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Editorial Board

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Editorial

Constitutional capitalism in action? Planning and property rights in Hong Kong in *Leighton Property Company Limited and Lee Theatre Realty Limited v. Town Planning Board*

Lawrence Wai Chung Lai

The leading decision of the Court of Final Appeal (CFA) in *Leighton Property Company Limited and Lee Theatre Realty Limited v. Town Planning Board (Leighton)* is probably the most significant one it has made since July 1997.

The reason is simple. It addressed private property rights in land in relation to the *Town Planning Ordinance* (TPO) as a constitutional issue. In particular in connection with planning (zoning) restrictions laid down by the Town Planning Board under the TPO, the judgment refers to the *Basic Law* provisions as to private property rights under Article 6 and Article 105. Articles 7, 25, 27, 28(2) were also mentioned in the decision. The heart of the matter can only be fully grasped in light of the purpose of the *Basic Law* itself.

The fathers of the *Basic Law* surely intended (a) to establish a "highly" autonomous local government as a special place within the People's Republic of China; and (b) to preserve the economic and social "status quo" that prevailed in Hong Kong at the time of the Sino-British Agreement concerning the constitutional and political future of Hong Kong. These fundamental concerns are reflected, respectively, in the provisions of Article 2 and Article 5.

> Article 2 reads:
> "The National People's Congress authorizes the Hong Kong Special Administrative Region to exercise a high degree of autonomy and enjoy executive, legislative and independent judicial power, including that of final adjudication, in accordance with the provisions of this Law."
>
> Article 5 reads:
> "The socialist system and policies shall not be practiced in Hong Kong Special Administrative Region, and the previous capitalist system and way of life shall remain unchanged for 50 years."

Article 5 is particularly significant as it expressly constitutionally protects "capitalism" (and that is why it can be argued that Hong Kong is now in an age of *de jure* "constitutional capitalism" (**Lai 2002a, 2002b**)). While

the concept of a "capitalist system" is open to interpretation, the fact remains that Article 5 is a unique example of constitutional provision for a specific economic order. Most countries' constitutions neither prescribe nor forbid any particular economic system. The "previous capitalist system" provision in Article 5 of the *Basic Law* of Hong Kong is a significant exception[1]. The Constitution of the United States of America, a textbook example of a capitalist society, does not have any reference to safeguarding any form of economy, not to mention "capitalism", a concept that sprang up in the 19 Century. It clearly insulates Hong Kong from Article 15 of the Chinese constitution, amended in March 1993, which provides for "a socialist market economy".

The spirit of Article 5 is given more specific meaning by Article 6 and Article 8.

> Article 6 of the *Basic Law* reads: "The Hong Kong Special Administrative Region shall protect the rights of private property in accordance with the law."
>
> Article 8 of the *Basic Law* reads: "The laws previously in force in Hong Kong....shall be maintained, except for any that contravene this Law, …..".

Legal opinion in Hong Kong, until the *Leighton*, was that the town planning and urban renewal legislation was constitutional. The expression "in accordance with the law" in Article 8 has often been advanced to suppose that the "protection of private property" is qualified. Thus, private property rights are always qualified by "the law" (namely ordinances in force, such as the TPO). This view further relied on Article 105, which expressly provides that property can be subject to "lawful deprivation" provided compensation "according to the real value of the property" is paid. This line of argument was considered by an author (**Lai 2002a**) as problematic in three respects.

> "First, the overriding concern of Article 6 should be the protection of private property. If "the law" relating to town planning affecting private property effectively deprives rights [of owners] without compensation, as in the case of down zoning, such law obviously compromises [or] contravenes the Basic Law. The expression "according to the law" is a typical phraseology in Chinese national law, which is a continental law system. It denotes and emphasizes both due process (i.e. the opposite of arbitrary exercise of judicial power) and specific pieces of legislation. The point, however, is that the specific piece of legislation must not contradict the general spirit of the Basic Law." (**Lai 2002a: 219**)
>
> "Second, the *Basic Law* stresses compensation, which is clearly

[1] Other exceptions are the Spanish constitution of 1978, which guarantees "freedom of trade within the scope of a market economy" and the Swiss constitution of 1874, which guarantees the freedom of commerce and industry.

absent from the *Town Planning Ordinance* where it deprives rights of the landowners by down zoning or Comprehensive Area designation. It may be contested that "deprivation" means nullification of the entire property, as in the case of resumption, while statutory planning merely attenuates certain rights. This is a dangerous suggestion as "attenuation" could be so strong that in effect the whole estate is devoid of its value and hence equivalent to "deprivation." (**Lai 2002a: 219**)

"Finally, government taxes "betterment" in connection with lease modification for permitting using land for a higher-value purpose but does not compensate down zoning. This kind of asymmetry can hardly be said to be fair." (**Lai 2002a: 219-220**)

Now the CFA has dealt with the first two points mooted by this author. It has clarified the meaning of "according to law" and the question of compensation in Article 105. The former means property rights are to be "guaranteed by clear and accessible laws" and, the judgment continues:

"30….That phrase and similar phrases such as "prescribed by law" and "according to law", appear in numerous Articles of the Basic Law and the Bill of Rights. It is well-established that they mandate the principle of legal certainty, requiring the subject-matter of the Article to be regulated by laws which are accessible and precisely defined. It follows that the phrase introduces another aspect of protection: Property rights are to be guaranteed by clear and accessible laws, and not, for instance, left to uncharted administrative discretion."

"35. Neither does the fact that Article 105 makes no provision for compensation for interference with land short of expropriation have any present relevance. Conferment of a right to compensation in deprivation cases does not diminish the protection conferred against other forms of interference with the right to acquire, use, dispose of and inherit property."

However, the point about asymmetry between a betterment levy by way of a lease modification premium and the absence of a reverse premium to lessees due to downzoning was not considered in *Leighton*, which is thus silent on Article 5 (capitalism). This is lamentable as a foundation of capitalism (Article 5) is the freedom and privity of contract. Land has been sold on terms dictated by the government to lessees as commodities in an open market. This means that the state is breaking its own covenant regarding land uses and built forms when it unilaterally imposes a zoning regulation under TPO that takes away some rights under the government lease. In any case, town planners in government should in their practice give due consideration to private

property rights and seriously examine if their "regulatory taking" power under TPO may violate private property rights (**Lai 1997, 2002a, 2002b**) in light of *Leighton*. It remains to be seen how the application of the refined and extended "principle of proportionality" now required by the CFA will bring in a new mode of operation for the Town Planning Board or, looking at the reality behind the operations of the Board, the Planning Department.[2]

[2] Professor Stephen Davies pointed out, "The 'principle of proportionality' has always been in action. The judgment has added a further element in adjudicating the principle, namely "… a fourth step asking whether a reasonable balance has been struck between the societal benefits of the encroachment and the inroads made into the constitutionally protected rights of the individual, asking in particular whether pursuit of the societal interest results in an unacceptably harsh burden on the individual." It has also glossed the third step by stating that judgment will always lie over any decision "manifestly without reasonable foundation', in turn glossing that by noting "It is considered to be highly unlikely that Board decisions imposing planning restrictions arrived at lawfully and in conformity with the principles of traditional judicial review, would be susceptible to constitutional review unless the measures are exceptionally unreasonable." Finally, the judgment as to costs makes it clear that what was at issue here as far as the GFA was concerned was merely the key principle that TPB decisions need to give greater respect to existing property owners rights and cannot override them by administrative fiat, only by due process…"

LIST OF CASES

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Surveying & Built Environment

Saiwan Redoubt
Part I: A unique, intriguing but neglected and abused example of Hong Kong's military heritage

Stephen N.G. Davies[1], Ken S.T. Ching[2], Lawrence W.C. Lai[3]

ABSTRACT

In October 2015, during preparations for a University of Hong Kong undergraduate course, the remarkable structure of the original Saiwan Redoubt and the considerable extent of its subsequent modification since c.1930 was revealed. The modifications are a palimpsest of colonial Hong Kong's changing defence system and the changing world of military technology in the first half of the 20th century. This unique defensive work – the first infantry Redoubt formally to be planned and built in Hong Kong – has not only hitherto been ignored, but has suffered from a complete lack of effective heritage protection.

KEYWORDS

Saiwan Hill, Lei Yue Mun Fort, Saiwan Battery, Defence planning, Battle of Hong Kong, obsolescence.

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INTRODUCTION

Each year, since 2012, the Department of Real Estate and Construction in the University of Hong Kong's Faculty of Architecture has taught an introductory course on Hong Kong's military built heritage and the possibilities of better approaches to conservation through the property rights theories informed by the works of the late Ronald Coase (1910 – 2013). The course features field trips to examples of Hong Kong's grossly neglected – and in some cases wilfully abused – Second World War military built heritage as an essential teaching and learning tool. For the 2015-2016 academic year the course coordinators, Professors Lawrence W.C. Lai and Daniel Ho, decided to include Saiwan Battery and Saiwan Redoubt in the list of field trips upon suggestion of the first author.

To ensure that the field trip would go well, a visit was undertaken to study the Battery and Redoubt on 17th August, 2015.[4] The field trip showed that the Redoubt was not in its original 'as built' state and that considerable research would be needed to understand the design and purpose of the original structure. An additional task would be to relate both original structure and its changes to the role of the Redoubt, especially in the Battle of Hong Kong, the only occasion on which Hong Kong's defensive system was tested in action. The first author was responsible for the relevant archival and documentary research.

The aim was therefore to try to discover as much as possible about the Redoubt as it was originally conceived and constructed. This would be battling the usual dearth of publicly available information about Hong Kong's defensive systems, especially such alterations and additions as were made to them in the years immediately before the Second World War and in the years from 1945 until the 1970s or 1980s. The Department has pioneered the use of aerial photographs and historical maps to help mitigate this shortcoming and these were the key documents sought.

The first objective was to find original plans (see **Figures 1, 2 and 3**).[5] These plans revealed two things. First, that the

[4] Those attending the visit were Professors Lawrence W.C. Lai, Daniel C. W. Ho, and Stephen Davies; and course tutor Dr. Holvert Hung; research student Mr Chan Yiu-hung and graduate Dr. Ken Ching; and Dr Ching's assistant chartered land surveyor Ms. Circle Yuen.

[5] It was easier (and cheaper) to order copies from the UK, which is where the key plans were sourced. The plans are WO78/5352 in 3 sheets. The same plans are held at Hong Kong's Government Record Office:
Map MM-0355-01 Sywan Hill Redoubt, 1895. MM-0355-1, 1895.
Map MM-0355-02 Sywan Hill Redoubt, 1895. MM-0355-2, 1895.
Map MM-0355-03 Sywan Hill Redoubt, 1895. MM-0355-3, 1895.

In addition there are the plans of the battery:
Map MM-0463 Hong Kong Defences, Sywan Hill, 1899, June 1899
Map MM-0464 Hong Kong Defences, Sywan Hill, 1900, February 1900

And there are three earlier area maps:
MM-0358 Survey of Part of Sywan Hill, 1887.
Map MM-0359 Survey of Top of Sywan Hill, 1885.
Map MM-0414 Cantonment of Sywan and the Lyeemoon, 1845.

Redoubt as it was originally designed and constructed was completely different to the structure that exists today. Second, that its original design was come upon in tandem with the development of the upgraded defence system for the eastern end of Hong Kong Island centred around the Lei Yue Mun Fort (**Figure 3**), including the new, originally artillery barracks complex between Lei Yue Mun Fort and the Saiwan Redoubt. There is an earlier contributory element to this developmental trajectory, which we shall touch on in the next sections.

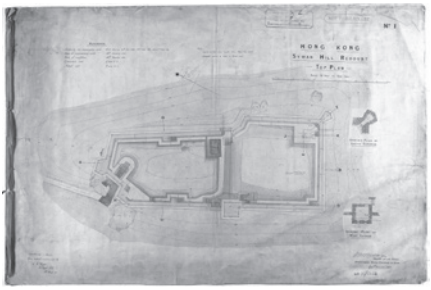

Figure 1: The 1895 plan of Saiwan Redoubt

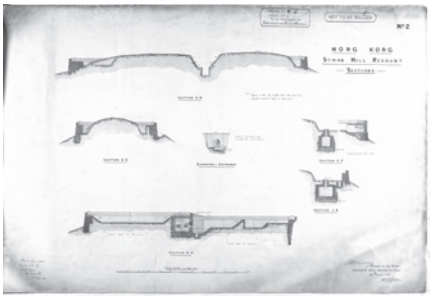

Figure 2: The 1895 profile plan of Saiwan Redoubt

Figure 3: Planning map for Saiwan Redoubt showing links with Lei Yue Mun Barracks and Lei Yue Mun Redoubt (Detail)

It should be noted that "Sywan", "Saiwan" or "Sai Wan" in Chinese means "West Bay". This would appear to be an error that appears on the earliest maps resulting from an inaccurate rendering of a spoken Cantonese toponym. Some early British maps also call what we now call "Chai Wan", "Chaiwan" or "Tsai Wan" (in Chinese "Firewood Bay"). It can readily be seen how the error occurred, since it needs to be remembered that most Hong Kong toponyms were gathered, by non-Chinese speaking or writing British surveyors, from mostly illiterate local inhabitants and were never written down in Chinese, only in their Romanized forms. These muddles were gradually sorted out after the Second World War and found definitive expression in the government published, bilingual *A Gazetteer of Place Names in Hong Kong, Kowloon and the New Territories* in 1960. Derivative toponyms such as Siu Sai Wan ("Little Chai Wan") and Sai Wan Hill are still used.[6]

[6] "Sai Wan Ho" (West Bay River) in the Shaukeiwan area is quite unrelated and refers

THE SAIWAN REDOUBT IN THE CONTEXT OF LOCAL HERITAGE RESEARCH

There are at least four "redoubts" that were in action during the December 1941 Battle of Hong Kong. They were: the Shing Mun Redoubt (**Lai et al 2011**), which fell on the early morning of 10 December triggering the abandonment of the Gin Drinker's Line; Devil's Peak Redoubt (**Lai et al 2002; Lai and Ho 2003**), which was part of the defenders' last foothold on the Mainland and was evacuated during the 17th December; and Lei Yue Mun Redoubt, scene of a hard fought battle during 18th and 19th December, and Sai Wan Redoubt nearby, which fell before midnight on 18th December, after the Japanese landing on Hong Kong Island. The two redoubts on the mainland have been categorized as Grade 2 (item nos. 503, 463) by the Antiquities Advisory Board (AAB). Sai Wan Redoubt has been entirely ignored.[7] As a contribution to heritage conservation planning and history, this paper is a detailed analysis of that neglected Redoubt, informed by archival materials obtained from the UK National Archives; Public Records Office of HKSAR Government; Japan Center for Historical Records; the maps and aerial photographs listed in the list of references, sourced from the Survey & Mapping Office of the Lands Department, and the Geography Library, Department of Geography, University of Hong Kong, and other primary and secondary sources available at the University of Hong Kong Library, particularly the microfilmed Colonial Office record series CO129 and the invaluable, searchable index prepared by Dr Elizabeth Sinn, and the growing literature on Hong Kong's military history. Where long out of print, 19th century British fortifications literature is concerned, the authors owe a signal debt to the Internet Archive.

THE SAIWAN REDOUBT IN THE CONTEXT OF LATE 19th CENTURY MILITARY SCIENCE

The original Redoubt is remarkable for a permanent fortification work of its date. It meets fairly well the standard definition of a redoubt, "a small enclosed work that does not have flank defence from its own parapet", but differs from both older and its own more advanced contemporary exemplars in a number of ways[8] Perhaps most important, it reflects only slightly a sense of the changes in military science that had swept through British military thinking in the years since the Crimean War (1853-1856) in consequence of the breech-loading rifle, the machine gun and, above all, the breech loading, rifled, shell firing gun that had transformed the destructive power and range of artillery.

The design seems almost to hark back to the enunciations of the standard British

to a small bay on the west side of Aldrich Bay into which ran a stream from the slopes of Mt Parker.

[7] See http://www.aab.gov.hk/en/historicbuilding.php accessed on 22 September 2016

[8] For the definition see the glossary at http://www.victorianforts.co.uk/gloss.htm accessed on 26 July 2016.

manual for field fortifications – dating from 1834 – by J.S. Macaulay, a Royal Engineer officer (**Macaulay 1860**).[9] However Saiwan Redoubt seems to break most of Macaulay's design rules insofar as, in enclosing an only slightly changed hilltop, its available interior space was drastically reduced, thereby simultaneously creating a very large defensive perimeter (very roughly the defensive parapet was (and is) c.330m long as compared to Macaulay's recommended 146m) whilst sharply reducing the possible manoeuvring space for the defending garrison.[10] As we shall see, it is possible that through Macaulay's rules we can decode one of the most distinctive features of the Saiwan Redoubt: its two, largely separate parts.

