environmental state of the city
Flora and Fauna

The flora and fauna of the city are transformed elements of the ecosystem. The flora is changed due to the purposeful formation of specific urbophytocenoses by man: lawns, flower gardens and flower beds, gardens, parks and squares. The fauna is impoverished and replaced with synanthropic species due to destruction of habitats, landscape fragmentation and transformation of landscapes.

Flora

Trees in the centre of Saint Petersburg are often weakened for a number of reasons: soil compaction, drastically variable wetting mode, as a rule, lack of moisture, soil contamination, especially with de-icing materials, air pollution. The trees of parking lots and those located near traffic lights are more affected by air pollution. In the city there are green spaces, where trees have to be replaced annually.

Windfall cases are frequent. Thus, over 350 cases of falling trees were recorded during the summer period, of which about 100 fallen trees caused damage. First of all, they were deciduous species such as birch, poplar, maple, linden; of coniferous — mainly larch. The main reason for the fall of trees is their poor condition and the presence of rot against the background of frequent storm winds with gusts reaching 20–22 m/s.

Also, the Dutch elm disease is a serious threat to green plantations in the city. Its spread is facilitated by the linear planting of elms. There are no effective treatment measures, 100% of the affected trees perish. The only possibility to preserve the remaining healthy trees is through the removal of diseased trees and the destruction of felling residues.

The emerging focus of Dutch elm disease, located on Dobrolyubova Avenue near the buildings of the Yubileyny Sports Complex was revealed on the design area.

It should also be taken into account that in Saint Petersburg city parks are closed for drying for 2–3 weeks after thawing of the soil, approximately from the end of March to the beginning of May (depending on the weather). This is necessary to protect the lawns from trampling when they are most vulnerable. This measure restricts severely the possibility for recreation in the parks.

Fauna

In the suburbs of the city there occur a fox, American mink, common ferret, otter, elk, hedgehog, shrews, alpine hare, squirrel, grey rat, field and house mouse, bank and field vole.

In total in Saint Petersburg there are 190 species of birds, some of which have adapted to life in the city: the fieldfare and red-winged thrush, quack and great spotted woodpecker began to nest on the water bodies of the city and the suburbs; a black-headed gull is common over the Neva. Many representatives of the bird fauna of forests, meadows and reservoirs live in suburbs; sparrows are especially numerous. During seasonal passages, swans, geese, brants, sandpipers, and ducks stop on reservoirs.

The fauna of rivers and lakes is diverse: pike, roach, bream, perch, ruff, eelpout, etc. are common. Salmon, pollan, and eel enter inland water bodies from the Baltic Sea.

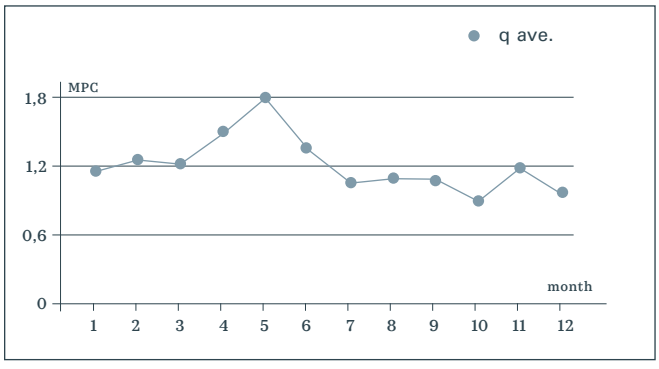
The fauna (heterotrophs) is an ecosystem element secondary to vegetation (autotrophs). Success of consumers in a particular ecosystem depends not only on abiotic factors, i.e. suitable temperature, humidity, illumination, etc., but also on biotic factors - inter- and intra-species interactions. Vegetable communities are fodder based and at the same time are a habitat of animal species. In this connection, it is difficult to plan a certain faunistic composition of the park, but it is necessary to create conditions for habitation of various indigenous species. Measures on artificial introduction of rare species will also be ineffective.

Current environmental state of the city
Atmospheric air

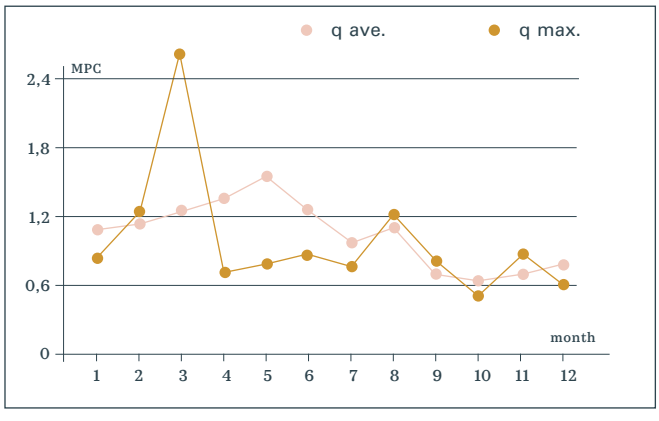
The main sources of air pollution in Saint Petersburg are motor transport and industry. On average, the level of air pollution in the city is estimated as increased. Nitrogen dioxide, ammonia, ozone, suspended substances, benzopyrene and formaldehyde are the main contributors to air pollution and adverse health effects for people. Of pollutants in the air, plants are primarily negatively affected by sulphur oxide and nitrogen oxides, which lead to foliage damage.

ANNUAL MEASUREMENT OF AVERAGE MONTHLY CONCENTRATIONS OF NITROGEN DIOXIDE AND OXIDE (MPC RATIO[1]) IN SAINT PETERSBURG IN 2017.

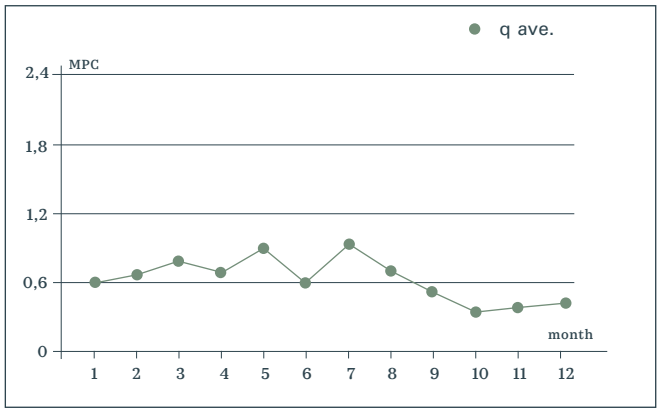
ANNUAL MEASUREMENT OF AVERAGE MONTHLY AMMONIA CONCENTRATIONS (MPC RATIO[1]) IN SAINT PETERSBURG IN 2016.



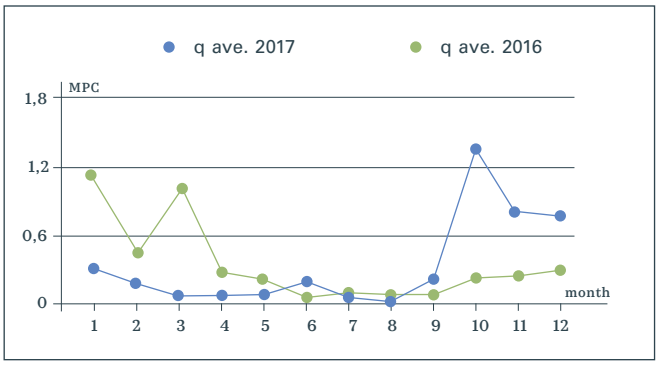
ANNUAL MEASUREMENT OF MONTHLY AVERAGE AND MAXIMUM OZONE CONCENTRATIONS (MPC RATIO[1]) IN SAINT PETERSBURG IN 2017.



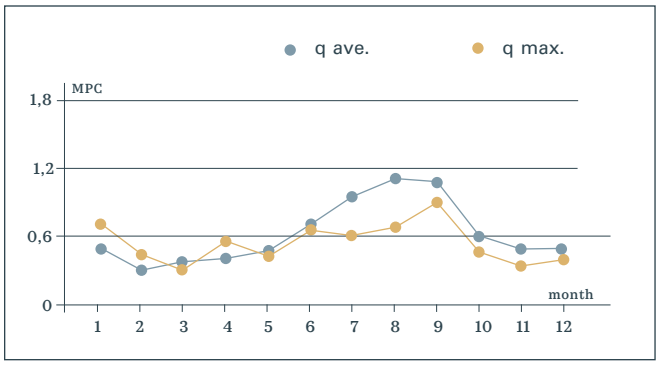
ANNUAL MEASUREMENT OF AVERAGE MONTHLY SUSPENDED SUBSTANCES CONCENTRATIONS (MPC RATIO[1]) IN SAINT PETERSBURG IN 2017.



ANNUAL MEASUREMENT OF AVERAGE MONTHLY BENZO(A)PYRENE CONCENTRATIONS (MPC RATIO[1]) IN SAINT PETERSBURG IN 2016 AND 2017.



ANNUAL MEASUREMENT OF MONTHLY AVERAGE AND MAXIMUM FORMALDEHYDE CONCENTRATIONS IN SAINT PETERSBURG IN 2018.



1. Maximum permissible concentration ratio.

Current environmental state of the city
Waters

The waters of Saint Petersburg include surface and groundwater. In addition, a large volume of wastewater is generated in the city. The Malaya Neva river is characterised as contaminated, and swimming in it is forbidden. Underground waters can have a negative impact on the park: they can contribute to recontamination of the territory and flooding, and damage underground structures.

Surface waters

The Malaya Neva river is classified as contaminated. Contaminants characteristic of the Malaya Neva: organic compounds of technogenic nature (COD) and copper. Excess in total iron and zinc are observed steadily; manganese, unsteadily; lead, sporadically.

With the current contamination level of the Malaya Neva, swimming in it is forbidden.

Groundwaters

Aquifers, lying at a depth of about 50-100 m and having a direct relation to atmospheric precipitation, contain fresh groundwaters. The main areas of groundwater feed are the Izhorskaya Plateau, Lembolovskaya Plateau, Koltushskaya Plateau and Bugrovskaya Plateau, located outside the city's boundaries. The regional basis for drainage of aquifers and aquifer systems is the Gulf of Finland. The Neva River with its tributaries is drained by groundwaters.

Underground space of the city is saturated with underground structures (subway tunnels, sewerage, collectors). In some areas, groundwaters can have an extremely negative impact on engineering structures, foundations and basements of buildings, water supply networks and utilities, sewerage collectors and subway tunnels. Due to the high levels of standing and the low degree of natural drainage of most of the city territory, groundwaters are a source of submergence of underground structures (basement of building, foundation, crossing, underground parking, etc.).

The main groundwater-related problems that may affect the designed park include:

- presence of thick layers of loose ground on the territory of the city: paleovalleys with development of intermorainic aquifers containing high-pressure waters ('floating earth') in them;
- no forecast of changes in the hydrogeological conditions of the territory taking into account the existing engineering structures, which are artificial barriers and affect groundwater traffic and unloading conditions;
- depletion of surface water runoff;
- flooding of the territory as a result of groundwater discharge disruption during construction;
- contamination of groundwaters, causing their negative corrosive effect on underground structures, utilities, physical and mechanical properties of subsoil.

Wastewater

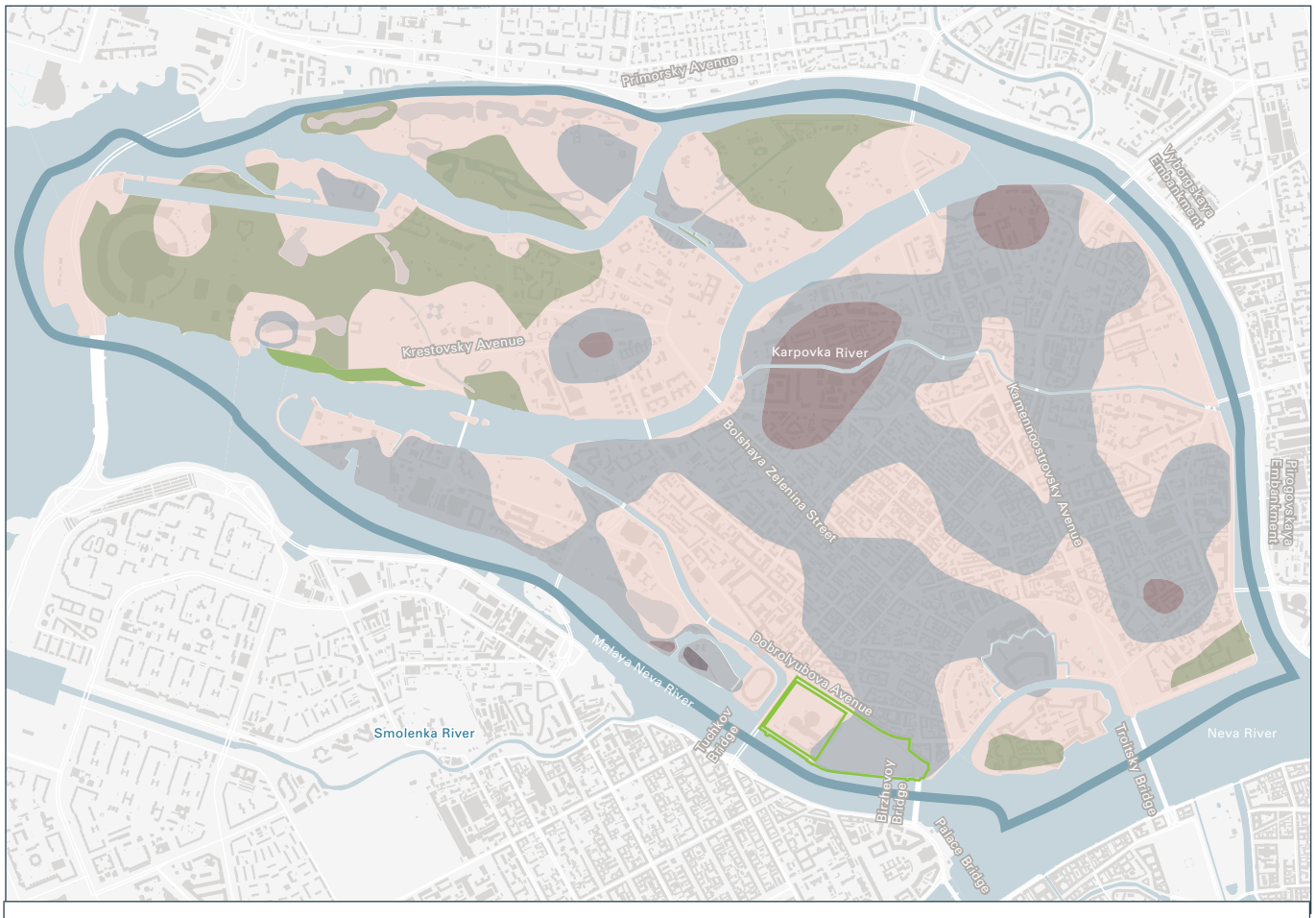
70% of the entire territory of the city, including Petrogradsky District, has a combined sewerage system, which receives household, industrial, as well as surface (rain, melt) runoff. As of 1 January 2018, 98.5% of all municipal wastewater was treated in Saint Petersburg. It is planned to bring that number to 100%.

Current environmental state of the city
Soil and Land resources

Most of the soils of Petrogradsky District are contaminated. Although soil contamination does not have a significant impact on the condition of trees, it is harmful to the health of the population. The condition of soils on the design territory is not determined — it is required to conduct engineering and geological surveys.

The soil of Saint Petersburg is contaminated primarily with heavy metals and organochlorine substances. The main contaminants of soils in the city are 3, 4-benzopyrene, lead, zinc, polychlorinated biphenyls (PCBs), copper, arsenic and cadmium. Soils of the Petrogradsky District have one of the highest levels of contamination in the city.

A soil survey of the Petrogradsky District was carried out in 2005–2013. The results of the survey showed that only on 2 hectares the soil contamination is assessed as 'permissable.' On the territory of 221 hectares the soil was assessed as 'moderately dangerous' (the soil of a small part of Krestovsky and Kamenny Islands), on 1230 hectares — as 'dangerous,' and on 65 hectares — as 'extremely dangerous.' The main sources of soil contamination on the territory of the district are motor transport and a number of industrial enterprises located in the delta of the Karpovka River and along Petrovsky Avenue previously belonged to the State Institute of Applied Chemistry.



Current environmental state of the city
Waste management

There is no centralised separated collection of municipal solid waste in the city, but there are numerous recycling initiatives by public organisations and businesses. The introduction of recycling is not ruled out in the nearest future.

In the vicinity of the site, PetroVast company has installed containers for plastic. There are also containers for recycled materials and for hazardous waste (batteries and accumulators, mercury lamps and mercury thermometers). Actions by the 'Separate Collection' movement take place in Proviantsky Square on Blokhina Street on the first Saturday of each month from 12:00 to 15:00, and they attract those citizens who recycle at home.

In addition, the City Government has introduced a system of separate collection of hazardous waste through eco-containers and eco-vehicles running on schedule. Energy saving and mercury lamps, mercury thermometers, other household mercury-containing appliances, batteries and accumulators are accepted from the population.

Requirements of the legislation in relation to waste management

Waste management activities, including transportation, sorting, utilisation and disposal are licensed.

Waste accumulation is possible for a period of up to 11 months. During the warm time of the year (at the temperature of above +5 °C), municipal solid waste must be removed daily. At temperatures of below –5 °C, they must be removed once every three days. Companies of the city that have a license to transport such waste mostly have rear-loading garbage trucks and container trucks in their fleets.

In the Russian Federation the sanitary rules for maintenance of the territories of inhabited places are in force. The rules are out of date and are being revised, but they are now in force.

Requirements for the organisation of sanitary maintenance of parks[1]:

- utility zone with areas allocated for the installation of replacement waste containers should be located not closer than 50 m from places of congestion of people having a rest (dance floors, stages, fountains, main alleys, viewing platforms, etc.);
- determining the number of ash bins should be based on the following: one ash bin per 800 square metres of the park area. On the main alleys, the distance between the ash bins should not be more than 40 m. At each stall or kiosk it is required to place an ash bin with a capacity of at least 10 litres;
- intermediate collectors for temporary storage of waste and sweeps should be installed to facilitate the collection of waste in the areas remote from the places of mass congestion of tourists;
- determining the number of containers for commercial sites should be based on the average accumulation of waste for 3 days.

1. Excerpts from SanPiN 42-128-4690-88. Sanitary rules of maintenance of territories of inhabited areas.

Environmental state of the design area

There is uncertainty about the ecological state of the design area. There is a risk that contaminated soil remained on the territory due to the activities of the State Institute of Applied Chemistry (GIPH). To reduce the risks of re-contamination of the territory, the following is recommended: environmental engineering surveys, removal of contaminated soil from the root layer, isolation of underlying potentially contaminated soils and assurance of effective draining.

In 1919, the building of the Second State Wine warehouse on Vatny Island was transferred to the State Institute of Applied Chemistry. For more than 80 years, this Institute has been dealing with defence industry issues and working with missile fuels, cold reagents, etc. In this connection, toxic and radioactive waste was formed and the site of the former GIPH was contaminated with heavy metals, radionuclides and organic pollutants.

In 2011, the State Institute of Applied Chemistry moved, and the preparation of the site for construction of the multifunctional complex 'Embankment of Europe' began in its place. The design documentation was developed at the first stage of engineering, and surveys were carried out.

In 2014, the contract on which the project was implemented was terminated. The construction site and the results of the project implementation were transferred to the construction of the Judicial Quarter.

At the moment of surveys in 2006-2011, soil contamination in the layer up to 6-10 m was recorded. In the course of works the contaminated soils were withdrawn and removed. However, there is a risk that the territory may contain contaminated and heavily contaminated soil due to:

- insufficient withdrawal of contaminated soil and construction waste from the demolition of the State Institute of Applied Chemistry buildings;
- rise of contaminated groundwater.

MEASURES TO REDUCE RISKS AND PREVENT SECONDARY CONTAMINATION OF SOIL

Conducting engineering and environmental surveys in implementation of the park project, including research of gas emissions from soil

Removal of contaminated and potentially contaminated soil from the root layer

Isolation of underlying potentially contaminated soils

Assurance of effective drainage of the territory and measures to prevent submergence.

Creation and maintenance of diverse sustainable natural and anthropogenic ecosystems in the park

> The goal of the project from the environmental point of view is to create and maintain diverse sustainable natural and anthropogenic ecosystems in the park.

FOR CREATION AND MAINTENANCE OF VARIOUS SUSTAINABLE NATURAL AND ANTHROPOGENIC ECOSYSTEMS THE FOLLOWING IS REQUIRED:

- Creation of a soil cover and maintenance of its composition and properties;
- Creation of diverse indigenous plant communities.

CREATION OF SOIL COVER AND MAINTENANCE OF ITS COMPOSITION AND PROPERTIES

Considering the inevitable negative impact of transport and industrial pollution of the city on the condition of soil, it is impossible for a park in the centre of the city to maintain them in an uncontaminated condition. However, it is necessary to maintain the composition and properties of soil favourable for operation of the park.

For this the following recommendations can be given:

- insulation of soil from the bottom to prevent the risk of secondary contamination;
- most of the park territory should not be sealed, that is, be isolated by weatherproof coatings (including the surface of water bodies);
- the soil surface should be completely turfed and landscaped to prevent water and wind erosion;
- methods to prevent erosion on the slopes should be applied;
- in the rest of the territory, preference should be given to permeable coatings (grass pavers, etc.);
- The thickness of soil and subsoil should be sufficient for formation of the full-fledged root system of plants, including trees, as well as for the creation of a drainage system;
- drainage should be provided with discharge of storm and melt waters into the city sewerage.

CREATION OF DIVERSE INDIGENOUS PLANT COMMUNITIES

The following recommendations should be followed to incorporate the park into the ecological framework of the megapolis and to maintain indigenous flora and fauna:

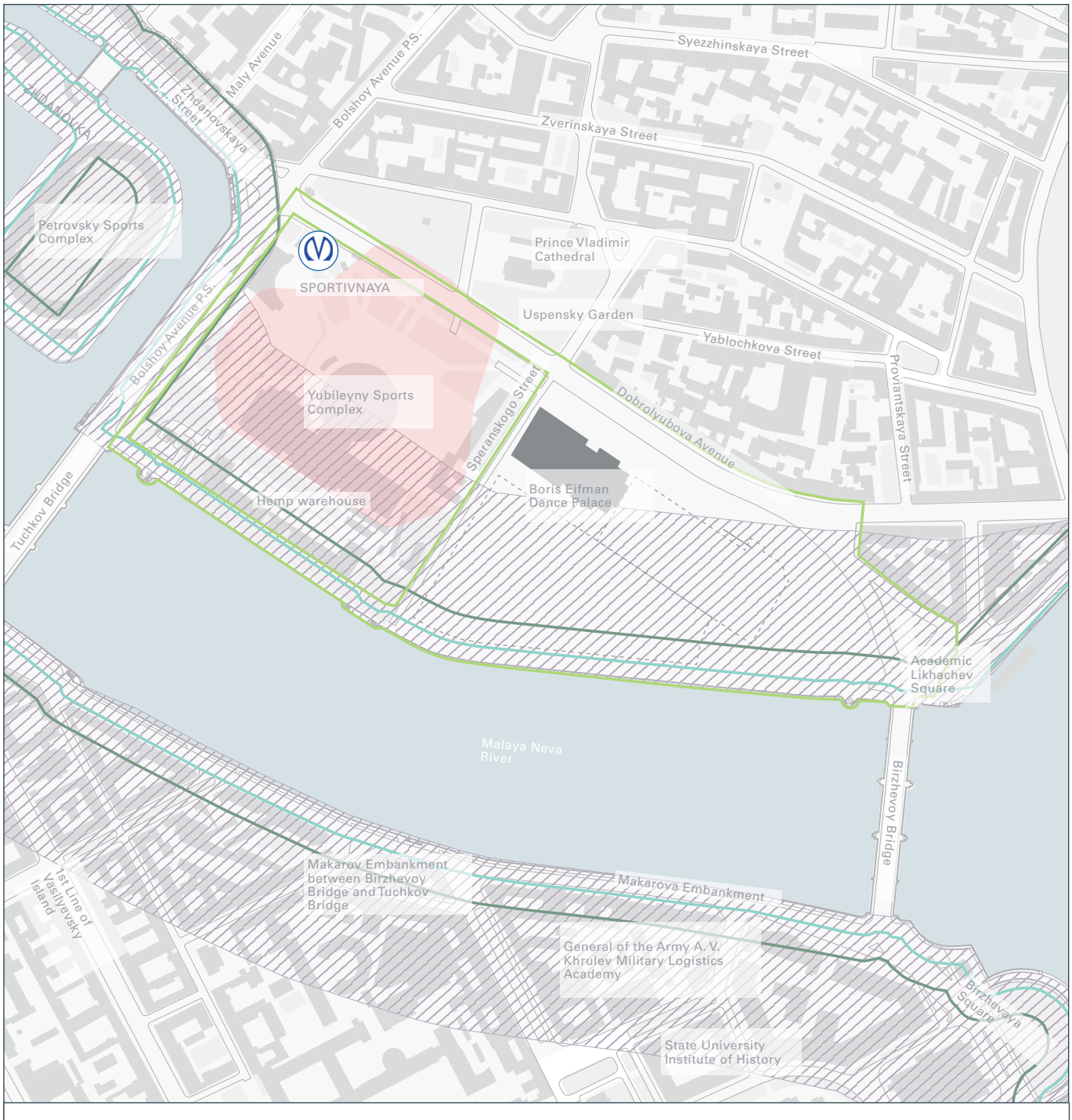
- use species of only indigenous flora or long-introduced species;
- pay special attention to indigenous species of shrubs and herbs, which create ecological niches for the heterotrophic component of the ecosystem;
- provide for shrubbery, tree crowns, areas of uncut grass, which will become micro shelters for animals;
- take into account that soil and water represent special habitats.

