Annex A

Heritage Appraisal of the Masonry Bridge, Pok Fu Lam Reservoir, Pok Fu Lam Reservoir Road, Hong Kong

Pok Fu Lam Reservoir (薄扶林水塘) is the first public Historical reservoir in Hong Kong. The construction of the reservoir commenced in 1860 and water supplies to the city began at the end of 1863. Several extensions were undertaken between 1866 and 1877. Prior to the construction of Tai Tam Reservoir in the 1880s, Pok Fu Lam Reservoir was the only reservoir providing fresh water supplies to the Central and Western Districts.

Before the construction of Pok Fu Lam Reservoir, the supply of water mainly relied on more primitive sources such as wells and streams. Most of the Chinese residents relied on these sources for their water supply. Europeans usually had private wells dug near their homes to obtain water for daily use. The Government also allocated funds in its budget to pay for the sinking of wells and construction of small ponds in the upper reaches of the main streams in order to store water for public use.

The occurrence of rainfall and availability of natural fresh water resources throughout the year in Hong Kong is rather uneven and unreliable. Hong Kong is a mountainous area and there are no large lakes or rivers for the supply of water. Because of seasonal monsoon winds and typhoons, the summers in Hong Kong are hot and wet, while winters are cold and dry, which causes the rainfall pattern to be extremely uneven. In addition, granite, which is the main rock type in Hong Kong, is not ideal for the retention of underground water. All these factors have contributed to Hong Kong having insufficient underground water resources.

After Hong Kong Island was formally ceded to Britain in 1842, the territory experienced rapid population growth. In the first 20 years of British rule, the population of Hong Kong increased rapidly from around 7,000 people to almost 120,000. Most of the people lived in the north-western part of Hong Kong Island, i.e. the

Interest

City of Victoria¹. The Government realised that in order to develop the city and cope with the drastic population growth, an adequate and stable water supply was of the utmost importance.

During the governership of Sir John Bowring, the 4th governor of Hong Kong, the development of infrastructure was actively in progress. He appealed to private entrepreneurs to invest in water services for the community. Unfortunately, no response was received as it was considered a very difficult and risky task to establish water supply facilities on such an undeveloped island and such an investment might not be profitable. As a consequence, the Government had to shoulder the responsibility of supplying water to the public, and it subsequently announced on 14 October 1859 that a payment of £1,000 would be given to anyone who could produce a viable proposal for fresh water supply in Hong Kong. It also reserved £25,000 to cover the cost of implementing Hong Kong's first water supply plan.

On 29 February 1860, a British national named S.B. Rawling proposed the construction of the first reservoir in the Pokfulam valley region for the storage of rainwater. Owing to the technological constraints at that time, the location of the reservoir had to be well above the urban area but could not be too far away from it, thus allowing sufficient height for the stored rainwater to travel the necessary distance to reach the densely populated areas in the City of Victoria. The Pokfulam region satisfied both requirements.

The plan included the building of a 15-foot-high dam across Pokfulam valley that would allow rainwater to be collected in the reservoir. A 10-inch-diameter pipe with a length of 17,400 ft was to run from Pok Fu Lam Reservoir, pass present-day Robinson Road and finally reach Bonham Road. Two storage tanks, one at the end of the pipe with a capacity of 200,000 gallons, and another on Tai Ping Shan Street with a capacity of 850,000 gallons, were to be built. These storage tanks could be inter-connected. The water supply scheme also included the building of 30 standpipes and 125 fire

¹ Reference can be made from the fact that the City of Victoria had a population of over 160,000 in 1897, which represented 69% of total population of Hong Kong.

hydrants. Rawling estimated that the Pok Fu Lam Reservoir scheme would provide the public with one million gallons of water daily. The Government finally accepted Rawling's scheme, and set aside £30,000 for its implementation in the same year. In order to recover this amount of provision, the Government stipulated that 2% of rates would be used for this purpose. The construction works commenced in 1860, and the reservoir started to supply water by the end of 1863.

