

## Recreation of the historical site Ornamental ponds “Figurnye prudki”

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### ABSTRACT

The objective of this paper is reconstruction of a part of the Oranienbaum Palace-and-Park Ensemble, Saint-Petersburg, Russia, the conventional name of the part is ‘Figurnye Prudki’. At present Russian Federation have quite a few palace-and-park estates, landscape architecture monuments, which today are in a bad repair or breakdown state. The Figurnye Prudki site is one of such monuments, therefore recommendations containing in this article for the recreation of the property seem to be relevant.

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## Introduction

In this article we used knowledge of different authors about some historical information; landscape where our object is situated; hydrological conditions of different objects; land improvements; reconstruction in general and many other.

But in fact, there is not much information about reconstruction of our object, and solutions of this problem. In this article we present you some review and scientific information about reconstruction of a part of the Oranienbaum Palace-and-Park Ensemble in Saint-Petersburg, Russia, the conventional name of the part is 'Figurnye Prudki'. All references you can see on the text.

Today restoration aims at recreation of historical monuments as close to the monument original appearance as possible. In case of this site, subject of the article, its recreation is complicated as its construction has never been completed. However, now architectural drawings for Figurnye Prudki made by Antonio Rinaldi, the architect in charge of rebuilding of the Grand (Menshikov's) Palace in those days [1-5], still exist, which allows their restoration to the original appearance although it will be impossible to recreate their engineering systems because of the absence of technical data. Therefore the purpose of the reconstruction today is to recreate the site and build new engineering systems ensuring the necessary hydrological conditions and reinforcement of the pond banks. Other necessary operations include cleaning up of the pond beds and adding more earth to the small islands. Recreation of the historical landscape requires landscape tending, tree cutting, planting of new trees, as well as preservation of the old-time trees [5-12].

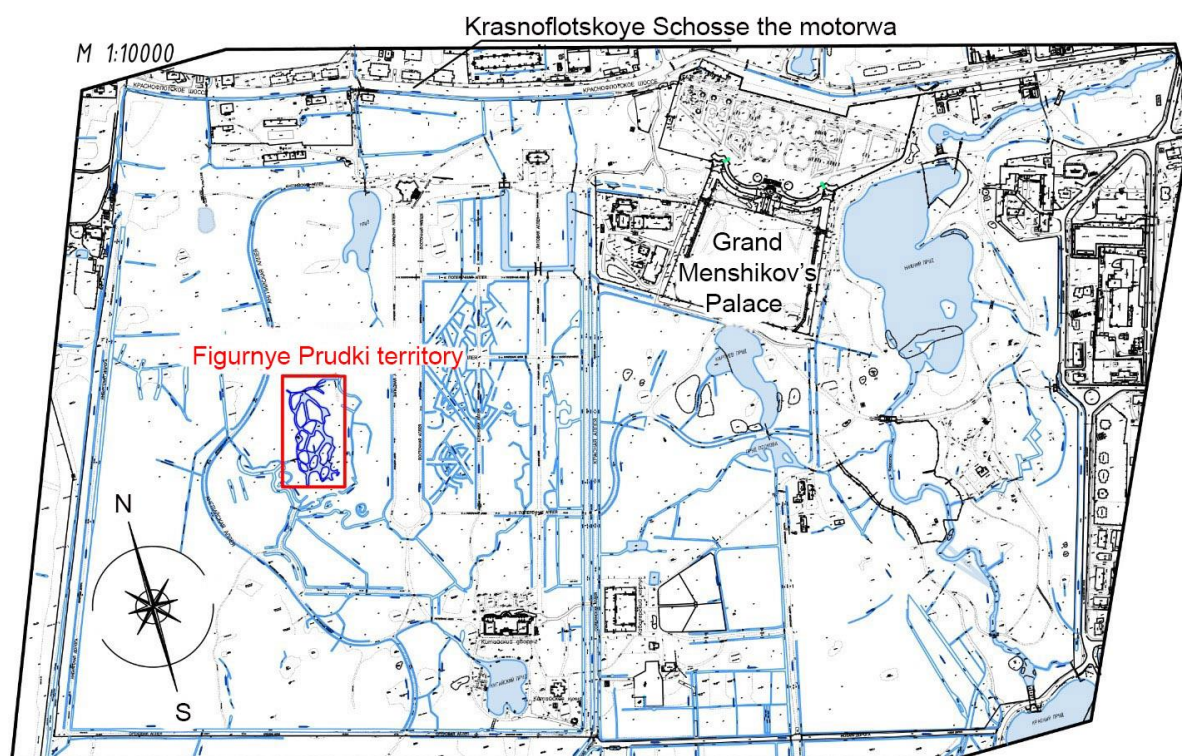


Figure 1. Figurnye Prudki Lay-out

Russia, St. Petersburg, Krasnoflotskoye Schosse the motorway; Figurnye Prudki territory – the part in red color on the left side; Grand Menshikov's Palace – in black characters on the right side