The most promising for the creation of a variety of indigenous plant communities is the creation of one or more 'ecosystem cores,' potentially suitable for maintenance of biodiversity[1]:

- shape close to circle/square, with radius of at least 50 m;
- there are no paths;
- vegetation: multi-tiered (grassy and shrub tier, shrub tier, tree tier) and dense (closure of crowns of trees - at least 60–70%);
- the factor of anxiety is minimised; in particular, traffic of people, noise, and artificial lighting.

1. The 'ecosystem cores' should be compatible with the requirements of visitor safety, park programme, and user demands.

Restrictions of sanitary protection zones and zones with special conditions of use



In the design area, there are zones with special conditions of use: coastal belt, water protection zone, coastal protective belt. Also, the sanitary protection zone of the Yubileyny Sports Complex is partially located on the territory. Compliance with the requirements of zones with special conditions of use will ensure reduction of the negative impact on water resources. Sanitary protection zones contribute to reduction of the impact of pollution on human health.

RESTRICTIONS IN ZONES WITH SPECIAL CONDITIONS OF USE

ZONE TYPE		RESTRICTIONS
ZONES WITH SPECIAL CONDITIONS OF USE[1]		
	Waterfront belt	Assurance access of individuals for movement and stay, amateur fishing. The following shall not be allowed: · traffic and parking of vehicles.
	Water protection zone	The following shall not be allowed: · traffic and parking of vehicles, except for their traffic on roads and parking on the roads and in specially equipped areas, hard coating; · construction of petrol stations, fuel and lubricants warehouses (except ports), service stations; · use of pesticides, agrochemicals and placement of their storage facilities; · discharge of sewage and drainage waters.
	Coastal protection belt	The following shall not be allowed: · use of waste waters for soil fertilisation; · placement of dumps of outwashed subsoils; · ploughing of lands.
SANITARY PROTECTION ZONES[2]		
	Sanitary protection zone of SK Yubileyny	It is not allowed to place the following: · residential development; · landscaping and recreational zones; · recreation zones; · sports facilities; · children's playgrounds, etc.

1. The restrictions are fully set out in Articles 6 and 65 of the Water Code of the Russian Federation.
2. Sanitary Rules and Regulations SanPiN 2.2.1/2.1.1.1200-03 'Sanitary protection zones and sanitary classification of enterprises, structures and other facilities'.

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Sustainable development

Requirements and recommendations

The proposed architectural and landscape solutions should involve contemporary technologies to maximise the efficiency of use and viability of the park.

Solutions should be developed that minimise the labour costs in construction and use of the park.

It is recommended to give preference to structures with long life cycles that are easy to use and inexpensive to maintain. Use certified construction materials and energy-efficient technologies.

Use flexible and adaptive constructions that can accommodate the changing demands of users.

The park concept should provide for visitors' comfort in terms of temperature, sound level, and visual environment.

Architectural constructions and softscape should provide a comfortable microclimate and minimise the influence of adverse weather. Among other things, solutions should develop ways to optimise wind flow so as to provide ventilation in the park without creating conditions for wind increases and high-speed prevailing winds.

The districts adjacent to especially loud sections of the park should be protected from noise. These measures should be included in the concept.

In the park, water preservation technologies should be used in order to increase the soil permeability and manage the water supply using sustainable drainage systems. This will also reduce the risk of flooding.

The park should be accessible at any time of year. To this end, a network of paths should be developed that can be traversed in dry weather, snow, and flood conditions. The main routes should be accessible by snow-removal equipment.

It is recommended to avoid materials, constructions and vegetation species that are sensitive to extreme or changing climatic conditions. Quick drying materials that do not degrade in quality and are not susceptible to mould are preferred.

It is recommended to include educational and outreach functions in the field of sustainable development in the park's programming.

It is recommended to provide bio-water receiving devices with vegetation, to ensure additional biological treatment that regulates water flows.

Sustainable development

The principles of sustainability at the foundation of the Tuchkov Buyan Park concept are aimed at creating a comfortable, user friendly and climate-adaptive design. The sustainable development of the park should be addressed from the very first design stages of this project , as this is the basis for its effectiveness and successful implementation. Contest participants are invited to provide long-term, effective and efficient ways to integrate their designs into the existing infrastructure, taking into account existing structures (concrete foundations and technical equipment). Reusing the existing structures coupled with sustainable design will be an important step towards reducing the use of raw materials and CO_2 emissions. In general, Tuchkov Buyan Park is to provide an example of employing international best practices in the Russian context.

(Micro-) climate and outdoor comfort

In order for the park to be enjoyed all year round, the climatic comfort of the park's visitors is of the utmost importance. Given Saint Petersburg's conditions with its humid climate, the most critical period lasts from November to March, and it is the coldest in February when the average temperature drops to -6°C. Due to the harsh wind coming from the west and southwest and blowing along the river (from October to April its velocity can exceed 17 m/s), the weather feels even more dank and there are few people who want to stay outside for a long time.

THERMAL COMFORT

By attending to the thermal comfort of visitors, the park can be enjoyed all year round. For the summer months, it is necessary to include protection from the sun and heat — for example, by using vegetation to create shade. It is important to maintain a balance between open and closed spaces to ensure heat dissipation throughout the summer.

PROTECTION FROM THE WIND

In addition to the temperature, wind greatly influences how the weather feels, therefore it is important to optimise the air flows in the park and include sheltering from the wind, especially in areas meant for rest. Natural wind barriers include dense vegetation, which can reduce wind velocity by up to 70%. Wind velocity in the park should not exceed 8 m/s (95% of the time). However, it is important to maintain ventilation corridors for the dispersal of air pollutants.

URBAN HEAT ISLAND EFFECT

A large vegetated area can mitigate the effects of the urban heat island. This requires minimising the area of hard surfaces in accordance with balancing the territory in the Park Programming section. Air cooling can be amplified by the evaporation of water: open water surfaces can be used for this purpose. Permeable materials should be used for paving pathways and green parking lots.

ACOUSTIC COMFORT

Transport and industrial noise has a negative effect both on animals in the park and on people, so the concept should include noise barriers in the form of green areas, earth berms, etc. Soundproofing barriers should be installed as close as possible to the sources of noise, and areas of the park that offer privacy — as far away from them as possible.

VISUAL COMFORT

It is not recommended to use high-contrast lighting and sudden changes in the lighting level in order to avoid glare sensations (for example, when a shady walkway with dense vegetation abruptly changes into an open space with direct sunlight). Artificial lighting along the paths and waterfront should not be in high contrast to the surrounding environment.

Materials and circular economy

The materials used today in the construction sector are becoming increasingly scarce, so sustainable design requires reuse, recycling, the reduction of raw materials, and other principles of a circular economy. Such a strategy will reduce the amount of waste during the whole life cycle of the park, from construction to maintenance and dismantling. In addition, Tuchkov Buyan Park can demonstrate a new waste management policy and in doing so contribute to its promotion.

CIRCULAR ECONOMY AND RECYCLING

A circular economy entails a certain waste management hierarchy, in which the prevention and minimisation of waste is the preferred option, followed by recycling (including the reuse of waste as intended). Subsequently, energy recovery is possible, and the least desirable option is disposal. Such an approach should be applied during the construction as well as the operation of the park. In addition to the recycling-friendly design of the new structures of the park, special attention should be paid to the use and integration of the existing structures. Moreover use of recycled material and easy recycling principles should be considered in the design choices.

SELECTION OF CONSTRUCTION MATERIALS

The objective is to minimise the use of resources through an ecological selection of materials, which includes natural materials, renewable raw materials and recycled materials. Using wood from nearby forests and concrete produced at the nearest plants will help reduce hydrocarbon emissions. The use of materials that emit toxic substances and pose a threat to human health is prohibited.

MAINTENANCE

The competition concept should include not only the construction but also the maintenance of the park and its ecosystem, which should be arranged in an efficient and most cost-effective way, including through the use of durable materials. All structures and surfaces should be designed to have the highest durability and maintenance convenience.

WASTE PRODUCED DURING CONSTRUCTION AND OPERATION

A large percentage of the waste stream is generated when clearing the territory and during construction and demolition. The park's concept should be designed to minimise waste and wastewater during construction (through the separation of waste on site, collection of remains for later use, well-designed return logistics, etc.) and operation of the park (by reusing remains, composting plant remains, installing public recycling containers in the park, encouraging environmentally conscious behaviour in visitors, raising awareness about recycling, and using greywater or rainwater for flushing toilets, etc. To prevent system failures due to greywater[1] reuse in cold climates, additional precautions should be taken). It is important to reduce water consumption for outdoor landscape irrigation by 50% from a calculated baseline. The location for the composting area should be chosen so that it is easily accessible yet inconspicuous, and the smell should not disturb visitors. In addition, it is important to prevent the possibility of groundwater pollution.

Emissions

Carbon dioxide emission, including due to the production of electricity and heating, is one of the most serious threats to the ecology of our planet. Reducing light and noise pollution during the construction and operation of the park will reduce energy consumption and at the same time will have a positive impact on vegetation, animals and humans. A detailed list of recommendations and restrictions can be found in the 'Transport' chapter.

CARBON FOOTPRINT AND ENERGY EFFICIENCY

CO_2 emissions produced during the construction and operation of the park have a large impact on the ecological situation, so it is crucial to use energy efficient products and systems. Participants must present an energy concept taking into account existing infrastructure[2], and propose a smart distribution of available energy in the area under design and in the surrounding areas.

AIR QUALITY

The air quality in the park is strongly influenced by the surrounding streets. Multi-tiered softscaping with shrubs, vegetation or earthen barriers along the main traffic roads will help to shield pedestrians from polluted air.

LIGHT POLLUTION

To prevent light pollution, various lighting modes depending on the time of day and zoning of the park (in accordance with the requirements of the Park Programming section) should be provided. Efficient use of electricity should not infringe upon visual comfort or safety requirements.

NOISE POLLUTION

Noise pollution in the park should be minimised. Noisy areas (playgrounds for example) must be set away from quiet zones, and the sounds of traffic should be screened.

1. Greywater — household wastewater, excluding water from the toilet
2. For more information, see the sections Structural and Engineering Systems and Urban Grids and Engineering Systems.

Climate-change resilient constructions

Park spaces should be adaptable and be able to be used in various ways depending on the season and functional programme. This principle pertains not only to outdoor areas, but also to underground spaces. It is advisable to make landscaping designs, including stormwater management and water retention systems or shelters from wind, rain and sun, multifunctional and able to adapt to functional and climatic changes. For the sake of sustainable development, it is also recommended to take into consideration the problem of climate change, its causes and consequences. This is even more relevant in northern latitudes as the impact of climate change in the latitude of Saint Petersburg is much more pronounced than the global average. For example, the average temperature in Russia in 2016 grew 2.5 times quicker than the global average[3]. Accordingly, all structures should be designed taking into account possible climate changes and their negative consequences, as well as the potential of reuse of the new construction in the future.

CONSTRUCTION OF CLIMATE CHANGE-RESILIENT BUILDINGS

When designing foundations and road and path networks, changes in soil moisture levels and the depth of soil that freezes in the winter should be taken into account. Next to buildings which are resilient against flood and heavy rain, protection and possibility to use the park during floodings should be given.

FLEXIBILITY

Adaptability of the concept can be achieved by consistently applying the following three principles: flexibility, convertibility, and expandability. In practice, these strategies can be implemented by making changes to the project design as the needs of the public change in the future and through the use of alternative materials and technologies. Examples of adaptive designs: stairs with steps on which you can sit, bodies of water that turn into skating rinks in the winter, or multifunctional areas which can be used for holding small-scale entertainment and educational events (lectures, concerts, dances, etc.) or for ordinary recreation.

1. According to the meteorological service of Russia Roshydromet.

Social aspects

The park should be accessible and convenient for all people without any restrictions, regardless of their physical condition. The decisive factor for improving the quality of life of citizens needs to be the 'design for all' approach which calls for radically simplifying outdoor public spaces and making them user-friendly and intuitive. A diversity of park infrastructure will create a wide selection of usage scenarios and will attract visitors during the cold season when people usually avoid going for walks in the fresh air.

DESIGN FOR ALL

Inclusiveness involves the construction of accessible steps and inclined surfaces, installation of information boards and seating areas, and ensuring the accessibility of paths. All surfaces must be comfortable for disabled people with motor and/or visual impairment, including in adverse weather conditions. When selecting materials, it is necessary to take into account their mechanical properties, colour, brightness and reflective properties. The concept should include inclusive playgrounds, seating areas with varying seat heights, barrier free access to the park, and a navigation system that is comprehensible not only for visual but also for tactile and auditory perception.

HEALTHY, SAFE AND ACTIVE LIVING

Infrastructure for year-round outdoor activities like an ice-skating rink, playgrounds or paths for jogging allows for the park's use to be expanded. Visitor safety must be taken into account: provide adequate lighting and visibility, clearly plan routes, and use security systems.

EDUCATION

The environmental principles underpinning the park will be instrumental in popularising the ideas of sustainability, thereby decreasing the level of vandalism and increasing survival rates of newly planted trees. The more citizens will know about sustainable development, the more they will appreciate the new park and the importance of green spaces for the urban environment as a whole.

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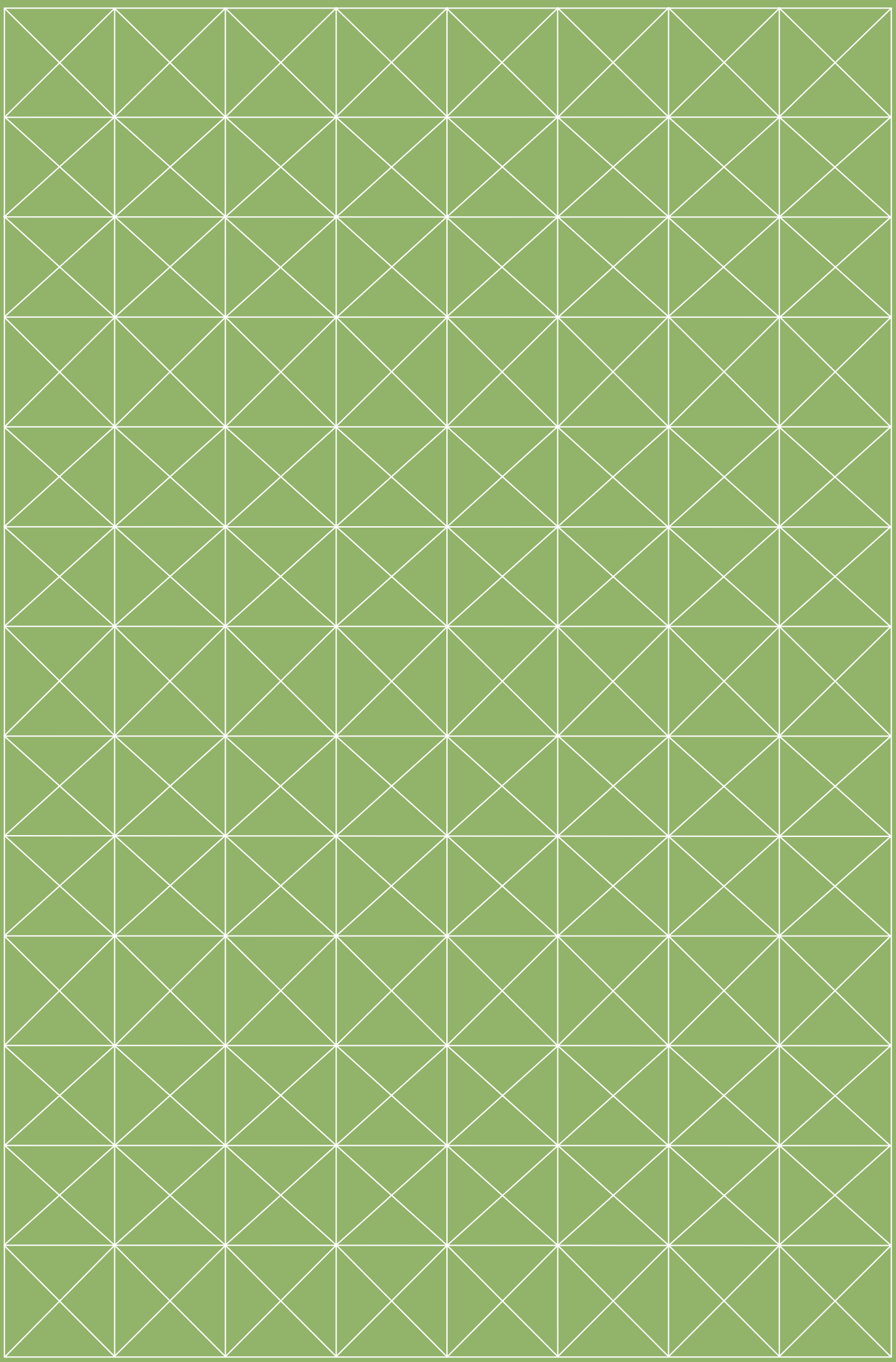
Climate



General information about the climate of the city of Saint Petersburg

> The aim of the project is to create a comfortable unique micro-climate for year-round use of the park, using the difficult weather conditions of Saint Petersburg to its advantage.

Participants need to take into account the difficult weather conditions of Saint Petersburg, the predicted climate changes, and the need to create a comfortable micro-climate in the park for its use in any weather all year round.

Saint Petersburg and the Leningrad region belong to a zone of temperate climate, transitional from oceanic to continental, with moderately mild winters and moderately warm summers. The main peculiarity of the climate is the variability of weather caused by frequent changes of air masses, which, depending on the region of formation, are divided into marine, continental and Arctic.

In addition to sharp weather changes on the territory of area, dangerous meteorological phenomena are observed: strong winds, including squalls and whirlwinds, snowfalls and snowstorms, ice, fog, heavy frosts and heat, short-term heavy rains and prolonged rains, thunderstorms, hail, forest fires, drought and floods.

There are an average of 75 sunny days per year in the city, while cloudy weather with scattered lighting prevails the rest of the time.

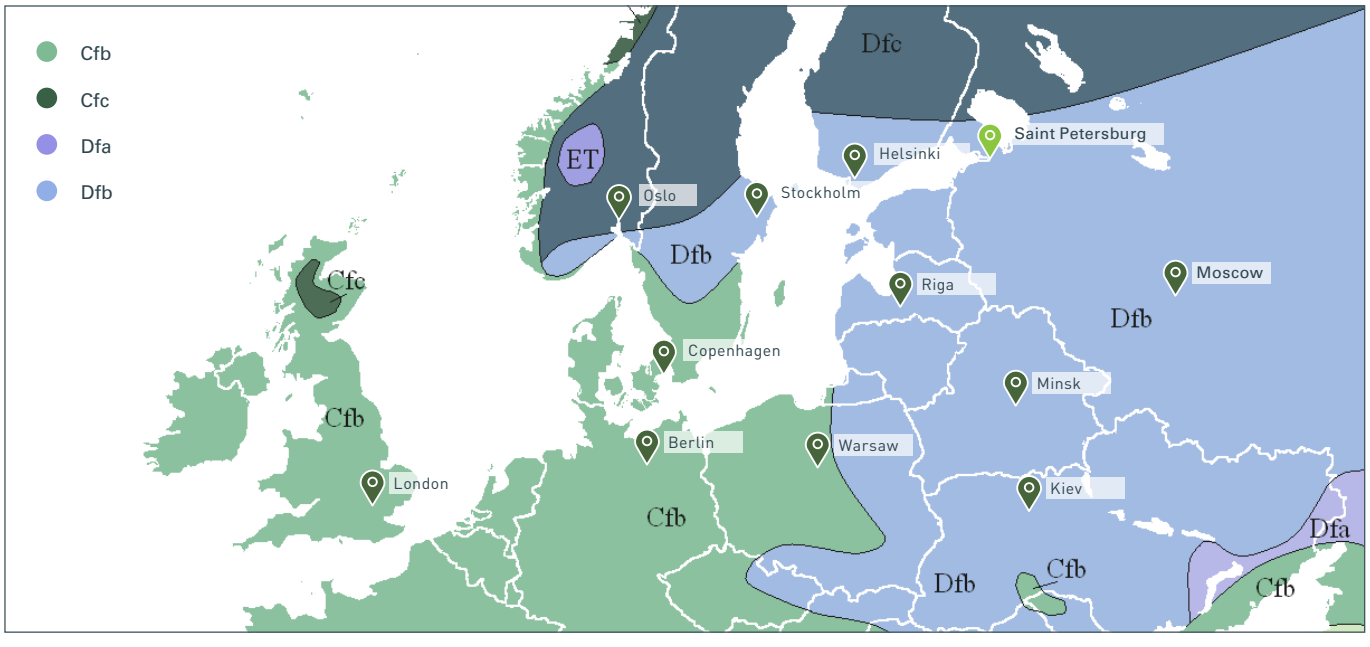
Humid sea air coming from the west and the south-west from the Atlantic Ocean has a mitigating effect on the climate.

The prevailing direction of the winds for the year is western, northwestern and southwestern.

Saint Petersburg is characterised by high air humidity (80%) with low evaporation of moisture. The average annual precipitation in the city for the past 30 years was 653 mm. Most of the precipitation (67%) falls in the warm season, from April to October.

Urban conditions have a significant impact on the micro-climate of Saint Petersburg: impurities in the air retain solar heat. Because of this, the summer temperature in the daytime is 2-3 degrees higher in the city than in the suburbs. In the winter, it is 10-12 degrees higher in the city.

MAP OF CLIMATIC ZONES BY V. P. KÖPPEN AND R. GEIGER



According to the Köppen-Geiger system, Saint Petersburg is classified as Dfb type. D - zone with clear boundaries of summer and winter, f - zone without a dry season, b - zone with a warm summer. According to this system, the best criterion for a climate type is which plants grow in a given area in natural conditions. The classification is based on the temperature and precipitation mode. The Köppen-Geiger map shows a change of the zone type to Cfb by the year 2100.

Temperature mode

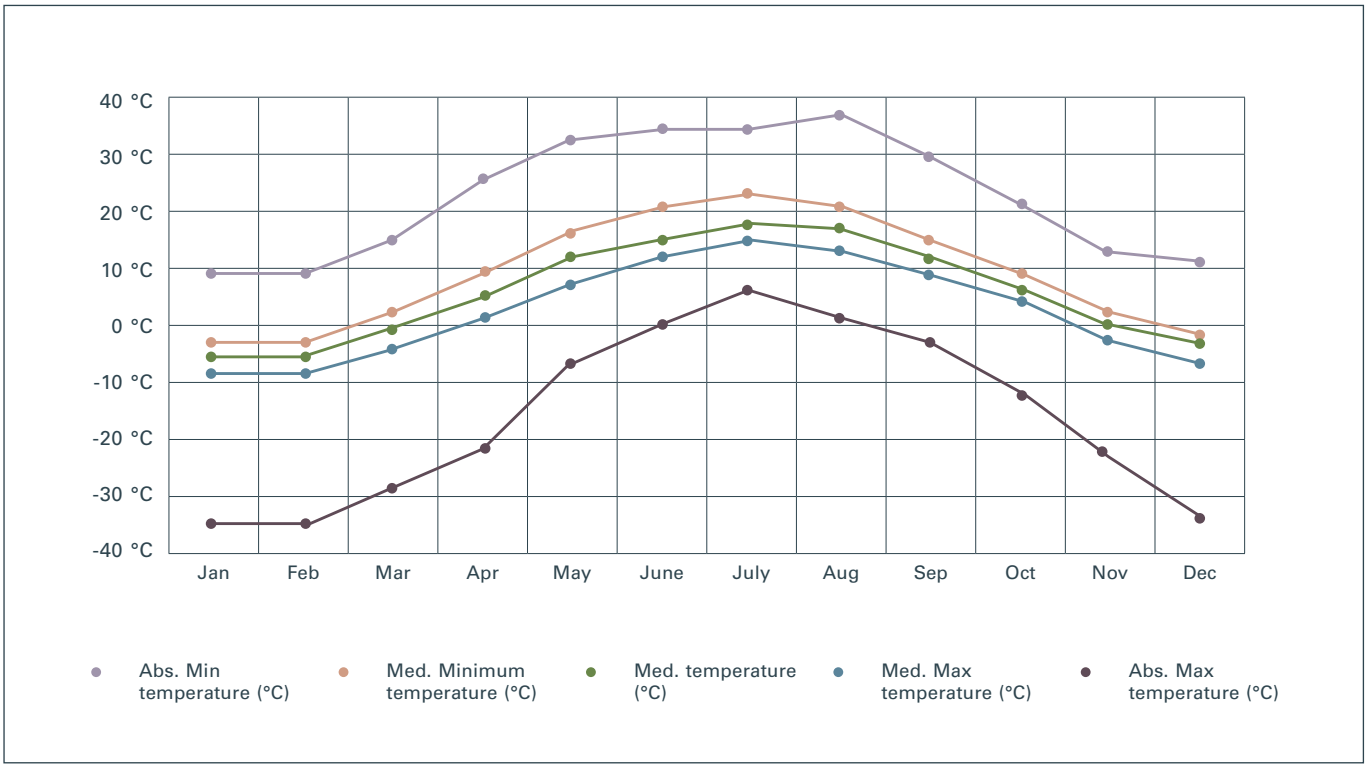
The first day with an average positive temperature falls in early April, and the first day with an average temperature below zero in mid-November. The average duration of the whole period with a positive average daily temperature is 230 days, and the period with temperatures above +5 °C is 165 days.

