The development of environment-conscious buildings and the creation of green spaces by the public-private partnerships with utilization of the upper part of the sewer facility in the metropolis, Tokyo

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ABSTRACT

Sewerage facilities are generally recognized as annoying institutions by residents, therefore, the Bureau of Sewerage made the upper part areas of the facilities covered and then utilized as parks or athletic fields, etc. In the neighboring area of the Shibaura Water Reclamation Center, it was expected to become a core of the area by comprehensive utilization in response to the local community's request because a large-scale redevelopment project had been advancing and the upper part area of the center had been valuable city space. This made us decide to perform a project to provide the construct environmental-friendly large-scale compound buildings and very large-scale green space to the upper part space of the newly rebuilt facility, which includes at the same time to solve the problem of rebuilding the obsolete facility; to provide the upper part space of the sewage facility; and to achieve the contribution to the town planning in the surrounding area of Shinagawa station.

KEYWORDS

effective utilization of the upper space of facilities, good urban environment sewage reclaimed wastewater, wastewater heat

BACKGROUND

The first modern sewerage disposal plant in Japan was the Former main pump house at the Mikawashima Treatment Plant, which started operation in 1922. And, it is the Shibaura Water Reclamation Center (WRC) that is the third old one in Tokyo, starting operation in 1933. The Shibaura WRC absorbs and treats wastewater from Chiyoda-ku, Minato-ku, Chuo-ku, Shibuya-ku, and so on which function as the central role of capital function. This Center which had been established according to a plan became deteriorated with almost 90 years of its history,
faced the large-scale renewal time, and was also required maintenance for the improvement of discharged water quality at the time of rainy weather.

(1) Valuable city space

Sewerage facilities are generally recognized as annoying institutions by residents because of odor, heavy truck traffic, and so on.

Therefore, the Bureau of Sewerage Tokyo Metropolitan Government (BSTMG) made the upper part areas of the facilities covered and then utilized the areas as parks or athletic fields, and so on. In total, 54 hectares of upper part areas of all WRCs and plural pumping stations of BSTMG are utilized effectively as of 2019. The surrounding area of the Shibaura WRC is close to the center of Tokyo, so it was expected to become a core of the area by comprehensive utilization in response to the local community's request because a large-scale redevelopment project had been advancing and the upper part area of the WRC had been valuable city space.

(2) Large-scale green space

The Shibaura WRC is located near the Shinagawa Station. In 2007, "Town planning Guideline in the surrounding area of Shinagawa and Tamachi stations" was established. In the guideline, the area including the Shibaura WRC was positioned to the priority improvement area as a base to undertake a core role of the environmental model-city formation and was required to contribute to the town planning.

In response to these backgrounds, BSTMG decided to perform a project to construct environmental-friendly large-scale compound building and large-scale green space on the upper part space of the facility while reconstructing the deteriorated facility. The purpose of this project was to solve the problem of sewerage services and to contribute to the town planning in the surrounding area of Shinagawa Station by providing the upper part space of the sewerage facility simultaneously.

CHARACTERISTICS OF THIS PROJECT

On the areas where sewerage facilities are located, the city planning for sewerage projects is decided. The upper part space usage used to be implemented by obtaining the permission of the governor of Tokyo in the form of utilizing the upper part space of sewerage facilities for other purposes according to the article 53 (Building permission) and Article 65 (limits of building and so on) in the City Planning Act. In 2000, the City Planning Act was revised and the three-dimensional City Planning System was established, which makes it available to construct buildings for other purposes in planning area of sewerage facilities.

This enabled multiple utilization of the upper part space of the sewerage facilities for institutional and commercial uses while continuing to provide sewerage services. It was the first domestic case
that this three-dimensional City Planning System was utilized as for sewerage project.

**SUMMARY OF THE BUSINESS MODEL**

(1) Public offering to enterprise groups

Upon the implementation of this project, BSTMG made a public offering to enterprise groups to construct and operate the upper part building. As conditions of the public offering, BSTMG included obligations to operate with the highest level of consideration for the environment in the construction and operation of the building, such as making it an “environmental model building” of the highest standards such that it will become a landmark of the environmental model city around Shinagawa Station, and utilizing resources such as reclaimed wastewater and wastewater heat to the maximum extent possible.