However if, as hypothesized below, the Redoubt we see in the 1895 plan and on the ground had started life as the planned Keep in 1844/45 (see next section), then some at least of the weaknesses identified may be a function of a 'best fit' adaptation, not a poorly thought through complete design intention.

If the design looks backwards, it is notable that it also ignored completely the most advanced contemporary thinking. Conspicuously missing, for example, are any casemates to which the defenders could retreat under the onslaught of heavy artillery bombardment. The best contemporary thinking was exemplified in the small, inexpensive designs promoted by Lieutenant-Colonel Sir George Sydenham Clarke, epitomized in the Grange and Woodlands Redoubts near the village of Twydall east of Chatham, UK, the headquarters of the Royal Engineers, known collectively as the Twydall Redoubts.[11] These had been built in 1885 and incorporated the lessons of the Balkan Wars and the specific examples of the Plevna Redoubts.[12]

It follows that as designed and built, Saiwan Redoubt was a unique and extremely interesting structure, full analysis of the purpose and manner of operation of which should cast significant light on the British defence planning mentality in late 19th century Hong Kong. This casts in high relief the scandalous neglect to which the Redoubt has been subject over the last half-century and more, a period during which it might have been easier to source and rescue relevant archival material and commission relevant archaeological work, than is the case today.

[9] The first edition was in 1834 (London: James Fraser), here we have consulted the 4th edition (London: Bosworth & Harrison, 1860).

[10] For Macaulay's rule see ibid, 25-30.

[11] For Clarke's thinking see *Fortification: Its Past Achievement, Recent Development and Future Progress*, London: John Murray, 1890 – here we refer to the 2nd ed. same publisher 1907. For his thoughts on infantry redoubts see p.156 passim. What is interesting is that Clarke was Secretary of the Colonial Defence Committee from 1885-1892, the very period in which the Lei Yue Mun defences were first planned.

[12] for the Twydall Redoubts see http://www.victorianforts.co.uk/pdf/datasheets/grangewoodlands.pdf accessed on 26.7.2016. For the Plevna Redoubts see **Murray (2013)**, Ch.2 and **Barry (2012)** Ch.15.

THE SAIWAN REDOUBT AS ORIGINALLY PLANNED

The oldest record we have of a planned fortification on Sai Wan Hill (西灣山, 196.9m), the highest hill in the Shaukeiwan/Chaiwan region of Hong Kong Island, is shown on the earliest (1845) large scale British map of the area.[13] On that map the top of the hill has a shaded area and the remark, "Proposed site for The Keep coloured purple" (**Figure 4**).[14] What might this have meant?

Figure 4: 1845/46 map of the top of Sai Wan Hill showing planned Keep

Here we may turn again to Macaulay. In Chapter IV of his manual, where he is dealing with the detail of constructing temporary field fortifications – in essence structures of earth, wood and stone – in relation to temporary barracks for troops, Section IV elaborates on how the quarters or barracks for the defenders are to be defended. Macaulay begins this section by noting,[15]

"The most certain mode of giving confidence to the defenders, and consequently increasing the strength of a work, is to secure to them the means of retreat; to offer them a last place of refuge, in which they may obtain terms of capitulation, honourable in proportion to the courage displayed in their previous defence."

This last refuge Macaulay refers to as a 'keep', distinguishing it by its make-do construction and small size from the more elaborate 'blockhouse' and more permanent 'redoubt'.[16] We also learn

[13] UK National Archives WO 78/472 Hong Kong. Sywan Cantonment and Lyemun (Lei Yue Mun) showing soundings. Reference table. Scale: 3 inches to 400 feet [1:1,600]. Compass indicator. Copied from original maps of 1844-1845; signed by Lieutenant T B Collinson, Royal Engineers, May 1846, and by Edward Aldrich, 18 July 1846. Inset to item (1) map showing the position of Green Island relative to Kowloon and originally produced to accompanying report number 198, 18 July 1846; this report is not filed with these maps and HKPRO Map MM-0414 Cantonment of Sywan and the Lyeemoon, 1845.

[14] The map is authoritative, but Collinson also drew ten elegant panorama sketches of Hong Kong. In the one looking across Lei Yue Mun from the Chinese mainland he identified Sai Wan Hill as *"The Upper Lyemoon Hill 637 ft. (The Keep)"* – see UK National Archives CO 700/HongKongandChina2, "Ten outline Sketches of the Island of Hong Kong, to accompany the Ordnance Map of Hong Kong. Royal Engineers Office, Hong Kong, 27th August, 1846." The authors are indebted to an anonymous reviewer for drawing their attention to this.

[15] **Macaulay (1860: 103)**

[16] **Macaulay (1860: 106, 155 & 163)**

from Macaulay that such keeps would be the final, covered structure within a system of outer fortified entrenchments. It follows that what is envisaged on this map, which shows the layout of the short-lived Saiwan Barracks on the slope below, is a fortified hilltop, dominating the surrounding terrain, to which the soldiers in the barracks could retreat should the barracks come under attack, and which they could defend until relief reached them.

We can infer from this that the earliest defensive thinking of the British, with respect to Saiwan Hill, was almost certainly orientated around potential threats from insurrectionary activity by the local communities of Chaiwan and Shaukeiwan and, as or more likely, from an assault by the plentiful 'pirates', who may or may not have been encouraged by the Qing authorities.[17] It is worth noting, in closing this review of evidence of very early awareness of the local tactical importance of Saiwan Hill and of the need to fortify it, that at the base of its long northern slope, in what the map calls Akoonom Bay (Ah Kung Ngam, 阿公岩) another annotation reads, "Proposed site for a dockyard". It is therefore at least possible – there are no extant documents that refer to whatever plan this may have been – that rather grander plans for the Shaukeiwan/Chaiwan area were once envisaged and that the army barracks and Saiwan Hill Keep may have been tied in with the possible development of a naval dockyard close to the key, deepwater passage from Victoria Harbour to the South China Sea.

From that early indication until half a century later Saiwan Hill would appear to have been left undeveloped. The next signs of change would appear to have coincided with a determination more fully and effectively to fortify the Lei Yue Mun, in the slightly hysterical atmosphere of the late 1880s and a fear of possible designs on Hong Kong by France and Russia.[18] In 1885 the Royal Engineers were tasked with producing a highly detailed survey of the top of Sai Wan Hill in the context of new defence planning. At this point, as we can infer from one of the two plans of the hill's summit that resulted, which had the title of *Hong Kong Defences: Survey of Top of Saiwan Hill*, a clear plan was in gestation that would aim to place a permanent fortification on the summit of Sai Wan Hill, the plan being explicitly referred to in correspondence between Hong Kong and London in 1887.[19]

[17] **Eitel (1895: 202-203)**. A dozen years later, in a letter to Sir John Bowring from Lord Panmure, Secretary of State for War dated 18th November 1857, Lord Panmure specifically refers to "the interior defence of the settlement (i.e. Hong Kong) against an insurrection of the inhabitants" – CO129/66, p.304.

[18] **Kwong and Tsoi (2014)**, Ch.4.

[19] CO129/325, p.337v – a letter from Frederick Stewart, Acting Colonial Secretary to the War Office. For the map see UK National Archives MR 1/556, Hong Kong. Two plans showing defences and contours: (1) 'Survey of top of Sywan Hill'; (2) 'Survey of Part of Sywan Hill'. Scale: 1 inch to 30 feet. Compass indicators. (1) Signed by Major E M Lloyd, Royal Engineers (on behalf of the absent commanding officer). (2) [Surveyed by] Corporal D W Watt, Royal Engineers; signed by Colonel A F Storer, Commanding Royal Engineer, China, June 1887. Inset to item (1): 'Site Plan': map showing the location of Sywan Hill relative to surrounding hills

The Redoubt that was eventually built c.1895 stood above what are known as the Lei Yue Mun Barracks (鯉魚門軍營), the first elements of which, blocks Nos 18, 20 and 21, as they later became called, had been constructed between 1890 and 1895 to provide accommodation for the garrison of the artillery units based at Lei Yue Mun.[20] (**Bard 2015: 123**) It is evident when standing on Saiwan Hill that it not only overlooks Lei Yue Mun and the fort complex there, but also commands a clear view of Chai Wan (the bay to the south) and all the inner Tathong Channel approaches to Lei Yue Mun, as well as dominating the land access to Lei Yue Mun from the south and east, whether along the coast or over Chai Wan Gap (柴灣坳). Ensuring that the hill was adequately defended would have been an important flank protection for the new barracks, and also for Lei Yue Mun Fort (鯉魚炮台) as, in 1844/45, would the planned Keep have been a protection for the soldiers of the Saiwan Barracks. This would explain why the earliest references to the first actual structure on Saiwan Hill are co-terminus with the completion of the Lei Yue Mun Redoubt, now the Hong Kong Museum of Coastal Defence, in 1886.[21] In short, the Redoubt was the completion of a defensive plan for the Lei Yue Mun area before the Convention of Peking, guarding its south-eastern approaches and this can be seen from the contemporary planning map (**Figure 3**).[22] We can call this 'eastern defence system A' and contrast it with subsequent development (see **Figures 5a, 5b and 5c**).

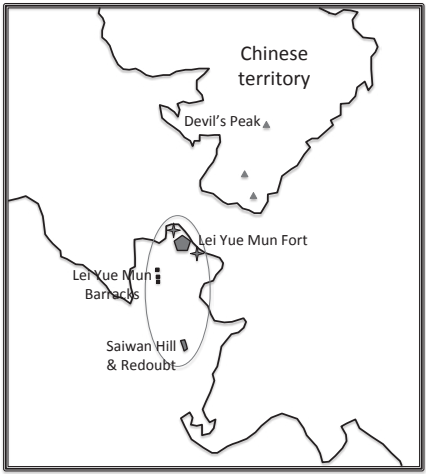

Figure 5a: Eastern Defence System A, 1887-1899

and the coastline; scale: 4 inches to 1 mile [1:15,840]; compass indicator.

[20] We have been unable to find decisive evidence as to when construction of the Redoubt began or when the Redoubt was completed and put into commission. The date 1895 is an inference from extant plans.

[21] For the 1886 date see **Kwong and Tsoi (2014: 42)**, citing the findings of a joint Royal Engineers/Royal Artillery Committee of that year.

[22] National Archive UK, WO 78/5352, HK – Sywan Redoubt Site Plan, 24th December 1895. See also the discussion in **Kwong and Tsoi (2014: 40-42)**.

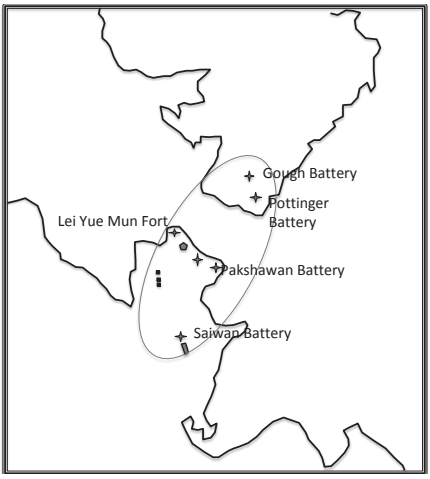

Figure 5b: Eastern Defence System B, 1900-1906

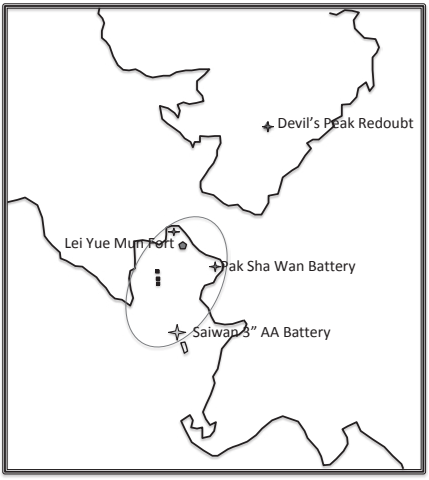

Figure 5c: Eastern Defence System C, 1941

The thinking behind defence planning at the time was predicated on the risk of an attack by a European power launched from the sea. Whilst the focus was obviously on preventing an enemy force penetrating the Lei Yue Mun narrows, no planner would have overlooked a probable landing by enemy marines or infantry in Chai Wan aiming to neutralize the harbour defences by land assault. Indeed we know from exercises conducted by the Hong Kong Volunteer Defence Corps in 1895 that just such a possibility was anticipated.[23] Saiwan Redoubt would have been a key position for both monitoring the launch of any such effort and in frustrating its achievement.

The Redoubt is c.1100m from Lei Yue Mun fort, so well within the recommended distance between fortified infantry positions in contemporary military fortifications thinking.[24] This assumed infantry defenders in each position defending a radius of action around their respective defended localities of c.1100m, with the defended localities being up to 2286m apart. Interestingly, therefore, the distance of Saiwan Redoubt from Lei Yue Mun is approximately the defended radius for a redoubt one finds in Macaulay: the thinking of a generation earlier.[25] In fairness, of course, what dictated the distance in Hong Kong was topography rather than weaponry.

With the British annexation of the New Territories in 1898, a more comprehensive defensive plan for the eastern entrance to Victoria Harbour was made possible. As we can see from original plans, the first idea in 1898 involved placing a 6" gun on the top of

[23] *Reports on the Hong Kong Volunteer Corps*, No. 22/95, p.317. The exercise was on 3rd November 1894.

[24] Clarke commended 2,500 yards (2286m) between defended positions, though he was assuming machine gun positions – **Clarke (1907: 158)**.

[25] **Macaulay (1860: 50)**

Devil's Peak, a 9.2" gun where Gough Battery was built, two 9.2" guns where Pottinger Battery was built and two 6" guns at a new battery just below Saiwan Redoubt.[26] By 1904, after revisions, the result was the completion of Gough Battery with two 6" guns, Pottinger Battery with two 9.2" guns, Pak Sha Wan Battery with four 12 pdr QF guns and Saiwan Battery with two 6" guns.[27] In Lei Yue Mun Fort there were still two 6" and three 6 pdr QF as well as a 9.2" RML gun and a 6 pdr QF in the Reverse and a 9.2" RML and two 6 pdr QF in the West Batteries (see **Figure 5b**).[28] The plans for Saiwan Battery, in their conspicuous indifference to the presence of Saiwan Redoubt, suggest that in some sense the only five year-old Redoubt was already no longer being seen as relevant to the defences or, at least, that its role vis-à-vis the new battery was a merely contingent one. Insofar as it was relevant, it would still have been to act as a lookout for and to cover the battery against land assault.

However, in the completed scheme for the mainland side of Lei Yue Mun there is a puzzle that may help solve one of the adaptations to the original Redoubt, namely the evidence of added structures on the top of the caponiers. It must be said immediately that these have not been dated. The puzzle is a structure of unknown purpose between the Devil's Peak Redoubt, to be completed in 1914, and Gough Battery. This concrete structure, now a roofless ruin, has two significant features. First, it stands at almost exactly 645' (196m), which is within 5-6m the height of the top of the two caponiers at Saiwan Redoubt. Second, it is orientated with its axis of observation approximately 1900-1950. That is, it looks directly at Saiwan Redoubt. There is thus a possibility, in the short period (1899-1911) during which Saiwan Battery's 6" coastal defence guns were operational, that the Redoubt was adapted to form one end of a baseline range-finding system and that one of the structures may have been added to a caponier for that purpose. Research on this issue is still continuing since in general baseline range finding was an American, not a British practice.

That the Redoubt may have been used at some stage for range finding may be evidenced by a pillar, sited in the middle of the north lunette, which has a metal bracket on its top suggestive of a fixing for an instrument. This pillar closely resembles the British standard Mk 1 depression rangefinder pedestal of the mid-1880s, designed to accommodate the standard Watkin Position Finders of the era.[29] This pedestal is also the subject of on-going enquiry (see **Figure 20**). However, a plan from 1904 produced towards the

[26] This first plan is part of UK National Archives WO 78/4142 dated 22nd November 1900, has the survey dated December 1898 and signed off by Colonel H. Elsdale on 4th Feb 1899.

[27] In 1909/1910 Pak Sha Wan was upgraded to three 6" BL guns, see WO 78/5351. The authors are indebted to an anonymous reviewer for this clarification. For Saiwan Battery National Archive UK, WO 78/4137, HK – Sywan hill, proposed battery (bty) for 2 x 6" BL guns, 2 sheets, Feb 1900, 10' = 1". The plans are actually dated June 1899.

[28] The complete weapons inventory is for the entire complex of the Lei Yue Mun Fort, which includes the Redoubt's outlying batteries.