According to the results of the studies on ECHAM5_MPI-OM model of general circulation of the ocean atmosphere for the three greenhouse gas emission scenarios, the average annual air temperature by the end of the 21st century could rise up to 8.2 °C (2.8 °C) in the case of a favourable scenario, and 9.4 °C (4.0 °C) in the case of an adverse scenario.

AIR TEMPERATURE

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Abs. Min	-35,9	-35,2	-29,9	-21,8	-6,6	0,1	4,9	1,3	-3,1	-12,9	-22,2	-34,4	-35,9
Med. Min.	-8,0	-8,5	-4,2	1,5	7,0	11,7	15,0	13,5	8,8	4,0	-1,8	-6,1	2,7
Med. temp.	-5,5	-5,8	-1,3	5,1	11,3	15,7	18,8	16,9	11,6	6,2	0,1	-3,7	5,8
Med. Max.	-3,0	-3,0	2,0	9,3	16,0	20,0	23,0	20,8	15,0	8,6	2,0	-1,6	9,1
Abs. Max.	8,7	10,2	15,3	25,3	33,0	34,6	35,3	37,1	30,4	21,0	12,3	10,9	37,1

Data from 1971 to 2019



Atmospheric precipitation, snow cover and soil freezing depth

Saint Petersburg by its geographical location falls into a zone of excessive moisture. Precipitation in the city is mainly determined by the intensity of cyclonic activity.

Since the amount of precipitation is about 200-250 mm higher than the moisture evaporation, Saint Petersburg is characterised by high air humidity of about 80% (in summer—60-70%, and in winter—83-88%). The number of days with relative humidity of at least 80% varies from 140 to 155.

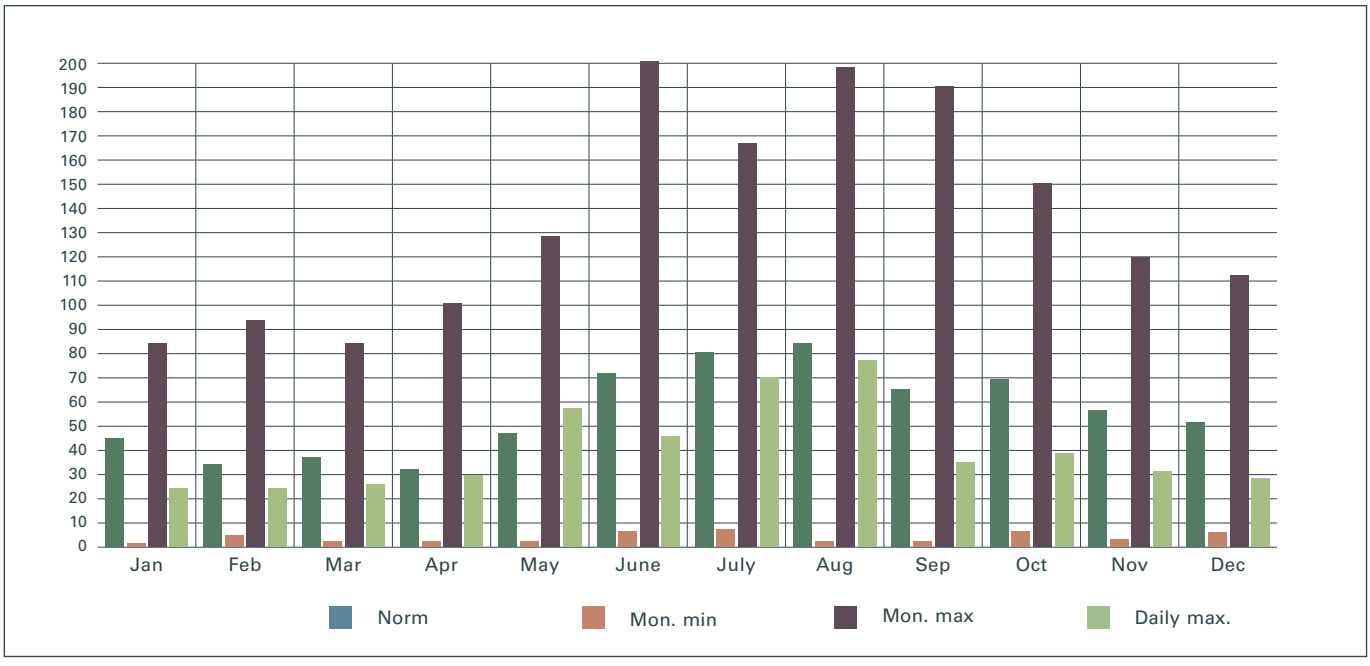
During the year, precipitation falls unevenly: most of it (67%) falls during the warm period (April-October, with the maximum in July-August) and only 33% in the cold period (minimum in February-March). The driest month is April, with 31 mm of precipitation. Precipitation of 662 mm is the average total for the year, with the most precipitation falling in August (83 mm).

According to the estimates, the amount of precipitation will increase by the end of the 21st century in comparison with the period of 1981-2010: in a favourable scenario, by 228 mm; in an unfavourable scenario, by 262 mm (with an average annual precipitation for the last 30 years of 653 mm).

AVERAGE MONTHLY AND ANNUAL PRECIPITATION, MM

Month	Norm	Monthly minimum	Monthly maximum	Daily maximum
January	44	0,0 (1836)	82 (2011)	23 (1955)
February	33	3 (1886)	92 (1990)	23 (1990)
March	36	0.9 (1923)	83 (1971)	26 (1971)
April	31	2 (1850)	99 (1764)	29 (1991)
May	46	2 (1842)	127 (2003)	56 (1916)
June	71	5 (1853)	199 (1742)	44 (2004)
July	79	6 (1973)	166 (1979)	69 (2002)
August	83	2 (1955)	197 (1869)	76 (1947)
September	64	2 (1851)	190 (1767)	34 (1912)
October	68	5 (1987)	150 (1984)	37 (2003)
November	56	2 (1862)	118 (2010)	31 (2010)
December	51	4 (1852)	112 (1981)	28 (2009)
Year	662	308 (1853)	864 (2016)	76 (1947)

Data from 1971 to 2019



Snow cover

In Saint Petersburg, the snow cover lasts on average for about 120 days. Sustainable snow cover is usually formed in early December, and collapses in the last decade of March.

Due to the increase in the temperature during the cold season, the proportion of liquid and mixed precipitation, as well as the frequency of thaws, increase.

The maximum increase in the snow cover per day is 22 cm. The intensity of snowfall is mainly 0.5-0.6 cm/h, with a maximum intensity between 1 and 4 cm/h.

The water reserve in the snow depends on its density and height of the snow cover, and the average per year in the city is 73 mm, in field areas of the suburbs it increases to 103 mm.

Due to the increase in the temperature during the cold season, a further increase in the proportion of liquid and mixed precipitation is forecast, as well as an increase in the frequency thaws, leading to further shift in the period of formation and destruction of the stable snow cover in Saint Petersburg, reduction of its height, and increase in water reserves in the snow.

AVERAGE MONTHLY SNOW COVER HEIGHT

Month	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Year
Number of days	0	0	0	2	13	24	28	25	23	4	0	0	118
Height in cm	0	0	0	0	3	9	15	19	14	1	0	0	—
Max. height in cm	0	0	0	17	38	56	63	68	73	53	1	0	73

Data from 1971 till 2019

Freezing depth

In accordance with Annex B SP 11-105-97, geotechnical conditions of the plot belong to III category of complexity.

The Order of the Construction Committee of Saint Petersburg Government 12/10/2004 No. 20 “On the Territorial Methodological Document ‘Methodology for Soils Frost Hazardous Properties Characteristics Assessment in Construction of St. Petersburg’”:

P. 1.8. Normative soil freezing depth dfn in Saint Petersburg is assumed for clay and loams dfn = 1.2 m; sand clays, fine and dusty sands dfn = 1.45 m; large and medium size sands dfn = 1.55 m; macrofragmental soils dfn = 1.75 m. The dfn value for soils of inhomogeneous composition shall be determined as the weighted average value.

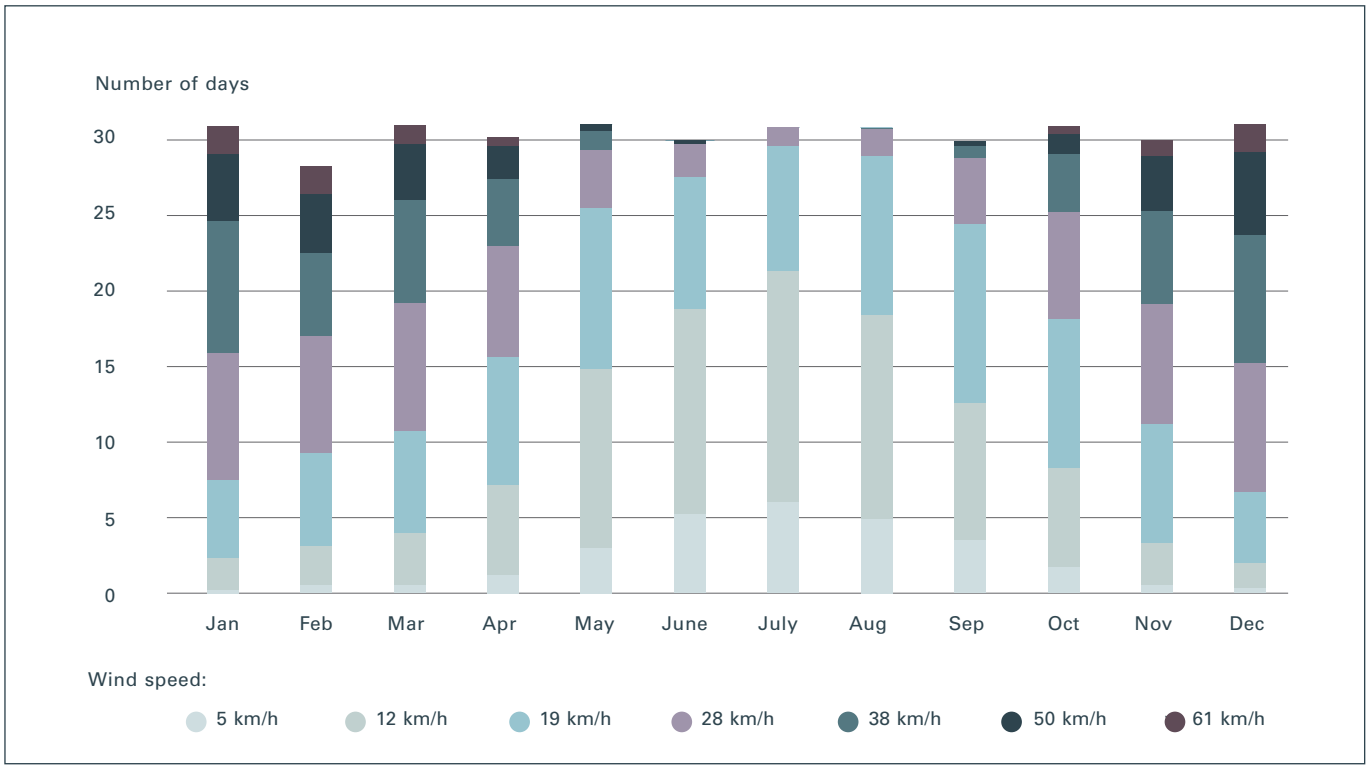
Wind

The greatest influence on the climate of the region is produced by the air masses coming from the Atlantic. On average, winds of western, north-western and south-western directions account for almost 46% (in autumn, about 50%) of all winds for the year; winds of northern and eastern directions, 28%; and southern and south-eastern, 26 %. The main feature of the climate of Saint Petersburg is the long-term and short-term variability and instability of the weather caused by frequent change and interaction of air masses.

The main feature of the climate is the variability of the weather, caused by frequent change of air masses, which, depending on the region of formation, are divided into marine, continental and Arctic.

Sea air masses come from the west, south-west or north-west when Atlantic cyclones move through the North-Western regions of Russia. Cyclones bring cloudy, windy weather and precipitation. In winter, they cause sharp warming, and in summer, on the contrary, bring coolness. Dry continental air comes from the east, south or southeast. Dry weather with low clouds, hot in summer and cold in winter, is established in anticyclones formed in these air masses. Dry and always very cold Arctic air formed over ice comes from the north and northeast, from the Kara Sea. Invasions of Arctic air masses are accompanied by the onset of the clear weather and a sharp decrease in the air temperature. In the areas of increased pressure formed in these air masses, even in summer there are frosts, and in winter — the most severe frosts. The variety of synoptic processes and frequent change of air masses are the cause of large inter-diurnal fluctuations of meteorological parameters. Temperature differences caused by the change of air masses can significantly exceed the amplitude of daily oscillations and often reach ± 20 °C or more.

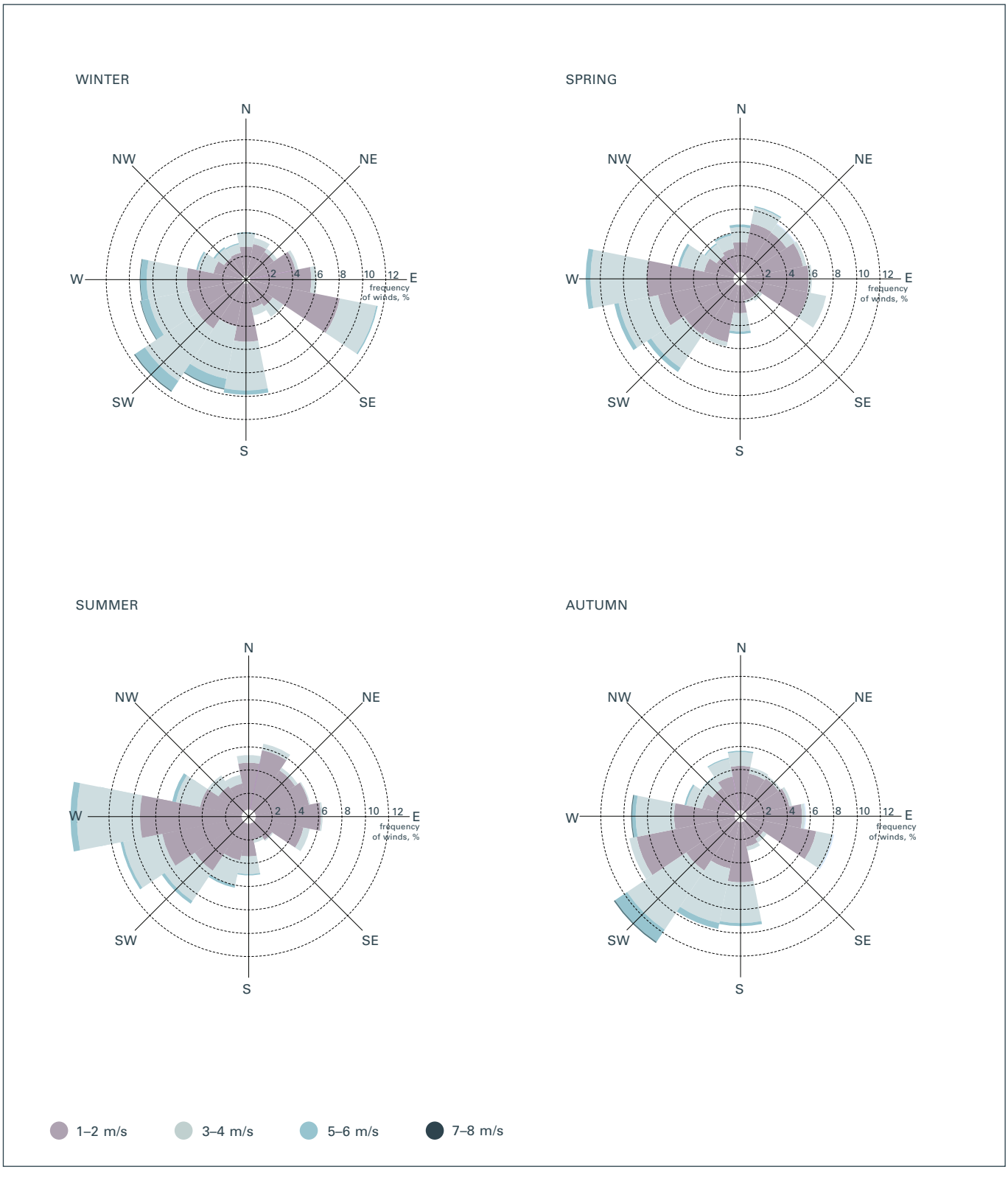
WIND SPEED



AVERAGE MONTHLY AND ANNUAL WIND SPEED M/S

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Year
2.6	2.4	2.3	2.2	2.0	1.9	1.8	1.8	1.9	2.4	2.6	2.6	2.2

REPEATABILITY (%) OF WIND DIRECTIONS BY SEASON



Floods and water level in the Malaya Neva River

The observed trend of the water level rise in the Baltic Sea and the Gulf of Finland, as well as the increase of precipitation intensity and quantity, may lead to an increase in the number and frequency of occurrence of wind-driven floods on the territory of Saint Petersburg. By the end of the 21st century, the total number of floods is expected to increase by more than 40%, with 'particularly dangerous floods' increasing by 30%.

When assessing the risk of flooding of the territory of the city protected by the dam, it should be noted that the most vulnerable in case of water level rise in the Neva Bay of up to 2.1 m are the territories with access to water, including Petrogradsky District, where the design territory is located. In general, more than 11,000 hectares of the city will be subject to flooding.

According to the results of the assessment of the Gulf of Finland maximum level rise in the Kurortny District of St. Petersburg, from the data of the regional model estimates taking into account the factor of global warming and local peculiarities of the coastal zone and the support formed by the complex of protective structures, the maximum level of water rise outside the protected territory can be as high as 417 cm. According to the calculation data, with a surge of 4.5 m, the flooding zone is very extensive and exceeds 2,000 hectares.

The predicted change in the ice mode of rivers leads to a further increase in the jam phenomena. According to preliminary estimates, if the water level during a jam flood raises up to 4.5 meters about 460 hectares of Saint Petersburg area will be flooded.

In accordance with a report entitled "Information on the Neva floods on the hydrological post nearest to the design area of the investment project 'Europe Embankment,'" there will be no catastrophic floods in Saint Petersburg after the completion of construction of the Protective Structures Complex. This is facilitated by the Protective Structures Complex built in 2011. This is also facilitated by the existing design of the embankment, which is a protective structure against flooding; respectively, the creation of 'soft coast' is not allowed.

CLASSIFICATION OF FLOODS ON THE NEVA RIVER

Flood category	Height of water above zero of the Kronstadt footstock[1], cm	Flooding area, sq.km
Hazardous	161-210	10-45
Severely hazardous	211-299	45-100
Catastrophic	over 300	over 100

ESTIMATED MAXIMUM ANNUAL WATER LEVEL IN THE BOLSHAYA NEVA RIVER AT THE MINING INSTITUTE FOR THE PERIOD OF OBSERVATIONS 1691-2009, IN THE PRESENCE OF THE PROTECTIVE STRUCTURES COMPLEX (AS OF 2010)

Repeatability	Probability, %	Maximum annual level, m (Baltic System of Heights)
1 time in 10 years	10	2.42
1 time in 20 years	5	2.58
1 time in 50 years	2	2.87

1. Measurements of absolute heights are made from the zero of the Kronstadt tide gage within the Baltic height system throughout the Russian Federation.
2. The cross section of Birzhevoy Bridge on the Malaya Neva river, when it is correlated to the Bolshaya Neva river, is located 2.6 km upstream of the hydrological post 'Mining Institute.'

Ice mode

Within Saint Petersburg (up to 32 km from the mouth) the freezing period of the Neva lasts from 2-3 to 15-20 days. The boundary of fast ice in most winters is restricted to the limits of the Neva Bay, and its thickness on average does not exceed 50 cm. The thickness of drifting ice, as well as fast ice, has decreased on average by 10-15 cm in relation to the norm over the last 15 years.

Frequent interchange of cold Arctic air masses and warm Atlantic ones during the fall and winter months along with the temperature rise impact the character and duration of ice formation.

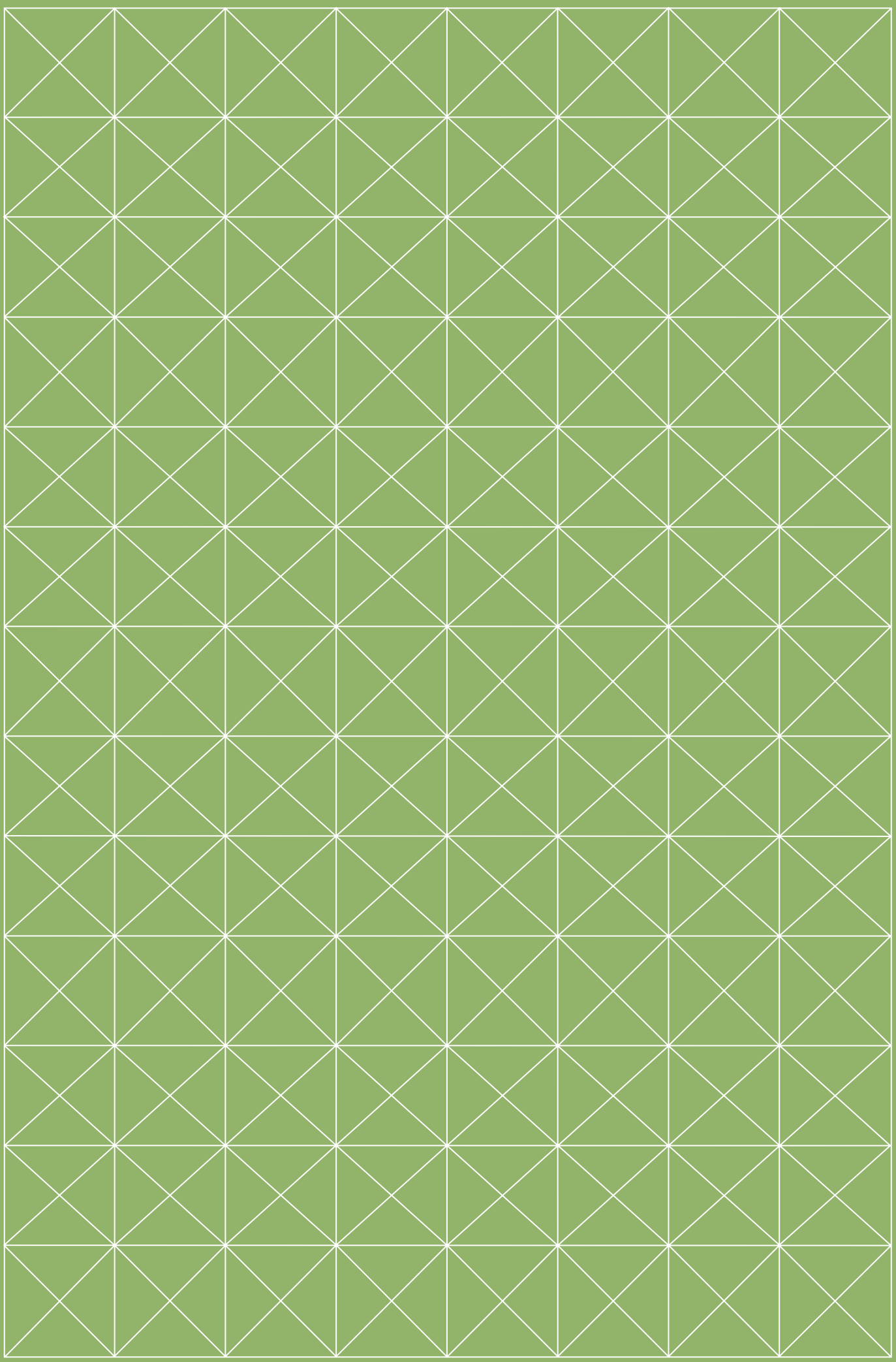
According to regional modelling data, the duration of the ice season in the Gulf of Finland by the end of the 21st century can decrease by 2 months. Further reduction of the area of drifting and fast ice and its thickness is also forecast.

The absence of stable ice cover and an increase of the frequency of occurrence of wind-driven floods will lead to active stream erosion of the banks of the Gulf of Finland.

The expected changes in watering conditions (increase in precipitation quantity and intensity) may increase the area of flooding in the city, especially considering the high levels of groundwater occurrence.

