Historic Building Appraisal
Ex-Yaumati Service Reservoir
King's Park, Yau Ma Tei, Kowloon

Historical Interest

The ex-Yaumati Service Reservoir (前油蔴地配水庫) was built in 1894, sixteen years before the completion of the Kowloon Reservoir (九龍水塘) in 1910. The latter was the first reservoir-based water supply system with water supply from reservoirs in Kowloon. Before the lease of the New Territories on 1 July 1898, the Kowloon Peninsula under British jurisdiction contained no possible site for a reservoir. Up until 24 December 1906, the supply of water for Kowloon had relied on wells.

Osbert Chadwick (1844 – 1913), a consulting engineer to the Crown Agents for the Colonies,[1] was sent to Hong Kong to investigate its sanitary condition and in 1882, he compiled a "Mr. Chadwick's Reports on the Sanitary Condition of Hong Kong", with his recommendations on increasing water supplies as a means of improving the santitary condition of the territory. Chadwick returned to Hong Kong in 1890 to follow up his 1882 recommendations. His proposal related to the water supply for British Kowloon was implemented and completed in 1895. Three wells were sunk at the sources of water at three valleys situated north of the village of Yaumati. Well No. 1 was situated near today's junction of Pui Ching Road (培正道) and Man Fuk Road (文福道), Well No. 2 was near the junction of Waterloo Road (窩打老道) and Argyle Street (亞皆老街), and Well No. 3 was near the junction of Ho Man Tin Hill Road (何文田山道) and Wylie Road (衛理道).

The wells were connected by iron pipes to a clear water tank at Yaumati (today's Yau Ma Tei) having a top water level of 12.5 feet above Ordnance Datum (abbreviated as T.W.L. 12.5 ft. A.O.D.) and a capacity of 148,000 gallons. Mains were also laid. On 24 December 1895, the pumping machinery at the Yaumati Pumping Station at No. 344 Shanghai Street started

[1] Osbert Chadwick was educated at the Royal Military Academy at Woolwich, where he was trained as a civil engineer, and was then attached to the Royal Engineers from 1864 to 1873. After resigning his commission, he served as a consulting engineer to the Crown Agents for the Colonies, through which he was sent to Hong Kong in 1881 as special commissioner to report on the sanitation and public health problems of the colony. Chadwick spent several months in Hong Kong. His "Mr. Chadwick's Reports on the Sanitary Condition of Hong Kong" was published by the Colonial Office in 1882. It recommended measures to improve hygiene, including a system of water supply, a system of sewage disposal and proper drainage, the provision of public toilets, public bathhouses and clean markets, and the establishment of a Sanitary Board (established in 1883). Chadwick returned to Hong Kong in 1890 to follow up his 1882 recommendations. For his construction of the waterworks in Malta, he was made a Companion of the Order of St. Michael and St. George (CMG) in 1886. With the outbreaks of bubonic plague since 1894, the government was determined to expediate improvements to the sanitary conditions in Hong Kong. Chadwick was, therefore, sent to Hong Kong for a third time in 1902, advising on how to improve the sanitary conditions in Hong Kong. He focused on street sewers, drains and nullahs. Chadwick had contributed to the amendments of Wateworks Ordinance and the enactnment of the Public Health and Buildings Ordinance 1903.

operation.[2] The water was directly pumped from the clear water tank to users, whereas the surplus would be pumped to the two service reservoirs regulating water supply. One was at King's Park, Yau Ma Tei (T.W.L. 215 ft. A.O.D.) of 162,600 gallons capacity. Another was one at Hung Hom (T.W.L. 160 ft. A.O.D., approximately situated at today's Ho Man Tin) having a capacity of 92,850 gallons. The two reservoirs were both completed in 1894.

In 1900, Chadwick submitted to the government another proposal for increasing water supply. He highlighted the hilly nature of the new territory and suggested that water supplies could be augmented by exploiting the new water resources in the valleys there by gravitation. With a gravitation scheme, water could be delivered under high pressure over a significant distance from a storage reservoir high in the hills, with the significant advantage that no expensive pumping was required. The Kowloon Waterworks Gravitation Scheme (九龍重力自流供水系統) was carried out under the supervision of Lawrence Gibbs (*c.* 1867 - 1942). He was Assistant Engineer in the Public Works Department when he was instructed to prepare a gravitation scheme for Kowloon and the urban districts (Kowloon City and Sham Shui Po) in New Kowloon.[3] Later, he left the government civil service, and joined a local firm of architects and civil engineers to form Messrs. Denison, Ram and Gibbs.[4] The firm was entrusted to design and supervise the whole of the works of the proposed gravitation scheme.

The scheme involved the construction of a storage reservoir, filter beds, a service reservoir and mains in New Kowloon. The storage reservoir (i.e. Kowloon Reservoir) would be connected by a cast iron main to filter beds on

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[2] The surviving two-storey red brick building of the engineer's office is a Grade 1 historic building, which is now known as the former Pumping Station of Water Supplies Department.

[3] In his "Report on Water Supply, Kowloon" dated 8 January 1900, Gibbs pointed out that according to the census of January 1897 of the population in British Kowloon, there were 716 civil non-Chinese land population, 26,442 civil Chinese land population, 7,624 floating population, and a military and naval population of around 1,500. In Kowloon City and Sham Shui Po, with estimated population of 2,000 and 1,500 respectively, should be included in the scheme.