[29] See http://www.victorianforts.co.uk/CoastDefence2.htm accessed on 26.7.2016.

end of a long, thirty year long wrangle over military lands between the colonial administration and the War Office, also has a position finding station on the hill slope below the Redoubt to the east, at about 500'.[30] So what role the Redoubt may or may not have played as a base for range finding for either the 6" battery or the later mobile howitzer battery placed close east of the Lei Yue Mun Barracks is uncertain.

In any case, a secondary function may have been to provide a refuge for battery personnel should a major assault be pressed home and threaten to overrun the guns. However, space would have been tight. It would seem that even from the outset the Redoubt had been designed to be manned by no more than an infantry section armed with small arms and one machine gun.[31] By 1915, when the Devil's Peak Redoubt had been completed on top of Devil's Peak, but Sai Wan Battery had been decommissioned, it seems the Redoubt was abandoned (see **Figure 5c**).

Rapidly redundant though it may have been what did this original Redoubt look like? How was it manned? How was it defended?

The basic layout and entrance

The Redoubt is not a simple rectangle on the hilltop but can be divided into three distinct elements: the Northern Section, the Southern Section and the Central Communications Cross-Trench (**Figure 6**). The Redoubt was originally 224.4' (68.4m) long and 103' (31.4m) wide at its maximum. The centre line is orientated roughly 338 degrees/158 degrees or NNW/SSE, which for convenience we shall describe it in the simpler terms of north/south.

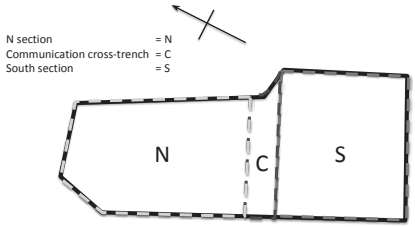

Figure 6: Basic three-part structure

The northern end is an elongated, interrupted, irregular pentagon with a spread base. At the northern point is an asymmetrical, pentagonal lunette that offers an observation point and covering fire for the battery below as well as for the gate and its approaches.[32] To the southwest of the gateway, providing additional covering fire for the entrance and its approaches, there is a demi-bastion. From the north lunette and its extension in a traverse to the northeast corner and also in the other direction from the demi bastion the

[30] CO129/325, p.348.

[31] These are inferences from **Kwong and Tsoi (2014: 62-63)**. A British Army infantry section in the late 19th century, following the Cardwell reforms but before the 1913 reform to the double-company system, was around 25 men. The organizational structure of a foreign service battalion was of eight companies or around 100, each divided into two half-companies of 50, each half-company forming two sections of 25 – see **Harold E. Raugh (2004: 182)**.

[32] Today in the centre of the bastion is the rectangular pillar with metal fittings that clearly at some stage carried some sort of instrument or weapon, which we infer was probably a range finder.

perimeter walls trend slightly east and west of south to complete the irregular pentagon, with the wider base forming the upper, gallery walkway part of the communications cross trench.

The communications cross trench forms a marked break between the northern and southern sections that, as described below, are on different levels with no direct access from the gallery walkway of one to the gallery walkway of the other. At the west end of the cross trench is the West Caponier, the command heart linking the two ends of the Redoubt. The ensemble forms the lower northern section of the Redoubt (**Figure 6**).

South of the cross trench is the higher, southern part of the Redoubt, which is almost square in plan. At the southeast corner there is a projecting Southeast Caponier and the Redoubt's water supply (see below). Apart from a partial demi-bastion in the northeast corner, the Southeast Caponier and the southern projection of the West Caponier in the northwest corner of the southern section, the three-sided perimeter wall of the southern section is uninterrupted (**Figures 6 and 7**).

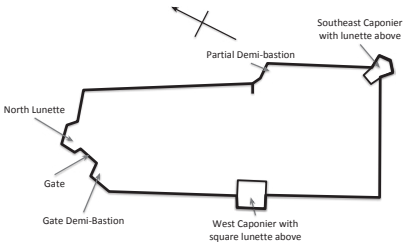

Figure 7: Actual shape and main fortified elements

When first built the Battery was approached from the north by a single track zig-zagging steeply uphill over its final stretch. Lower down at around 400' it forked, the western path leading down to the Lei Yue Mun Barracks, the eastern path running along the eastern boundary of the barracks until it met a complex of paths coming uphill to the barracks from the Lei Yue Mun Fort and Ah Kung Nam areas. (See **Figure 3**).

The northwest traverse of the perimeter wall between the demi-bastion and bastion was pierced at the mid-point of its foot by an arched gateway, now blocked. This was approached by a paved footpath from the north – after 1904, a footpath connecting only with Saiwan Battery – that ended 18' below the internal gallery walkway and approached the doorway up 24 stairs, with each an 11" step with a 9" riser. The gateway, 7.08' high and 5' wide was blocked by a door of 3" thick teak faced with 1/8" thick iron sheeting and pierced by four 6" x 1.5" loopholes for observation and small arms fire. The gateway gave into an entrance stairway with a further 16 stairs to the level of the interior gallery walkway, representing in the total of 40 stairs for a nearly 20' change in level from the end of the path in a short horizontal distance of 36', a slope of nearly 300. It follows that in the northwest corner the internal gallery/walkway looped around the internal entrance stairs. It is not known whether the opening was edged with railings. To the right rear of the entrance stairs as one mounted them, was a set of five stairs leading up to the parapet walkway (**Figure 11**).

The total enclosed area of the Redoubt, exclusive of the subsequently constructed vehicle ramp in the northeast corner to be described below, was and remains, 1608 sq.m. (17,308 sq.ft.).

The rather curious two-section design of the Redoubt is possibly explained by standard thinking about Redoubt perimeters as noted above in relation to Macaulay's ideas. That is, by dividing the longer, north to south walls into two, with the central sections of the perimeter wall without a walkway but topped by broken glass chevaux de frise, the Redoubt design went some way towards conformity with standard thinking. It is also faintly possible that the Keep envisaged in 1844/45 had been a smaller, square structure confined to the higher, southern part of the hilltop, with a NW Caponier to mirror the SE Caponier and give 3600 fields of fire (**Figures 8 & 9**). Had that been the case, then the larger Redoubt, with its curious two level, two section layout may contain a trace memory of earlier plans that had been adapted to a new, enlarged purpose.

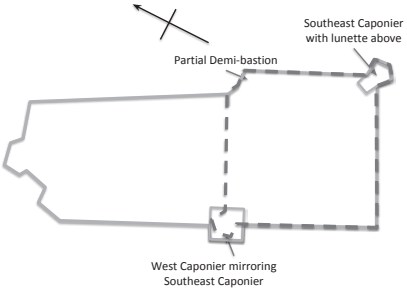

Figure 8: A possible design intention for The Keep, 1844/45

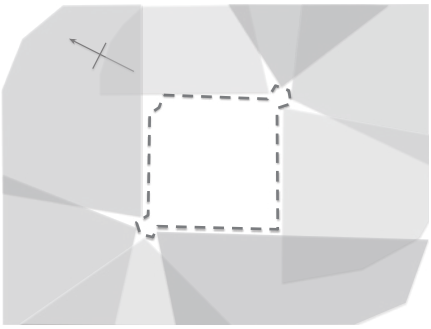

Figure 9: Fields of fire from protected positions of the hypothesized Keep

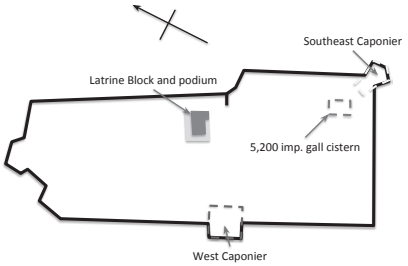

Figure 10: Principal internal structures

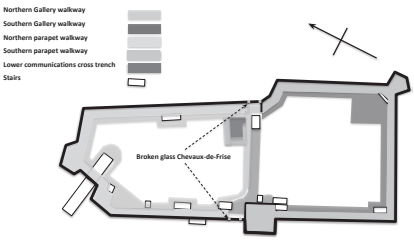

Figure 11: Gallery walkways, parapet walkways, stairs to parapet walkways and lower communications cross trench

The perimeter wall

The structure is bounded by a concrete perimeter wall, 4.67' thick at the foundations, dug in 5'-7' below surface level. The wall is 7.42' thick above ground and between 12' (3.66m) and

14' (4.27m) high. It was built around a low hill top, now divided into two by the central trench, with the southern part now 6.56' higher than the northern, the two highest points being 100' apart on the NNW/SSE line.[33] The hilltops were evidently levelled to create two, gently rounded mounds as well as cut away at the sides for gallery walkways, internal structures and the perimeter wall and, as noted, divided from each other by the deep communications cross trench to be described below.

The perimeter wall was capped by a concrete parapet walkway on average about 3.75' (1.14m) wide around the whole perimeter wall, though on two different levels (see below). The parapet walkway had a low, 3' (0.91) high, 2.24' thick parapet, without crenellations or firing embrasures. This still exists. A beaten earth internal communications gallery walkway ran 6' below the parapet walkway around the entire perimeter wall, though on two different levels as will be described below. This internal gallery walkway has now been filled in except in part of the southeast corner. The internal gallery walkway of the northern part was joined across the centre of the Redoubt by a deep communications trench on two levels (see **Figures 2 & 12**).

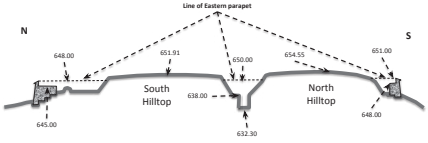

Figure 12: Cross-section of Redoubt from end of North Bastion to South Parapet showing levels in Feet

The northern section

On the Redoubt's northern side, after the demi-bastion, doorway and lunette, a short 23.4' section of perimeter wall runs roughly eastwards to the northeast corner. From there the wall runs south for 120', though angling slightly southeast, to form the eastern wall of the northern part of the Redoubt. Half way along this long eastern wall, a set of ten steps mounts from the gallery walkway to the parapet walkway. At the southern end of this section of the perimeter wall the parapet walkway ends and the gallery walkway splits around the latrine block to enter the communications cross trench, which it crosses to form a complete loop around the northern hilltop. Beyond the latrine block and the end of the parapet walkway, there is a small open area with a drain for rainwater. On its southwest corner there is a set of steps down to the lower communications trench leading to the West Caponier. Beyond the end of the parapet walkway, where there is a gap over the drain area, the eastern wall curves outwards to a sort of demi-bastion that forms the northeast corner of the southern section of the Redoubt.

The north section's gallery walkway is at a different level to that of the southern part, the two walkways being quite separate, with the only access point from one to the other being in the area of the West Caponier. An important feature is its pattern of slopes.

[33] It does not appear that the concrete was reinforced.

For effective drainage purposes the walkway is at its highest at the top of the entrance stairs. It gradually slopes away along the northeast traverse, runs level along the east wall before sloping down 2' in the c.103' width of the centre of the Redoubt as it crosses the central trench, where it turns north and remains level until it reaches a set of four steps just short of the entrance area. The drainage system ran in two directions. From the doorway eastwards a concrete drain runnel on the perimeter wall side of the gallery walkway drained east and south to a drain at the east end of the crossway along the central trench. A supplementary drain flowed east from the west and north edges of the platform on which the latrines stood, which also received the run-off from the latrine block roof. From the south side of the doorway the drain runnel ran south to a drain just north of the West Caponier. The profile drawings show the gallery walkways sloping outwards to drain into the drain runnels where these existed. On the cross walkway the slope was pitched to ensure drainage into the lower part of the cross trench, on which more below (**Figures 10 & 13**).

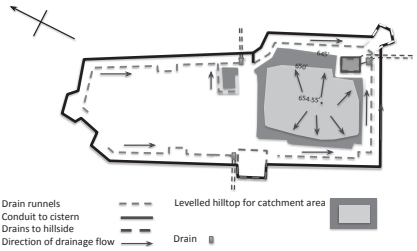

Figure 13: Drainage System for rain water showing levelled off southern hill top sloped west to east

The communications cross trench system is more fully described below. Like the gallery walkways, it has been completely filled in. It is not clear whether the trench exploited a natural division of the hilltop's landform, or whether the cross trench was cut through. From earlier maps, the latter seems probable. The north side of the 22' deep trench formed a 5' wide pathway at the general level of the whole interior gallery walkway and served as the crossing point in the middle of the Redoubt for the gallery walkway around the northern part of the Redoubt. At the crossway's eastern end were the 'L'-shaped latrines, the site of which is now entirely buried (**Figure 10**). These were a brick, tiled roof structure set onto a concrete floored podium in a cutaway in the southeast corner of the southern hilltop and entirely below parapet level. Unlike with the rainwater drains, no drainage is indicated for the latrines. We know from their plans, improbably on the planning map for the Redoubt, that they used night soil buckets (known in the British military as 'honey buckets') and so depended on the regular collection and sale of night soil by Hong Kong's flourishing night soil collection concerns.[34] In action it is to be supposed that the nearby drain to the

[34] The Chinese term is 倒夜香. 'Honey bucket' has its origins in North American usage c.1914 according to **Eric Partridge (2015)**. For the first regulations of what was by repute a very profitable business, see Hong Kong Government Gazette, vol. XX, No. 40, notice No. 152 of 2nd October 1874, Rules and Regulations made under Ordinance No.9 of 1867 to make further provision for the maintenance of order and cleanliness in the Colony of Hong Kong.

eastern hillside would have been used for getting rid of waste.

The southern section

From where the eastern wall steps east by some 20' in the area of the cross trench, the perimeter wall runs roughly south to the area of what the plans call the Southeast Caponier.[35] This was evidently planned as one of the most important defensive structures in the Redoubt. It projects from the southeast corner of the perimeter wall in a narrow, single level, symmetrical pentagon with four faces outside the perimeter wall, the fifth face being its junction with the main fortification. The top of the caponier was a level continuation of the parapet walkway and its edges were surmounted by the parapet to form a lunette similar to that on the north end. The interior was 6.83' high and the floor was 1.83' below the level of the gallery/walkway, the entrance to the caponier being down two steps and along a short, 6' long tunnel. Inside the caponier the NE face had two firing loopholes, the SE face one, the SSE face one and the SW face two to make a total of six. These covered the east and south perimeter walls and approaches, and the southeastern approaches to Saiwan Hill (**Figure 14**).

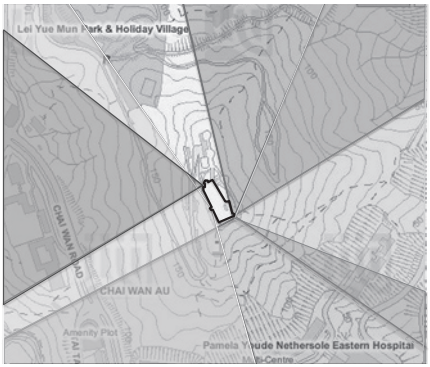

Figure 14: Arcs of fire covered from fully protected firing loopholes

Evidently the Redoubt was expected to be manned on a continued basis, as the provision of a properly built latrine and a water cistern suggest (**Figure 10**). The latter was a feature of the area immediately outside the entrance to the Southeast Caponier. It was constructed as a buried, concrete, brick lined and tile floored, 5,200 imperial gallon water tank, serviced by a simple water catchment system. This used the southern gallery walkway drainage runnels as the rainwater conduits. To that end the east gallery walkway of the southern section of the Redoubt sloped down from its northern end, where it was level with the parapet walkway, to the Southeast Caponier entry, by which point – a distance of c.82' – it had dropped 6.17'. The southern gallery walkway had a much slighter slope of just 0.17'. Where the two joined was a 9 sq.ft. grating with a sump joined by a pipe to the water tank. Both sump and water tank had overflow drains leading out through below the walls to the hillside below. Because of the differing levels of the two parts of the Redoubt, only the southern area was used as a rainwater catchment.

[35] In fortification terminology this is rather misleading, it being more accurately described as a bastion, see **Stephen Spiteri (1994)**.

A further refinement indicated on the plan is that the hilltop of the southern section was levelled off and given a marked pitch from west to east, making it a large, rain-catching surface. It is unknown whether it was surfaced with cement or chunam (**Figures 12 & 13**). The presence of the water cistern in the southern section may merely be fortuitous, or a deliberate distancing of water collection from the latrines. Equally, however, there is a possibility, were the Redoubt some sort of continuation and extension of any earlier plans for a smaller Keep, that the latter had included a water cistern, one of the most vital features of any fortification that hopes to hold out for any length of time when besieged.