— 12 —

Appendix



Photographic Evidence

A BIRD'S-EYE VIEW RECOMMENDED FOR THE MAIN PERSPECTIVE DRAWING OF THE PARK

VIEW OF THE DESIGN AREA FROM MAKAROV EMBANKMENT

VIEW OF THE DESIGN AREA FROM NEVA CENTRAL WATERWAY

VIEW OF THE DESIGN AREA FROM PETROVSKY STADIUM

VIEW OF THE DESIGN AREA FROM THE SPIT OF VASILYEVSKY ISLAND

VIEW OF THE DESIGN AREA FROM PRINCE VLADIMIR CATHEDRAL

VIEW OF THE HEMP WAREHOUSES AND THE DESIGN AREA FROM TUCHKOV BRIDGE

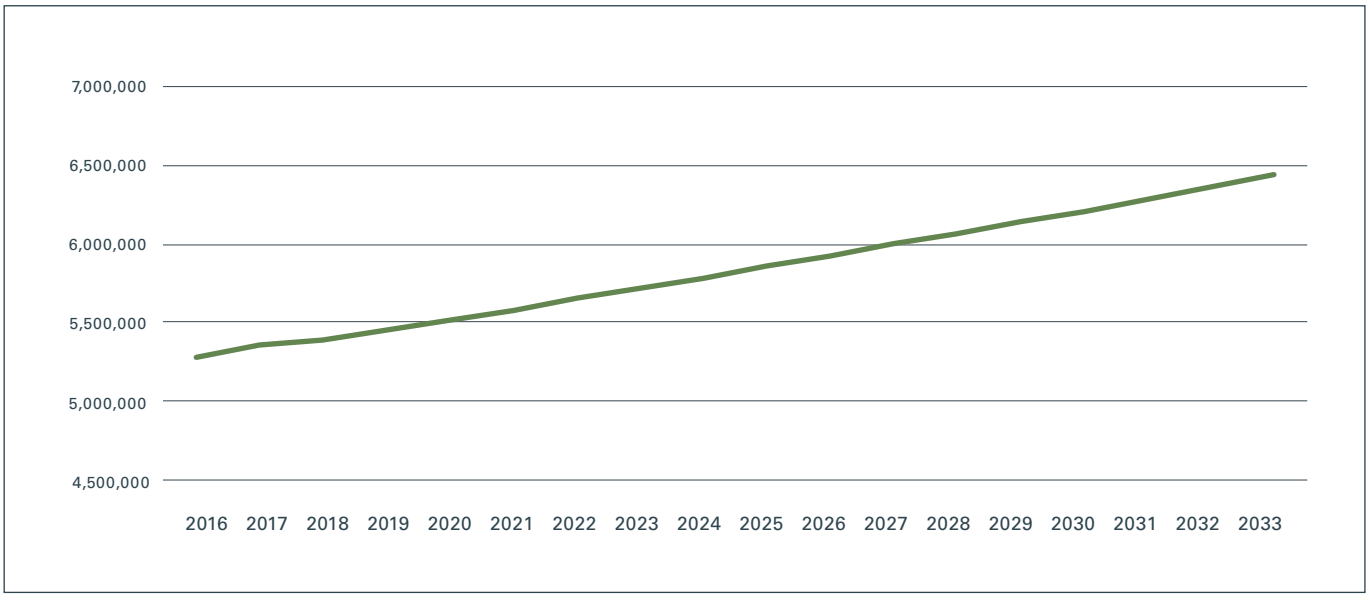
VIEW OF THE HEMP WAREHOUSES AND THE DESIGN AREA FROM TUCHKOV BRIDGE

VIEW OF PALACE EMBANKMENT FROM THE DESIGN AREA

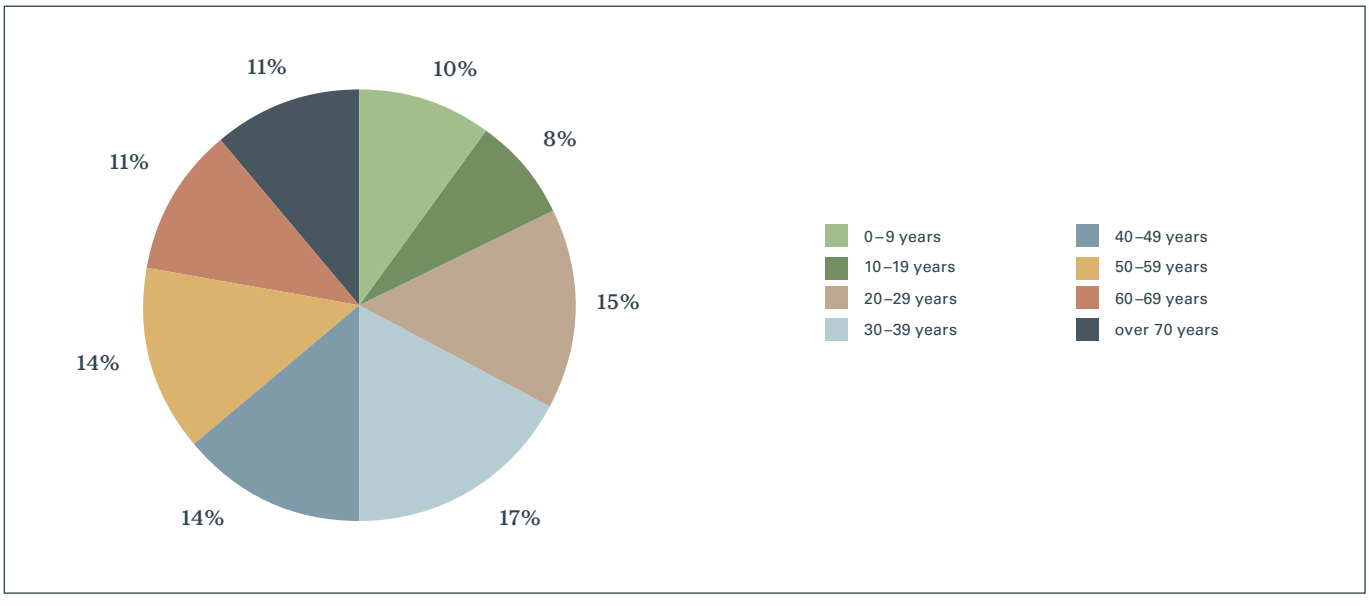
VIEW OF THE SPIT OF VASILYEVSKY ISLAND FROM THE DESIGN AREA

Population of Saint Petersburg

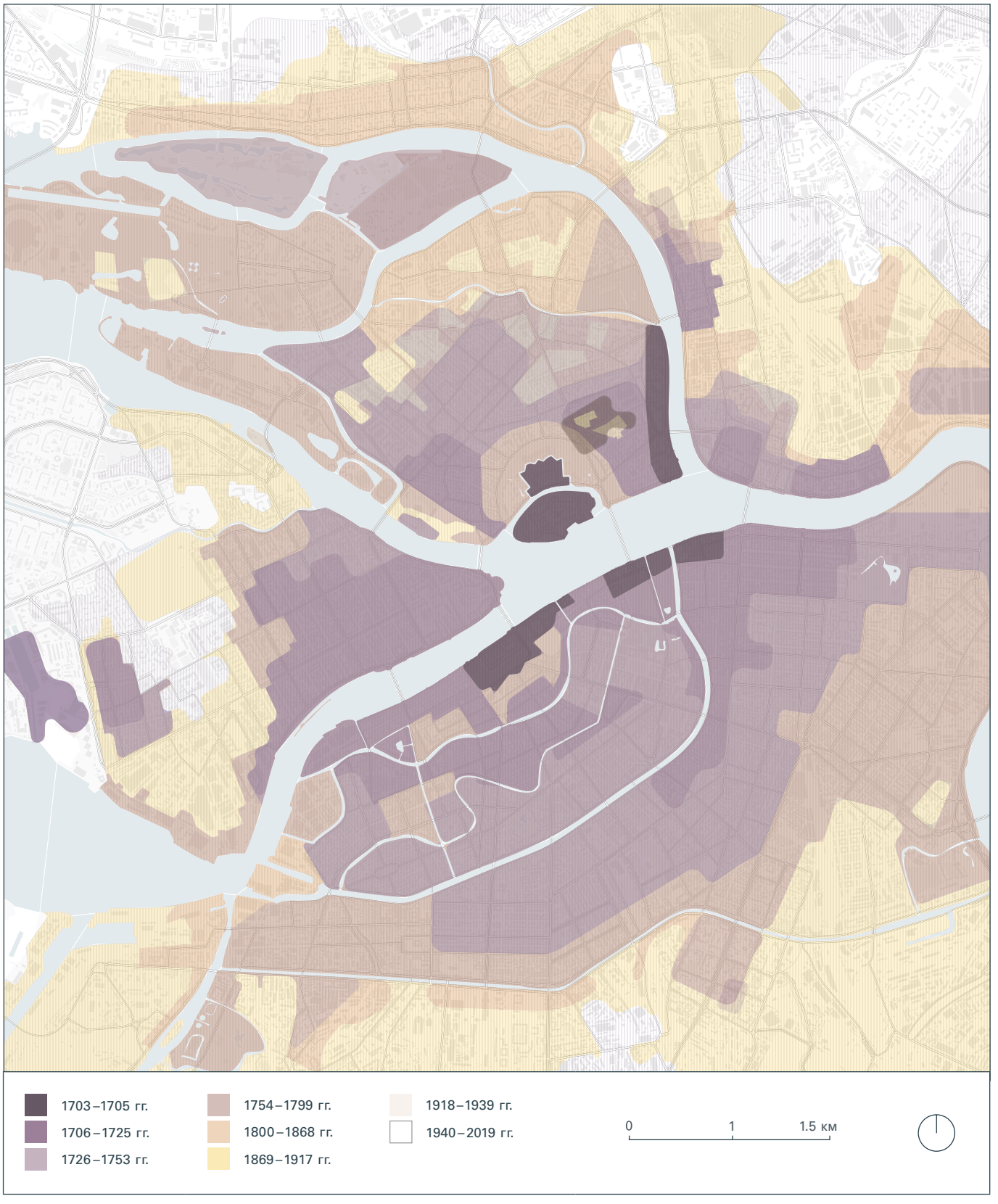
POPULATION



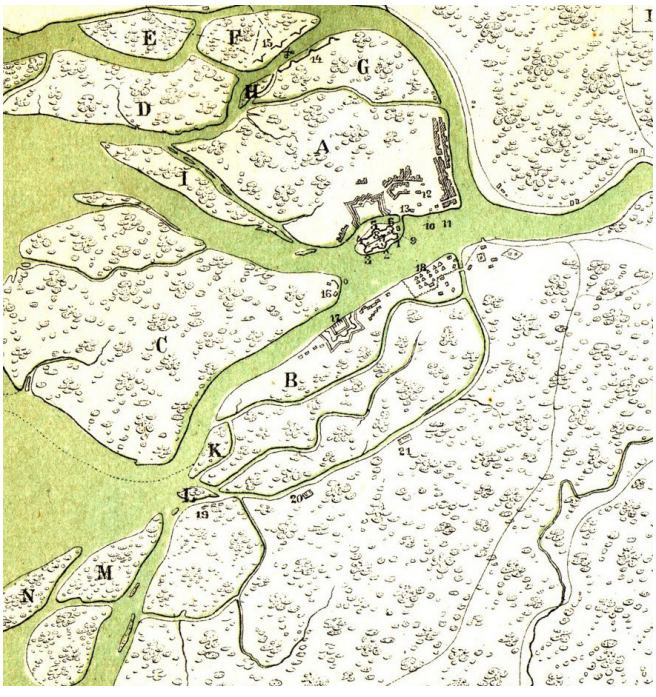
POPULATION STRUCTURE (AGE SPLIT), %



Stages of Saint Petersburg's development



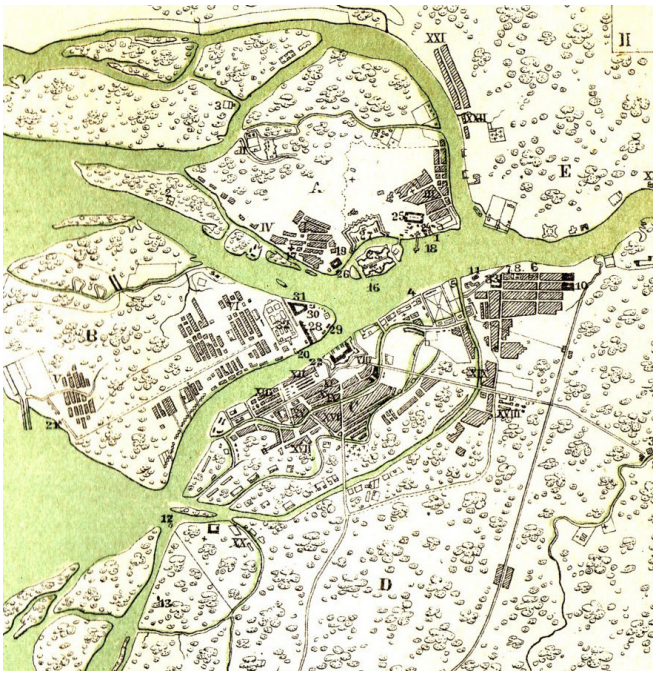
1703–1705



Map of Saint Petersburg, 1705
© Public Domain / Retromap / Encyclopedic Dictionary of Efron. Lithograph by A. Ilyin

The city is first formed as an unprotected settlement outside the Peter and Paul Fortress, in the form of sloboda settlements. The city development carried out simultaneously on both sides of the Neva, with the fortress as the focal point. Port construction and the Troitsk marketplace appeared, featuring warehouses, a customs office and the bazaar on the southern bank of the City Island. Construction of the first industrial enterprise: Admiralty Shipyard (1705) in the Admiralty District, where the Winter and Summer Palaces of Peter the Great were also constructed with the Summer Garden.

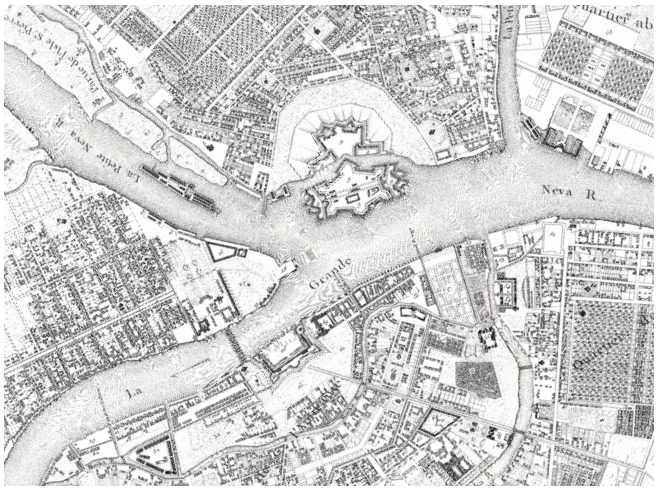
1706–1725



Map of Saint Petersburg, 1725
© Public Domain / Retromap / Encyclopedic Dictionary of Efron.
Lithograph by A. Ilyin

Implementing the principle of the regular arrangement. Shaping the residential development along the Moyka River (the city border until 1726). 1719: designs for the reconstruction of Admiralty Island (architect N. Ph. Gerbel) and Vasilyevsky Island (architect D. Tresini): creating the 'five beam' city development system (today, Millionnaya Street, Nevsky Avenue, Gorokhovaya Street, Voznesensky Avenue, Konnogvardeysky Boulevard), along with the systems of the Vasilyevsky Island lines. Extending the band of the industrial facilities (Liteyny Dvor, the Okhtinskaya Shipyard and the Galley Shipyard, etc.), with sloboda settlements developing around them.

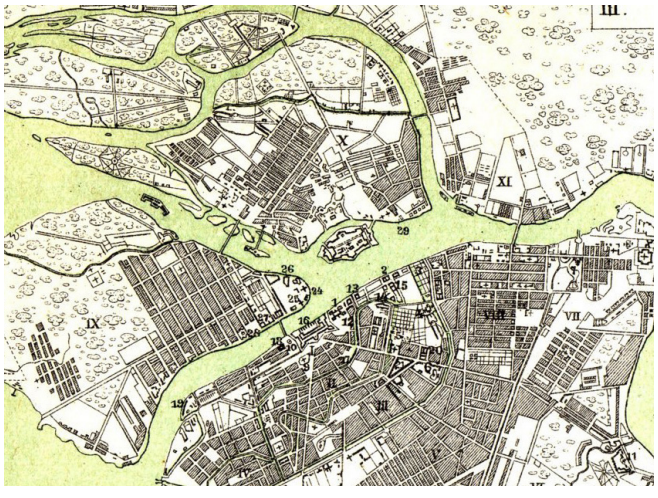
1726–1753



Plan of A. F. Truskott, 1753. An abridged version of the map of St. Petersburg, compiled by the Academy of Sciences in 1753.

Slowing down the city development pace. Creating The Commission for Saint Petersburg Construction (1737); developing the site master plans, creating construction regulations, standards, sample designs. The administrative organisation of the city introduced dividing it into five parts; the city's downtown is the Admiralty District. The consistent arrangement including the Admiralty, the eastern part of Vasilyevsky Island and the Peter and Paul Fortress is being formed with the Neva surface as its unifying element. The regular development formed in the central part of City Island (military sloboda settlements). Manor houses constructed along the Fontanka river. The city extends to the southeast.

1754–1799



Map of Saint Petersburg, 1799

Activities of The Commission for Arrangement of Saint Petersburg and Moscow: city planning regulations and the legal framework for the development of the city, its outskirts and greenlands. A series of city areas behind Kronverk, Maly Avenue of Vasilyevsky Island, along the left bank of the Fontanka River were declared as outskirts. Restrictions on building height (20.13 metres) and prohibitions to build factories and plants within the city boundaries are instituted. It is prohibited to build from wood between the Bolshaya Neva and the Fontanka. The site master plan of A. V. Kvasova (1769) is implemented, creating the development of the Palace Square, plans of the Admiralty, embankments of the Fontanka, etc. Active development of small islands as summer residences and recreation areas.

1800–1868

The new plan of St. Petersburg 1868

The city area extends through annexation of the regimental sloboda settlements. The major city and suburban ensembles and engineering facilities are created. Arrangement of embankments, pavements, public gardens and square gardens. Wooden construction in the city prohibited in 1830; for City Island, the ban is introduced in 1850, 1861. Restrictions on architecture, colour and design solutions of private houses are removed; the height limits, restrictions of arranging the buildings against the red lines, etc. are retained. The Vyborg Side, the western part of Vasilyevsky Island, and the area behind the Obvodny Channel become centres of industrial construction. Development of the railway network begins.

1869–1917

PLAN OF ST. PETERSBURG. 1914
© RGIA / Presidential Library

The city area significantly extends to the north, east and south. Intensive industrial development of the city outskirts. The left and right bank railway transport systems are formed, the Sea Port at Gutuevsky Island is built. The Plan of Saint Petersburg Arrangement by Imperial Consolidation as of 7 March 1880 (as amended in 1909) governs city development activities. The scope of the residential development increases significantly (spike in construction in the Petrograd Side after 1903). The system of dacha communities along the highways and railways is formed. The Aeronautical Park and Corps Aerodrome appears in the south, with Commandant Aerodrome in the north.

1918–1939

Plan_Leningrad_1927
© Public Domain / Wikimedia / Государственный картографический институт

Development of the Layout of Petrograd Zones (1919). Three zones were singled out: the central zone (continuous facade line of the development), the middle zone (certain residential groups surrounded by greenery) and the peripheral zone (with greenery prevailing with individual buildings inside). Competitive designs of certain ensembles in the historical downtown. Construction of workers' settlements in the Putilov, Volodarsk, Moskovsko-Narvsky Districts. The Master Plan of Leningrad was approved in 1939; it was implemented partially: the city extending to the south; the radial, arc-shaped, and diagonal highways laid, parks laid out. Residential development of Malaya Okhta, Schemilovka, Avtovo Districts along Moskovsky Avenue.

1940–2019

Plan of St. Petersburg 1993
© LLC «MAP TD» / Retromap

Low-rise residential development of the peripheral districts. The Master Plan of Renovation and Development of Leningrad (1948): getting back to the concept of the concentric radial-beam development retaining the historic downtown. Large-scale housing construction of 4-6-storey buildings along Moskovsky Avenue, in Okhta, Vyborg Side, in the Nevsky District, etc. The Primorsky and Moskovsky Victory Parks are formed. A new system of vertical dominants is created, based on the principles of corridor perception. Starting in 1960, free-pattern town planning of micro districts is used, with widespread use of industrial pre-fabricated structures. At present, intensive development is underway in such districts as Lakhta-Olgino, Shuvalovo-Ozerky, Rybatskoye, Shushary, Moorino, and others; redevelopment of the former industrial areas (including in the historical downtown) with focus on residential and commercial construction.

Identity of the Northwest region flora

Saint Petersburg is located in the southern taiga region known for its coniferous, small-leaved trees. Dark coniferous spruce and light pine forests, small-leaved birch, aspen, alder and mixed forests are widespread and often inundated or boggy. The most distinctive and characteristic landscapes of this area are pine forests on sandy coastal dunes; spruce forests with deciduous trees; dewy birch groves, alders and aspen; spruce-alder forests with grass layers; coastal and floodplain meadows; lowland marshes and reedbeds in coastal areas.

Participants are invited to use the phytocoenosis characteristic of the aforementioned landscapes as models or references. The European spruce (Picea abies) and the Scots pine (Pinus sylvestris) are the main forest-forming tree species in the north-west region. Prevailing in derivative forest stands are drooping birch (Betula pendula) and fluffy birch (Betula pubescens), aspen (Populus tremula) and black alder (Alnus glutinosa), and mountain ash (Sorbus aucuparia). Among bush varieties are various species of willow (Salix), buckthorn (Frangula alnus), elderberry (Sambucus racemosa), and common juniper (Juniperus communis).

Indigenous species — drooping and fluffy birch and various species of willow and mountain ash — are less susceptible to diseases and pests and are also resistant to difficult climatic conditions and life in an urban environment. However, out of native trees today only drooping and fluffy birches can be found throughout the city, while the coniferous species of spruce and pine make up no more than nine percent of the tree species in the city.

For the planting of territories, the recommended ratio according to the phytocenotic principle is 80% small-leaved tree species and 20% broad-leaved species. The recommended ratio of native plants and introduced species, as well as their varieties, is 80% and 20% respectively.

Such an approach will make it possible to not only increase the biodiversity of the urban environment but also to recognise the city of Saint Petersburg as the northernmost metropolis in the world, to feature the beauty of boreal flora of the southern taiga, and to inspire within the population of Saint Petersburg a sense of belonging towards their native nature.

Types of spatial structure

> **Types of spatial structure (TSS) is the basic classification attribute of the extent and spatial structure of the park. TSS are determined by the tree cover canopy density, stand density and character of the tree arrangement. The canopy density is the ratio of the area closed by the tree crown to the total site area. There are three types of spatial structure.**

Closed space

These are spaces almost completely covered by the tree canopy. These are forested areas, woods, with the canopy density[1] varying from 1 up to 0.6 (0.7), with spaces with the vertical canopy density (multi-tiered planting) preferred.

Open space

These are represented by all kinds of areas not covered with dense planting and structures. These include meadows, lawns, level spaces, large flower gardens, squares, flat sport facilities, water bodies.

Semi-open space

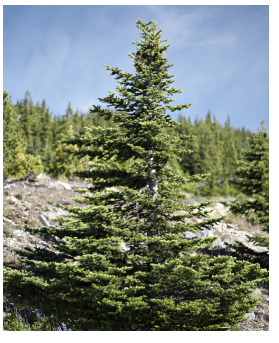
These are spaces with less than half of the area covered by tree crowns: tree groups in the lawns (canopy density of 0.5–0.2) are divided into sites with group-type or even distribution of the trees. The groups may feature higher stand density (canopy density of 0.5–0.4) or lower stand density (canopy density of 0.3–0.2, sparse density). Unlike closed spaces, semi-open spaces feature better visibility and visual connections with the adjoining sites.

DETERMINING TYPE OF SPATIAL STRUCTURE DEPENDING ON THE CANOPY DENSITY RATIO[1]:	
TSS	CANOPY DENSITY RATIO:
Closed	1–0.6
Semi-open	0.5–0.2
Open	< 0.2

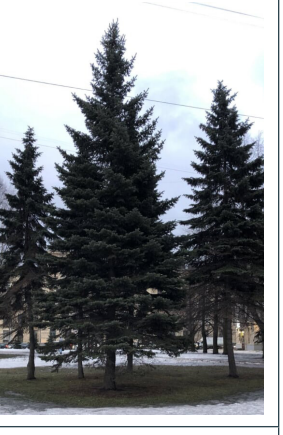
1. Planting rates for trees and bushes of the urban plantation. Ministry of the RSFSR for Housing and Utilities, 11 December 1987

Recommended range of plants

> When developing the park concept, it is recommended to take into account the suggested assortment of plants. However, it is not necessary to strictly follow the table below.