The site is not a well-known part of the Oranienbaum palace-and-park ensemble. The Figurnye Prudki ponds lie in the western part of the park, six hundred meters from Menshikov's Palace occupying the area of one hectare (figure 1). It is a system of small islands separated by waterways. At the intersection of several waterways used to be small ponds circular in shape (typical of the regular parks - it proves that Rinaldi was an architect of the early classical style, that still had baroque features). The site was designed to be a water labyrinth. The miniature islands had five ornamental arbors and were connected by seventeen bridges. The waterways interconnected into one hydro-system allowing a free water flow in the ponds [10-19].





## Initial data

At the initial design stage of the Figurnye Prudki recreation project the developers ought to do the following:

- Submit offers on how to recreate the ditch system on the territory surrounding Figurnye Prudki that would allow both land improvement around the ponds and water supply to the ponds;
- Develop recommendations on how to recreate the ponds themselves including recommendations for:
- Cleaning-up of the hydro-system with removal of silt deposits and bank building ensuring the water depth of 1.5m;
- Ornamental design for the banks of the ponds and waterways, as well as recreation of greenery typical of Russia's landscape parks in the second half of the 18th century.
- The base for recommendations under development are the data listed below obtained in the course of in-situ measurement and observation performed with the author's participation, as well as the data obtained from other sources. Thus, the scientific innovation aspect of the work is supported by comprehensive data on the unique park site under consideration.

The reconnaissance survey of the hydro land reclaiming systems on the territories of the park and the adjacent Kipensky forestry showed the following: the Figurnye Prudki area is basically a wet marshy forest land. The existing hydro land reclaiming systems of the park are not in operation – most of the ditches and canals designated to supply water to the park water bodies got shallow, silted and have all kinds of undergrowth [18-21]. The pipelines crossing the waterways deformed and got silted. The Figurnye Prudki ponds and waterways got silted to the extent that the average thickness of silt amounted to 0.96 m. Water depth doesn't exceed 0.4 m. The little islands and the area around are trashy and covered with brushwood and undergrowth. The waterways between the central mirror-like ponds of the Figurnye Prudki area have partially dried out.

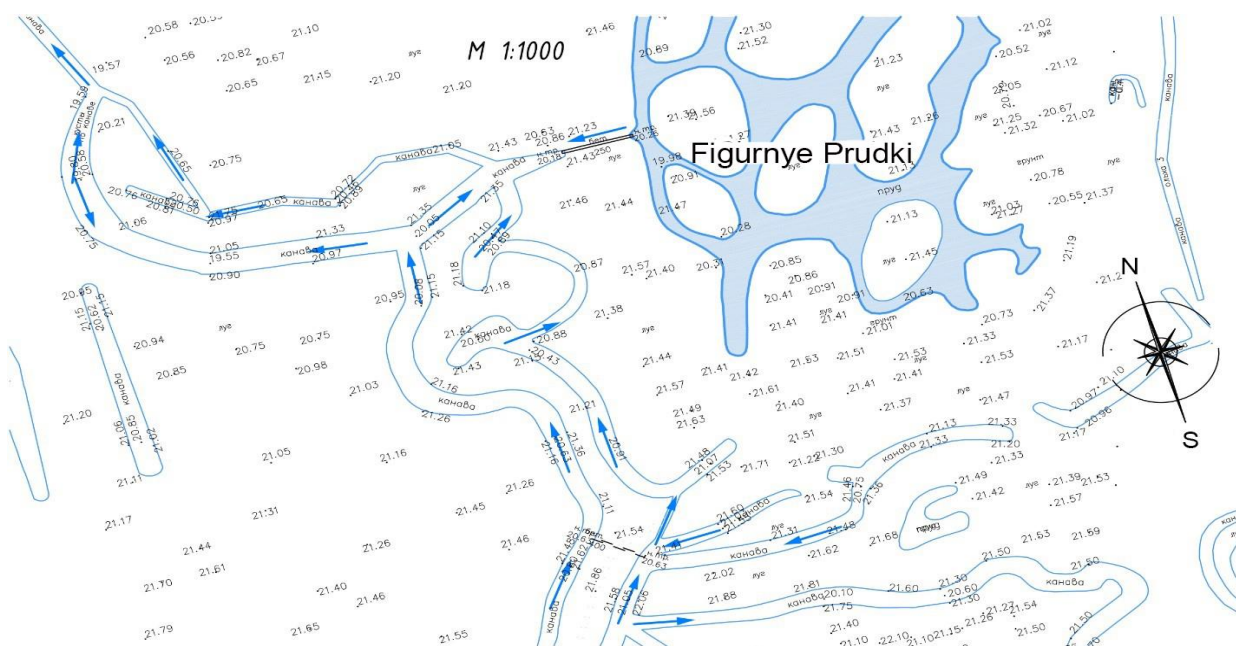


Figure 3. Water supply diagram Figurnye Prudki

At present the water body of the Figurnye Prudki is fed by water collected from the area of 0.012 km<sup>2</sup>. The water supply chart is presented in figure 3. Water streams flow in different directions so that the water congests not allowing a free water flow into the ponds.