We would add at this point that this feature of Saiwan Redoubt contrasts sharply with that of Devil's Peak Redoubt, planned and built almost twenty years later on the other side of the Lei Yue Mun, in which there was no cistern or any water catchment system. The only possible explanations for this difference are three. One is the possible difficulties posed by a rock monolith with respect to excavating an adequate cistern. A glance at the plans for the Devil's Peak Redoubt, which has a number of excavated shelters, makes this improbable. The other explanation may be the presence on Devil's Peak of a communications trench running downhill on the west side up which, presumably, water could be brought at regular intervals. However, the contrast is nonetheless considerable and a third explanation, comparing the meticulous plans of the Saiwan Redoubt with the almost sketch plan, emergency defences nature of the Devil's Peak fortification suggests that the answer may lie in comparative planning intentions.[36]

From the Southeast Caponier the gallery walkway runs westwards to the southwest corner, where there is a short, ten tread stair leading up to the parapet walkway. At this point the perimeter turns north towards the West Caponier, with the gallery walkway running along below the parapet walkway on the inside, but 6' below it. Where it reaches the West Caponier (see below) and, quite unlike the case of the northern section, there is no cross connection to its eastern side. Rather, the parapet walkway ends with the roof of the West Caponier or, by heading down eleven stairs to the gallery walkway, then a further thirteen stairs to the West Caponier entrance, makes a connection with the northern section of the Redoubt.

The West Caponier

The most intriguing feature of the whole Redoubt is thus the point on the western wall where, by inference, the Redoubt's command post was situated in what is described on the plan as the West Caponier.[37] This is a most unusual, square, tower-shaped structure, its outer face parallel to and projecting

[36] For the Devil's Peak Redoubt as planned drawing see WO 78/5432-001 and for the completed Redoubt WO 78/5432-002.

[37] Although the shape is unusual, this structure, because it has firing loopholes covering the interior of the Redoubt (the transverse trench and part of the north west gallery walkway), it more closely fits the usual function of a caponier.

only 8.833' from the perimeter. The roof of the caponier has a parapet on all four sides, with an opening directly from the parapet walkway coming north on the west side of the southern section of the Redoubt, thus forming a square, lunette-like defensive position. Below it is the caponier proper, a square shaped, 200 sq.ft. room with 3' thick concrete walls (2.5' on the interior face), with a 12' high ceiling, reinforced by 56 lb per yard railway metals (i.e. lengths of railway track). Additional lengths of track were set into the north wall 7.17' above the ground and planked over to form a raised platform.

The caponier had a total of eight rifle loopholes on the ground floor, plus two windows, though unlike the loopholes these were not narrowed to the interior opening. It had an additional six loopholes accessed from the raised platform. The ground floor west wall had the two, 3.5' wide, 2.33' high window openings with removable glazed, wood framed windows, closable on their outside faces by 1/8" iron shutters, which could serve either as rifle or machine gun openings, though the field of fire was out over a fairly steep drop looking over Chai Wan Gap, so not of great tactical significance.[38]

The north wall of the caponier had four rifle loopholes at ground floor level, two covering the outside perimeter wall and the other two covering the inner approach walkway. Above these, using the raised platform noted above, the ground floor loopholes were doubled up. On the south wall there were only two rifle loopholes on the outer side covering the foot of the perimeter south face. On the east wall, beside the doorway, were two rifle loopholes covering the central walkways, with two more above them accessed from the raised platform. The result was six loopholes covering the internal approaches to the caponier. We have noted above that **Kwong and Tsoi (2014: 62-63)** have identified data indicating that the Redoubt as a whole in the early 20th century was only supposedly equipped with a single machine gun. This would probably not have been deployed in the West Caponier.

The West Caponier was entered by a 4' wide doorway, the height of which is not given on the plan. If the present doorway is the same, which seems probable, then the height is c.7'. It opened from an irregularly shaped area, accessed by stairs from north and south, though these were at different levels. To access the north stairs from the West Caponier, one would have to go down one stair, just to the left of the door and then access the eight stairs to the gallery walkway beyond which was another set of nine stairs to the parapet walkway. Alternatively there was access to the northern section gallery walkway by using the lower cross-trench. To the right of the doorway as one exited the caponier were the thirteen stairs to the south gallery walkway. Directly opposite the doorway across the landing of the stairs from the southern gallery walkway was the southern hillside, which had been cut away to create the

[38] Either at build or later, a simple hoiting arrangement for the flap shutters was devised, working through holes pierced through the west wall.

space outside the door. Down the single step to the left, to the lowest point in the main Redoubt, there was a grated drain, with its drains passing below the perimeter to the western hillside.

The Central Communications Cross Trench and the interruption of the parapet

To the left of the West Caponier doorway when exiting the caponier there was a walkway some 6' below the level of all gallery walkways. From this lowest area the lowest part of the central trench crossed towards the east side some 22' below the hilltops each side and 16-18' below the parapets. The lower trench ran from the area outside the West Caponier doorway across the Redoubt to reach a set of seven steps up to the eastern end of the northern section's gallery walkway. It follows that the central cross trench was at two levels, the lower a little under 6' below the upper (**Figures 2, 11 & 12**).[39]

Unlike the parapet walkway of the western side of the southern part of the Redoubt, which ended on the roof of the caponier, that of the northern side stopped 8' short of the West Caponier's northern wall (**Figure 11**). The length of the perimeter parapet between where the walkway ended and the caponier began had a broken glass cheval de frise on its top. Where the two parts of the Redoubt met at the eastern perimeter, at the point where it widened, there was also a gap with no parapet walkway, now filled in. This too was topped by a broken glass cheval de frise (**Figure 11**). At the southeast end of the northern section's gallery walkway, there was another storm water drain, again with its drainage passing to the hillside beneath the perimeter. It should also be noted that the parapet walkway and gallery walkway of the southern section are not only on different levels (the parapet walkway of the southern part is 3' higher than that of the northern part and the gallery walkway some 4' higher) but on the east perimeter, south of the stairway up from the lowest part of the trench, the two parapets are disjoined from each other by a low wall – a continuation of the parapet of the southern section's east parapet, which has turned in along the line of the southern face of the central trench (**Figures 7 & 11**). It is possible that, if there had been an 1845 plan for The Keep, that this small, stub wall is a remnant of an originally intended complete southern section parapet. That raises the possibility of an original square design with two caponiers; one in the south east and the other in the north west (**Figure 8**).

THE REDOUBT AS A DEFENSIVE STRUCTURE

It would seem that the two main parts of the Redoubt represented two distinct defensive areas, with a possible rationale for this to be found in plans for the earlier Keep. The remaining puzzle, however, is how any defence

[39] In short, the entire gallery walkway system was below the parapet, even the north 40' or so of the eastern side of the southern section where it sloped up to the level of the parapet walkway, it being axiomatic that any observer would be looking upwards towards the Redoubt at a steep angle.

would have been conducted given the low parapet, entirely unpierced by any sort of openings. At 3' high, this offered protection for all but the head and shoulders of a kneeling rifleman or machine gun team. However, any rifleman adopting a firing position along the parapet would have been sharply silhouetted against the sky to an attacker from below, offering a well-defined target.

This is a pertinent point when we consider the arcs of fire of the entirely protected firing points in the Redoubt (**Figure 14**). These tell us two things. They tell us from what directions the planners assumed the most probable attacks on Saiwan Hill would come. And they tell us which parts of the Redoubt were considered defendable by riflemen, who were not in fully protected firing positions. It will be seen from **Figure 14** that the fields of fire from the two caponiers comprehensively protect the majority of the eastern, southern and western flanks of the Redoubt. By contrast the northern flank of the Redoubt, which overlooks the Saiwan Battery position, as well as the eastern wall of the northern section, is protected only by weaponry deployed behind the parapet of the northern lunette and the northeast and eastern wall. Here we can see that, if the extant Redoubt is an adaptation from a smaller, earlier Keep, the latter had far better protected fields of fire that could cover all approaches (**Figure 9**). It follows that in contrast to the Keep, which would have had to have covered all approaches to Sai Wan Hill, the Redoubt was designed with an eye to defending approaches from the NNE through S to NW, though mainly from Sai Wan (Chai Wan) towards the Saiwan Battery position and the Lei Yue Mun Barracks, especially through Chai Wan Gap.

It would seem to follow that in operation, on the assumption that full manning would have entailed a section of 25 men, the majority of the defenders will have been allocated to the caponiers and, possibly, the armoured gateway. These will have been positions entirely in cover and, as we can see from the description above and from looking at the diagram in **Figure 14**, would have ensured that anyone approaching from east, south or west could be brought under fire unless in dead ground. Outside the caponiers would have been lookouts patrolling the parapet walkway, but should an attack begin being pressed home, or should artillery fire be used – for which it has to be said that the Redoubt was clearly not designed – the caponiers and the gateway area would offer shelter.

It is manifest why it was that the Redoubt was swiftly ignored. The changed defensive arrangements following the annexation of the New Territories, the building of the fortifications on Devil's Peak and of Saiwan Battery rendered it irrelevant. Perhaps more trenchantly, the design was a throwback to a long gone era, perhaps betraying a sense of warfare unduly influenced by British colonial experiences in India and Africa where the enemy were in general not modern armies equipped with modern machine guns and light, medium and heavy artillery. In its design it also ignored

altogether its exposure to the sea and to naval bombardment. The contrast with the entirely modern artillery conscious Lei Yue Mun Redoubt is manifest, especially given that the Lei Yue Mun fortifications had been constructed eight years before Saiwan Redoubt. It follows that the Saiwan Redoubt was not easily upgradable to cope with the changed situations. By 1915 it appears to have been disused.

THE SAIWAN REDOUBT IN THE EARLY 20th CENTURY AND DURING THE BATTLE OF HONG KONG

As the timeline in Appendix 1 reveals, the Redoubt's life as an integral part of the defences of Hong Kong was short. By 1915 the extant references to it note an "old Redoubt on top of Sywan Hill" and an abandoned 6" Battery just north of the Redoubt, the 6" Mk VII guns that had replaced the original 6" BL in 1909 having been removed in 1911.[40] Evidently by 1915 the Sai Wan Hill fort complex was no longer in active use. Although we are in the dark as to any changes to the structure that may have been made by this time, the probability is that the Redoubt and battery were still fairly much as they had been built, with the possible addition of a structure for a baseline range-finding system mentioned above.

This would appear likely to have continued to be the case until the battery was refurbished as an anti-aircraft battery equipped with two 3" guns in place of the original 6" coastal defence guns. Exactly when this was is, however, uncertain. The Hong Kong Museum of Coastal Defence holds that by the mid-1920s the site had been rebuilt to this end. Against this is Weir's timeline, incorporated into **Appendix 1**, which suggests scant evidence of any actual guns in situ until possibly as late as 1935. A more specific date is given by Bard, who avers that the two 3" guns were in position "around 1934".[41] One possible point at issue here is the date of construction of the new access road to the battery. The original road, as shown on the 1895 map contemporary with the building of the Redoubt, and still shown on a map with its survey data from the mid-1930s, ran directly up the north hillside to the battery from the southernmost cluster of buildings in Lei Yue Mun Barracks.[42] As we shall see, from a Japanese map of 1942 (**Figure 16**) it is possible that in order to install the new, 3" anti-aircraft guns in c.1934, a new road was driven in. By 1941, then, the Redoubt would appear to have been irrelevant to the coastal defence artillery system and not obviously an element of the Saiwan Anti-Aircraft Battery.

[40] **Bard (2015: 101)**

[41] ibid, 123.

[42] Great Britain. War Office. General Staff (1945), Victoria Harbour: Hong Kong and New Territory, Scale 1:20,000, GSGS (Series); 3868. 3rd ed. "Revised 1938. (Grid change only, 1945.)" "Air Survey by the R.A.F. and ground control by 2nd Colonial Survey Section, R.E., 1924-25. Field Revision by P.W.D. Hong Kong 1932, and by R.E. Survey Section, 1935-37. Plotted by the Geographical Section, General Staff, 1930. Drawn and heliographed at the Ordnance Survey 1930, 1939. Photolithographed by O.S. 1945." World polyconic projection accessed at http://digitalarchive.mcmaster.ca/islandora/object/macrepo%3A66905 on 8th August 2016.

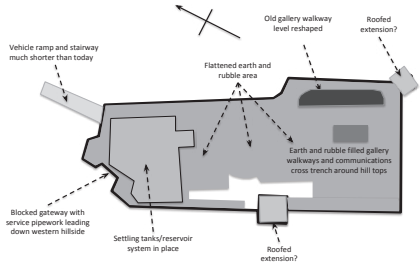

Figure 15: Alterations and additions 1930s(?) to 1941

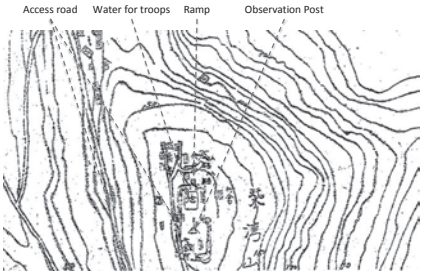

Figure 16: Japanese map showing pre-1941 alterations and additions

The Redoubt does not appear to have been manned by any infantry fighting detachment during the Battle of Hong Kong. The more significant changes shown in **Figure 15**, especially the blocking of the entrance, the installation of the vehicle ramp, the filling in of the gallery walkways and the creation of the water treatment system, which the Japanese evidence indicates were completed before the Battle of Hong Kong, would have rendered the Redoubt largely useless as anything other than an emergency defensive position.

However, there does seem to have been a Royal Air Force presence until 16th December 1941, and possibly thereafter, by a Royal Air Force (RAF) Wireless Observation Unit (WOU) under Flight Lieutenant Hector 'Dolly' Gray.[43] This is significant with respect to the possible changes to the Redoubt from its original configuration, because the standard RAF WOU of the period, each of 6-8 personnel, used motorized transport, which may have relied on the construction of the present vehicle ramp.[44] In the context of Hong Kong's rudimentary air defences, since Saiwan Hill commands a view of the narrow approach through Lei Yue Mun that offered a significant navigational marker in an era of exclusively visual navigation, for aircraft coming from the south and east to attack Victoria Harbour, the Redoubt was excellently placed. The Japanese map shows an Observation Post in place in the general area of the centre of the Redoubt.[45] At the time of the Japanese invasion of Hong Kong Island on 18th December 1941, therefore, whatever military presence there was in the Redoubt was not such as to be able to offer much by way of effective defence against assault.

More to the point, the Redoubt had been the subject of significant aerial and artillery bombardment. On 16th December, **Kwong and Tsoi (2014:**

[43] **Tony Banham (2005: 82)**. The authors are much indebted for assistance to Mr Andrew Dennis of the Royal Air Force Museum, UK.

[44] RAF WOUs are one of the least studied bodies in military history. By 1941 they came in two 'flavours'. The standard WOU acted as an early warning system, visually observing enemy formations and reporting back by radio to assist active defence through alerting anti-aircraft batteries and scrambling and vectoring protective fighter cover. However another type, called the 'Y Service', was an early form of radio signals intelligence and monitored enemy aircraft radio transmissions. It is not known what 'flavour' Flt Lt Gray's unit was.

[45] **Banham (2005: 85 & 87)**

189) report, eighteen G4M bombers of the Kanoya Air Group bombed Saiwan Battery. Given the accuracy of bombers at this period, it seems possible that the Redoubt would also have suffered. On the same day artillery bombardment certainly hit the battery, destroying the height-finder, so here again there is a possibility that ranging fire or any overshoots would have hit the Redoubt.[46]

By 1930 hrs. of the night of 18th December, just before the Japanese landings, the Redoubt was reported to have been "under heavy fire (9-in. Howitzer) for half an hour, (with) the whole fort…badly damaged (such) that the structure would not stand up to further shelling."[47] There is some doubt here as to which structure had been so severely weakened, since there are few signs today that the perimeter wall or the caponiers were in any way significantly damaged or, indeed, that the main battery structure below it had unduly suffered either.

By inference the Japanese were better aware of the importance of the Redoubt in terms of tactically dominating the northeast area of Hong Kong Island, where the schwerpunkt of the landings was located. Accordingly at c.2100 on the night of the 18th, around the time of the Japanese landings at North Point and Shaukeiwan, a Fifth Column force assaulted the Redoubt from Shaukeiwan and captured it.[48] Shortly thereafter a loudspeaker was set up on the hill and boomed out that "We Japanese have captured Saiwan Hill", "It is useless to resist."[49] Subsequent efforts by 'C' Company, Royal Rifles of Canada failed to dislodge the Japanese forces and this extremely dominant tactical position for the defence of the north eastern part of Hong Kong Island was permanently lost (**Copp 2001**).[50]

Three conclusions may be drawn. The first of these may have been adaptive use of the Redoubt as one end of a baseline ranging system in the days of Saiwan Battery as part of Hong Kong's coastal defences, 1899-1911 as noted above. More pointedly, the significant changes visible in the 1949 aerial photograph (**Figure 17**) were the result of pre-war changes. These included the new, more easily graded road up through Lei Yue Mun Barracks to Saiwan Battery possibly to install the two 3" AA guns. In addition, given the rapid expansion of Lei Yue Mun Barracks in the 1930s when Nos. 2, 3, 10, 30, 33, and 34 blocks were all completed,[51] the redundant north-western part of the Redoubt was converted to provide an improved water supply to the barracks and the

[46] **Kwong and Tsoi (2015)**, op.cit, p.189, Bard also reports heavy artillery bombardment affecting the Redoubt, op.cit. , p.135. See also **Maltby (1948: 710-712)**.