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
1	ХВОЙНЫЕ ДЕРЕВЬЯ				
1.1	Balsam fir Abies balsamea Height: 12–15 m Width: 6–7 m	Even conic crown. The needles are dark green, glossy, with white trimming underneath. The cones are violet. Shade-resistant. Requires high soil and air humidity. Resistant to the urban conditions. Winter-resistant, frost-resistant.	Additional list of plants; Introduced species;	Foundation plinth;	 © R. A. Nonenmacher / CC BY-SA / Wikimedia
1.2	White fir Abies concolour Height: 15–18 m Width: 5–6 m	Narrow conic crown. The needles are large, gray-blue. Light-demanding. Drought-resistant. Wind-resistant. Relatively resistant to urban conditions.	Additional list of plants; Introduced species;	Foundation plinth;	 © Mark Wagner / CC BY / Wikimedia
1.3	Korean fir Abies koreana Height: 10–12 m Width: 4–5 m	Conic crown. The needles are dark-green on the top, silver light underneath. Decorative violet cones. Light-demanding, can withstand partial shade. Requires protection against the wind. Requires high soil and air humidity. Relatively resistant to urban conditions.	Additional list of plants; Introduced species;	Foundation plinth;	 © Crusier / CC BY-SA / Wikimedia
1.4	Subalpine fir Abies lasiocarpa Height: 8–12 m, Width: 3–5 m	Conic crown. Aromatic dark green needles. Shade resistant. Requires high soil and air humidity. Resistant to urban conditions.	Additional list of plants; Introduced species;	Foundation plinth;	 © Daniel Mosquin / UBC Botanical Garden and Centre for Plant Research

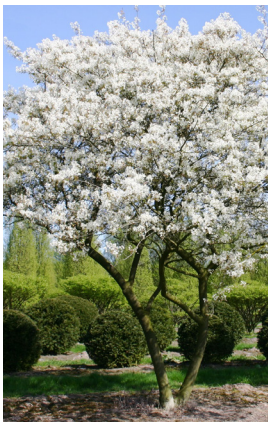
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
1.5	Compacta subalpine fir Abies lasiocarpa 'Compacta' Height: 4–5 m, Width: 3–4 m	Conic crown. Aromatic dark green needles. Shade resistant. Requires high soil and air humidity. Resistant to urban conditions. Grows slowly.	Additional list of plants; Introduced species;	Foundation plinth;	 © Alexander Zhukov / packagile.ru
1.6	Siberian fir Abies sibirica Height: 15–20 m, Width: 4–7 m	Narrow conic crown. The needles are dark green, glossy, aromatic, not sticky. Shade resistant. Requires high soil and air humidity. Insufficiently resistant to gas-polluted air.	Additional list of plants; Introduced species; Historically present in gardens of Saint Petersburg	Foundation plinth; Embankment;	 © Crusier / CC BY-SA 3.0 / Wikimedia
1.7	Russian larch (Arkhangelsk larch) Larix sukaczewii (L. archangelica) Height: 25–30 m, Width: 5–7 m	Pyramidal crown in the young years, and updrawn branches. The needles are bright green and yellow orange in autumn. Light-demanding. Resistant to urban conditions, is quite comfortable with dust, gas and smoke pollution. Can grow in containers. Wind-resistant.	Main list of plants; Local species;	All zones;	
1.8	Siberian larch Larix sibirica Height: 25–30 m, Width: 5–7 m	Pyramidal crown. The needles are bright green and yellow orange in autumn. Light-demanding. Resistant to urban conditions, quite comfortable with dust, gas and smoke pollution. Can grow in containers. Wind-resistant.	Main list of plants; Local species;	All zones;	 © Ludvig14 / CC BY-SA / Wikimedia

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
1.9	Norway spruce Picea abies Height: 20–30 m, Width: 6–10 m	Wide conic crown with horizontal branches and drooping side branches. Hard dark green needles. Shade-resistant, but grows better in sunny places. Soil and air humidity demanding. Cannot stand water stagnation, salt accumulation or dryness of the soil. Winter-resistant, frost-resistant.	Main list of plants; Local species;	Foundation plinth; Terrace;	
1.10	Will's Zwerg Norway spruce Picea abies 'Will's Zwerg' Height: 2–3 m, Width: 1–1.5 m	Dwarf form with narrow, conical, dense crown. Grows slowly. Hard shoots, with short, dark green, thick, hard needles. Young shoots growing in spring are bright light green or yellowish green creating eye-catching contrast with the old needles. Young cones are orange yellow. Light-demanding, shade-resistant. Moisture-loving, cannot stand water stagnation or exceedingly dry air. Winter-resistant, frost-resistant.	Main list of plants; Local species;	Foundation plinth; Terrace;	
1.11	Blue spruce Picea pungens Height: 20–30 m, Width: 6–10 m	A spruce tree with a symmetric pyramidal or cone-shaped crown. The needles are blue green, sticky, hard. Light-demanding, can stand light shade. Moisture-loving, drought resistant. Moderately resistant to urban conditions, Winter-resistant, frost-resistant.	Main list of plants; Introduced species;	Foundation plinth; Terrace;	
1.12	Glauca, Glauca Globosa, Hoopsii, Oldenburg blue spruce. Picea pungens Sorts 'Glauca', 'Glauca Globosa', 'Hoopsi', 'Oldenburg' Height: 4–8 m, Width: 3–4 m	A spruce tree with a compact symmetric pyramidal or cone-shaped crown. The needles are blue green, sticky, hard. Light-demanding, can stand light shade. Moisture-loving, drought resistant. Moderately resistant to urban conditions, Winter-resistant, frost-resistant.	Main list of plants; Introduced species;	Foundation plinth; Terrace;	

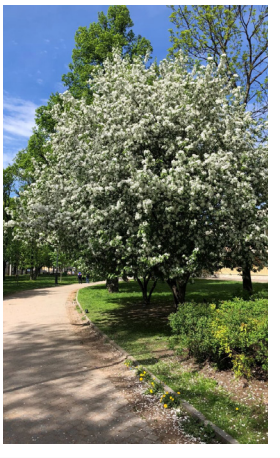
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
1.13	Scots pine Pinus sylvestris Height: 15–25 m, Width: 5–10 m	A spruce tree with a picturesque crown, which is cone-shaped in the young years and umbel-like later. The needles are glaucous blue green. Light-demanding, can stand light shadow. Drought-resistant. Sensitive to air pollution, moderately resistant to urban conditions. Winter-resistant, frost-resistant.	Additional list of plants; Local species;	Foundation plinth;	
1.14	Fastigiata Scots pine Pinus sylvestris 'Fastigiata' Height: 8–10 m, Width: 1–2 m	A spruce tree with a narrow columnar form of the crown, with vertically growing branches. The needles are gray blue. Light-demanding, can stand light shadow. Drought-resistant. Wind-resistant. Moderately resistant to urban conditions. Winter-resistant, frost-resistant.	Additional list of plants; Local species;	Foundation plinth;	 © Matthieu Sontag / CC-BY-SA / Wikimedia
1.15	Norske Typ Scots pine Pinus sylvestris 'Norske Typ' Height: 8–12 m, Width: 4–6 m	A spruce tree with a compact, columnar crown. The needles are long, blue green. Light-demanding, can stand light shadow. Drought-resistant. Wind-resistant. Moderately resistant to urban conditions. Winter-resistant, frost-resistant.	Additional list of plants; Indigenous species;	Foundation plinth;	 © Boomkwekerij Ebben B.V
1.16	Eastern arborvitae Thuja occidentalis Height: 12–20 m, Width: 4–6 m	A spruce tree with a wide oval loose crown. The needles are dark green in summer, with brown shade in winter. Shade-resistant. Moisture-loving. Not wind-resistant. Resistant to air pollution, resistant to urban conditions. Winter-resistant, frost-resistant.	Additional list of plants; Introduced species;	Foundation plinth;	

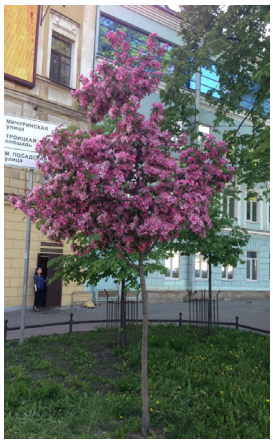
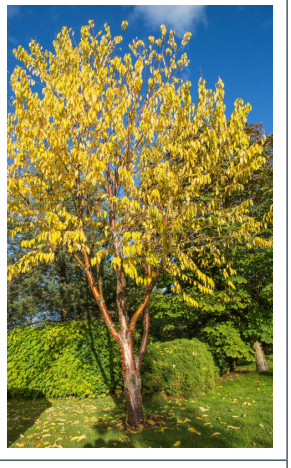
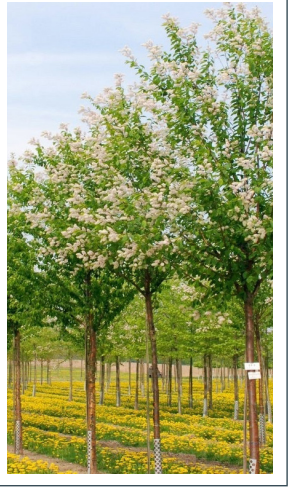
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
1.17	Brabant White Cedar Thuja occidentalis 'Brabant' Height: 8–10 m, Width: 3–4 m	A spruce tree with the wide oval loose crown. The needles are dark green in summer, with brown shade in winter. Shade-resistant. Moisture-loving. Not wind-resistant. Resistant to air pollution, resistant to urban conditions. Winter-resistant, frost-resistant.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Academic Likhachev Square;	 © R. A. Nonenmacher / CC BY-SA / Wikimedia
2	BROAD-LEAVED TREES				
2.1	Black alder Alnus glutinosa Height: 10–15 m, Width: 4–8 m	A tree with an even pyramidal crown. The leaves are green, green yellow in autumn, drop off late autumn. In the young years, the crown is rather open becoming denser afterwards. Fast-growing. Moderately resistant, can stand half shadowy places. Cannot stand boggy land with the stagnated water. Moderately resistant to gas pollution. Resistant to urban conditions. Wind-resistant.	Additional list of plants; Local species;	Terrace; Embankment; Coulisse;	 © R. A. Nonenmacher / CC BY-SA / Wikimedia
2.2	Imperialis Black alder Alnus glutinosa 'Imperialis' Height: 6–8 m, Width: 4 m	A slim tree with an even pyramidal crown. Young shoots are red brown. The leaves are green, small, deeply cut, green yellow in autumn, drop off late autumn. In its younger years, the crown is rather open becoming denser afterwards. Fast-growing. Moderately resistant, can stand partially shaded places. Moderately resistant to gas pollution. Resistant to urban conditions. Wind-resistant. Winter-resistant, frost-resistant.	Additional list of plants; Local species;	Terrace; Embankment; Coulisse;	 © R. A. Nonenmacher / CC BY-SA / Wikimedia
2.3	Aurea Grey alder Alnus incana 'Aurea' Height: 6–8 m, Width: 4 m	A tree with an oval compact crown, with upward orange brown branches. Young shoots are yellow orange, and orange brown in winter. The leaves are small, egg-like, elliptic, and gold yellow in spring, becoming green yellow afterwards, and are slightly hairy underneath; they are yellow or slightly green in autumn. Catkins are reddish, abundant, and look beautiful on the leafless branches IV. Grows slowly. Light-demanding, can stand light shade, but the leaves become green in the shadowy places. Moisture-loving, can stand water stagnation. Resistant to urban conditions. Cannot stand soil compaction. Winter-resistant, frost-resistant.	Main list of plants; Local species;	Terrace; Green buffer; Embankment; Coulisse; Adjacent streets; Academic Likhachev Square;	

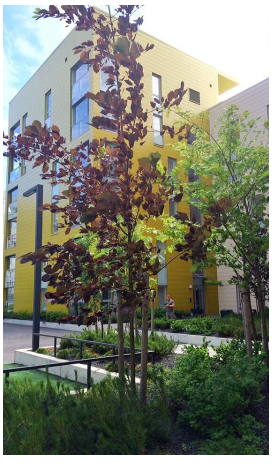
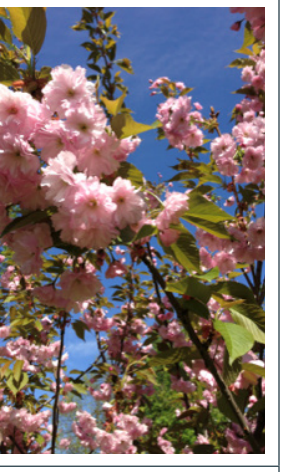
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.4	Laciniata Common Alder tree Alnus incana ‘laciniata’ Height: 6–8 m, Width: 4 m	A tree with a oval compact crown, with upward orange brown branches. Young shoots are yellow orange, and orange brown in winter. The leaves are green, small, deeply cut, green yellow in autumn, and fall in late autumn. In the young years, the crown is rather open, becoming denser afterwards. Catkins are reddish, abundant, and look beautiful on the leafless branches. Grows slowly. Light-demanding, can stand light shade, but the leaves become green in shady locations. Moisture-loving, can stand water stagnation. Resistant to urban conditions. Cannot stand soil compaction. Winter-resistant, frost-resistant.	Main list of plants; Local species;	Terrace; Green buffer; Embankment; Coulisse; Adjacent streets; Academic Likhachev Square;	 © Krzysztof Ziarnek, Kenraiz / CC BY-SA /Wikimedia
2.5	Princeton Gold Norway Maple Acer platanoides ‘Princeton Gold’ Height: 9–10 m, Width: 6 m	A tree with a thick, dense round crown. In spring, the leaves are golden yellow with an orange hint; in summer—green yellow. The autumn colouring is bright yellow orange. The flowers are yellowish green, odoriferous, in the form of cymose inflorescences. Light-demanding, can stand light shadow. Moisture-loving. Cannot stand water stagnation or soil over-consolidation. Resistant to urban conditions, wind-resistant. High winter resistance.	Main list of plants; Introduced species;	Terrace; Green buffer; Academic Likhachev Square;	
2.6	Drummondii Norway Maple Acer platanoides ‘Drummondii’ Height: 10–15 m, Width: 6 m	A tree with a wide pyramidal, and later round crown. The leaves are large, five-lobed, tinged shrimp-pink as they open, with a white stripe along the leaf edge afterwards. The middle of the leaf is bright green. In autumn, leaves turn somewhat yellow. The flowers are yellowish-green and small. Ash keys are ochre-yellow. Grows slowly. Light-demanding, gets sick in shade—the leaves become green. Moisture-loving. Cannot stand moisture stagnation, drought and soil salinisation. Suffers from soil compaction. Resistant to urban conditions, not wind-resistant. Winter-resistant, frost-resistant.	Main list of plants; Introduced species;	Terrace; Green buffer; Academic Likhachev Square;	 © Ornamental Trees Ltd.

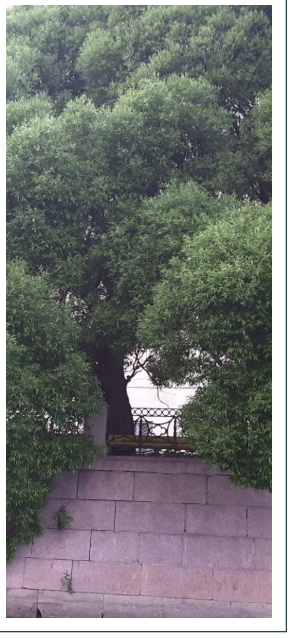
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.7	Norway Maple Royal Red Acer platanoides ‘Royal Red’ Height: 12–15 m, Width: 8 m	A tree with a wide pyramidal crown, with distinctive leading trunk and uneven density. The leaves are large, five-lobed, bright red as they open, and later turn dark red, glossy, dark orange-red in autumn. The flowers are yellow, small V. Ash keys are ochre-yellow. Grows slowly. Light-demanding, can stand half shadows, gets sick in the shadow, and the leaves become green. Moisture-loving. Cannot stand moisture stagnation, drought or soil salinisation. Suffers from soil compaction. Resistant to urban conditions, not wind-resistant. Winter-resistant, frost-resistant.	Main list of plants; Introduced species;	Terrace; Green buffer; Academic Likhachev Square;	 © Lazaregagnidze / CC BY-SA / Wikimedia
2.8	Tatarian maple Acer tataricum Height: 6–8 m, Width: 6–8 m	A small tree or bush with a wide umbel-like crown and decoratively bent trunks. The leaves are matted, bright green, yellow and red in autumn. The flowers are green, odoriferous V-VI. The fruits are winged, red VIII-IX. Resistant to shadow, grows well in lighted places as well. Can stand soil salinisation. Drought resistant. Smoke-and gas-resistant, resistant to urban conditions. High winter resistance.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Coulisse; Green buffer; Academic Likhachev Square; Adjacent streets;	
2.9	Amur maple Ginnala Acer ginnala (A. tataricum subsp. ginnala) Height: 6–8 m, Width: 6–8 m	A small tree or bush with a wide crown. Looks similar to Acer tataricum. The leaves are three-lobed, glossy, bright green; red in autumn. The flowers are yellow, odoriferous V-VI. The fruits are winged, red VIII-IX. Light-demanding, can stand shadow. Moisture-loving, relatively drought resistant. Suffers from soil salinisation and excessive moistening. Smoke- and gas-resistant, resistant to urban conditions. High winter resistance.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Coulisse; Green buffer; Academic Likhachev Square; Adjacent streets;	 © Wouter Hagens / Public Domain / Wikimedia
2.10	Juneberry Amelanchier lamarckii (canadensis) Height: 3–5 m, Width: 2–3 m	A small tree with a transparent, wide, umbel-like crown. The leaves are elongated, reddish as they open, glaucous green afterwards; orange red in autumn. The flowers are white V-VI. The fruits are purple black, rounded with the glaucous bloom, VIII. The root system is not deep, well-developed. Grows fast. Light-demanding, can stand half-shadow. Can stand excessive soil overwatering, temporary drought. Wind-resistant. Moderately resistant to gas pollution. Resistant to urban conditions. Frost-resistant. Winter-resistant.	Additional list of plants; Introduced species;	Underground parking roof; Terrace; Coulisse; Embankment; Green buffer; Academic Likhachev Square; Adjacent streets;	 © UAB «Mmc Forest»

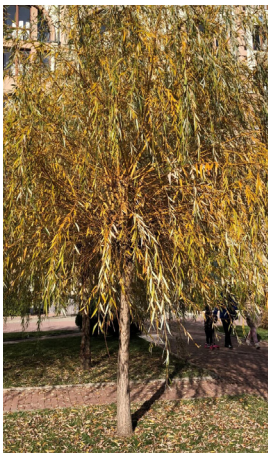
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.11	Birch downy Betula pubescens Height: 15–20 m, Width: 5–10 m	A tree with a white trunk. The tree crown is broadly branched, conical. The leaves are shiny; in early years, sticky and fragrant; in the spring, light green; in the summer, dark green; in the autumn, yellow. Light-demanding, shade-enduring. Moisture-loving; can survive temporary flooding. Drought-enduring, but sheds leaves. Prefers moist soils. Medium gas resistance. Tolerates urban conditions. Wind-resistant. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Terrace; Coulisse;	 © Kristian Peters / CC BY-SA 3.0 / Wikimedia
2.12	Birch silver Betula pendula Height: 20–25 m, Width: 5–10 m	The tree is 18–20 (max. 25) metres high, the crown diameter is 7 – 9 (maximum up to 12) metres. The crown is sprawling, highly vaulted, openwork with drooping branches of the second or more order. The bark of the trunk is white, layered. Leaves are green. The autumn colour is yellow. Grows fast. Light-demanding. It is unpretentious to soils and moisture. Dry periods are well tolerated. Tolerates a slight water-logging of the soil. Medium gas resistance. It tolerates urban conditions. Windfirm. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Terrace; Coulisse;	 © Anneli Salo / CC BY-SA / Wikimedia
2.13	Birch silver: ‘Fastigiata’, ‘Obelisk’ Betula pendula ‘Fastigiata’, ‘Obelisk’ Height: 10–15 m, Width: 3–4 m	Slender tree up to 10-15 m tall. The crown at a young age is column-like. Later, wide-columned. The bark of young trunks is white. The root system is pivotal with a large number of thin superficial fibrous roots. The leaves are triangular-diamond-shaped, dark green. In the autumn, they are yellow. Light-demanding, but tolerates light partial shade. It is unpretentious to moisture, does not tolerate a close groundwater occurrence. Drought-enduring. Poorly tolerates the wind, windward. It is unstable to any atmospheric pollution. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Terrace; Adjacent streets;	 © Genesis Plant Marketing Ltd
2.14	Silver birch ‘Tristis’ Betula pendula ‘Tristis’ Height: 15 m, Width: 5 m	The crown is openwork, sprawling, fairly symmetrical, with thin, vertically downward dipped, long branches with a beautiful white flaky bark. With age, black cracks appear at the base of the trunk. The branches are drooping. The leaves are medium-sized, dark green; in the autumn, yellow. Flowers are aglets, IV-V. Light-demanding, shade-enduring. Moisture-loving, drought-enduring. It can survive temporary flooding. Windfirm, resistant to urban conditions. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Embankment; Terrace; Coulisse;	 © Andrew Butko / CC BY-SA / Wikimedia

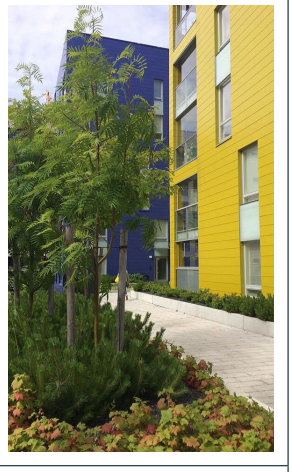
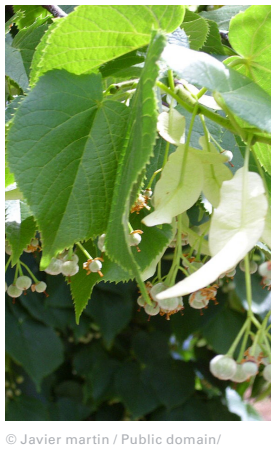
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.15	Silver birch ‘Zwitser Glorie’ Betula pendula ‘Zwitser Glorie’ Height: 15 m, Width: 5 m	A fast-growing tree with a regular, open crown and a beautiful white flaky bark. With age, black cracks appear at the base of the trunk. The branches are drooping. The leaves are medium-sized, dark green; in the autumn, yellow. Flowers: aglets, V. Light-demanding, shade-enduring. Moisture-loving, drought-enduring. Windfirm, resistant to urban conditions. Frost-resistant, winter-hardy.	Main list of plants; Local species;	Foundation plinth; Green buffer; Embankment; Terrace; Coulisse; Adjacent streets;	 © Boomkwekerij Gebr. Van den Berk B.V.
2.16	Siberian crabapple ‘Street Parade’ Malus bacccata ‘Street Parade’ Height: 4–6 m, Width: 3–4 m	A small tree with a narrow oval crown. The leaves are shiny, dark green; when blooming, pale green; in the autumn, yellow-brown. The flowers are white, umbraculiferous, plentiful. Fruits are spherical, red on a long fruit stalk, persist for a long time. The growth rate is average. Light-demanding; tolerates partial shading. Moisture-loving; it can survive a short drought. Relative smoke and gas resistance. Resistant to urban conditions. Winter-hardy, frost-resistant.	Additional list of plants; Introduced species;	Green buffer; Terrace; Underground parking roof; Academic Likhachev Square; Adjacent streets;	 © Pictokon
2.17	Apple tree ‘Everesti’ Malus ‘Everesti’ Height: 4–6 m, Width: 4–5 m	A small tree or multi-stemmed shrub with a loose, spreading crown with dark green foliage, simple white flowers with pink stripes along the edges of the petals, orange-red with a thin red stripe of fruits. Light-demanding; tolerates partial shade. Moisture-loving; it can survive a short drought. Relative smoke and gas resistance. Resistant to urban conditions. Winter-hardy, frost-resistant.	Additional list of plants; Introduced species;	Green buffer; Terrace; Underground parking roof; Academic Likhachev Square; Adjacent streets;	
2.18	Apple tree ‘Royalty’ Malus x purpurea ‘Royalty’ Height: 4–6 m, Width: 3–4 m	A tree or shrub with a wide oval, spreading crown. The leaves bloom purple-red; in the summer they are shiny greenish-red; in the autumn, brownish-red or orange. The flowers are purple or ruby red, large. Fruits are purple or dark red with a glaucous waxy coating. Light-demanding; it can survive partial shading. Moisture-loving. Resistant to urban conditions. Winter-hardy, frost-resistant.	Additional list of plants; Introduced species;	Green buffer; Terrace; Underground parking roof; Academic Likhachev Square; Adjacent streets;	 © Opioła Jerzy / CC BY-SA / Wikimedia