However, due to budget limitations and financial hardship faced by the Government, the funding allocated for the construction of Pok Fu Lam Reservoir was finally cut down², so that the storage capacity of the reservoir was reduced from the original 30 million gallons to just two million gallons. This was inadequate, as the daily water consumption in 1863 was 500,000 gallons, which meant that the reservoir could only supply water to the community for four days. Many critics were concerned that a reservoir of this size could not To rectify the problem of solve the water supply problem. inadequate capacity, several rounds of extension works to Pok Fu Lam Reservoir were undertaken between 1866 and 1877, which resulted in an increase of impounded water capacity to 68 million gallons after a new reservoir was built further upstream in 1877³. The catchment area had thus also been extended to 416 acres. The construction of the Pok Fu Lam Conduit commenced in 1876 and was completed in 1877. It consisted of a covered conduit built at a gauge basin immediately below the Pok Fu Lam Reservoir's dam, which extended from there uphill to the Albany Tanks.

Nonetheless, Pok Fu Lam Reservoir still could not satisfy the ever-increasing demand for water in Hong Kong. By the 1880s, this led to the development of a much larger scale and more comprehensive water supply system centred on Tai Tam Reservoir.

² The amount originally allocated for the construction of Pok Fu Lam Reservoir was $\pounds 23,417$, but later reduced to $\pounds 22,700$. In the end, the actual expenditure for the construction of Reservoir was merely around $\pounds 20,000$. *Source:* Ho, Pui-yin, *Water for a barren rock : 150 years of water supply in Hong Kong*. Hong Kong: Commercial Press, 2001.

³ The cost for the extension of Pok Fu Lam Reservoir was \$223,000.

The Masonry Bridge is situated at the east end of the *Architectural Merit* reservoir and carries Pok Fu Lam Reservoir Road, which runs along *Merit* the northern side of the reservoir. It spans the mouth of one of the feeder streams that run off the surrounding hillsides. It is built of granite and features an elegant semi-circular arch. The bridge is neatly finished with granite copings with chamfered margins and reticulated surfaces. The road surface on top of the bridge has been paved with cement. This bridge, together with the other four masonry bridges on Pok Fu Lam Reservoir Road, provide not only indispensable linkage with the reservoir's other waterworks facilities, but also the access for maintenance and visitation.

Apart from routine maintenance and repair works, the *Authenticity* Masonry Bridge does not appear to have been altered. All the significant architectural features remain intact. In addition, the Masonry Bridge has continued to perform its original function since it was built, which further adds to its authenticity.

As one of the oldest surviving historic structures of Pok Fu *Rarity* Lam Reservoir, which is itself the first public reservoir in Hong Kong, the Masonry Bridge and associated historic structures together bear witness to a pioneering waterworks project that played a significant part in the social development of Hong Kong. The structures also demonstrate the unprecedented commitment of the Government with respect to the provision of a permanent water supply system in the early colonial period.

The Masonry Bridge, together with the other surviving *Social Value* historic waterworks structures of Pok Fu Lam Reservoir, set the *& Local Interest* standard for other water supply systems in the late 19th century. Currently situated within the Pok Fu Lam Country Park and on the Hong Kong Trail, the reservoir is well known for its peaceful and scenic environment and is often visited by hikers and morning walkers. Its social value is further enhanced through its use as a popular fishing spot for anglers⁴.

⁴ Including Pok Fu Lam Reservoir, there are 17 reservoirs and 9 irrigation reservoirs in Hong Kong that are open to the public for fishing in the non-spawning season, being the period from 1 September of each year to 31 March of the next year. Any person who would like to fish in the reservoirs may apply for a fishing licence from the Water

The Masonry Bridge is an integral part and has significant *Group Value* group value with other historic waterworks structures of Pok Fu Lam Reservoir, namely the Gauge Basin (量水站), the former Watchman's Cottage (前看守員房舍) and four Masonry Bridges which have been declared monuments, as well as a Box Culvert (方形暗渠) (Grade 2), an Embankment (土堤) (Grade 2), an Old Masonry Dam (Grade 2) and Air Vents at the Service Reservoir (配水庫通風口) (Grade 3). The above declared monuments and graded historic structures of Pok Fu Lam Reservoir formed a cluster of historic waterworks structures depicting the historical development of the freshwater supply system and socio-economic development of Hong Kong in the mid-19th century. The reservoir is also in close proximity to the Bethanie (伯 大尼修院) (declared monument), the University Hall (香港大學大 學堂宿舍) (the exterior of which is a declared monument), and some surviving historic structures of the old Dairy Farm.