[47] **John Grehan & Martin Mace (2015 eds: 117)**. The text comes from **Maltby (1948: 712, para 63(b))**.

[48] **Banham (2005: 103)**. It is interesting that **Maltby (1948)** makes no mention of this and, indeed, in his description of his defensive preparations no mention is made of Saiwan Hill save as a location for the AA Battery, a searchlight position and an artillery observation post (p.710, paras 48(b) and 48(f) and p.712 para 62).

[49] **Banham (2005: 119)**

[50] **Copp (2001: 15), Maltby (1948: 712, para 63(k))**

[51] **Bard (2015: 123)**.

old doorway blocked.[52] Thanks to a Japanese map (**Figure 16**) discussed in the next section, we now know that this was the case.

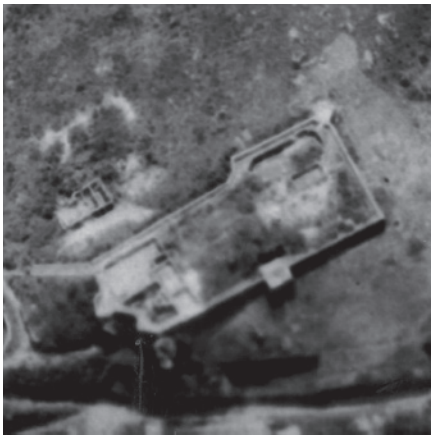

Figure 17: Detail from 1949 aerial photograph of Saiwan Redoubt area

CHANGES TO THE ORIGINAL REDOUBT

It is evident from any present-day inspection that the Redoubt has been significantly altered since it was built. This appears not to have occurred before the mid-1930s. The questions that remain, given some of the analyses of these issues above, is therefore to identify the changes have occurred, if possible to date the changes and put them into some sort of sequence, and to find explanations for them.

In the diagrams the major changes have been divided into three simple groups. The first and major group consists of changes that we know had been completed before 1941 (**Figure 15**), namely the vehicle ramp, though shorter than the present ramp, the flat area in the middle, the water treatment changes in the northwest corner, significant changes to the southeast corner, including the building of a structure on top of the Southeast Caponier, what looks like a roofed structure on top of the West Caponier and the filling in of all gallery walkways and the central cross trench, except for the areas near the West Caponier and the Southeast Caponier. This is of course equivocal between pre-war and immediately post-war changes. However, the map made by Japanese forces immediately after the Battle of Hong Kong (**Figure 16**) resolves most issues.[53]

We can see from it and its brief annotations that the access road to the battery and Redoubt area was in existence at the Battle of Hong Kong. The water storage and treatment system was also installed – though the Japanese map does not show the supply pipeline from the Mt Parker catchment that can be seen on the 1949 aerial photograph. The ramp up from the head of the battery access road is shown and, by inference, the map suggests that the

[52] Inspection of the 1949 photograph shows that water was drawn by pipeline and siphon action from the catchment on the east side of Mt Parker, sent by pipeline down under the road at Chai Wan Gap and then uphill to what was probably a pumping station just below the Saiwan Battery access road. From there pipes went up to the Redoubt and also along the hillside to a nearby building from which a pipe ran on downhill towards the barracks. Vestiges of these arrangements can still be seen in the 1963 aerial photograph (**Figure 14**).

[53] The archive cover reads First Regiment, Heavy Artillery (1942), Partial Mapping of Fortifications on Hong Kong Island. 2 January, 17th Year of the Emperor (Japan Center for Asia Historical Records, National Public Library).

interior of the Redoubt bar the southeast corner and, possibly, the area near the West Caponier had been filled in.

Given the probable amount of fill material needed for this (a very rough calculation suggests c.16,000 cu.ft. (c.450 cu.m.)), it seems probable that the ramp that appears in the Japanese map was built to carry in some or all of it and the construction material for the new water treatment facilities. Human labour was still the normal solution for brute work in Hong Kong in the 1930s, each labourer with two baskets suspended from a carrying stick carrying some 24-48 kg per load.[54] Assuming a soil/rubble mix at around 1000kg per cubic metre, some and possibly most of the 450-500 tonnes of material necessary to fill the gallery walkways will have been carried up to the parapet walkway level or excavated from the internal hill tops.[55] That makes 10,000 to 20,000 basket loads, or several weeks' work by a party of labourers. Even with some level of automation the exercise is unlikely to have taken less than a month.

In the central area, where later a circular area appears, the Japanese have marked an Auxiliary Company Observation Post using the artillery's conventional sign.[56] Whether this was in fact for the battery below, or Flt Lt Gray's WOU is unclear. The 1949 aerial photograph, like the Japanese map, shows only a large, relatively open space between the water treatment facility, the old gallery walkway and cross trench area immediately outside the West Caponier and the Southeast Caponier area. A photograph of Saiwan Hill taken by the German Australian photographer Hedda Morrison in late 1946 or early 1947 is ambiguous, but it does seem possibly to show something that could be a mobile radar unit or something similar in this cleared, central position. (See **Figure 19**).

Changes since that time to the present (**Figures 18-23**) can be divided into two stages.

Figure 18: Detail of Saiwan Hill showing Redoubt and possible mobile radar, Hedda Morrison, 1946-47

[54] **Menpes & Blake (1909: 122-123)** have a graphic description of the carrying of building material up to The Peak.

[55] The density of rubble is given as 1048 kg per cu.m. at http://www.epa.vic.gov.au/business-and-industry/lower-your-impact/~/media/Files/bus/EREP/docs/wastematerials-densities-data.pdf Critical here will be any estimate of the amount of excavated material necessary to construct the water treatment tanks and any material garnered by levelling the hilltops.

[56] For the conventional signs see **United States War Department (1944: 362)**.

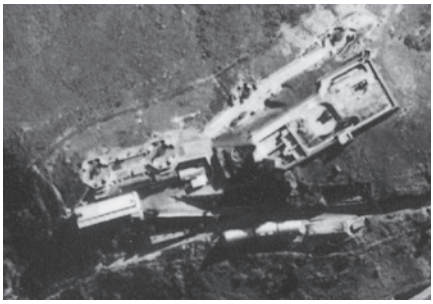

Figure 19: Detail of 1956 aerial photograph of Saiwan Redoubt area

Figure 20: Detail from 1963 aerial photograph of Saiwan Redoubt area

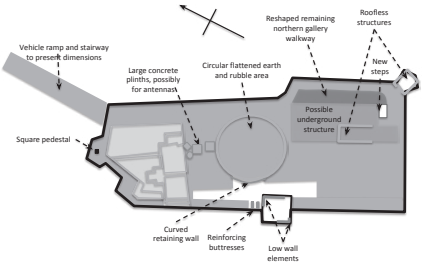

Figure 21: Alterations and additions 1963 photo

Figure 22: Detail from 1974 aerial photograph of Saiwan Redoubt area

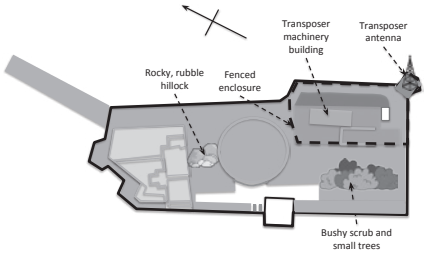

Figure 23: Alterations and additions 1974 to present

The first stage, which is vividly clear in the 1956 aerial photograph (**Figure 19**), is the adaptation of the southeast corner and the creation of a central, circular area. The latter had a curved retaining wall on its west side and a curved southern wall cut into the northern side of the southern hill. In the photograph there is a clear structure parked towards the southern curved wall, with something extending from its upper surface, possibly a radar antenna.

In the southeast corner the changes are extensive and hard to date though visible at various stages in **Figures 17, 19, 20** and **22**. The old sloping gallery walkway along inside the east wall can be seen to have been deepened to make it all level with the old, deeper southern end. Its southeast and northeast ends have been made into quarter circles

making a deep, open area outside the doorways of the bunkers to be described shortly. From this below ground open area steps are evident from the walkway's southern end on the west corner up to parapet walkway level. The southern hillside east flank has been cut away and new bunkers with four doorways built and then covered. There would appear to be ventilation shafts with square caps on the surface above this new structure. Most of these changes are apparent in the 1949 aerial photograph and were pre-war. What is new in the 1956 photograph is on the west side of the new sub-surface bunker structure. This is a rectangular, recessed area with, on its west side, a semi-circular extension pushing out westwards. In this area set below the surface level of the southern section there is a second, smaller cuboid structure.

The two cuboid probably mobile structures described may both be part of a gunnery control radar system. In the same 1956 picture, it can be seen that all 3.7" Anti-Aircraft gun emplacements, two constructed post-war, have guns in place. It follows that our tentative hypothesis is that the changes to the centre and to the southeast corner would appear to have been a major re-purposing related to the upgrading of the anti-aircraft defences in 1949. Clarifying these changes is a subject for further research.

A final, brief point to be dealt with more fully in Part II of this study of the Saiwan Redoubt, is that in the 1956 aerial photograph, in which the interior area of the Redoubt is clean and tidy as befits an operational military premises, it is possible to identify the War Department Marker Stone B.O. No.4. We know from large scale maps of Hong Kong made in the early 1970s that the surface of the Redoubt had been surveyed in detail. The maps[57] show five triangulation stations, numbered 127 and 127A in the north and 127B, 127C and 127D in the south. 127 is in the centre of the head of the ramp, with 127A in the northeast corner immediately to the east. 127B would appear to be the War Department Marker Stone B.O. No.4, and 127C and 127D respectively mark the southwest and southeast corners of the upper surface of the Redoubt. Further research is ongoing to try to track down the details of this survey and verify whether, in fact, the old marker stone was used.

Since those changes and the withdrawal of the guns in 1957 (see timeline) the main changes to the Redoubt, other than the TV transposer station described below, have been due to dilapidation. The 1963 and 1974 aerial photographs show no significant upgrade to any of the Redoubt, though the 1963 image shows clearly the possible Watkins Position Finder (or similar) pedestal invisible in the 1949 and 1956 images. What looked like roofed structures in 1949 have lost their roofs and the vehicle ramp seems to have been enlarged and had a staircase built down the middle, which is not apparently present in the 1956 photograph. The central area has degraded from the

[57] See survey maps nos. 215-NW-1 of March 1975 and 215-NW-5 march 1972.

crisp circular area of 1956 with its curved retaining walls on the south and west side to something more like the appearance today. Today between the circular area and the water treatment area in the northern section, around the well between the circular area and the West Caponier, and across the southwest corner there has been gradual incursion of scrub, which is doing steady damage to the structure that remains.

Neither the 1949 nor the 1956 photograph clearly shows whether the two buttresses below the western cheval de frise, immediately north of the West Caponier, then existed. They would appear to be in place by the 1963 photograph, though the evidence is ambiguous. The buttresses are curious, suggesting in engineering terms that the west wall, at its tallest, unsupported point, was threatening to collapse inwards and needed support. The construction of the buttresses closed off completely the firing arcs from the upper and lower interior loopholes of the West Caponier, that controlled the steps into the area near the West Caponier entrance from the parapet and gallery walkways of the northern section. It seems possible that the buttresses were a post-war addition, but they may have been in place by the time of the Battle of Hong Kong, the weakness in the wall having been revealed by the engineering work necessary to put in the access road in the late 1930s or when the Redoubt was being filled in. Another possibility is that Japanese tunnelling work beneath this point had effects that required the buttresses. It is unlikely this issue will be resolved.

More lasting damage has been done that began in the mid-1970s when permission was given to Television Broadcasts Limited (TVB) to convert the southeast corner of the Redoubt into a television transposer station. The permission would appear to have been given in 1974 and the first structural changes to the Redoubt can be seen to have been in place in the 1974 aerial photograph (**Figure 22**). The 1949-1956 changes to the southeast corner described above have been obliterated by a succession of alterations required for the new service that have taken place between 1974 and today including, from early in the period, the building of a latticework antenna tower on the top of the Southeast Caponier. Various power and other requirements have been installed within the perimeter wall nearby both in the underground bunker structure and on the surface where the recessed area had previously been. Initially a large fence, supported by concrete pickets was erected, today this is a razor-wire protected, chain-link fence on steel pickets. No heritage conservation issues would appear to have been raised at any stage either then or since.[58]

[58] By inference this happened before 1994, since the existence of the transposer for the purposes of Ch. 48 for TVB Jade is mentioned in **Chan (1994), p.118**. More recently the tower has been used in the introduction of digital terrestrial television.

CONCLUSIONS

Saiwan Redoubt is a palimpsest of the military history of the north-eastern part of Hong Kong Island from 1844 to the years immediately after the Second World War. It also offers an excellent route into understanding the dramatic changes in military technology in all its aspects – defensive and offensive structures and weapons, signals intelligence, air defence, amphibious warfare – that took place between the mid-1840s and the 1970s. In addition, as our research has shown, and which is the subject of major further enquiry, the Saiwan Redoubt and Lei Yue Mun military areas seem to have played a significant role in the emergence of the particular, Hong Kong arrangements for military land holdings. Most of the major issues would seem to have been argued out between the War Office, the Colonial Office and the various stakeholders in Hong Kong in the period between c.1863 and 1890, as far as we can determine specifically to clear the way for the building of the Lei Yue Mun Barracks, the Lei Yue Mun fort complex and Saiwan Redoubt.[59] That this singular and important structure, with its intriguing history penetrating so deeply into both Hong Kong's land allocation system and its military history, is not even on the Antiquities Advisory Board's catalogue of listed buildings is a disgrace, betraying quanta of ignorance and indifference that stagger the mind.[60]

Throughout this discussion of the Saiwan Redoubt as part of Hong Kong's military heritage that is still in basically sound physical condition, we have largely ignored a key remaining feature, wholly irrelevant to the Redoubt's military functions, but of arguably greater heritage significance. This is a War Department Boundary Marker stone, close to the highest point in the southern section of the Redoubt, which predates the Redoubt by over fifty years and goes back to the first systematic cadastral and trigonometrical surveys in Hong Kong's history that used modern techniques and instruments. This object has also been entirely ignored by Hong Kong's 'guardians' of 'heritage' and we shall turn to in Part II.

ACKNOWLEDGEMENTS

The authors are thankful to Professor C Y Jim of the University of Hong Kong for allowing them to access 1956 RAF photos not found in the Survey and Mapping Office of the Lands Department.

[59] CO 129/323, pp.441-444; CO129/324, pp.133-146; CO129/325, pp.331-370 are good starting points.

[60] See http://www.aab.gov.hk/en/aab_1.php accessed on 26.7.2016.