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.19	Apple tree ‘Rudolph’ Malus ‘Rudolph’ Height: 4–6 m, Width: 3–4 m	A small tree with a vertically growing crown and slightly deflected shoots, drooping with age. The leaves are broadly elliptical, dark green; when young, with a reddish tinge. The buds are pink, the flowers are pink, the back side of the petals is darker. V-VI Fruits are yellow. Kept on the branches for a long time. Light-loving. Moisture-loving. Non-windfirm. Resistant to urban conditions. Frost-resistant, winter-hardy.	Additional list of plants; Introduced species;	Green buffer; Terrace; Underground parking roof; Academic Likhachev Squarereets;	
2.20	Populus tremula (or aspen) ‘Erecta’ Populus tremula ‘Erecta’ Height: 10–15 m, Width: 3–4 m	Deciduous tree with a narrow-crowned, dense crown. The bark is light gray, remains smooth for a long time. The branches are slightly winding, pointing up. The leaves are round, dull green, bluish underneath; the autumn colour is red-orange; when the wind blows, the leaves ‘shuffle.’ Male clone (does not release pollen). Forms root suckers. The growth rate is fast. Light-loving. Endures shading. Moisture-loving. Moderate drought tolerance. Windfirm. It tolerates urban conditions. Frost-resistant, winter-hardy.	Additional list of plants; Local species;	Green buffer; Terrace;	 © Abc10 / CC BY-SA / Wikimedia
2.21	Bird-cherry Maackii Prunus maackii Height: 10–15 m, Width: 6 m	A tree with a wide pyramidal crown. The bark is shiny, smooth, golden yellow. The oval leaves are bright green above, lighter below, and intense yellow in autumn. The inflorescence is racemous, upright. The flowers are white, the aroma is weak, V Fruit is a drupe, berry; the colour of the fruit is black. Growth is fast. Light-demanding, tolerates some shading. Moisture-loving. It does not tolerate waterlogging. Slight soil dryness and compaction is tolerated. It tolerates urban conditions, gas resistant. Windfirm. Frost-resistant, winter-hardy.	Main list of plants; Introduced species;	Embankment; Coulisse; Terrace;	
2.22	Padus maackii ‘Amber Beauty’ Prunus maackii ‘Amber Beauty’ Height: 10–15 m, Width: 4–5 m	A tree with a wide pyramidal, spreading crown. The trunk is covered with a brownish-golden smooth, shiny bark. The leaves are shiny, bright green, lemon yellow in the autumn. White flowers V-VI. Fruits are small, rounded, black. VII Light-demanding. Moisture-loving. Drought is tolerated. Windfirm. Smoke and gas resistance. It tolerates urban conditions. Frost-resistant, winter-hardy.	Main list of plants; Introduced species;	Embankment; Terrace;	

№E	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.23	Bird cherry ordinary ‘Colourata’ Prunus padus ‘Colourata’ Height: 5–8 m, Width: 4–5 m	A small tree. The crown is loose, ovoid or rounded, wide. Young leaves are purple; in adulthood, bronze or brownish-green. Autumn colour: purple or yellow-red. The flowers are pale pink with a slight smell of almonds, collected in abundant drooping brushes V. Fruits are shiny black, spherical, edible VII-VIII. Forms root suckers and coppice shoots. At a young age, it grows rapidly, then growth slows down. Light-demanding, shade-tolerant, but in the shade almost does not bloom and loses the purple hue of the leaves. Moderately moisture-loving. Urban conditions are satisfactorily tolerated. Frost-resistant, winter-hardy.	Main list of plants; Local species;	Embankment; Coulisse; Terrace; Academic Likhachev Square; Adjacent streets;	
2.24	Cherry tree sargenti ‘Rancho’ Prunus sargentii ‘Rancho’ Height: 5–8 m, Width: 4–5 m	A small tree. The crown is compact, smooth, funnel-shaped. Leaves are bright green. Autumn colour: purple or yellow-red. The flowers are pale pink, fragrant, collected in abundant drooping brushes VI. Fruits are small, red, dark red, spherical, inedible VIII-IX. At a young age, it grows rapidly, then growth slows down. Light-demanding, shade-tolerant, however, in the shade it develops uneven blooms, loses the purple hue of the leaves. Moderately moisture-loving. Urban conditions are satisfactorily tolerated. Frost-resistant, winter-hardy.	Main list of plants; Introduced species;	Foundation plinth; Underground parking roof; Green buffer; Terrace; Academic Likhachev Square; Adjacent streets;	
2.25	Cherry tree sargentii Prunus sargentii Height: 6–12 m, Width: 3–8 m	A small tree. The crown is uneven, wide, loose. Leaves are bright green. Autumn colour is reddish-green. The flowers are pale pink, slightly aromatic, V-VI. The fruits are small, black-red, spherical, inedible VIII-IX. At a young age, it grows rapidly, then growth slows down. Light-demanding, in the shade loses decorativeness. Moisture-loving, shade-tolerant. Urban conditions are satisfactorily tolerated. Frost-resistant, winter-hardy.	Main list of plants; Introduced species;	Foundation plinth; Underground parking roof; Terrace; Embankment; Coulisse;	
2.26	English oak ‘Fastigiata’ Quercus robur ‘Fastigiata’ Height: 12–15 m, Width: 4–5 m	A tree with a narrow columnar or pyramidal, dense crown. The branches are vertically directed. The root system is deep, pivotal, branched with age. The leaves are leathery with rounded lobes, dark green above and lighter below, in autumn yellow-brown. It grows quite slowly. Light-loving, does not tolerate the shading of the apex at a young age. Drought and heat resistant, does not tolerate stagnation of water, but can withstand temporary moisture until foliage dissolves. Not resistant to wind loads. Resistance to smoke and gases is average. Winter hardiness is average.	Main list of plants; Introduced species;	Foundation plinth; Terrace;	 © PlantEnBestel.nl

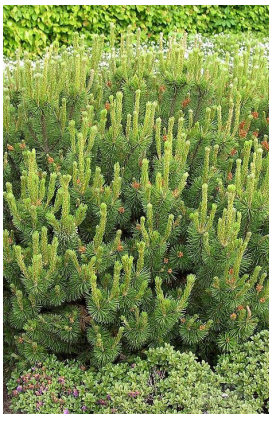
№E	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.27	Common willow Salix alba L. Height: 8–10 m, Width: 5–10 m	A tree with a wide-spread, even, dense, silver crown. The leaves are lanceolate, silky-greenish-gray on top and bottom silvery, silky-pubescent, which makes the tree spectacular at the slightest blowing of the wind. A tree of moderate growth. Light-loving; it tolerates slight shading. Moisture-loving. It does not tolerate waterlogging. Temporary flooding and drought are tolerated. Resistant to urban conditions, diseases and pests. Frost-resistant, winter-hardy.	Main list of plants; Local species;	Embankment; Coulisse; Terrace;	 © Liné1 / CC / Wikimedia
2.28	White willow Salix alba var. argentea Height: 8–10 m, Width: 5–10 m	A tree with a wide-spread, even, dense, silver crown. The leaves are lanceolate, silky-greenish-gray on top and bottom silvery, silky-pubescent, which makes the tree spectacular at the slightest blowing of the wind. A tree of moderate growth. Light-loving; it tolerates slight shading. Moisture-loving. It does not tolerate waterlogging. Temporary flooding and drought are tolerated. Resistant to urban conditions, diseases and pests. Frost-resistant, winter-resistant.	Main list of plants; Indigenous species;	Embankment; Coulisse;	 © Magnus Manske / CC BY-SA / Wikimedia
2.29	Brittle willow Salix fragilis Height: 8–20 m, Width: 6–10 m	Deciduous tree with a spreading crown and olive-green shoots. Large dark green leaves. Grows fast. Light-demanding, tolerates partial shade. Moisture-loving. Temporary flooding and drought are tolerated. Resistant to urban conditions, diseases and pests. Wind-resistant. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Coulisse; Embankment; Terrace; Academic Likhachev Square;	

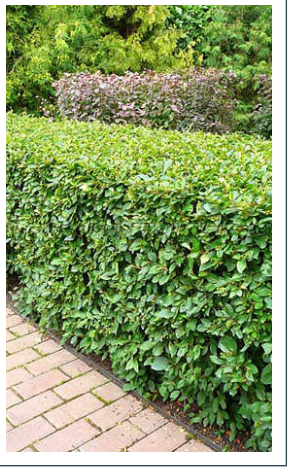
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.30	Willow fragile bubbly ‘Bullata’ Salix fragilis f. bullata Height: 5–8 m, Width: 6–8 m	Deciduous tree with a wide spherical crown with olive-green shoots. Large dark green leaves. Average growth rate. Useful phytoncide properties. Light-demanding; it tolerates partial shade. Moisture-loving. Temporary flooding and drought are tolerated. Resistant to urban conditions, diseases and pests. Wind-resistant. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Coulisse; Embankment; Terrace; Academic Likhachev Square;	
2.31	Willow fragile ‘Sphaerica’ Salix fragilis ‘Sphaerica’ Height: 3–6 m, Width: 3–6 m	Deciduous tree with a wide spherical crown with olive-green shoots. Large dark green leaves. Average growth rate. Useful phytoncide properties. Light-demanding; it tolerates partial shade. Moisture-loving. Temporary flooding and drought are tolerated. Resistant to urban conditions, diseases and pests. Wind-resistant. Frost-resistant, winter-resistant.	Main list of plants; Local species;	Foundation plinth; Coulisse; Embankment; Terrace; Academic Likhachev Square;	
2.32	Sverdlovsk weeping willow Salix blanda x alba (S. X ‘Sverdlovskaja Plakutschaja’ V.Schaburov et I.Beljaeva) Height: 6–8 m, Width: 3–6 m	Deciduous tree with hanging crown and olive-green or olive-yellow annual shoots. Leaves are shiny grey-green, yellow in autumn. Light-loving, endures half-shade. Moisture-loving. Endures temporary flooding and drought. Resistant to urban conditions, diseases and pests. Resistant to wind loads. Frost-resistant. Winter-resistant.	Main list of plants; Local species; (hybrid)	Foundation plinth; Coulisse; Embankment; Terrace; Academic Likhachev Square;	
2.33	Rowan-tree Sorbus aucuparia Height: 8–15 m, Width: 3–4 m	Small tree or large shrub with oval crown. Leaves are dark-green at the top, lighter at the bottom. In autumn they are coloured in purple, orange-red and yellow tones. The flowers are white, fragrant, picked in large shield-shaped inflorescences V. Fruits are orange-red, spherical, preserved on branches for long. VIII-IX Light-loving, endures half-shade, blooms and bears fruit in shaded conditions poorly. Endures gas contamination of air and smoke poorly. Doesn’t endure bogginess.	Additional list of plants; Local species;	Foundation plinth; Coulisse; Embankment; Terrace;	

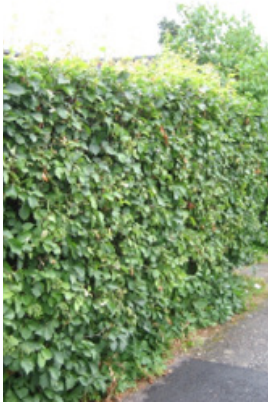
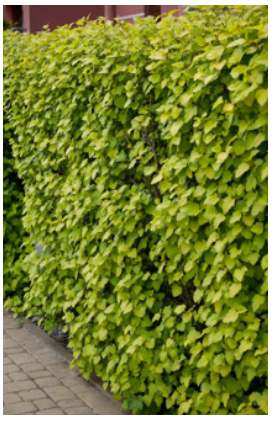
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.34	Rowan-tree ‘Edulis’ Sorbus aucuparia var. edulis Height: 10–15 m, Width: 5–7 m	Tree with narrow pyramidal crown, with age-wide pyramidal crown. Leaves are large, openwork, yellow-orange or red in autumn. Inflorescences are large, fragrant V. Fruits are large, round-oval, orange-red VIII. Light loving, endures light half-shade. Moisture-loving. Does not endure over-moistening, bogginess or salinisation. Endures gas contamination of air and smoke poorly. Frost-resistant, winter-resistant.	Additional list of plants; Local species;	Foundation plinth; Coulisse; Embankment; Terrace;	 © Lealans Garden Centre
2.35	Medium rowan-tree (intermediate) Sorbus intermedia Height: 6–10 m, Width: 3–5 m	Small tree with wide-oval crown. Leaves are dark green, solid, yellow in autumn. Flowers are white V. Fruits are orange-red IX-X. Light loving, endures light half-shade. Drought-resistant. Wind-resistant. Sustainable in urban conditions Frost-resistant, winter-resistant.	Additional list of plants; Introduced species;	Foundation plinth; Coulisse; Embankment; Green buffer; Terrace; Academic Likhachev Square; Adjacent streets;	
2.36	Rowan-tree ‘Dodong’ Sorbus commixta ‘Dodong’ Height: 6–8 m, Width: 3–5 m	Small tree with openwork crown with red-brown shoots Leaves are large openwork dark green. Bright red or scarlet in autumn. Flowers are white V. Fruits are bright red, orange IX. Light-loving. Drought-resistant. Wind-resistant. Not gas-resistant. Sustainable in urban conditions. Winter resistance is high, can freeze.	Additional list of plants; Introduced species;	Foundation plinth; Terrace;	
2.37	Small-leaved linden ‘Rancho’, ‘Boehlje’, ‘Greenspire’ Tilia cordata ‘Rancho’, ‘Boehlje’ ‘Greenspire’ Height: 8–12 m, Width: 4–5 m	Tree with a regular, compact, symmetrical, oval or pyramidal-ovate crown. Leaves are heart-shaped, dark green, shiny. Light yellow in autumn. Flowers are small, yellowish-white, fragrant VI-VII. Fruits are spherical nuts. Light-loving. Endures shading. Moisture-loving. Drought-sensitive. Wind-resistant. Endures urban conditions well. Frost-resistant, winter-resistant.	Main list of plants; Local plant (border of the range);	Green buffer; Terrace; Academic Likhachev Square;	 © Javier martin / Public domain/ Wikimedia

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
2.38	European Linden 'Pallida' Tilia x europaea 'Pallida' Height: 15–20 m, Width: 6–8 m	Tree with a symmetrical, regular, pyramidal crown. The shoots and buds are reddish in autumn. The growth rate is fast. Leaves are curved heart-shaped, large, bright green, slightly glossy. Autumn yellow colour. Flowers are small, fragrant, yellowish-white VII. Light-loving, can endure a half-shade. Moisture-loving, endures short-term excess of moisture. Wind-resistant. Endures cuts, moulding, trimming well. Endures urban conditions well. Frost-resistant, winter-resistant.	Main list of plants; Local plant (border of the range);	Green buffer; Terrace; Academic Likhachev Square;	
2.39	Small-leaved elm Ulmus parvifolia Height: 8–10 m, Width: 6–8 m	Tree with a thick, rounded crown. Leaves are small, dark green. Yellow in autumn. Light-loving. Drought-resistant. Wind-resistant. Endures cuts, moulding, trimming well. Sustainable in urban conditions. Winter resistance is high, can freeze.	Additional list of plants; Introduced species;	Green buffer; Terrace; Academic Likhachev Square;	
3	CONIFEROUS SHRUBS				
3.1	Common juniper 'Repanda' Juniperus communis 'Repanda' Height: 0.2–0.4 m, Width: 2 m	Shrub with a dense crown of overlapped tile-shaped branches with spiny green needles. In winter, needles can become brown. Light loving, endures half-shade. Resistant to urban climate and harmful emissions. Winter resistance is high.	Additional list of plants; Local plant;	Foundation plinth; Underground parking roof; Green buffer; Coulisse;	 © Allegro
3.2	Horizontal juniper 'Andorra Compacta' Juniperus horizontalis 'Andorra Compacta' Height: 0.3–0.5 m, Width: 2 m	Shrub with cushion-shaped, neat crown with rising shoots and grey-green needles, becoming purple in winter. Light-loving. Resistant to urban climate and harmful emissions. Suffers from air dryness. Does not endure stagnation of water. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Green buffer; Coulisse;	 © Equilibrium / Daves Garden

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.3	Savin juniper Juniperus sabina Height: 1–1.5 m, Width: 4–5 m	Flat shrub with extended crown shape and green needles. Light-loving, endures shading. Drought-resistant. Does not endure stagnant humidification. Minimally demanding of soil, grows on poor soils. Does not endure salinisation of soil. Resistant to urban climate, smoke and gases. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Green buffer; Coulisse;	 © GardenExpert
3.4	Savin juniper ‘Mas’ Juniperus sabina ‘Mas’ Height: 1–1.5 m, Width: 3 m	Flat shrub with extended crown shape with glaucescent needles. Light-loving, endures shading Drought-resistant. Does not endure stagnant humidification. Little demanding to soil, grows on poor soils. Does not endure salinisation of soil. Resistant to urban climate, smoke and gases.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Green buffer; Coulisse;	
3.5	Decussate microbiota Microbiota decussata Height: 0.3–0.6 m, Width: 1 m	Flat shrub with extended crown shape with bright-green needles. Shade-enduring. Resistant to pests and diseases. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Coulisse;	
3.6	Mountain pine Mughus Pinus mugo var. ‘Mughus‘ Height: 2–3 m, Width: 2–3 m	Evergreen shrub, with extended crown, needles are dark green. Light-loving, endures light shading. Drought-resistant. Minimally demanding of soil and moisture. It endures some compaction, salinisation and overwetting of soil. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Terrace; Green buffer; Coulisse; Academic Likhachev Square;	 © Milan Havlis

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.7	Mountain pine 'Pumilio' Pinus mugo var. Pumilio Height: 0.8–1.2 m, Width: 0.8–1.0 m	High evergreen shrub, flat round crown, green needles. Light-loving, endures light shading. Drought-resistant. Minimally demanding of soil and moisture. It endures some compaction, salinisation and overwetting of soil. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Terrace; Green buffer; Coulisse; Academic Likhachev Square;	 © Nanas Bloomers
3.8	Amelanchier Lamarckii Amelanchier lamarckii (canadensis) Height: 3–5 m, Width: 2–3 m	Large deciduous shrub with transparent wide umbrella-shaped crown. Leaves are elongated, reddish when opening, then green with a glaucescent bottom of the leaf, and bright orange-red in autumn. Blossoms with white flowers picked in the clustery inflorescences V-VI. Fruits are purplish black, rounded with glaucescent bloom, VIII. The root system is shallow, well developed. It's growing fast. Does not form root shoots. Light-loving, endures half-shade, but blossoms more abundantly in the light. It endures overwetting of the soil, as well as temporary drought. Wind-resistant. It feels good in the conditions of the city.	Additional list of plants; Introduced species;	Foundation plinth; Underground parking roof; Terrace; Green buffer; Coulisse; Embankment; Academic Likhachev Square;	 © Rasbak / CC BY-SA 3.0 / Wikimedia
3.9	Purplefruit chokeberry, black chokeberry Aronia Prunifolia, Aronia melanocarpa ´Viking´ Height: 2–2.5 m, Width: 1–2 m	Shrub with dense crown, dark green, shiny leaves with bright autumn colour, shield-shaped white inflorescences and black fruits. Light-loving. Shade-enduring. Drought-resistant, endures short-term increase of groundwaters. Salt-resistant. Wind-resistant. smoke-, dust-, gas-resistant. Endures urban conditions well. Winter resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Underground parking roof; Terrace; Green buffer; Coulisse; Embankment;	 © BotBln / CC BY-SA 3.0 / Wikimedia
3.10	White dogwood Cornus alba Height: 2.5 m, Width: 2 m	Shrub with wide crown with cherry shoots. Flowers are whitish in shield-shaped inflorescences VI-VII. Fruits are white, pale blue berries. Sun-loving, endures shading. Relatively drought-resistant, endures heat, temporary overwetting. Endures urban conditions well. Winter resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Underground parking roof; Terrace; Green buffer; Coulisse; Embankment; Academic Likhachev Square;	 © Daum

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.11	White dogwood ‘Elegantissima’ Cornus alba ‘Elegantissima’ Height: 2.5 m, Width: 2 m	Shrub with wide crown with cherry shoots and glaucescent white-edged leaves, coloured in pink or burgundy tones of different intensity in autumn. Flowers are whitish in shield-shaped inflorescences VI-VII. Fruits are white, pale blue berries. Sun-loving, endures shading. Relatively drought-resistant, endures heat, soil alkalisation, temporary overwetting. Endures urban conditions well. Winter resistance is high.	Additional list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Coulisse; Embankment; Academic Likhachev Square;	 © Allegro
3.12	White dogwood Sibirica Cornus alba ‘Sibirica‘ Height: 2.5 m, Width: 2 m	Shrub with wide crown with coral red or burgundy shoots and purple red autumn colour of leaves. In autumn it is distinguished by purple or reddish colour of leaves. Sun-loving, endures shading. Relatively drought-resistant, endures heat, temporary overwetting. Endures urban conditions well. Winter resistance is high.	Main list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Coulisse; Embankment; Academic Likhachev Square;	 © Winter Hill Tree Farm
3.13	White dogwood ‘Kesselringii’ Cornus alba ‘Kesselringii’ Height: 2.5 m, Width: 2 m	Shrub with wide crown. Shoots are brown-burgundy. Leaves are reddish green. Flowers are white in shield-shaped inflorescences (VI-VIII). Relatively drought-resistant, endures heat, temporary overwetting. Endures urban conditions well. Winter resistance is high.	Additional list of plants; Local species;	Foundation plinth; Terrace; Green buffer; Coulisse; Embankment; Academic Likhachev Square;	 © Jacksons Nurseries
3.14	Lustrous cotoneaster Cotoneaster lucidus Height: 1.5–2 m, Width: 0.8–1.2 m	Shrub with wide crown. Leaves are shiny green. Shade-enduring, but grows better in sunny places. Relatively drought-resistant, endures heat. Endures urban conditions well. Winter resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Academic Likhachev Square; Adjacent streets;	

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.15	Bosc's thorn Crataegus flabellata Height: 1.5–2.5 m, Width: 1.2–2.0 m	Relatively drought-resistant, endures heat, soil alkalisation, temporary overwetting.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Academic Likhachev Square; Adjacent streets;	
3.16	Medium (intermediate) forsythia, varieties Forsythia x intermedia, sorts Height: 1.5–2.5 m, Width: 2–3 m	Deciduous shrub with spreading loose crown Leaves are dark green. Flowers are bright yellow, IV-V. Light-loving, endures half-shade. Not resistant to cold winds. Drought-resistant, smoke-, gas-resistant. Endures urban conditions well. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Academic Likhachev Square; Adjacent streets;	
3.17	Panicle hydrangea Grandiflora, Kyushu, Unique and other varieties Hydrangea paniculata ´Mustila´, 'Grandiflora', (Kyushu, Unique, Pink Diamond, Pinky Winky) Height: 2 m, Width: 1.5–2 m	Shrub with thick rounded crown with large, dense wide-conical inflorescences consisting of big white flowers, pinking when blossom fading, VII-X. Leaves are dark green. Light-loving, endures half-shade. Does not endure stagnation of moisture or dryness of the soil. Resistant to air pollution. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Embankment; Underground parking roof;	
3.18	Dwarf ninebark, species and varieties 'Aurea', 'Luteus' Physocarpus opulifolius 'Luteus' Height: 1.5–2 m, Width: 3 m	Tall shrub with wide crown. Leaves are corrugated, green or yellowish-green. Inflorescences are shield-shaped, pinky-white, VI. Drought-resistant, smoke-, dust-, gas-resistant. Endures urban environment well. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Academic Likhachev Square; Adjacent streets;	 © Allegro

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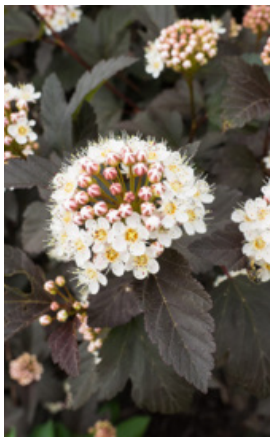
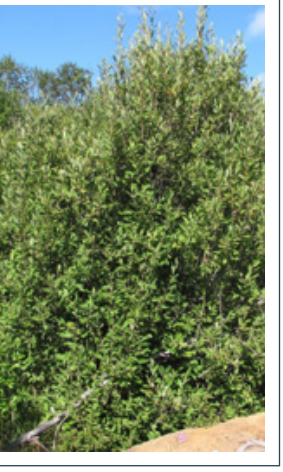
3.19	Dwarf ninebark “Diablo D’Or”, “Red Baron” Physocarpus opulifolius ‘Diable D’Or’, ‘Red Baron’ Height 2–2.5, Width 2	Tall shrub with compact crown. Leaves are corrugated, copper-red. Inflorescences are shield-shaped, pinky-white, VI. Drought-resistant, smoke-, dust-, gas-resistant. Endures urban environment well. Winter-resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Academic Likhachev Square; Adjacent streets;	
3.20	Common snowberry Symphoricarpos albus Height 0.7–1.5, Width 0.7–1	Shrub with dense, thick, rounded spreading crown, thin, scattered, drooping branches. Leaves are grey-green, slightly shiny. Flowers are white, VI-VIII. Fruits are white VIII-XII. Moisture-loving, drought-resistant. Sun-loving. Shade-enduring. smoke-, dust-, gas-resistant. Endures urban environment well. Winter-resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Academic Likhachev Square; Adjacent streets;	
3.21	Bush cinquefoil “GoldStar”, “Friedheim” Potentilla fruticosa ‘Goldstar’, ‘Friedheim’ Height 0.8, Width 1	Small shrub with thick rounded crown. Leaves are small, gray-green. Flowers are yellow, blooming VI-X Light-loving, shade-enduring Drought-resistant. Endures cutting and trimming well. Resistant to urban conditions. Wind-resistant. Winter-resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Embankment; Underground parking roof;	 © MPF / CC BY-SA 3.0 / Wikimedia
3.22	Rugose rose, varieties Rosa rugosa, sorts Height 0.5–1.2, Width 1–1. 5	Beautifully flowering, unpretentious shrub with round, compact crown and straight branches, densely covered with needle thorns. Leaves are large, complex, consist of 5-9 rugose dark green leaves, yellow in autumn. Blooms in large, bright pink fragrant flowers, VI-IX. Fruits are orange, red, VII-X. Light-loving, shade-enduring. Drought-resistant. Does not endure stagnation of water. Endures urban conditions, resistant to traffic pollution. Winter-resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Academic Likhachev Square; Adjacent streets;	 © Sielos Medis