Supplies Department.

REFERENCES

Archives at Public Records Office, Hong Kong

BK007715. CO 129, 1841-1951 (CO129 - Microfilm): Original correspondence consists of despatches exchange between the Governors of Hong Kong and the Secretary of State for the colonies.

HKRS287-1-933. Waterworks Exhibition.

Hong Kong Government Reports Online

"City of Victoria and Hill District Waterworks", Sessional Papers, 1906.

"Report of the meeting on 6 December 1894", Hong Kong Hansard, 1894.

"Report of the meeting on 25 November 1895", Hong Kong Hansard, 1895.

"Report of the meeting on 8 December 1897", Hong Kong Hansard, 1897.

"Report of the meeting on 26 September 1901", Hong Kong Hansard, 1901.

"Report of the meeting on 27 February 1902", Hong Kong Hansard, 1902.

"Report of the meeting on 31 July 1903", Hong Kong Hansard, 1903.

"Report of the meeting on 20 October 1930", Hong Kong Hansard, 1930.

Notification No. 98, Hong Kong Government Gazette, 15 October 1859.

Notification No. 12, Hong Kong Government Gazette, 14 July 1860.

Notification No. 404, Hong Kong Government Gazette, 27 September 1890.

Books, Articles, and Other Sources "The New Pokfoolum Waterworks", *The China Mail*, 13 July 1878.

「清淨局敍會」, 香港華字日報, 1910年1月4日。

Chadwick, Osbert. Peak Drainage and Water-supply [electronic Resource].HongKong:S.n.,1889.http://find.lib.hku.hk/record=HKU_IZ51524275540003414, viewed on 2January 2020.

Eitel, Ernest John. ed. *Europe in China*. Hong Kong: Oxford University Press, 1983.

Sir. Goodman, William Meigh. *Reminiscences of a colonial judge*. London: Kingsgate Press, 1907.

Guilford, C. Michael. A LOOK BACK : CIVIL ENGINEERING IN HONG KONG 1841-1941. *Journal of the Hong Kong Branch of the Royal Asiatic Society*, 37, pp.81–101., 1998.

Ho, Pui-yin. *Water for a barren rock : 150 years of water supply in Hong Kong*. Hong Kong: Commercial Press, 2001.

Lethbridge, Henry J., and Bruce. Shepherd. *The Hong Kong Guide, 1893*. Oxford University Press, 1982.

Lim, Patricia. *Discovering Hong Kong's cultural heritage: Hong Kong and Kowloon*. Hong Kong: Oxford University Press, 2009.

Stream of Memories, 2010, Water Supplies Department, https://www.wsd.gov.hk/filemanager/common/pdf/stream_of_memories.pdf, viewed 2 January 2020.

The British Dam Society. *The Reservoir as an asset*. London: Thomas Telford Publishing, 1996.

The Facts - Water Supplies, create date unknown, website of Water SuppliesDepartment,https://www.wsd.gov.hk/en/publications-and-statistics/pr-publications/the-facts/index.html, viewed 2 January 2020.

李偉明:《香港古橋:圖說古橋歷史與建築工程》,香港:商務印書館 (香港)有限公司,2014年。 馬冠堯:〈香港工程歷史的轉捩點 — 開闢大潭水塘的故事〉,載於馬冠 堯著,《香港工程考:十一個建築工程故事,1841-1953》,香港:三聯 書店 (香港) 有限公司,2011年。

鄭寶鴻編:《港島街道百年》,香港:三聯書店(香港)有限公司,2000年。