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War Office Records WO32; WO78; WO106; WO172; WO268

UK National Archive Map Room Records MR1

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Month and Year	**Map Number (scale)**
February 1963 August 1968 March 1972 September 1974	215-NW-5 (1:600)
March 1975	215-NW-1 (1:600)
March 1976 September 1976	11-SE-14C (1:1000)

*Government (*RAF) Aerial Photographs*

Year (Date) *RAF	**Photo Number (sortie number) [Flying height in feet]**
*1945 (11/11/1945)	4061 (681/6) [20,000]
*1949 (08/05/1949)	6100 (81A/128) [8600]
*1949 (08/05/1949)	6102 (81A/128) [8600]
*1956 (28/12/1956)	0026 (F22/81A) [16700]
*1961 (171/01/1961)	0119 (81RAF600) [30,000]
1963 (01/02/1963)	7803 [2700]
1963 (01/02/1963)	7805 [2700]
1967 (16/05/1967)	5631 [6250]
1972 (24/06/1972)	1854 [2500]
1973 (20/02/1973)	3058 [3000]
1974(21/11/1974)	9697 [12500]
1975 (26/021975)	19016 [4300]
1976 (30/06/1975)	14266 [2000]
1978 (30/11/1978)	23812 [????]
1979 (28/11/1979)	27881 [4000]
1980 (16/04/1980)	29803 [4000]
1981 (18/05/1981)	37391 [4000]
1982	40629 [4000]
1985(18/05/1985)	A00768 [4000]

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APPENDIX 1:

Saiwan Battery and Redoubt Timeline[61] (with notes on nearby Lei Yue Mun Barracks and Lei Yue Mun Redoubt)

- 1843: Army Commissariat invites tenders for building Saiwan Cantonment.[62]
- 1844: Cantonment at Saiwan[63]
- 1845: First draft of map of Cantonment of Sywan and Lyemoon has legend 'Proposed Site for The Keep' on the summit of Sai Wan Hill (called Upper Lyeemoon Hill). This seems never to have been built. Sywan Barracks shown with six buildings, four labeled.[64]
- 1846: A watercolour View of Sai-Wan looking East. 29th November 1846 by Murdoch Bruce, Inspector of Buildings, Overseer of Roads and Supervisor of Convict Labour. One of a set of several views of Hong Kong completed in 1846.[65]
- 1847: Sai Wan Cantonment believed to have been abandoned, but hard evidence of date of cessation of use not available.
- 1859: Government lease of land to the military on the site of the future Lei Yue Mun Redoubt.[66]
- 1863: Government attempts to get Saiwan Barracks land back from the military, but without success.[67]

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[61] Dr Davies is indebted to Mr Rob Weir, whose careful notes on Saiwan Battery and Redoubt form the core of the timeline – see http://gwulo.com/node/11032

[62] Friend of China, 23.11.1843

[63] CO129/10, p.686v, letter from Governor's Secretary to Assistant Military Secretary approving and sanctioning the limits of the new Cantonment. MPH 1/899/6-7 Description: Hong Kong. (6) 'Sketch of the Cantonment at Victoria': plan. Reference table. Scale: 3 inches to 600 feet. (7) 'Trace from the Contour Survey of the Cantonment at Sywan'. Reference table. Scale: 6.3 inches to 1,700 feet. Compass indicator. Both signed by Edward Aldrich, Major CRE, 20 April 1844.

[64] WO 78/472 Description: Hong Kong. Four contoured maps: (1) Green Island; (2) Stanley (Chek Chu) cantonment; (3) Kellett Islands; (4) Sywan Cantonment and Lyemun (Lei Yue Mun). Items (1, 3-4) showing soundings. Reference table to each item. Scale: (1) 1 inch to about 65 feet; (2, 4) 3 inches to 400 feet [1:1,600]; (3) 1 inch to 20 feet [1:240]. Compass indicator to each item. All sheets copied from original maps of 1844-1845; signed by Lieutenant T B Collinson, Royal Engineers, May 1846, and by Edward Aldrich, 18 July 1846. Inset to item (1) map showing the position of Green Island relative to Kowloon and neighbouring islands, with lines of triangulation; scale: 1 inch to about 865 yards. All items originally produced to accompanying report number 198, 18 July 1846; this report is not filed with these maps. Date: 1846. See also **Bard (2015: 29, 37, 53 & 57).**

[65] The full set – seldom seen – has twelve views, ten of the Central to Causeway Bay part of Hong Kong Island plus one of Aberdeen (South side of Chuck-pye-wan bay looking east. 29 November 1846) and the one with the Barracks: View of Sai-Wan looking East. 29th November 1846 – see for the rarity, Grosvenor Prints catalogue item 963 at www.grosvenorprints.com/catalogs/15%20Foreign%20Topography.pdf accessed on 9th August 2016.

[66] CO129/324, p.139. This is a much earlier date than is recorded in most works on Hong Kong's defences and was probably provoked by a perceived need to guard the eastern entrance to Victoria Harbour, probably by mobile artillery and infantry, during the Second Opium War.

[67] CO129/171, pp.277v – a marginal note in a memorandum indicates a correspondence was opened between the Government and the military authorities in April 1863, but ended without any change in 1864. CO129/172, p.440 – letter from the War Office to the Colonial

- 1875: Saiwan mentioned as "practically abandoned". Government renewed efforts to get Cantonment land back in both Stanley and Sai Wan. It failed.[68]

- 1884: New Lyemun Barracks commenced and built below Sai Wan Hill in c.5 phases: 1884, 1890, 1890-95, 1900-1910, 1920s, 1936-39[69]

- 1885: Survey of Top of Sywan Hill no trace of previous buildings or entrenchments.[70]

- 1887: Saiwan Hill Redoubt location re-surveyed.[71] Clear statement of an intention to build "Howitzer emplacements and an infantry redoubt on Swyan (sic) Hill".[72]

- 1890-95: Nos 18, 20 and 21 Blocks of Lei Yue Mun Barracks constructed as first elements[73]

- 1891: Land for Lei Yue Mun Barracks granted by Government.[74]

- 1894: Proposed Battery (Bty) for 2 x 6" BL guns.[75] Land granted by Government to War Office for Redoubt.[76] Government survey of "military land and reserves, Sywan Bay".[77] Hong Kong Volunteer Corps exercise repelling enemy "troop landing at Sywan Bay."[78]

- 1895: Saiwan Hill Redoubt plan.[79] Redoubt constructed, original approach road ascends directly from Lye Yue Mun Barracks with side track from Lei Yue Mun Fort.

- 1900 Pak Sha Wan Battery construction authorized.[80]

- 1901: Battery under construction.[81] Pak Sha Wan Battery with 4 x 12 pdr QF guns.

Office declaring both Stanley and Saiwan necessary for 'sanitary stations' and Stanley for exercises.

[68] CO129/171, pp.96-175, "practically abandoned" at p.279v.

[69] WO 78/2268 Description: Hong Kong. Two sheets of drawings of Lyemun Barracks: (1) block plan; (2) section. Reference table and notes to item (1). Scale: (1) 1:500; (2) 1 inch to 16 feet [1:192]. Drawn by L H Kwong, 1913; printed at the Ordnance Survey Office, Southampton, 1914. Inset to item (1): site map; scale: 4 inches to 1 mile [1:15,840]. Various coloured MS additions and notes to both sheets; additions dated 1920. Coloured pencil inscriptions state that these drawings were superseded by later versions; these later drawings have not been identified among the holdings of The National Archives.

[70] UKNA MR 1/556, PRO MM-0359.

[71] Two plans showing defences and contours: (1) 'Survey of top of Sywan Hill'; (2) 'Survey of Part of Sywan Hill'. Scale: 1 inch to 30 feet. Compass indicators. (1) Signed by Major E M Lloyd, Royal Engineers (on behalf of the absent commanding officer). (2) [Surveyed by] Corporal D W Watt, Royal Engineers; signed by Colonel A F Storer, Commanding Royal Engineer, China, June 1887. Inset to item (1): 'Site Plan': map showing the location of Sywan Hill relative to surrounding hills and the coastline; scale: 4 inches to 1 mile [1:15,840]; compass indicator. Dimensions: (1) 70 cm x 99 cm; (2) 101.5 cm x 138.5.

[72] CO129/325, p.337v – a letter from Frederick Stewart, Acting Colonial Secretary to the War Office.

[73] **Bard (2015: 123)**

[74] CO129/324, p.139.

[75] WO 78/4137.

[76] CO129/324, p.139.

[77] Hong Kong Government Gazette, 1st September 1894, Government Notification No.323, p.745 – half yearly report from the Director of Public Works.

[78] Reports on the Hong Kong Volunteer Corps, No. 22/95, p.317. The exercise was on 3rd November 1894

[79] WO 78/5352.

[80] WO 78/5351 and **Tse Tak San (2013: 17)**

[81] CAB 11/57.

- 1903: Battery under construction.[82]
- 1904: 2 x 6" BL (or 6" QF) guns.[83] British Army seeks to extend land holdings in Lei Yue Mun/Sai Wan Hill area from three lots totaling 80.5 acres to an area enclosing all three lots totaling 222.5 acres.[84]
- 1904: Government map of military area at Lei Yue Mun/Sai Wan Hill shows 700 yard rifle range leading SSE from the barracks, a howitzer position on the immediate east boundary of the barracks and a Position Finding Station immediately SE of the rifle range targets.[85]
- 1905: 2 x 6" BL (or 6" QF) guns, 1 x M/G.[86]
- 1905-1909: Lei Yue Mun Barracks extended with addition of Blocks 31 and 32 and Married Quarters.[87]
- 1906: 2 x 6" BL (or 6" QF) guns, 1 x M/G.[88]
- 1907: 2 x 6" BL Mk VII guns, to be reduced.[89]
- 1909: 2 x 6" BL guns (said to be BL Mk VII) mounted, but not approved.
- (CAB 11/57).[90] Pak Sha Wan Battery to be upgraded to 3 x 6" BL.[91]
- 1911: not listed.[92]
- 1915: There is an old Redoubt on top of Sywan Hill and an abandoned 6" Bty just north of the Redoubt.[93]
- 1920: By the mid 1920's, this site had been rebuilt as an AA Bty.[94] Possibly at around this time new approach road of shallower gradient constructed angling up the west side of the hill (but see next entry).
- 1930: 1:20,000, Hong Kong and the New Territories - Sheet 19 Victoria Harbour (1930) shows only paths accessing the Redoubt area
- 1930-1940: Lei Yue Mun Barracks completed with Blocks 2, 3, 10, 30,

[82] ibid.

[83] ibid. It is likely that Bard is confused with respect to suggesting 6" QF instead of 6" BL. As far as it is known, none of the 6" QF Mks I-III of 1892 to 1945 vintage that were converted to coastal defence use was ever employed in Hong Kong. Similarly no coastal defence 6" BL Mks III-VI guns were converted to 6" QF, although this was common in the seaborne equivalents as of 1895 and this may be the origin of the confusion. The difference lay in the propellant, with QF guns using brass cased cartridges and the BL silk bags and vent tubes. With the 6" BL Mk VII the silk bag and vent tube was preferred over the brass cartridge that, for medium and heavy artillery, had not shown any significant increment of rate of fire.

[84] CO129/325, pp.344-349 and attached sketch maps. This is part of a long and important wrangle between the civil government and the military over the terms and conditions governing the use of land in military reserves for military purposes, see CO129/325, pp.331-370.

[85] Ibid.

[86] CAB 11/57.

[87] Bard (2105), p.123.

[88] CAB 11/57.

[89] Ibid.

[90] The introduction of the Mk VII BL in 1909 and their removal in 1911 comes from **Bard (2015)**, op.cit, p.101. The evidence in CAB 11/57 and CAB 11/58 cited by Weir cites only 6" BL.

[91] **Tse (2013)** ibid, WO 78/5351.

[92] CAB 11/58.

[93] WO 32/5316.

[94] **Kwong and Tsoi (2014: 112)** – the date is by inference mid- to late 1930s. The table wrongly gives the number of guns as four.

33 and 34.[95]

- 1935: 2 x 3" 20 cwt AA guns.[96]
- 1936: 2 x 3" 20 cwt AA guns.[97]
- 1938: 1938 1: 20,000, Victoria Harbour (HB 5-19), 1930 grid, produced by the Geographical Section, General Staff No. 3868. War Office. This shows the boundaries of various military sites but does not have the new access road, the basic topographical data having been gathered in 1932.
- 1939: 2 x 3" 20 cwt AA guns.[98]
- 1940: Site reworked for 2 x 4.5" HAA guns, which were never installed.[99] By this date modification to NE corner of Redoubt for water treatment with supply from Mt Parker catchment for Tai Tam Tuk Reservoir, installation of vehicle ramp and old entrance gate blocked up. Latrine block removed or filled over. Most gallery walkways and central communications cross trench filled. What is unknown is whether the modifications to the southeast corner detailed later and in the text occurred at this time.
- 1941: 2 x 3" AA guns, 1 x 3.7" mobile AA gun (?) – this may be a confusion over the HKVDC 3.7" howitzer, 1 x RAF WOU in Redoubt area. 1 x Searchlight, 1 x OP. Shelled, bombed and (extensively) damaged 16th December. In action 8 - 18th December. Overrun at c.2100 hrs. on night of landings on Island 18th December by 5th column/Japanese infiltrators.[100]
- 1942: On Imperial Japanese Army map of the military sites on Lee Yue Mun Pass and Sai Wan Hill marked as "Chai Wan Hill".[101] This shows that the Redoubt in 1941 had the new access road, the water treatment facility, an access ramp an Observation Post and most of the galleries would appear to have been filled in.

Unknown date pre- or post-war: 5,200 gallon water cistern destroyed. Structures built on top of Southeast Caponier and West Caponier, but roofless by 1949. Significant change to the area on the east side of the southern section to create ammunition (?) bunkers and a possible gun emplacement.

- 1941-1945: Extensive Japanese tunnel excavations beneath the Redoubt
- 1945-1949: New service reservoir constructed at south end of barracks to replace water treatment facilities in NE corner of Redoubt.[102]

[95] **Bard (2015: 123)**.
[96] ADM 116/3490 and personal reminiscence of Andrew Salmon, a gunner NCO at Saiwan/ Lyemun Barracks 1935-1941: Imperial War Museum Catalogue number: 5202; Production date 1981-08-26; object category: IWM interview.
[97] CAB 11/196.
[98] WO 106/2379.
[99] ibid.
[100] WO 172/1687, Banham, Maltby.
[101] First Regiment, Heavy Artillery (1942): p. 1569.
[102] Shown as recently completed or in final construction stages on 1949 aerial photograph.

- 1949: Battery site rebuilt for 4 x 3.7" HAA guns.[103] Increased accommodation created with Nissen huts on concrete platforms on left side of final grade of approach road.

- 1949-1955: Curved western retaining wall built and circular area prepared with possible concrete antenna stay anchors for possible mobile radar or other antenna using unit (?).

- 1956: Clear aerial photograph of Redoubt in post-war shape, circular central area with clear southern wall and large cuboid, (probably mobile) object on southern side, evident new rectangular bay set into surface of Redoubt with semicircular area on west side situated on west side of sub-surface bunker in southeast corner. The area containing a mobile object. The shadows suggest the object in the central circular area and the southeastern rectilinear area may be something like a gunnery control radar.

- The same photograph shows a semi-circular area to the west of the ramp below the north lunette which may be a machine gun emplacement.

- 1957: Guns withdrawn after British Government decision to disband AA Regiments.[104]

- 1975: First documentation of a land lease to Television Broadcasts Ltd (TVB) to build a TV Transposer station on a 310 m^2 area in SE corner of Redoubt.

- 1976: First image of TVB transposer station, antenna on Southeast Caponier and fenced enclosure.

- 1980: aerial photograph shows southeast corner fenced off with heavy concrete picket fencing and large rectangular structure in centre of fenced area using sub-surface structure noted in Unknown date (above).

- 1985: aerial photograph with visible antenna tower on Southeast Caponier

- 1980s-90s (?): Lyemun Barracks Training Depot, Hong Kong Military Service Corps.[105]

- late 1990s/early 2000s: Saiwan Battery area refurbished by LCSD with sitting out area and some information signs.[106]

- c.1994: Southeast Caponier and nearby area still in use for TV Transposer unit to improve reception in Chaiwan and whole southeast corner fenced off. No heritage questions were raised.[107]

- 2008: TV Transposer station to be upgraded to service Digital Terrestrial TV service with possible extension of building and other services within fenced off enclosure.[108]

[103] WO 268/301.
[104] WO 32/15525.

[105] see http://www.britishchineseheritagecentre.org.uk/interviews-採訪/military-軍事/british-army-陸軍/item/mr-roger-ching
[106] It may be that this was a transient status, today there would appear to be minimal maintenance and the area is not listed or mentioned on either LCSD or the Eastern District Council website, nor appears as part of embedded information on the Lands Department GeoInfo map system.
[107] **Chan (1994: 118)**.
[108] see http://www.digitaltv.gov.hk/general/

- 2009: Blocks 7, 10, 18, 20, 21, 25, 30, 31 & 32 of Lei Yue Mun Barracks complex listed Grade 1 by Antiquities Advisory Board, Blocks 3, 5, 17, 33 and 34 listed Grade 2.[109]

- 2013: Upgrading of transposer station completed.

- 2014: In battery area, ruins of buildings secured against entry. Ruins of buildings and gun positions remain.

- 2016: Lei Yue Mun Barracks compound including Saiwan Battery recommended for listed building status, no decision yet made. Saiwan Redoubt not mentioned in notification.[110]

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news_13052009.htm and for continuing absence of any suggestion of heritage issues see http://www.legco.gov.hk/yr09-10/english/panels/itb/papers/itb1214cb1-658-1-e.pdf accessed on 9th August 2016. For 'on the nod' acceptance of the use of Sai Wan Shan as being concordant with Hong Kong Planning Standards and Guidelines (para 88 (f): since it was already a transposer station) see the Town Planning Board minutes for its meeting 17th October 2008, Agenda item 7, Application A/H14/56 at http://www.info.gov.hk/tpb/en/meetings/TPB/Minutes/m921tpb_e.pdf accessed on 9th August 2016.