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.23	Rugose rose or dogrose Rosa rugosa 'Alba', 'Rubra' Height: 1–1.2 m, Width: до 1 m	Spreading dense crown, leaves are dark green, flowers are large, fragrant, pink or white, VI-VIII, fruits are large, bright orange and red. Light-loving, endures half-shade. Drought-resistant Does not endure stagnation of water, overwetting, close occurrence of groundwaters, alkaline soils. Puts up with slight salinity. High gas-resistance, endures urban conditions well. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof; Academic Likhachev Square; Adjacent streets;	 © Samosters
3.24	Purple willow Salix purpurea Height: 1.5–3 m, Width: 2–3 m	Shrub with round oval crown. Shoots are red. Leaves are grey-green. Flowers: aglets, of purple colour. Light-loving, endures light shading. Moisture-loving. Endures temporary flooding. Drought-resistant. Endures slight salinisation. Sustainable in urban conditions. Winter-resistant. Frost-resistant.	Main list of plants; Local plant;	Foundation plinth; Underground parking roof; Terrace; Green buffer; Embankment; Coulisse;	 © Sten / CC BY-SA 3.0 / Wikimedia
3.25	Bog willow (daphne willow) Salix acutifolia Height: 2–4 m, Width: 2–4 m	Large shrub with wide spreading crown. Branches are thin, long, red. Leaves are lanceolate, green, yellow in autumn. Flowers: white; later, yellow aglets, II-III. Light-loving, endures light shading. Moisture-loving. Endures temporary flooding. Endures slight salinity. Resistant in urban conditions. Winter-resistant. Frost-resistant.	Main list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse;	 © Margarita Kochneva / Pixabay
3.26	Ash willow Salix cinerea Height: 2–6 m, Width: 2–4 m	Shrub with wide rounded crown. Shoots are green. Leaves are grey-green, yellow in autumn. Flowers: green aglets, III-IV. Light-loving, endures light shading. Moisture-loving. Endures temporary flooding. Sustainable in urban conditions. Winter-resistant. Frost-resistant.	Main list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse;	

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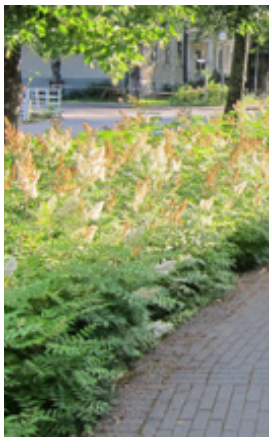
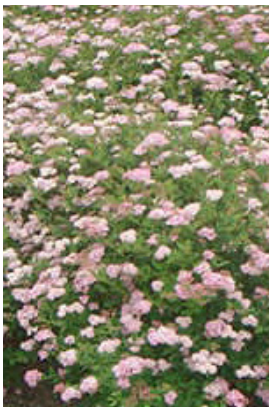
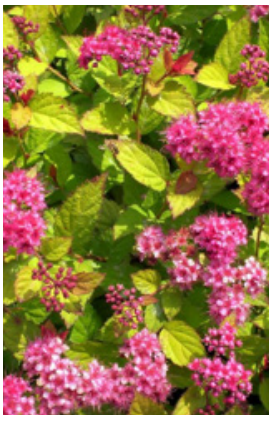
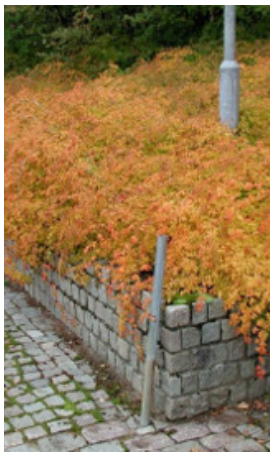
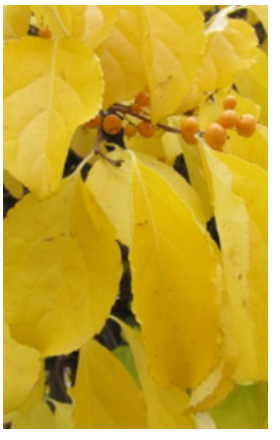
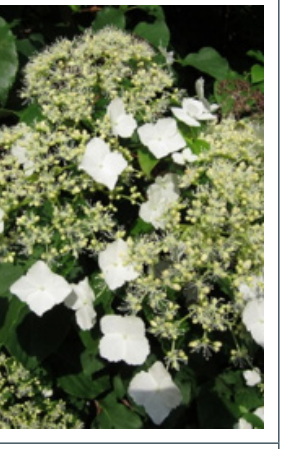
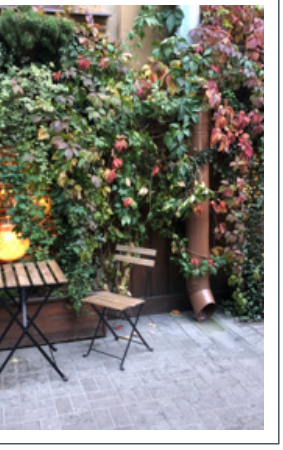
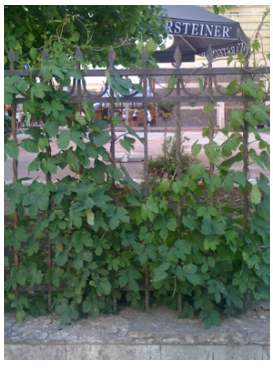
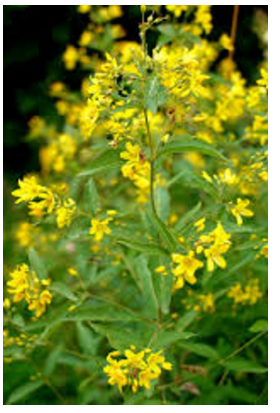
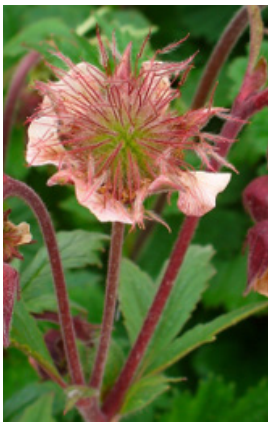
3.27	Tea-leaved willow (S. phylicifolia) Height: 0.5–1.5 m, Width: 2–4 m	Shrub with wide rounded crown. Shoots are brown. Leaves are dark green, yellow in autumn. Flowers: yellow aglets, III-IV. Light-loving, endures light shading. Moisture-loving. Endures temporary flooding. Sustainable in urban conditions Winter-resistant. Frost-resistant.	Main list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse;	 © Maja Dumat / CC BY / Wikimedia
3.28	Schizonotus Sorbaria sorbifolia Height: 1–1.2 m, Width: 1–1.5 m	Shrub, with leaves similar to mountain ash leaves. Flowers are small, white, picked in pyramidal inflorescences, VI-VIII. Light-loving, endures shading. Moisture-loving, endures temporary flooding. Endures urban conditions well. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof; Adjacent streets;	
3.29	Schizonotus ‘Sem’ Sorbaria sorbifolia ‘Sem’ Height: 1–1.2 m, Width: 1–1.5 m	Shrub with compact crown, greenish-yellow leaves. In autumn, they acquire bright shades from orange to burgundy red tones. Flowers are small, white, picked in pyramidal inflorescences, VI-VIII. Light-loving, endures shading, in shaded places leaves are green. Moisture-loving, endures temporary flooding. Endures urban conditions well. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof; Adjacent streets;	 © Golden Hill Nurseries
3.30	Birch-leaved spiraea Spiraea betulifolia Height: 0.8–1.2 m, Width: 1–1.5 m	Shrub with wide crown with leaves similar to those of birch, yellow autumn colour and blooming in white shield-shaped inflorescences, VI. Light-loving, endures half-shade. Drought-resistant. Wind-, smoke-, dust-, gas-resistant. Endures urban environment well. Winter resistance is high.	Main list of plants; Local species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof; Adjacent streets; Academic Likhachev Square;	

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.31	Birch-leaved spiraea 'Tor' Spiraea betulifolia 'Tor' Height: 1 m, Width: до 1–1.5 m	Shrub with wide, dense crown with leaves similar to those of birch, orange-red autumn colour and blooming in white shield-shaped inflorescences, VI-VIII. Light-loving, endures half-shade. Drought-resistant. Wind-, smoke-, dust-, gas-resistant. Endures urban environment well. Winter resistance is high.	Main list of plants; Local species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof; Adjacent streets; Academic Likhachev Square;	
3.32	Grey spiraea 'Grefsheim' Spiraea cinerea 'Grefsheim' Height: 1–1.2 m, Width: 1–1.5 m	Shrub with spreading transparent crown. Leaves are grey-green. Flowers are white, V-VI. Sun-loving, shade-enduring. Moisture-loving, drought-resistant. Wind-resistant. Smoke-, dust-, gas-resistant. Sustainable in urban conditions. Frost-resistant, winter-resistant.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof; Adjacent streets; Academic Likhachev Square;	
3.33	Japanese spiraea 'Little Princess' Spiraea japonica 'Little Princess' Height: 0.6 m, Width: до 1 m	Shrub with dense compact rounded crown. Flowers are soft pink, picked in small shield-shaped inflorescences, VI-VII. Leaves are small, dark green. Coloured in yellow-ochre shades in autumn. Dwarf variety. Grows slowly. Light-loving, endures shading. Moderately heat-resistant and drought-resistant. Endures urban environment well. Winter resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof; Adjacent streets; Academic Likhachev Square;	 © ToGoGarden, Inc.
3.34	Japanese spiraea 'Goldflame' Spirae ajaponica 'Goldflame' Height: 0.6–0.8 m, Width: до 1 m	Small shrub with yellowish leaves and pink inflorescences, VI-VIII. It is distinguished by multiple changes in the colour of leaves during the season: from orange-red in spring through yellow of different shades in summer to copper-orange in autumn. Light-loving, endures shading. Drought-resistant. Smoke-, dust-, gas-resistant. Endures urban environment well. Winter resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof; Adjacent streets; Academic Likhachev Square;	 © Horsford Gardens & Nursery

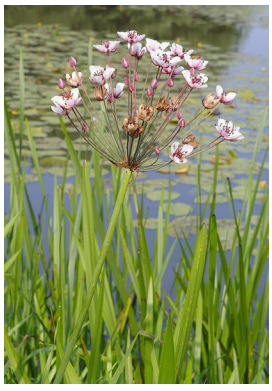
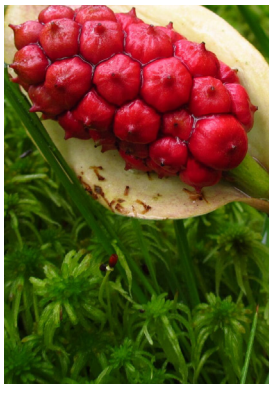
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
3.35	Japanese spiraea 'Antony Waterer' Spiraea japonica 'Antony Waterer' Height: 0.8 m, Width: до 1 m	Decorative semicircular spreading crown. Leaves are dark green in spring with reddish shade; in autumn, orange-red or purple. Flowers are bright pink, bright raspberry, picked in large shield-shaped inflorescences, VI-IX. Light-loving, endures shading. Moderately heat-resistant and drought-resistant. Endures urban environment well. Winter resistance is high.	Main list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof; Adjacent streets; Academic Likhachev Square;	 © James St. John / CC BY 2.0 / Flickr
3.36	Cut-leaf stephanandra 'Crispa' Stephanandra incisa 'Crispa' Height: 0.6–0.8 m, Width: 1.2–1.5 m	Shrub with extended crown, arched shoots and small deep-cut light-green leaves. In autumn leaves are lemon or yellow-orange. Flowers with light pleasant aroma, VI. Light-loving, endures light shade. Resistance to atmospheric pollutants is medium. Winter resistance is good.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof; Adjacent streets; Academic Likhachev Square;	
3.37	Alpine currant 'Schmidt' Ribes alpinum 'Schmidt' Height: 1–1.5 m, Width: 1–1.5 m	Shrub that first has a compact, then later wide crown, arched shoots and shiny juicy green leaves. In autumn leaves are yellow or yellow-orange. Flowers are small greenish in the racemes, V-VI. Light-loving, endures shade and half-shade. Moisture-loving, drought-resistant in the shade. Endures soil salinisation. Dust-, smoke-, gas-resistant. Endures urban environment well. Winter-resistant, frost-resistant.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof;	
3.38	Cranberry tree Viburnum opulus Height: 2–2.5 m, Width: 2–2.5 m	Crown is wide-round compact, almost spherical. Leaves are dark green, coloured in purplish red tones in autumn. Flowers are white, picked in an umbrella-shaped inflorescences, V-VI. Fruits are red, shiny. Light-loving, shade-enduring. Moisture-loving, can endure temporary overwetting. Sustainable in urban conditions. Frost-resistant, winter-resistant.	Main list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse;	 © Lestat (Jan Mehlich) / CC BY 3.0 / Flickr

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
4	COVER-GROUND SHRUBS				
4.1	Skunk currant Ribes glandulosum Height: 0.2–0.3 m, Width: 0.5–1.5 m	Creeping cover-ground shrub. Leaves are light green, orange, red in autumn. Flowers are unnoticeable, picked in racemes, V-VI. Red berries, IX-X. Shoots are taking root. Light-loving, shade-enduring Drought-resistant. Endures urban conditions, resistant to traffic pollution. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof;	
5	WOODY LIANAS				
5.1	Oriental bittersweet ‘Hercules’ Celastrus orbiculatus ‘Hercules’ Height: 8 m	Woody liana, male clone, thick crown, leaves are dense, rounded, with the length of up to 10 cm, shiny from the top, glaucescent from the bottom. In summer — green, in autumn — bright yellow or orange. Light-loving and shade-enduring. Moisture-loving, drought-resistant. Sustainable in urban conditions. Wind-resistant. Frost-resistant. Winter-resistant.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof;	
5.2	Hydrangea anomala subsp. Petiolaris Height: 2–6 m	Lianoid shrub woody liana, can creep on the ground. Leaves are dark green, glossy, coriaceous, of wide ovate shape. White flowers are picked in shield-shaped, loose inflorescences, VI-VII. Light-loving, endures shading. Moisture-loving. Sustainable in urban conditions. Frost-resistant, medium winter-resistant.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof;	
5.3	Parthenocissus quinquefolia Height: 0.2–0.3 m	Creeping, woody, deciduous liana Leaves are dark green, in autumn leaves get bright red or purple, glossy colour. Flowers are white, VII. Fruit: bluish-black berry with grey bloom. Shoots are taking root easily. Shade-enduring. Drought-resistant. Sustainable in urban environment. Winter resistance is high.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Coulisse; Underground parking roof;	

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
5.4	Common hop Humulus lupidus Height: 3–5 m	Herbaceous perennial. Leaves are dark green, large. Flowers are greenish, paniculate inflorescences or cones, VI-VIII. Shoots are taking root easily. Shade-enduring. Drought-resistant. Sustainable in urban environment. Winter resistance is high.	Additional list of plants; Local plant;	Foundation plinth; Coulisse; Green buffer; Embankment;	
6	HERBACEOUS PLANTS				
6.1	Tussock-grass (lime grass) Deschampsia cespitosa Height: 0.8–1.5 m	Perennial cereal. Leaves are dark green with a bronze shade. Flower: panicle. Change colour from greenish (when opened) to straw-golden, VII-IX. Sun-loving, shade-enduring. Drought-resistant. Relatively sustainable in urban conditions. Frost-resistant, winter-resistant.	Additional list of plants; Local plant;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof;	 © Christian Fischer / CC BY-SA / Wikimedia
6.2	Blue moor grass, varieties Molinia caerulea Height: 0.8–1.5 m	Perennial cereal. Leaves are dark green with yellow or bronze shade. Flower: panicle, change colour from greenish (when opened) to straw-golden, VII-IX. Sun-loving, shade-enduring. Drought-resistant. Sustainable in urban conditions. Frost-resistant, winter-resistant.	Additional list of plants; Introduced species;	Foundation plinth; Terrace; Green buffer; Embankment; Underground parking roof;	
6.3	Sweet-hay Filipendula ulmaria Height: 1.5–2 m	Perennial herbaceous plant. Leaves are interruptedly pinnate, with a strong smell when rubbing. Flowers are fragrant, small, yellowish-white, picked in a thick paniculate inflorescence, V-VI. Light-loving, shade-enduring Endures long flooding. Endures bogginess badly. Endures slight salinisation. Endures urban conditions well.	Additional list of plants; Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Au Jardin

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
6.4	Common loosestrife Lysimachia vulgaris Height: 0.5–1.0 m	Perennial plant with straight stem and elongated leaves. The flowers of the plant are bright yellow, VI-VII. Prefers places with high humidity level. Shade-enduring. Not drought-resistant. Endures urban conditions, flooding, proximity of groundwater. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Udo Schmidt / CC BY-SA 2.0 / Wikimedia
6.5	Water avens Geum rivale Height: 0.3–0.8 m	Compact perennial, modest in height; leaves are green, flowers: drooping bellflowers: pink, burgundy, V-X. Prefers places with high humidity level. Shade-enduring. Not drought-resistant. Endures urban conditions, flooding, proximity of groundwater. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © H. Zell / CC BY-SA / Wikimedia
6.6	Great Bellflower Campanula latifolia Height: 0.8–1.2 m	Perennial, with a straight stem, root leaf rosette is loose, thick, leaves are ovate, green, inflorescences are racemous, of white, blue or purple colour, VI-VII. Sun-loving, shade-enduring. Adapted to lack of moisture, resistant to diseases and pests. Not resistant to trampling. Endures urban conditions, flooding, proximity of groundwater. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Liné1 / CC BY-SA / Wikimedia
6.7	Female fern Athyrium filix-femina Height: 0.8–1.2 m	Perennial with large elliptical triply-dissected leaves. Shade-enduring. Moisture-loving. Not resistant to trampling. Relatively sustainable in urban conditions. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking;	 © MPF / CC BY-SA 3.0 / Wikimedia

№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
6.8	Buckler fern Dryoptiris carthusiana Height: 0.8–1.5 m	Perennial with large elliptical triply-dissected leaves. Shade-enduring. Moisture-loving. Not resistant to trampling. Relatively sustainable in urban conditions. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking;	 © Joseba Garmendia / CC BY-SA 3.0 / Wikimedia
7	5.AQUATIC PLANTS				
7.1	Carex acuta Carex acuta or Carex acutifolia Carex acutifolia Height: 0.7–1.1 m	Herbaceous wetland and coastal perennial, leaves are green-blue, spikelets are yellow-green, V-VI. In autumn becomes of yellow colour, dynamic. Light-loving, shade-enduring. Moisture-loving, not drought-resistant. Endures flooding, stagnant humidification. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking;	
7.2	Bladder sedge Carex vesicaria Height: 0.5–0.8 m	Herbaceous wetland and coastal perennial, leaves are green-blue, spikelets are rusty brown, V-VI. Light-loving, shade-enduring. Moisture-loving, not drought-resistant. Endures flooding, stagnant humidification. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Studio di Psicologia Mantova dr Carla Foletto
7.3	Killweed Lythrum salicaria Height: 0.8–1.4 m	Herbaceous perennial with a straight stem. Elongated leaves, lilac candle-shaped (spiciferous) inflorescences, VII-IX. Light-loving, shade-enduring. Moisture-loving, not drought-resistant. Endures flooding, stagnant humidification. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Manfred Heyde / CC BY-SA 3.0 / Wikimedia

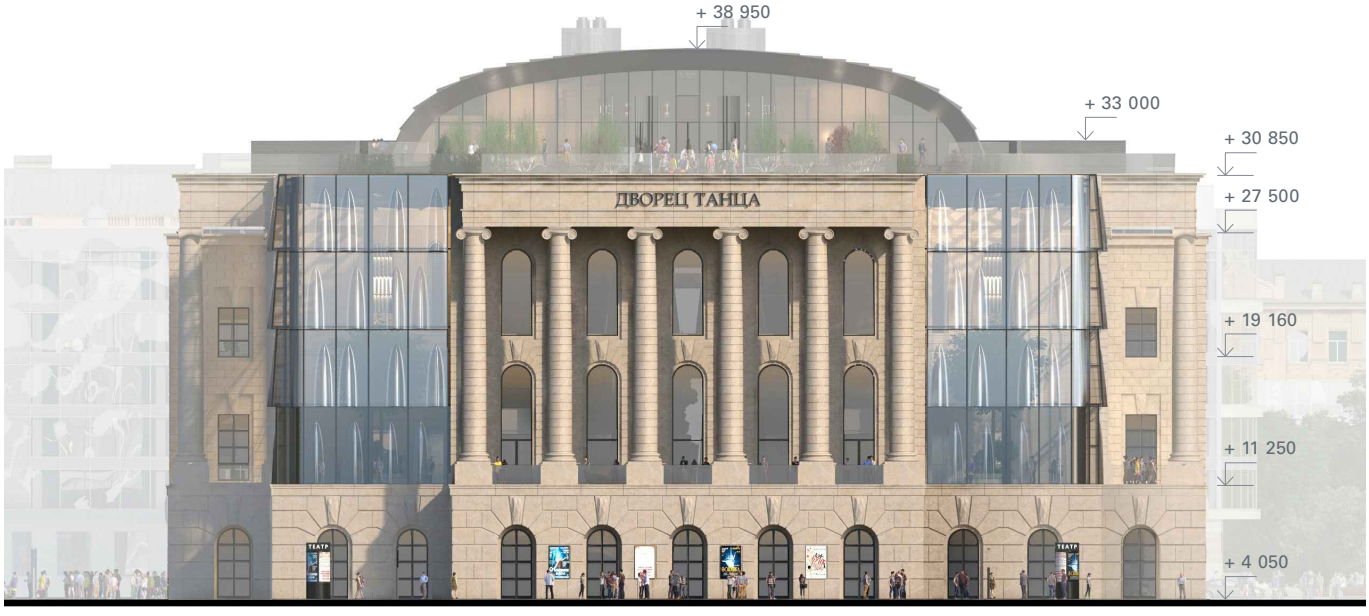
№	NAME AND DIMENSIONS	CHARACTERISTICS	RANGE	RECOMMENDED ZONE	PROFILE
7.4	Flowering rush Butomus umbellatus Height: 0.4–1.5 m	Perennial coastal aquatic plant with long and thick horizontal rhizome, three-sided linear leaves. Flower-bearing stems without leaves, inflorescence: umbel of pink flowers. Decorative when blooming, VI-VIII. Light-loving, shade-enduring Moisture-loving, not drought-resistant. Endures flooding, stagnant humidification. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Christian Fischer / CC BY-SA 3.0 / Wikimedia
7.5	Water lily Calla palūstris Height: 0.1–0.25 m	Wetland, coastal creeping perennial, leaves are oval, heart-shaped, bright or dark green. Inflorescences: spadices with white large decorative floral bract, V-VI. Fruit: bright red spadix. Light-loving, shade-enduring. Moisture-loving, not drought-resistant. Endures flooding, stagnant humidification. Frost-resistant, winter-resistant.	Local plant;	Foundation plinth; Embankment; Underground parking roof;	 © Marko Vainu / CC BY-SA 3.0 / Wikimedia

Perennials are not included in the recommended assortment of plants; they are to be selected for specific design decisions taking into account:

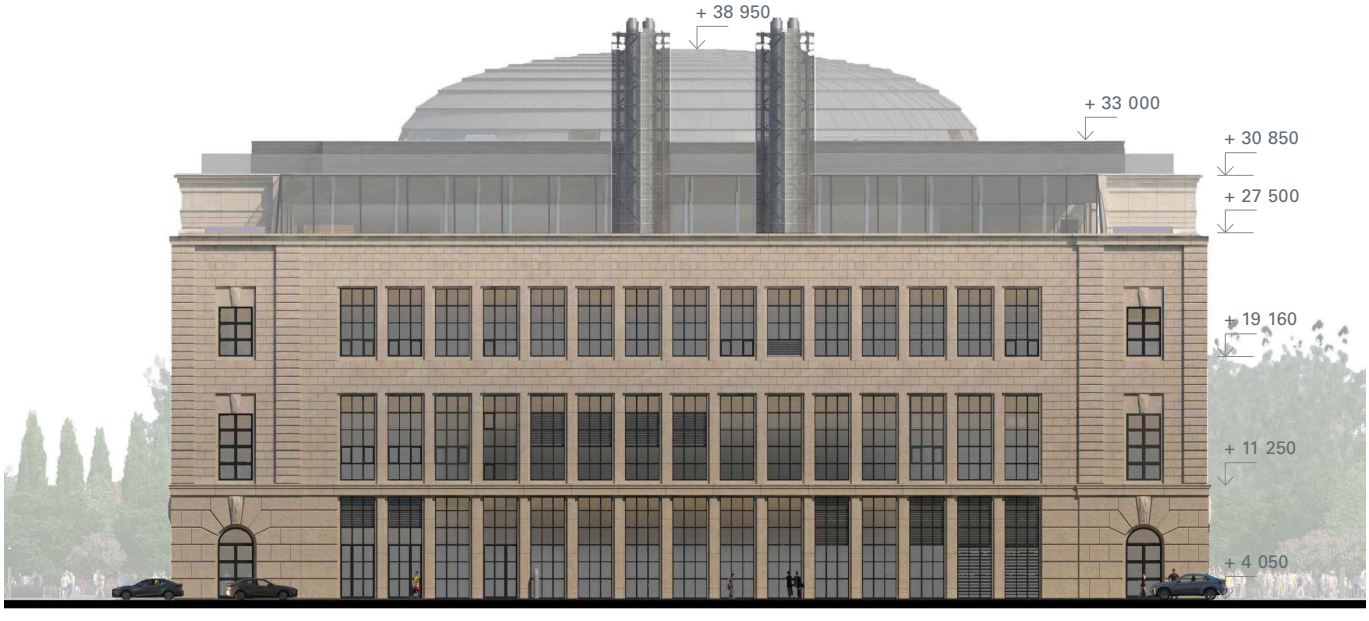
- The degree of participation in ecosystem processes;
- Their requirements regarding light, moisture and composition of the soil, and air pollution;
- Their requirement regarding winter and frost resistance for the climatic zone of USDA 4 (5A).