With the extension of their jurisdiction to the entire Kowloon Peninsula in 1898, the British named the areas to the north of Boundary Street (界限街), including Kowloon City and Sham Shui Po, as "New Kowloon". The boundary of New Kowloon was marked on a map dated 1937. Places like Cheung Sha Wan (長沙灣), Sham Shui Po (深水埗), Kowloon Tong (九龍塘), Tai Hom (大磡), Kowloon City (九龍城), Ngau Chi Wan (牛池灣), Ngau Tau Kok (牛頭角), Sai Tso Wan (茜草灣) and Cha Kwo Ling (茶果嶺) fell within the boundary.

[4] Denison and Ram was founded by Albert Denison and Edward Albert Ram in 1897. It was renamed Denison, Ram and Gibbs after it was joined by Gibbs. The firm was entrusted to design and supervise the whole of the works of the proposed gravitation scheme on behalf of the government because of the inadequacy of the staff of the Public Works Department and the fact that Gibbs, when still working with the Public Works Department, had investigated and reported upon the feasibility of the scheme. It was probably for the first time the governmet commissioned a local firm to provide consultancy for the construction of a reservoir-based water supply system for Kowloon. Other works done by the firm included the May Hall and Eliot Hall of The University of Hong Kong, The Helena May (Declared Monuments), the Maltida and War Memorial Hospital (Grade 2) and Clubhouse of Fanling Golf Course (Grade 2). Besides, Tai Po Lookout (Grade 1) was designed by Gibbs in the early 1900s and was used as his residence afterwards.

the ridge above Cheung Sha Wan near Tai Po Road. From the filter beds water would be conveyed by a main laid partly below and partly along Tai Po Road and up the hill to the Kowloon Tong Service Reservoir (i.e. the ex-Sham Shui Po Service Reservoir). The service reservoir would be connected to the old distribution system at Yau Ma Tei, which would be extended to Kowloon City on the eastern side and to Tai Kok Tsui and Sham Shui Po on the western side of Kowloon.[5]

In 1906, further progress of the works of the gravitation scheme enabled water to be impounded in the reservoir and, by adopting some temporary expedients, though still incomplete, the new works began to operate on 24 December of the same year.[6] The water from Kowloon Reservoir (T.W.L. 448 ft. A.O.D.) was filtered and had the water pressure broken at the Tai Po Road Filter Beds (T.W.L. 290 ft. A.O.D.) (大埔道沙濾池), and from there it was conveyed to the then Yaumati Service Reservoir (T.W.L. 215 ft. A.O.D.) by gravitation. In the 1910s – 1920s, the Yaumati Pumping Station was converted into a post office and was then abandoned in 1967. This service reservoir was probably disused due to bad leakage or following completion of the new service reservoir nearby in 1934.[7]

Architectural Merit

The ex-Yaumati Service Reservoir had a capacity of about 162,600 gallons (approx. 740 cubic metres). It was rectangular in plan. No record plan can be identified. However, according to the survey by the Water Supplies Department in 2021, the ex-service reservoir occupies an area of about 163 sq.m. (approx. 10.71 metres x 15.3 metres). The highest point of the building height from the floor to the ceiling on the central axis is around 5.21 meters. The construction displays an imitation of Roman civil engineering works, comprising walls, cove ceiling, arches and piers all built of red brickwork.[8] There are six piers supporting the roof, with a span of clearance of around 3.48 meters on the longer central axis, and around 2.89 to 3.48 meters on the shorter one. The red brickwork of walls is in Flemish bond, with headers and stretchers laid alternately in each course, while the roof's brickwork is in stretcher bond. The top water level was 215 feet A.O.D. Apart from the

[5] Besides, at Kowloon City, another service reservoir would be constructed to maintain the supply in case of a breakdown on the 2 miles of main between there and Hung Hom, where a service reservoir already existed.

[6] According to the "Report of the Director of Public Works for the Year 1906", the introduction of the supply from the new gravitation reservoir had superseded the pumped supply.

[7] The new fresh water service reservoir was converted into a salt water service reservoir in 1995.

[8] Semi-circular arch is a distinguished character of Roman architecture. However, in the case of the ex-Yaumati Service Reservoir, the minor segemental ceiling and the arches are built of brickwork.

brick walls, arches, piers, and cove ceiling, other features relating to the operation of the service reservoir, including vent pipes, the inlet and the outlet were visible during the site visit in January 2021.

Social Value & Local Interest

As an underground waterworks structure, the ex-Yaumati Service Reservoir was not well known to the public in the past. However, the service reservoir, together with the Yaumati Pumping Station, played an important role in the provision of safe fresh water for drinking and the improvement of hygiene, and was therefore of great social value to the population of the Kowloon Peninsula.

Group Value

The service reservoir has group value with other historic buildings, such as the former South Kowloon District Court (前南九龍裁判署, Grade 1) and Kowloon Methodist Church (循道衞理聯合教會九龍堂, Grade 3).

Rarity & Authenticity

The ex-Yaumati Service Reservoir is a very rare example of its type and has considerable built heritage value. Built in 1894, it is the oldest surviving service reservoir in Kowloon. When viewed in terms of the development of waterworks installations in Kowloon, the service reservoir was constructed at a time when the water supply in the peninsula relied solely on wells and pumping machinery before gravitation system could be operated in Kowloon since 1906. Consideration of the broader historical context is also important, given that the gravitation system commencing in 1906 was technically feasible in Kowloon only after the entire peninsula and the New Territories came under British jurisdiction. Therefore, the service reservoir survives as a significant historical reminder of the development of Kowloon in the early colonial period.

Architectually speaking, important functional elements, such as vent pipes, the inlet and outlet, and a later access replacing the original one near the inlet, are still visible on site. Patch repairs to the brick walls, cove ceiling, arches, piers and floor can be identified, but they have not diminished the authenticity of the service reservoir, which was constructed using traditional building techniques and materials.

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