[109] For list (entries are non-sequential and not together) see List of the 1,444 Historic Buildings in Building Assessment (as of 20 May 2016) at http://www.aab.gov.hk/form/AAB-SM-chi.pdf accessed on 9th August 2016.

[110] Recommendation N48 in List of new items and new categories with assessment results (as at 18 April 2016) at http://www.aab.gov.hk/form/list_new_items_assessed.pdf accessed on 9th August 2016.

Surveying & Built Environment

Saiwan Redoubt Part II: Hong Kong's Oldest Property Boundary Marker Stone and Triangulation Station

Stephen N.G. Davies[1] and Ken S.T. Ching[2]

ABSTRACT

Research into the history of the Saiwan Redoubt identified on the original plan an apparently unrelated marker stone. During a field trip in October 2015, it was discovered that this marker stone still stood. A separate research exercise to discover the origin and purpose of the stone found that it pre-existed the Redoubt by between forty and fifty years, that it was the sole remaining physical element of the short-lived Sywan (Saiwan) Barracks, 1844-1846, and that it may have played a role in Hong Kong's first, modern topographical survey.

KEYWORDS

Boundary marker stone, Board of Ordnance, Sywan Barracks, Lt B.E. Collinson, trigonometric station, survey.

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INTRODUCTION

In Part I of this two-part article, we considered the history of the unique and little studied Redoubt on the top of Saiwan Hill. If, as we argue, the Redoubt is a neglected treasure, during the research into it, an arguably more significant discovery was made. It is one of signal importance to the history of topographical and cadastral surveying in Hong Kong. For in the process of close analysis of the 1895 plan of the original Saiwan Redoubt, a short distance to the south-west of its highest point, which was the summit of Saiwan Hill or had become so following the 'sculpting' of the hill for water catchment purposes during the construction of the Redoubt, a symbol and some notation seemingly unrelated to the Redoubt proper were remarked. The symbol was a small, grey coloured square. To its left in blue ink was written "655.35 Top of stone", identifying the top of a stone of some sort at 655.35' above mean sea level and 1.2' (0.37m) above the highest point of Saiwan Hill at 654.55' (199.52m). To the right in black ink was written "W.D. Boundary stone, Marked B.O. No 4" (see **Figures 1a & 1b**). W.D. stands for War Department, the British authority in charge of Army affairs that became the Ministry of Defence in 1964. From a local heritage angle, this stone should be ranked with the principal datum in terms of significance. The Principal Datum is very important for compliance with provisions for height restrictions in land leases, the Buildings Ordinance and the Town Planning Ordinance (**Davies 2013**).

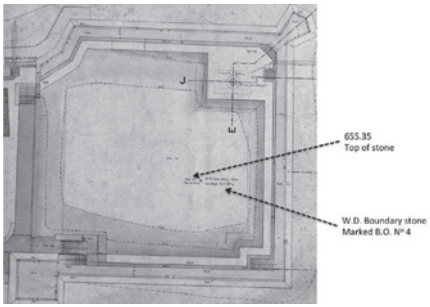


Figure 1a: The Location of the Boundary Stone in the Southern Section of Saiwan Redoubt

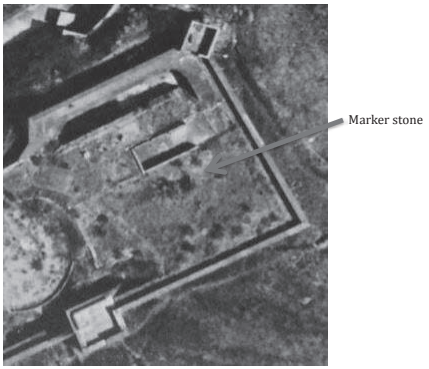


Figure 1b: The Location of the Boundary Stone its visibility on the bare hilltop of a 1963 aerial photograph

War Department Boundary Stone No. 4 does not have present day resonance, but its heritage significance is massive for the simple reason that it appears to be the sole surviving witness to three significant and foundational moments in Hong Kong's surveying story. From the point of view of topographical surveys of Hong Kong, the stone is at present the only surviving triangulation station (monumented trigonometric station) from the first, systematic triangulated survey of Hong Kong. But it is more than that, for the stone would appear to have served a second

purpose. In this second role it also stands as a foundational monument, only this time to the marking of property boundaries in Hong Kong, for as Board of Ordnance No.4, it was one of six marker stones that delineated the property boundary of one of the territory's first colonial military cantonments. As such it is therefore the earliest example we have of a property boundary marker. In addition, as we shall argue, the stone may also be witness to a determinate moment in the history of land surveying in Hong Kong when an early reliance on more 'natural' markers – common enough in most traditional boundary systems – ceded ground to rigorously observed cadastral markings using surveying instruments tied into a triangulation system. One might say, therefore, BO No.4 is a foundational marker for the entire surveying profession in Hong Kong, standing as mute testament to the important role surveying has played in the creation of property rights that lie at the root of the successes of one of Asia's most vibrant cities over the last one hundred and seventy two years.

When the plan data was first noticed, it was quite unclear what War Department boundary was referred to in the rubric or whether it had anything to do with the Redoubt. It was at least possible that the boundary in question could have been connected to some other aspect of Saiwan Hill. That also opened the possibility that the stone might predate the Redoubt, rather than having been put in place during construction. Another issue that was unclear, given the history of the Redoubt, was whether this feature of the original Redoubt still existed or whether, like so much else of Hong Kong's historical fabric, it had disappeared over the passage of years as a result of the vicissitudes of war and economic development as well as, in this case, the very extensive changes to the Redoubt that we have catalogued in Part I of this two part article.

Part of the research task for the Redoubt thus became to identify, date and document the Boundary stone.

DISCOVERING THE BOUNDARY STONE

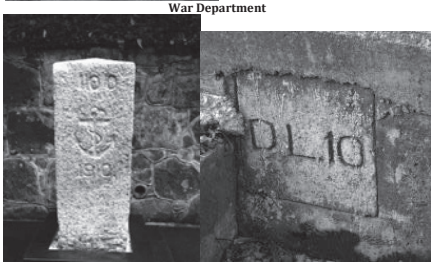
Once we were aware of the stone having at one time been a feature of the southern section of the Redoubt, the opportunity was taken, during the field trip to Saiwan Redoubt that had occasioned the whole research exercise, to find out whether the stone still existed.

The field trip involved over one hundred students divided into groups of around 10 and took place on 3rd October 2015. It is the practice on field trips, where possible, to give students specific elements of the structure being visited to look for and identify. This being the first field trip to Saiwan Battery and Redoubt, with research into the structures still being on-going and the presence of the mapped marker stone still being uncertain, the stone was not included in the trip's questions since we were not sure it was still where the 1895 map showed it.

However, it was felt very useful for the students' understanding of how heritage buildings research is conducted

that we should include at least some of them in our final step in preliminary work on the marker stone: ascertaining whether it still existed. We accordingly tasked one or two groups with checking through the scrubby, much overgrown area of the southern section hilltop outside the TVB antenna area fence, where the 1895 plan showed the stone to have stood. It was not known at this stage what the stone looked like, but the assumption was that it might appear somewhat like other, known military boundary stones in Hong Kong (**Figure 2a**). The possible position of the stone could be known only to within plus or minus a few metres since we had not yet managed to effect any ArcGIS reconciliation of the 1895 map and a present day, WGS84 map.

War Department



Royal Navy Defence Lot (Shek Kong)

Figure 2a: Examples of Hong Kong boundary marker stones—Military

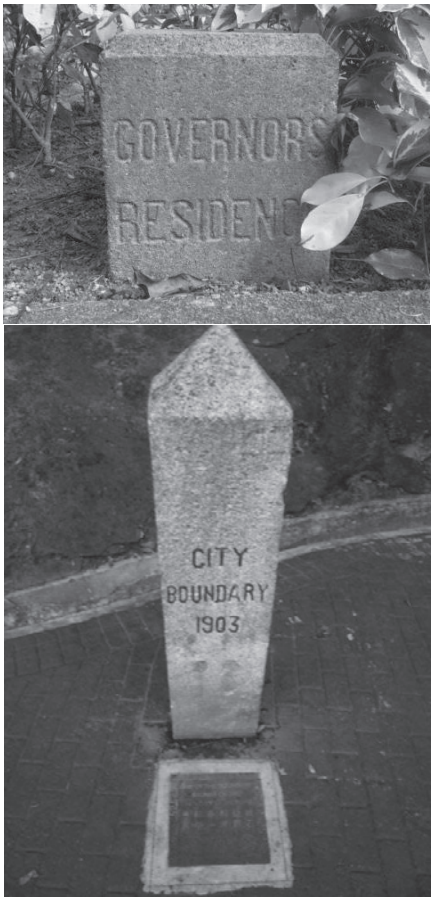


Figure 2b: Examples of Hong Kong boundary marker stones—Civilian

To collective astonishment the stone was identified within a matter of moments, standing close to the edge of a roughly cleared path alongside the closed area fence, through the heavy undergrowth in the southwestern quadrant of the Redoubt. It was much taller than any stone hitherto identified, and more crudely worked (**Appendix 1**). It had already suffered damage, possibly as a result of wartime bombardment, which battle narratives indicate had been intense, but as

probably from more recent vandalism as nearby chips of granite, possibly from the stone, suggested. Because of the unchecked growth of scrub over the once bare hilltop, the stone was also under threat from a young tree growing beside its western face that will, in time, either shatter or overset it, depending on how deeply implanted in the hilltop the stone is.

The preliminary visit, because of the exigencies of the course timetable, enabled only a brief conspectus. We identified a marking, "B.O.", over which appeared what seemed to be a damaged pheon, or broad arrow.[3] At this stage the number "4" referred to in the 1895 plan was not identified. It was thought it may have been defaced, may have been on the hard to see western face, masked by the threatening tree, or may only have existed on some now lost plan rather than having been physically chiselled into the stone's surface. It is interesting that on the "Contoured Map of the Cantonment of Sywan and the Lyeemoon" to be discussed later, a map done for and by officers of the Royal Engineers, so part of the Board of Ordnance and hence processed through the Board of Ordnance, a stamp or chop was applied which very closely replicates the markings we have identified on the stone (**Figure 3**).

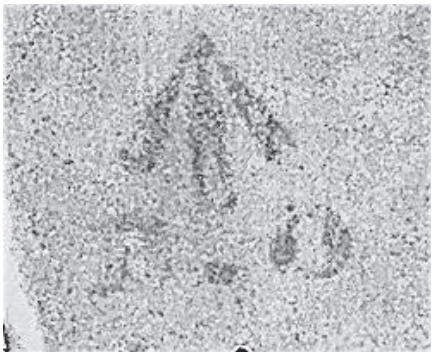


Figure 3: The Board of Ordnance stamp from the back of the map of the Contoured Survey of the Cantonment of Sywan and the Lyeemoon (in greyscale)

After the field visit had proved that the stone still existed, pending a further field visit fully to document it, the next step was to try to identify what the marker stone marked so that the meaning of both the plan data and what had been deciphered on the stone was clear. The only clues were the inscription "B.O. (and the as yet unidentified No.4)" and that the 1895 map identified it as a "W.D. boundary stone"; that is, as a stone in some way related to War Department property.

Exactly where to begin looking was initially uncertain because of what would turn out to be a chronologically based tension between the two, key acronyms "B.O." and "W.D". The first, as noted, meant "War Department (Property)", a known quantum in Hong Kong's land registration system and its use of boundary stones to mark the registered lots or parcels of land

[3] The pheon, a term in heraldry, has traditionally been the 'ownership logo' of British Government property. It is derived from the main motif in the armorial bearings of Sir Philip Sydney, Joint Master General of the Ordnance, 1585-1586. The Master General of the Ordnance was the head of the Board of Ordnance from the Board's founding in 1544 until its dissolution in 1855. The title was out of use until 1904 when it was revived and was held by the Fourth Military Member of the Army Board until the post was abolished in 2013.

into which the occupied parts of Hong Kong's territory are divided.

In Hong Kong such stones, set out to mark the boundaries of land lots, would seem to date back to the early years of British occupation. Exactly when the first such stones were set in place is not known. The Land Registration Ordinance (1844) makes no mention of any other system of land lot identification than a written register, stipulating in s.11 only that,

> " The Land Officer shall also keep an index of the parcels of ground, tenements, and premises mentioned in every such memorial, and also a like index or indexes of the names of the several parties to deeds, conveyances, and other instruments in writing, and of the devisors and devisees in the case of wills, and of the plaintiffs and defendants in the case of judgments, with accurate references in all such indexes respectively to the number and page of registry of the memorials to which any entry in such index or indexes relates."

When, after 1844, the use of lot marker stones became established and what were the modalities – where the stones were placed on a lot and how many of them there were – are obscure. Formal establishment of such a practice and the requirement that lot lessees should pay for the making and setting out of the marker stones was in place certainly by 1877, but how long before that there was a clearly established system is harder to determine. By the late 1870s, certainly, such boundary stones, usually of cut granite, identified land lots and distinguished between different sorts of lots (thus "IL" for "Inland Lot"), also identifying the lot number of the lot (thus IL 9) and, possibly for large lots, which in sequence of a number of marker stones a given stone was.

The sale by auction of a lot on Bonham Strand in 1867 did not have the requirement for the setting out of Boundary Stones as part of Conditions of Sale clause 6: The same was the case for a sale of a lot in Tai Kok Tsui in 1871. However, Conditions of Sale clause 6 of Garden Lots 71 and 72 in Tsim Sha Tsui and 73 in Tai Tso Pai in 1877 required that,

> "The Purchaser of each Lot shall pay to the Surveyor General, on behalf of Her Majesty the Queen, the sum of $10 upon the execution of the Crown Lease thereof, for and in consideration of the Boundary Stones properly cut, fixed, and marked with the Registry Number, which shall be placed by the Surveyor General for the Purchaser at the angle of each Lot".[4]

This was also a requirement of Conditions of Sale: 7 for Rural Building Lot No. 22 on The Peak in 1882.[5] The same is true for RBL 34 in 1885, RBL 43 in 1886, RBL 81 in 1888 and RBL102 in 1889.[6] The last mention

[4] Hong Kong Government Gazette, 6th April 1867, No.57, p.307; Hong Kong Government Gazette, 8th July, 1871, Notice No.100, p.307; Hong Kong Government Gazette, 3rd March 1877, Notice No..52, p.109.

[5] Hong Kong Government Gazette, 31st August 1934, No.S 301, p. 771.

[6] Hong Kong Government Gazette, 4th July

of such a requirement – though this does not entail that the requirement then ceased, solely that it is no longer mentioned in any public notice – was in 1934 for Garden Lot No. 35 in Repulse Bay.[7] Interestingly, at sales by auction of forty-three Kowloon Inland Lots in 1884, twenty-five Kowloon Inland Lots in Yaumatei in 1885 and thirty-eight such lots in Hung Hom in April of the same year and so on thereafter, none of the Conditions of Sale mentions any requirement for the putting in place of any marker stone or stones and this subsequently appears a constant.[8] It is probable that tucked in here is an unstated difference between small and large lots, with respect to the former of which marker stones may have been considered otiose. This is part of the largely unexplored matter of Hong Kong's diverse and interesting boundary marker stones.

Exactly how many different categories of such marker stone markings there have been and how many, if any, stones still exist that date from Hong Kong's earliest days seems unknown. To the authors' knowledge no inventories of known boundary stone types, or of stones that exist, or of which there is a clear record have ever been compiled.

Of the boundary stones that have entered the public record, little seems to be known for certain about their dating, although the general impression is that, at the earliest, most extant stones date from the last two decades 19th century. Marked acronyms on known surviving marker stones are said to be: AD (Admiralty); an anchor (Naval Lot); BS (Boundary Stone); City Boundary ((appears in full) Boundary of Victoria); DL (Defence Lot); GL (Garden Lot); IL (Inland Lot); KIL (Kowloon Inland Lot); KML (Kowloon Marine Lot); ML (Marine Lot); NKIL (New Kowloon Inland Lot); RBL (Rural Building Lot); WD (War Department); WDL (War Department Lot). Others are said also to exist, but only the above have been recently reported though it is not certain that examples of all those stated either exist or have in the past existed.[9]

Where land occupied by the British Army was concerned therefore, the known boundary stones of any age are marked 'W.D.', with a few stones marked 'W.D.L." (War Department Lot), which is consistent with part of the legend on the 1895 plan of the Saiwan Redoubt. One or other of those acronyms was as far as was known the marking for all militarily related boundary stones in Hong Kong until that was replaced by the "D.L." (Defence Lot) appellation when

1885, No.272, p.501; Hong Kong Government Gazette, 22nd May 1886, No.186, p.453; Hong Kong Government Gazette, 1st December 1888, No. 530, p.1097; Hong Kong Government Gazette, 14th October 1899, No. 564, p.1633.