Boris Eifman Dance Palace
Façades

Main façade

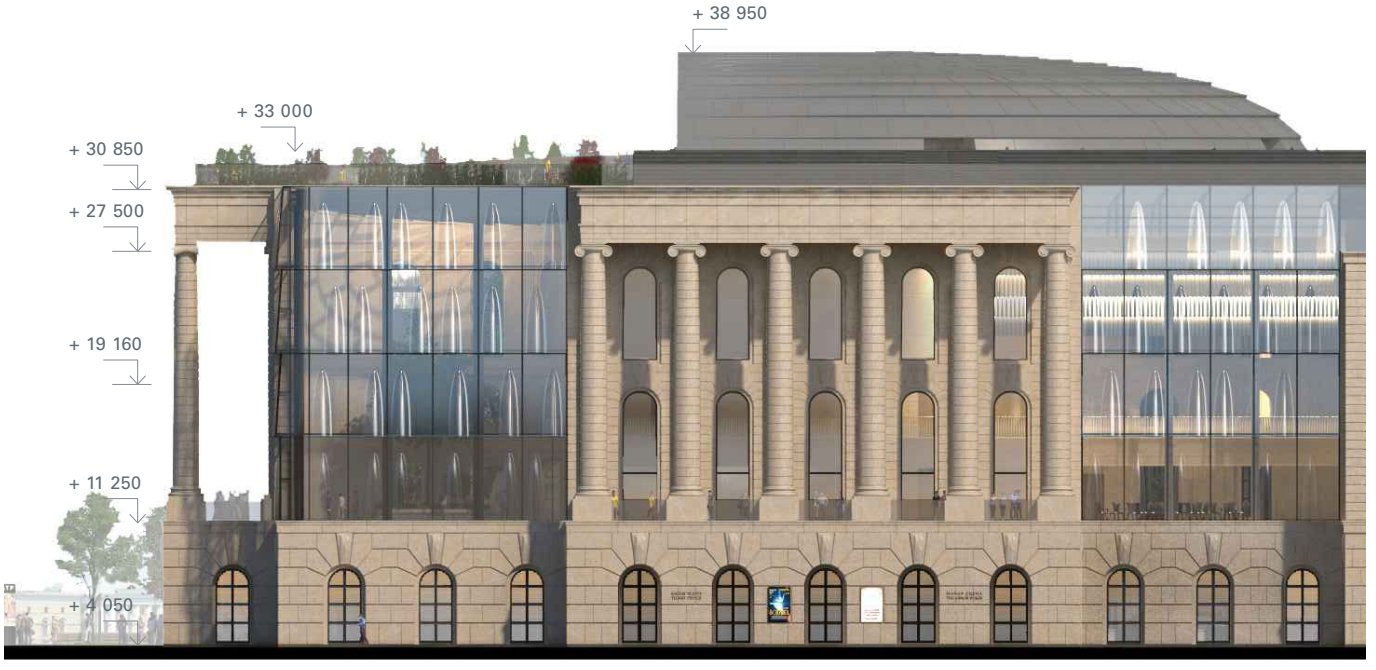


Speranskogo Street façade



Boris Eifman Dance Palace
Façades

Dobrolyubova Avenue façade



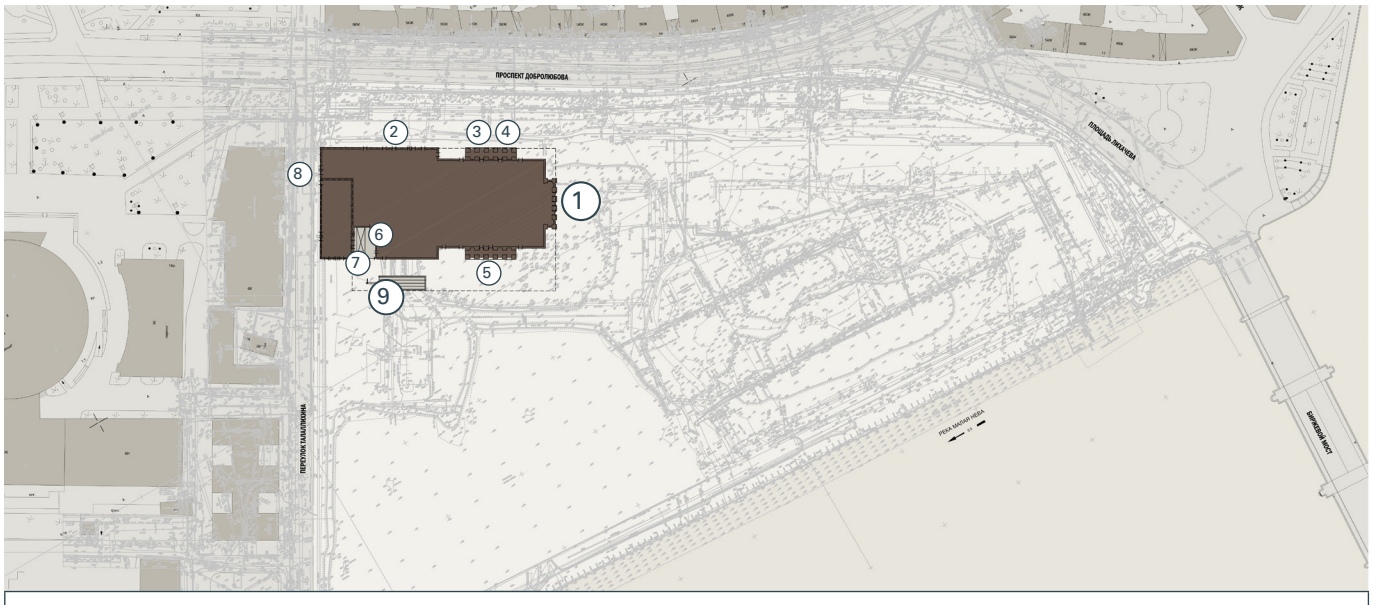
Riverside façade


+ 33 000
+ 30 850
+ 27 500
+ 19 160
+ 11 250
+ 4 050


+ 38 950
+ 33 000
+ 30 850
+ 27 500
+ 19 160
+ 11 250
+ 4 050

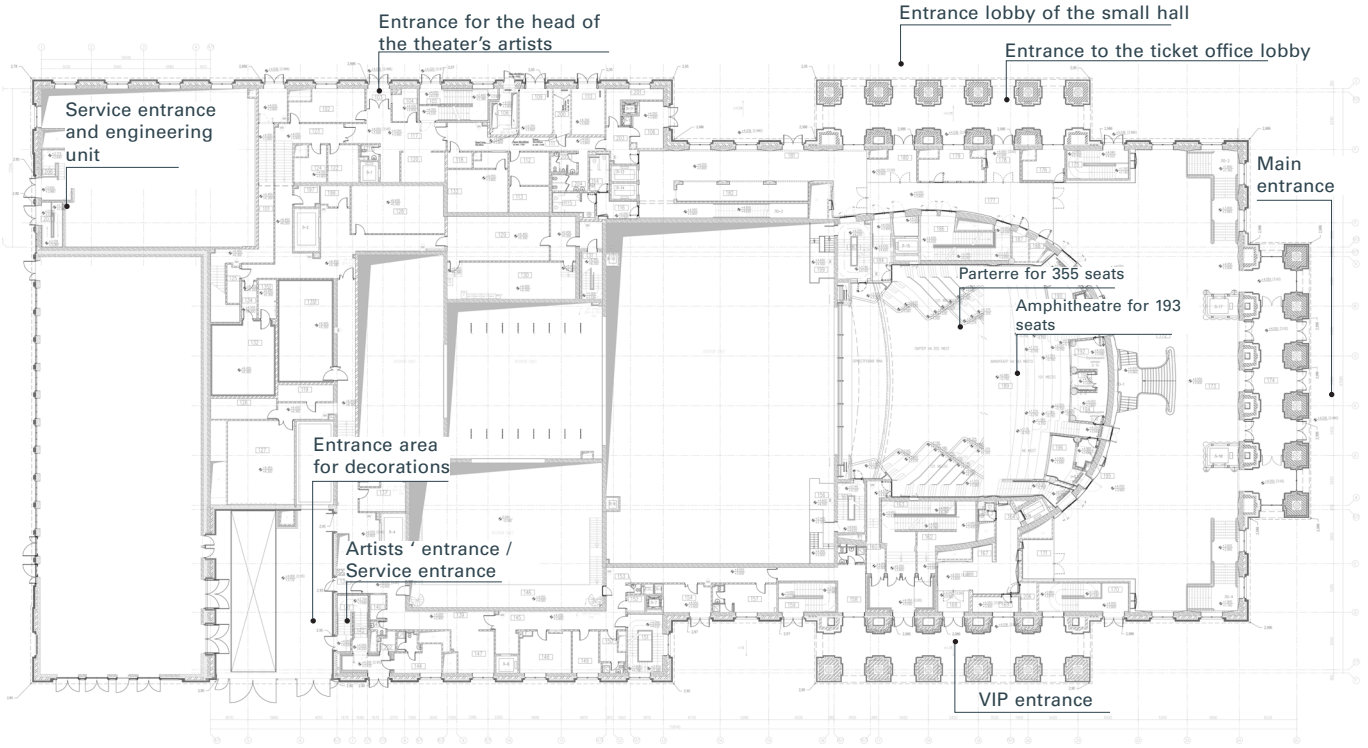
Boris Eifman Dance Palace
Plans

General plan of the building

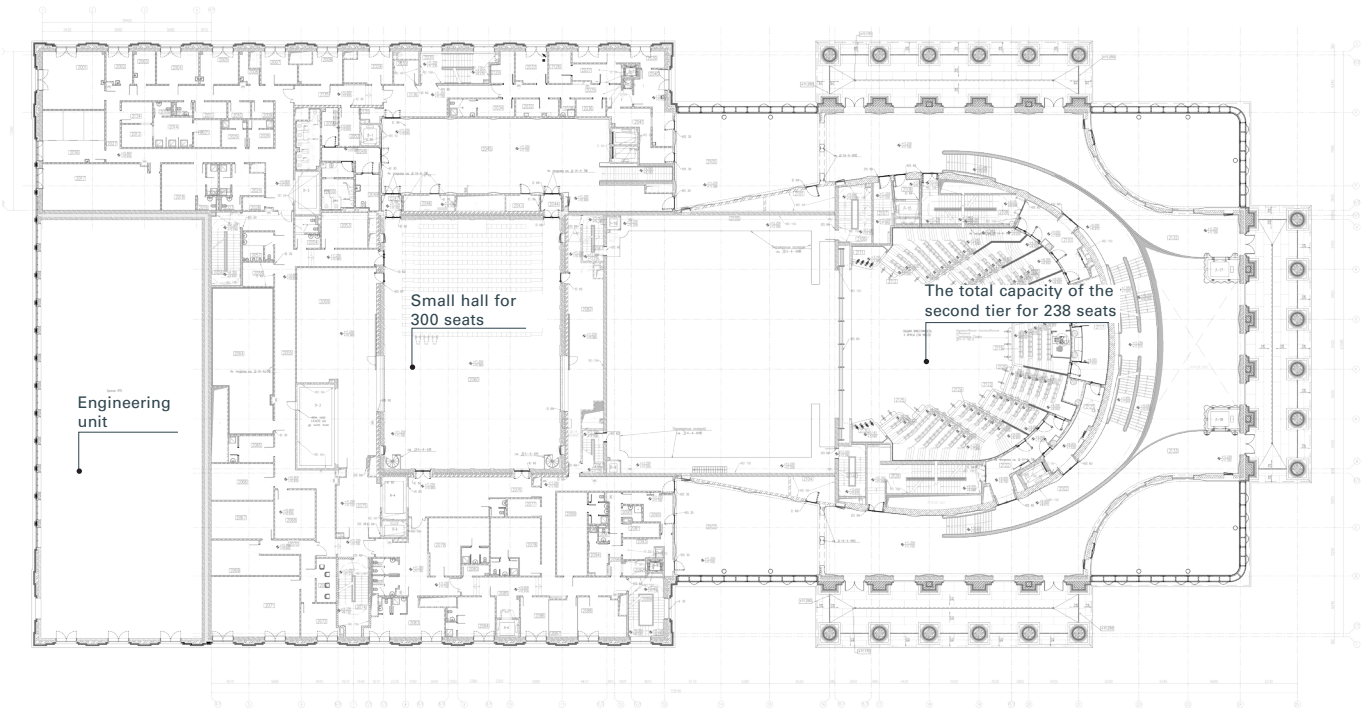


1. Main entrance
2. Entrance for the head of the theater's artists
3. Entrance lobby of the small hall
4. Entrance to the ticket office lobby
5. VIP entrance
6. Artists' entrance / Service entrance
7. Entrance area for decorations
8. Service entrance and engineering unit
9. Entrance/exit to the underground Parking

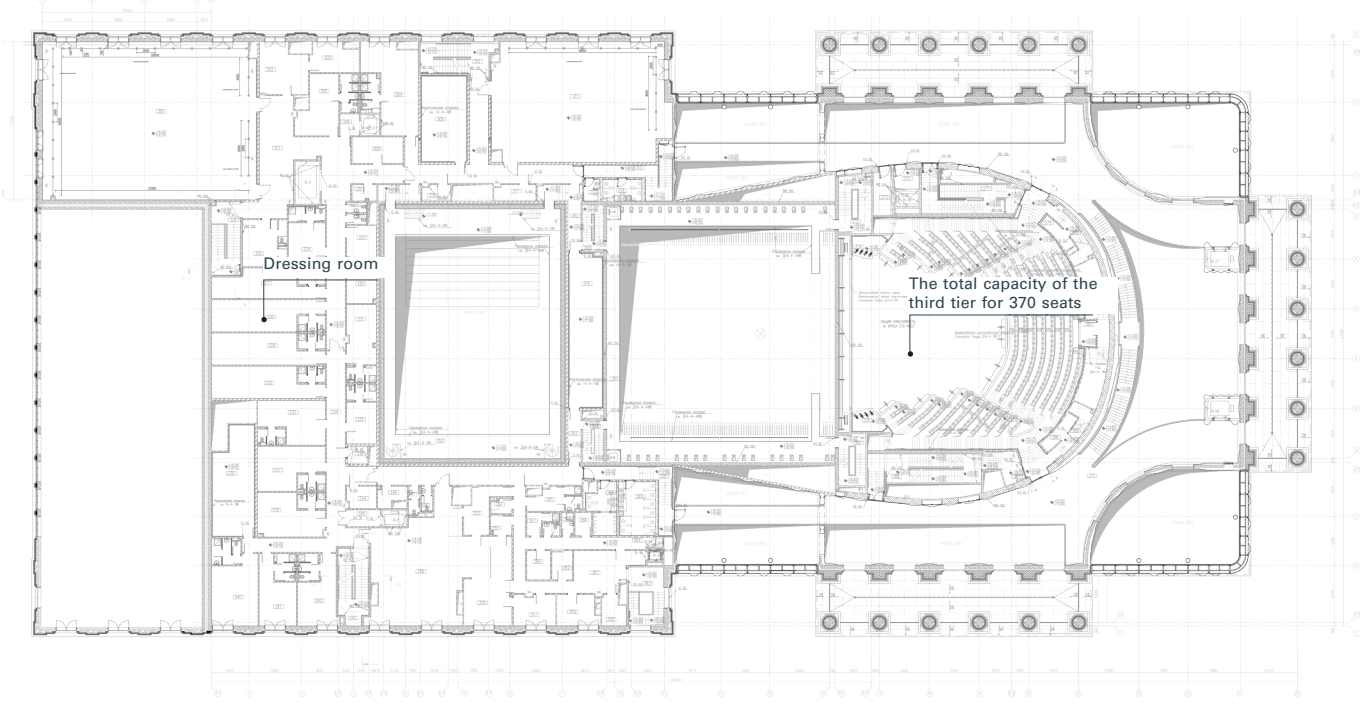
1st floor plan



2nd floor plan



3rd floor plan



— 13 —

Commentary from members of the jury

Commentary from members of the jury

Vladimir Anatolyevich Grigoryev

… After all, I think we are dealing with a specific task within the framework of a specific assignment. We have a territory, we have the specifications, and we do not have the task, beginning with this park, to propose how to transform all of Saint Petersburg. I, for that matter, would suggest that an even bigger problem altogether for this space is the Yubileiny complex. Then it would need to be redesigned, leaving, perhaps, the circular part, while its later-constructed buildings, the training halls, they should definitely be rebuilt. Because if we are talking about the development of the Tuchkov Buyan building, currently being transferred from being a federal property to a city property, and as you know this historic building is right on the bank of the Neva River and gave the area its name, then all of this needs to be considered as a general concept for the entire area and not limited to just the park. I think it has to be either like this or we should stick to the brief and the territory that has already been agreed to. The latter approach seems to me to be the absolutely correct one in the existing situation.

Sergey Enerovich Tchoban

Honestly, I don't have anything to add to the brief. I received it a week-and-a-half ago. Back then I already said what should be added to it. These were minor things, they were added, so I am fully satisfied. The only thing which is still very important in my opinion is the fact that the park is now adjacent to the Boris Eifman Dance Palace, and I think that it would be necessary to invite Mr. Eifman in May, since it is also of interest to him to know what is going to happen at the park site. The Dance Palace is very close to the park, and all open spaces such as an amphitheatre that he would like to have in front of his Dance Palace, a cafe or what have you will be in the park, and the theatre visitors will go to these places, therefore we have to address these issues jointly with the theatre's director.

… I just want to clarify my position. Indeed I learned from the newspapers, probably like all of us did, perhaps with the exception of Vladimir Anatolyevich [Grigoryev]

– well possibly he did as well - about the fact that the Judicial Quarter was only partially cancelled. When I saw this picture, where the Dance Palace is there but not the Judicial Quarter, this seemed to me, probably like it would to any professional or even to a layman, quite strange at first. I think that Yuri Isayevich [Zemtsov] indeed is absolutely right, and if we were to start this undertaking all over again and have enough time for it, then of course by taking the entire territory between Speranskogo Street, Dobrolyubova Avenue, Likhachev Square, Birzhvoy Bridge and the embankment, and designing it all over again, it would be a more comprehensive urban-planning solution, and a more correct one in this regard.

The decision to build the Dance Palace came about, among other things, because Boris Yakovlevich Eifman, an outstanding choreographer recognized in Russia and throughout the world, had been promised this theatre since 2002. That is, in the elapsed eighteen years the theatre has not only not been built for him, but as you can see, its construction has not even reached ground elevation. This theatre is not being built simply as a ballet theatre, but as the Boris Yakovlevich Eifman Dance Palace. That is, Boris Yakovlevich Eifman must come up with this theatre's program and must give impetus to this theatre, enabling it to carry on through time. Moreover, we can recall that there have been many projects for the theatre over the years, and the current project is the only one that Boris Yakovlevich has endorsed in full.

For all that, it is the theatre's fourth or fifth project. The decision was made with this in mind and a presidential decree was adopted to build this theatre right on that spot, and according to the design that had been made, regardless of the quite serious urban planning comprise that arose due to such a decision. I also thought that maybe without much pain, albeit professionals would recognize some pain is still a big pain, we can re-anchor the Dance Palace, i.e. rotate it 90 degrees, thereby opening up views onto Prince Vladimir Cathedral to a greater extent, which presently, with the Dance Palace's position parallel to Dobrolyubova Avenue, are being obstructed in a greater degree simply because the complex was different. It used to be obstructed by the courts, and now it is obstructed by the Dance Palace only. But as Vladimir Anatolyevich Grigoriev rightly noted, with whom I had this discussion as well, new rules for land use and development will go into effect only in 2021, if at all. Therefore in any case, even with this 'without much pain' approach, we will stall the construction of the Dance Palace by about two years. And as we know, for Boris Yakovlevich in the current situation every six months are at a premium. Because of all of these effectively trade-off approaches, though they are apparently obvious to everyone, we have that particular urban planning situation which is the starting point for competition participants.

Yuri Isayevich Zemtsov

It would be good to see what the facade of the Dance Palace will look like.

... now, after visiting the construction site, I have, regrettably, an even stronger feeling that there is a definite aggregate error. Of course, now when you see all of those reinforced concrete structures there and a huge foundation pit for the Dance Palace, you right away get the feeling that re-doing some of the main items in the brief is hardly possible. But I still think that a general concept for the Dance Palace and park should be worked out, which should be added to the brief as the jury's opinion. The situation now where, as it has turned out, the territory of the Dance Palace and its layout in its dimensions are beyond the bounds of the park, will lead, I am afraid, to a certain urban planning mistake. At the same time, I understand that a lot has already been done. But I would like to remind that there have been such precedents in Saint Petersburg before, for example when the stock exchange building which was almost completely built ... was demolished by an Imperial Edict, and the current stock exchange building was built in its place. And what would we do if this present stock exchange building wasn't there? Saint Petersburg clearly would be at a loss. It seems to me that just as by the president's decision, by agreement with the president, it was decided to create a park instead of the Judicial Quarter, then perhaps it is possible after all to raise the issue of the need for some changes in this design task with this same president. I would like for my opinion to be incorporated as a differing view. Thank you.

I said that I understand quite clearly that what I am proposing is, in some measure, unfeasible. But since we are dealing with this now, I think it is important to convey this reflection to the country's leadership.

Elena Olegovna Shtieglitz

Supplement to the Brief. Section Landscape. The area covered by tree crowns (i.e. the top view) must be at least 50% of the Park area. That is, visitors to the future Tuchkov Buyan are invited to walk mainly under trees, alternating open glades and curtains of shrubs. This wish, first of all, comes from the residents of Saint Petersburg (the Park of quiet rest), as well as the ratio of open and closed areas - a typical park space, characteristic of the historical centre of Saint Petersburg (Summer Garden, Mikhailovsky Garden, Tavrichesky Garden, Yusupov Garden, Alexandrovsky Garden in front of the Admiralty, Alexandrovsky Garden at the Metro station «Gorkovskaya», the garden of Saint Petersburg State University, the garden of Saint Petersburg

Pedagogical University Herzen, squares in the centre of Saint Petersburg, a park on Yelagin Island).

The recommendation for the location of an array of trees is more applicable to the eastern part of the park and the strip along the embankment, where the reason is a strong wind load from the Neva water area.

The range of planting material is proposed to be used in the project taking into account the history of the place and the following recommendations:

- on the territory of the future park there was a tree nursery (linden trees-Tilia cordata; maples- Acer platanoides; oaks- Quércus róbur; larch- Lárix sibírica; black alder- Alnus glutinosa; rowan- Sórbus aucupária; cherries- Prúnus cérasus; apple trees- Malus domestica; lilac- Syrínga vulgáris; rosehips- Rosa rugosa; and other breeds characteristic of the historical period of the late 18th-early 19th centuries.);
- the unfulfilled project of the N. V. Baranov Park used mainly lime trees, elms, oaks and chestnuts (Tilia cordata, Úlmus laévis, Úlmus glábra, Quércus róbur, Aésculus hippocástanum);
- the existing greenspaces on the site were mainly represented by clipped lime trees-Tilia cordata and the following shrubs: Syrínga vulgáris, Philadelphus coronarius, Crataégus monógyna, Spiraéa chamaedryfólia.
- within the central part of St. Petersburg there are no coniferous trees and shrubs in the park areas due to the special marine climate and harsh growing conditions in the centre of the large metropolis;
- the aesthetic appearance of the landscape of the central part of Saint Petersburg does not involve the use of birch- Bétula, decorative deciduous (variegated and red-leaved) forms of trees and shrubs, as well as evergreen (junipers) and evergreen groundcover plants.

Irene Djao-Rakitine

I'd like to say something about the introduction of the brief, especially regarding the ambition of the park. We all know that landscape is politics, the public realm is really about politics, and I think it was a strong message from the municipality and the government to build a park instead of a court. Politically it's a strong message. And it's great. We are all aware of the big climate-change challenges that we are facing now and that we will be facing in the future. So, with this park we should also take this matter into consideration.

In my opinion, the park will somehow become an image of Saint Petersburg. It will be seen on the international level as well as on the national level.

Nature and culture, both of these ideas are very specific to Saint Petersburg. I mean, the natural environment of Saint Petersburg is very strong. It's on the water, surrounded by water, and water is a big challenge now and even more in the future (drought, flooding etc.) On the other hand, Saint Petersburg is a cultural city par excellence. So, I think both aspects should really be at the forefront of the project; participants could use these two characteristic specificities of Saint Petersburg as themes: nature and culture.

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