

4-1-2 Preservation and Restoration Project for Important Cultural Properties in Japan Mikawashima Sewage Disposal Plant and Pumping Station Facilities, National Important Cultural Assets

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Abstract: The former Mikawashima Sewage Disposal Plant, the precursor of current Mikawashima Water Reclamation Center in Arakawa, Tokyo, is "the birthplace of modern sewerage system in Japan." The still standing pumping facilities are historically valued as the representative structures of the first modern sewerage plant in Japan. A series of former facilities including pump house and grit chamber are well-preserved with its original conditions. Historical value of the site was recognized and designated as national important cultural asset in 2007. Our preservation and restoration project was undertaken with the purpose to open the facilities to the public, under strict legal restrictions prohibiting undue modifications to assets by the Cultural Assets Preservation Act.

Keywords: important cultural asset, modern sewerage system, open to the public

1. Overview of former Mikawashima Sewage Disposal Plant and Pump Station Facilities

The construction of plant was approved by the cabinet order "Tokyo Sewerage Design" in 1908. Incorporating state-of-the-art technologies in the West at that time, such as activated sludge process, the plant started its operation in 1922 as the first modern sewage disposal plant in Japan. Before the Mikawashima plant, urban sewage in Tokyo was directly discharged to rivers without any treatment. After the plant completion, wastewater was collected to and treated at the disposal facilities before discharging to rivers. The completion of plant, therefore, marked the beginning of modern wastewater treatment in Tokyo, the prerequisite to grow as modern metropolis. The former Mikawashima plant operated for 77 years until 1999. Thereafter, the historical and academic values of the plant were recognized; the former plant was designated to be preserved as historical building. In 2008, under the instruction from the Cultural Affairs Agency, the preservation and public service plan was formulated. The plant was maintained and restored to open to the public from fiscal 2013.

2. Preservation and restoration works

The preservation and restoration works incorporated traditional techniques such as Japanese cement plastering and stony surface treatment, in order to retain its original cultural value.

(a) Removal of top cover over grit chamber

Grit chamber is the facility to sink and remove solid substance in wastewater. Our restoration work removed the aging and deteriorated top cover over grit chamber, in order to restore to its near-original design. The two grit chambers, east and west, were restored differently to exhibit the timeline. East chamber was restored to show its

original state of construction by removing inner facilities, while west chamber was remained as the state of ceasing operation by leaving those used facilities there.

(b) Screening machine house

This building was used to house steel-made screen to filtrate wastewater and debris collector to scoop floating waste continuously. The roof truss of the building has a carved seal of Yahata Steel Works, one of the leading steel works in Japan then, evidencing its origin and authenticity of its age. During the restoration, repair painting was added to the roof truss and facility surfaces.

(c) Inclined railway

Inclined railway was used to winch truck to transport grit and debris screened from wastewater. Railway was laid in an inclined concrete slope to winch flat-top truck up to the road in the plant. Former concrete slope and part of railway were excavated, block was laid at the surrounding space, and the slope was roofed over for convenience of visitors.

(d) Winch house

This building was used to house an electric winch to draw truck on railway. The winch was removed together with the inclined facility in 1962. Thereafter, the building was used as a warehouse with its floor covered with wood. In our restoration, however, the wooden floor was removed, in order to expose the underneath winch foundation on the bare concrete at the time of operation.

(e) Pump pit and underground conduit connected to the pit

Wastewater to the former Mikawashima plant branched off two ways, went through grit chambers, and joined together in front of pump house again to pass through connecting underground conduit to pumping pit. The cross section of underground conduit was in the shape of horseshoe. It was made of reinforced concrete and the floor was covered with ceramic tiles resistant to abrasion. During our restoration, a staircase leading to the basement was installed, together with ventilation and illumination to help visitors to see the sight of underground structures.

(f) Pump house

The building was used to house pumps that lifted wastewater in preparation of starting full-scale treatment. Outer wall of the building, covered with elegant, classic red brick tile, is attractive to visitors. During our restoration, part of damaged brick tiles was replaced with new ones. To reproduce original taste as much as possible, a detailed research was made to clarify the original tile used there. In addition to the above, part of pumping facilities were restored and repaired to maintain the existing conditions.

3.Future outlook

We would like to continue our due preservation and maintenance on the facilities to pass its historical value to the next generation. In the meantime, we would like to encourage people's deeper understanding of importance and role of sewerage, by opening the facility to the public and explaining its history and significance.

Figure 1 The former Mikawashima Sewage Disposal Plant



Figure2 Inside of the pump house of the former Mikawashima Sewage Disposal Plant