A concrete water supply pipe connects to the ponds from the western side (figure 3). However, the pipe downgrades away from the ponds and therefore it does not supply water into the ponds.

On the forestry territory the water runoff empties into the network of ditches and gets onto the park territory through two discharge ways (one is a concrete pipe and the other is a masonry structure). The water discharge pipe in the masonry structure has much silt and trash. Water in the ditches outside the park limits has the backup of water from the motorway, stands still and it causes flooding of the territory and woods decay. Also the woods and park territory has plots of marshy land from which water could be drained. On the whole the total maximal water catching area is 0.634 km<sup>2</sup>, from which the water runoff could be channeled into the network of ditches on the park territory. The amount of water needed to fill in Figurnye Prudki with consideration to quadruple water exchange is 37200 m<sup>3</sup>. Calculations of average water amount to be supplied to Figurnye Prudki have been made, and the annual amount of water estimated as 20600 m<sup>3</sup> not including the runoff from the forestry territory.

## *Recommendations on recreation of Figurnye Prudki*

Recommendations on recreation of Figurnye Prudki include:

- Removal of silt from the water body beds;
- Landscape wood cutting;
- Building of the bank line.

As per preliminary estimation, the amount of deposits equals to 2150 m<sup>3</sup>. Relative buried-silt content is 77%. It is recommended to remove silt mechanically using an excavator with a scoop and backhoe shovel and dump-body trucks for transportation of the excavated material to a storage facility. In the course of preparation for such operations access roads must be provided.

Landscape woodcutting – the project area where bank reinforcement will be done has 174 trees (volunteer plants) not included in the landscape design. The felled trees will be evacuated from the park territory.

*Two options have been examined for the reinforcement of the banks with wooden pile structures:*

*Option 1.* The bank protection line shall be a continuous row of wooden piles - 4.5 m in height and 20 cm in diameter. The pile tops shall be above the maximum flood level. The design reference mark is obtained using the bank slope ratio 1:1.5. The advantages of this design option are its architectural semi-antique appearance, which will ideally blend into the park landscape and also that the reinforcement structure is not very wide (about 0.7 m), which allows proper building of the islands. The disadvantage of the option is that such wooden piles are in the variable water level zone and therefore are prone to decay, thus such structures are less durable and need additional treatment of the wood.

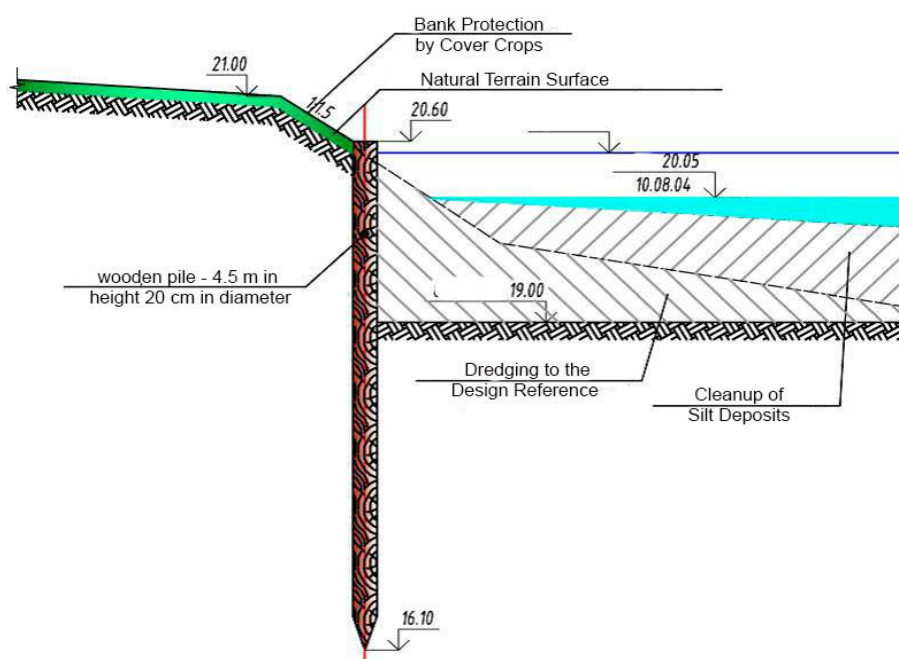


Figure 4. Construction scheme (opinion 1)

*Option 2.* The bank protection line shall be a continuous row of wooden piles - 4.5 m in height and 20 cm in diameter. The pile tops are below the maximum flood level. The design reference mark is obtained using the bank slope ratio of 1:2 and cobblestone pavement.