Applicants to the public offering were reviewed through a comprehensive-evaluation based open and competitive bidding system, totaling “planning proposal evaluation points” which include concern for the environment, as well as “evaluation points for land lease rights consideration” and “evaluation points for construction cost of combined sewer overflow (CSO) storage tank.”

(2) Land lease and land lease right system

BSTMG performed the loan of its facility site for a business proprietor for the purpose of the construction and the administration of a complex building which composed of a combined sewer overflow (CSO) storage tank and the upper part building. The price of this lease includes the price of land lease rights set to be collected at the start of the lease (rights fee), as well as the rent to be collected every year. Granting the rights to use of the floor area ratio (FAR) corresponding to an area approximately 3.9 hectares for the park built on the covered upper part of the sewerage facilities, in addition to the land lease rights area of approximately 1.1 hectares, made it possible to build a building higher than normal. The
amount of lease rights consideration paid by the business proprietor to BSTMG also takes into account the rights to use of the FAR.

(3) Handling of land lease rights consideration

Instead of taking cash payments for the land lease rights consideration, BSTMG acquired rights to partial ownership of the upper part building built by the business proprietor.

One reason for this arrangement is that it removes the burden of raising a huge amount of funding at once for the land lease rights, which it would have paid in addition to the construction costs of the building. Relieving this burden makes it possible for more enterprises to participate in this project, which made the public offering more competitive and opened the floor to proposals with a consideration favorable to BSTMG. Furthermore, this makes it possible to secure fixed income in the long term.

As expected, the public offering attracted applications from multiple enterprise groups, including a proposal for nearly three times as much as the minimum amount for the land lease rights consideration set by BSTMG.

BSTMG used the following means to acquire partial ownership of the upper part building. With the consideration of the land lease rights owned by BSTMG set to 100 and the partial ownership rights of the building owned by the business proprietor set to 100, the completed upper part building will have combined 200 land lease rights and partial ownership rights of the building. At this stage, in order for both BSTMG and the business proprietor to have the land lease rights and partial ownership rights of the building, BSTMG exchanged 50 of its 100 land lease rights to the business proprietor in exchange for 50 of the 100 building partial ownership rights owned by the business proprietor. As a result, BSTMG has 50 partial ownership rights of the building, in addition to 50 land lease rights.

(4) Master lease of partially owned section

The section of the upper part building to which BSTMG acquired partial ownership is operated as one whole with the section to which the business proprietor acquired partial ownership, as part
of a master lease contract for the business proprietor.

By using this master lease arrangement, BSTMG can leave the administration and operation of the building to the business proprietor, while collecting rent every year for the section to which BSTMG has partial ownership.

(5) Project Scheme

The main expenditure associated with this project includes the maintenance costs of the upper part building with BSTMG’s ownership in addition to the construction costs of the CSO storage tank and artificial ground (covering). The revenue includes the lease charge to the business proprietor and the lease income of the upper part building obtained as the setting value of the leasehold.

THE RESULT OF THIS PROJECT

BSTMG promoted the project to build the environment model building which plays a central role of the local development simultaneously with reconstructing the deteriorated facility. This resulted in the effective utilization of sewage resource as well as the contribution to the town planning such as creating oasis in the upper part space of the sewerage facility. The income from this project in FY 2018, after deducting the maintenance costs of the upper part building, is about 6.6 billion yen. This shows, from the view point of fiscal management, the project is contributing to realizing stable fiscal management of sewerage business by securing a certain amount of income over the long term.

Also, the artificial ground having about 2.6 hectares was developed on the upper part of the existing sewer facility to construct the 3.5 hectare lushly green open space where people could use it together with an existing park. This open space plays a role to decrease the heat island effect on central Tokyo. Besides, it helps to create bustle and the business proprietor holds various attractive events, which makes the space topical, where many people from other prefectures as well as the employees in the office building and local inhabitants visit. In 2018 more than 110,000 people attended to the events held in this building. Also, thanks to the attractive scenery, several hit television dramas have been filmed there, which has in turn attracted many visitors.

BSTMG has made an effort to conduct public relations activities aimed at visitors so that more people know there are sewerage facilities essential to urban life underneath the building, supporting their daily lives and using reclaimed water and wastewater heat as resources.
Based on the results of this project, BSTMG will consider the opinions of locals and characteristics of the community from the planning stage, and work with a variety of organizations including local governments and private enterprise to examine multiple uses of the upper parts of properties for other sewerage facilities as well, contributing to urban development from a broad perspective.