The option advantage is that the wooden piles are underwater and not prone to decay. The pile lifetime is longer than in option 1. The disadvantage of the design is that the slope is quite wide which causes difficulty in the small island development due to significant reduction of the usable area. In case of this option, wooden piles have just a structural function and will not integrate into the ornamental appearance of Figurnye Prudki.

Recreation of the Figurnye Prudki site in the said Palace-and-Park Ensemble is of major importance for preservation of this cultural and historical monument, which is on the UNESCO cultural and historical heritage list.

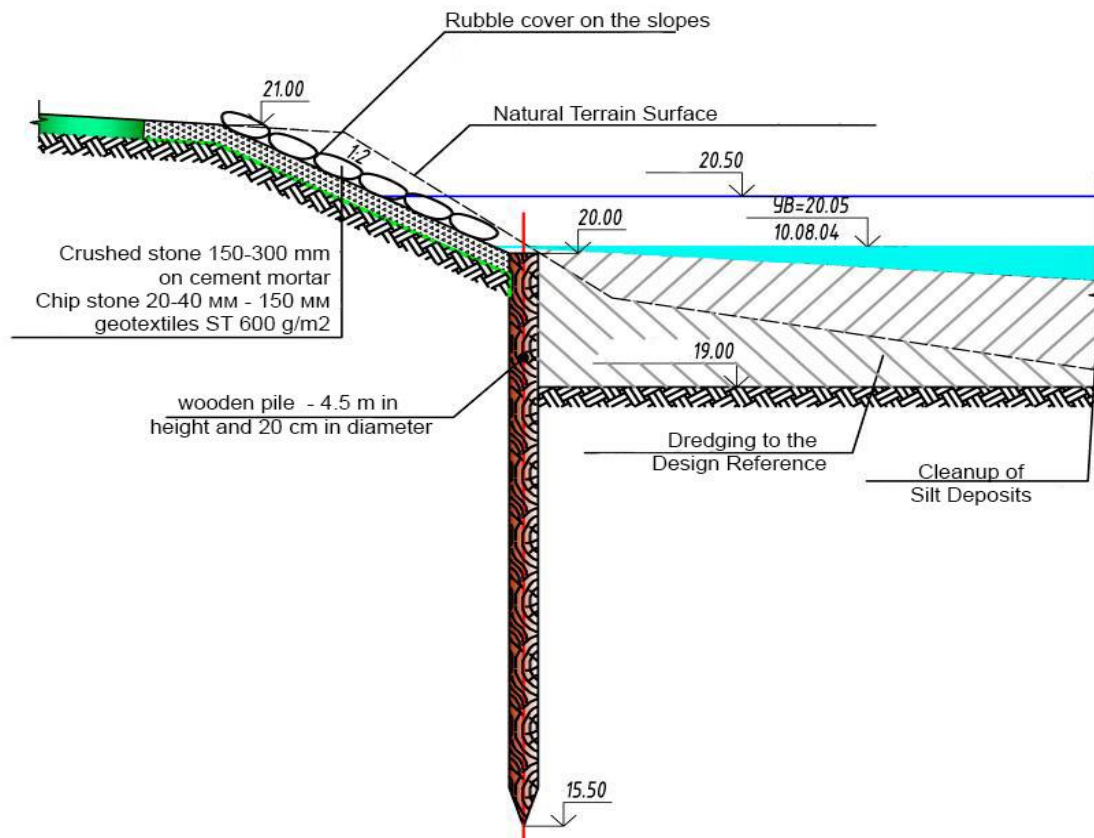


Figure 5. Construction scheme (opinion 2)

## Conclusions

The proposed reconstruction methods allow recreation of the ponds area to their original architectural appearance, and, as they are a part of the whole palace-and-park ensemble, recreation of the entire ensemble appearance.

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## «Фигурные прудки» – восстановление исторического объекта

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### АННОТАЦИЯ

Темой статьи является реконструкция участка дворцово-паркового ансамбля «Ораниенбаум» (Россия, г. Санкт-Петербург), носящего условное название «Фигурные прудки». В настоящее время на территории Российской Федерации имеется большое количество объектов садово-паркового искусства, находящихся в запущенном или аварийном состоянии. Объект «Фигурные прудки» является типичным для такого класса памятников, поэтому приводимые в настоящей статье рекомендации по его возрождению представляются достаточно актуальными.

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