[7] Hong Kong Government Gazette, 6th April 1867, No.57, p.307.

[8] Hong Kong Government Gazette, 20th December 1884, No.446, p.956; Hong Kong Government Gazette, 24th January 1885, No.33, pp.78-79; Hong Kong Government Gazette, 11th April 1885, No.157, p.300.

[9] The nearest to any sort of listing is to be found on websites such as http://gwulo.com/taxonomy/term/1214 or the work of the Hong Kong History Study Circle (香港歷史研究社) https://www.facebook.com/hkhistory.org. Other marker stones connected with military fortifications and communications, with the early days of urban electrification and so on are other cases that are largely unexplored.

Britain's War Office became part of the Ministry of Defence in 1964 (**Figure 2**). The acronym "B.O." in relation to British military property in Hong Kong has hitherto been unknown.

With a rapid elimination of any connection to the Buildings and Nuisances Ordinance (1856), the Hong Kong Building Ordinance (1869) or the Building Ordinance (1889) and its successors, the decoding of the acronym was soon narrowed down to only one unexpected candidate, the "Board of Ordnance."[10] This was unexpected because the Board of Ordnance existed only until 1855. It was the British government entity in charge of artillery and engineering aspects of military logistics and of government stores and equipment from c.1544 until disbanded in 1855.

Part of the Board's responsibilities vis-à-vis its responsibilities for fortifications and fortified towns was that of designing and mapping fortifications and barracks. This was the duty of one of the Major-General of the Ordnance's four Departments, the Surveyor-General's Department, which had begun life in 1597. In the mid-18th century the mapping responsibility moved beyond that of the immediate local area of fortifications and barracks and extended to Britain as a whole. In June 1791 this lead to the creation of the British national mapping authority, the Ordnance Survey, and it was this mapping function that, as we shall see, was part of the solution to the puzzle of the Boundary Stone **(Hewitt (2010), Seymour (1980))**. Equally germane to the problem, all entities under the authority of the Board of Ordnance, including all such British military property as guns, stores, equipment, etc. and boundary marker stones, carried either or both of the Board of Ordnance marking "B.O." and the pheon, or broad arrow. Examples are known in Canada and Britain (see **Figures 4a, 4b, & 4c**).

Other examples of Board of Ordnance boundary stones elsewhere

Figure 4a: Marker on the boundary of the military reserve, New Butlers' Barracks Complex, Fort George, Niagara-on-the-Lake, Ontario and standing outside the Junior Commissariat Officers' Quarters since possibly 1816. It can be seen how similar is this marker to the one discovered in Saiwan Redoubt. **(Merritt 2012, Ch.11 and p.95)**

[10] The upward, broad arrow sign is familiar to colonial civil servants, indicating government property.

Figure 4b: A much more refined version evidently existed as this example from Magilligan Point, Lough Foyle, Northern Ireland, c.1830 attests from http://www.geograph.ie/photo/3031087 accessed on 9th November 2015

Figure 4c: British example of a "B.O." ordnance boundary marker stone in Plymouth. see (http://museumcatalogue.plymouth.gov.uk/Details/collect/10002022)

At this point a minor digression is necessary so that it is clear why the businesses of topographical mapping and also of military construction were, by the mid-19th century, the responsibility of a single body under the Board of Ordnance. In 1683 a Royal warrant ordered an establishment of engineers, under a Chief Engineer, to perform all the technical functions required for designing and building the fortifications and other military infrastructure – including roads and bridges for example – necessary to the army. In 1717 this was given a more formal military style as the Corps of Engineers, one of the two Ordnance Corps,[11] though it is important to grasp that this body was not a formal part of the army, and thus not under the aegis of the army authorities. Instead it fell under the separate, if connected, domain of the Master General of the Ordnance and included in its ranks both civilians and the members of the 'military train'. That is, the Board of Ordnance was the organization that handled military logistics, which included the guns and dockyards of the Royal Navy.[12] During the 18th century the responsibilities of

[11] The other was the Royal Regiment of Artillery.

[12] The histories of the Board of Ordnance and its supplies cognate, the Commissariat, are extremely complex. A good starting point for the Ordnance Board is **Skentelbery (1967)**. The Commissariat, which was a civilian organization until 1869 and part of the Treasury, has had no general history devoted to it. A helpful starting point is **William Reid (1995)**.

the Corps of Engineers were expanded to include topographical surveying over far wider areas than those immediately around fortifications and fortified towns **(Seymour 1980: 3-6)**.

By the time of its founding the British Ordnance Survey was thus a part military, part civilian organization working within the Board of Ordnance, drawing its military staff initially from both the Artillery and the Engineers, and was the centre of official British terrestrial cartographic work whether in Britain or overseas. By the mid-19th century, therefore, the Board of Ordnance and the Corps of Royal Engineers came to be responsible for mapping existing and newly acquired territories in the expanding British Empire where there was no independent survey and where, which seems to have been by no means always, there was a demand for maps.[13]

In the years up to 1841, therefore, the role of British military surveyors was by no means ubiquitous in the domains of the burgeoning British Empire. As much to the point, where such surveying roles were found, it was not necessarily officers of the Board of Ordnance who discharged it: Western Australia's Surveyor-General, John Septimus Roe, a naval officer, being a case in point **(Jackson 1982)**, with the establishment of an entirely locally staffed and directed survey and mapping service, as in India from 1767, being the alternative **(Markham 1878, Phillimore (1945-1958))**. With some notable exceptions, a significant role for the officers of the Royal Engineers seems more to have been a feature of the last half of the nineteenth and the early twentieth centuries **(Braun 2008, Bunton 2001), Edney (1997), Given (2004), Home (2003, 2006)**. In the Straits Settlements, as Singapore and Malaya were contemporarily known, surveying was initially somewhat haphazard, with the Royal Engineers playing a significant role between 1826 and 1847, with control then being taken by the Survey of India, until the RE regained prominence in the 1870s **(Mugnier 2006, Wright 1908: 318)**. Even in cases like South Africa, where the role of the Royal Engineers was prominent as of the British annexation in 1806, it does not appear that systematic topographical surveying of the sort that Collinson undertook was common before the late 1830s **(Robson 2011, Robson and Oranje 2012)**. In all cases in the British Empire where systematic surveying did take place, there was an undoubted and important link between an accurate topographical survey and the cadastral surveys on which the landholding structure in colonial possessions depended even where, as appears often to have been the case, an accurate triangulation lagged land allocation by decades.

In that sense the salience of the Royal Engineers in 1841 Hong Kong was a

[13] The Corps of Engineers was given the title Corps of Royal Engineers in 1787, however until 1855 only the officers of this unit were members. The rank and file were members of the Soldier Artificer Company from 1782-1787, of the Corps of Military Artificers from 1787-1812 and the Corps of Royal Sappers and Miners until, with the abolition of the Board of Ordnance in 1855 and the absorption of the various elements into the Army, all became the Corps of Royal Engineers, see **Porter & Watson (1889-1915)**, vol. 1.

relatively new departure. The Board of Ordnance's local Corps of Engineers' representative, the rather prickly Major Edward Aldrich RE (1802-1858), bore responsibility not only for the new colony's fortifications, but also for any topographical surveys of the newly acquired territory, which he saw as indispensable for the effective discharge of his primary role **(Holdsworth and Munn 2012: 2-3)**. It is perhaps indicative of the crossover role of the Royal Engineers in such initially militarised British colonies as Hong Kong that whilst Aldrich was the Commander of the Royal Engineers in Hong Kong from 10th June 1843, as of 1844 he was also a member of the civil administration under Sir John Davis, acting as advisor to the Surveyor-General's Office. This signalled as clearly as possible the linkage in Hong Kong that grew stronger through time, between the triangulated primary network of the main topographical survey and the cadastral surveys on which the Crown leasehold structure depended.[14]

Part of Aldrich's responsibilities was to design and have erected permanent buildings to house the British garrison as well as permanent, fortified defences. It was in embarking on that duty that Aldrich learned there were no accurate survey plans of Hong Kong. In his view, to be able to proceed a survey would have to be completed **(Bard 2015: 25)**. To effect the task Aldrich was sent a young Royal Engineers officer, trained in the Royal Military Academy, Woolwich and at the Royal Engineers' depot in Chatham, Lt T.B. Collinson (1821-1902) **(Holdsworth and Munn 2012: 107)**. Collinson, like Aldrich, had served with the Ordnance Survey in Ireland, a survey renowned for its influence on cartography, not least in its use of contour lines to indicate height, an example Collinson was to follow in his survey of Hong Kong **(Holdsworth and Munn 2012: 107)**. He arrived in Hong Kong towards the end of the summer or early in the autumn of 1843 on the East Indiaman Mountstuart Elphinstone. It seems likely that he began the survey fairly soon after his arrival. Both he and his commanding officer, as members of the Corps of Royal Engineers supervising a company of the Corps of Royal Sappers and Miners, were employees of the Board of Ordnance. This is a key point.

It is so because, as a result of the signal logistical failings of the Board of Ordnance during the Crimean War (1853-1856), in 1855 it was abolished and, with it, the "B.O." abbreviation, though not the pheon, which continued and continues to be used to mark British government property and familiar in the surveying world – at least in Britain – through its use for levelling benchmarks, which date from the late 19th century.[15] With the abolition of the Board of Ordnance the work of the Royal Engineers, including their survey work, passed under control of the War

[14] The authors are indebted to an anonymous referee for this point,

[15] For the modern irrelevance of benchmarks **Royal Institute of Chartered Surveyors (2006)**, for benchmarks see http://www.heritageandhistory.com/contents1a/2010/05/bench-marks-and-levelling-points/?doing_wp_cron=1474610227.7143690586090087890625

Department and the marking of both government property and such markings as those used by the Royal Engineers in their surveys ceased using the acronym "B.O." and switched to "W.D." The use of "W.D." to mark government property then continued even after the War Department was renamed the War Office after 1857 until the change we have noted in 1964.

It follows from this analysis that the stone that had been initially identified on the 1895 plan and subsequently found still in situ in the Saiwan Redoubt bearing the logo and initials of the Board of Ordnance, must predate 1855. It accordingly seemed to the authors that although the 1895 plan states that the stone was a "W.D. Boundary Stone", which fits with how military property in Hong Kong was designated at that time, the stone was not itself part of the Saiwan Redoubt proper.

Given the "B.O. No.4", a reasonable inference was that whatever boundary the stone was related to, assuming it predated 1855, its meaning would have to be sought in pre-1855 documentation of Hong Kong's land allocation system as respected military land. Such documentation is by no means plentiful and knowing where to start was not immediately obvious. A short cut, it seemed, was to see if anything like the Boundary Stone featured in the earliest cartographic record in Hong Kong, given that this was the work of Lt Collinson.

The initial hunch was that the stone might perhaps have been a trig point (monumented trigonometric station) for Collinson's 1844-1845 survey. Accordingly the detail of Collinson's map (available as a zoomable, online resource via the National Library of Scotland[16]) was consulted. With five exceptions the map specifies the nature of any trig point. Collinson lists 'pile', 'pole', 'rock' and 'stone'. On inspection, there was a trig point on Saiwan Hill where the Redoubt was to be built fifty years or so later. It is marked 'rock' and has a spot height of 657' (**Figure 5a**). This fitted the location, although not the 1895 attribution of it as a 'boundary stone'. Indeed the only two 'stone' trig points on Collinson's map are the two markers for the survey's baseline of 2836' at Shek O. That B.O. No.4 may not have been one of Collinson's 1844-1845 trig points but only a cadastral marker is a possible inference but, as we shall see, almost certainly incorrect.

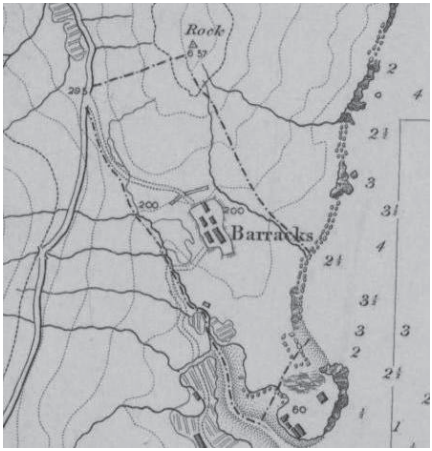


Figure 5a: Detail from the The Ordnance Map of Hong Kong (1846)

[16] https://mapsengine.google.com/07550989709782409818-18169102623046931205-4/mapview/?authuser=0

Figure 5b: Detail from the larger scale Contoured Map of the Cantonment of Sywan and the Lyeemoon (1846)

Both maps in **Figure 5** were by Lt T.B. Collinson RE. The larger scale map shows a revised cantonment boundary (red) and a rather different original eastern cantonment boundary to that shown on the main map.

The 1895 plan notes that to "top of stone" the height above the then mean sea level was 655.35'. The discrepancy between this and Collinson's 657' is a difference of only 1.65'. Given the trajectory of Hong Kong's vertical datum 1841-1895, this is not a problem **(Davies 2013)**. But what was lacking was any record of the progress of Collinson's survey that would help make sense of the 1895 Redoubt map's labelling of the stone as 'No.4'. None of Collinson's 37 marked trig points has any number and it followed that whilst identifying the stone as a trig point was, bar the 'stone'/'rock' discrepancy, plausible, unless some other examples of the survey's trig points remain, the identification was problematic.[17] Further research will be concerned with this issue.

Searching for some further clue on the 1845 map it was noted that the colophon and its "References" (key to symbols) explains exactly the purpose of the stone that has been found (**Figure 6**). The important reference is the first, "Boundary of Ordnance Property". This is a heavy line consisting of a dash and a dot. Referring back to the map it is clear that there is only one such boundary marked. This is in Saiwan and is the boundary of the property allocated to the British Army for the short-lived Saiwan Barracks. Further confirmation of this is to be found in the larger scale plan of the "Cantonment of Sywan and Lyeemoon" that Collinson prepared as part of Aldrich's plans for Hong Kong's military installations, although it should be noted that there is a significant discrepancy in the boundaries depicted, especially the older, eastern boundary on the smaller scale map, which does not match that shown at larger scale.[18]

[17] 20 of the trig points are 'piles', 2 are 'poles', 8 are 'rock' and 5 have no specified material. Of the trig points one is in Kowloon, 29 are on Hong Kong Island and 7 are on small islands and rocks around Hong Kong Island's perimeter.

[18] UK National Archives, WO 78/472: Four contoured surveys. No.4: Cantonment of Sywan and Lyeemoon (HK), 4½" to 200 yds, 7' 6" x 3' 10", To accompany report No. 198 dated July 1846,

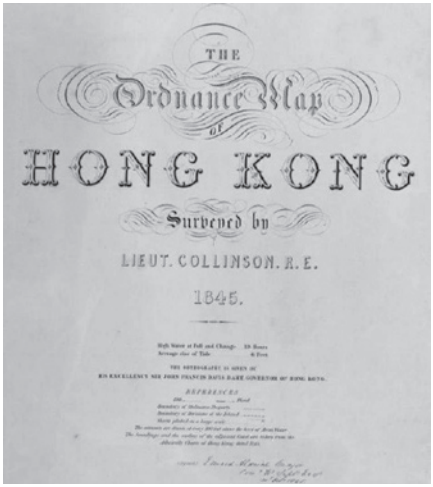


Figure 6: The colophon to the first Ordnance Map of Hong Kong

It can be seen that the northeast corner of the Ordnance Property enclosing Saiwan Barracks is exactly where the stone that has been found is located. The larger scale map shows exactly six stones altogether. Supposing that the stones were numbered in sequence, which seems unexceptionable, then we have two possible sequences. Anti-clockwise No.1 would by elimination have to be the Boundary Stone shown just to the north of a small knoll on which a house is shown labeled "Captain Rainier's House (dismantled)".[19] No. 2 would then be the Boundary Stone marked on the Tathong Channel shore 400 yards to the N of No.1. No.3 will have been the boundary stone marked half way up the hill WNW of No.2, where the boundary doglegs NW to the summit on today's Sai Wan Hill. That would make No. 4 the stone on top of Saiwan Hill, which fits both plan and what has been found, No.5 is then the stone marked at Point 295' on the road through the Shaukeiwan/Chai Wan Gap and No.6 the stone marked where the road down from Chai Wan Gap meets the creek in the north west corner of Sywan Bay before turning towards Captain Rainier's dismantled house. The clockwise alternative would be that No.1 was the stone on the shore N of the dismantled house of Captain Rainier, No.2 the stone on the road by the creek flowing into the north of Sywan Bay, No. 3 the stone at spot height 295' on the road at Chai Wan Gap, No. 4 the Boundary Marker Stone on Sai Wan Hill, No. 5 the stone half way down the hill at the boundary dogleg and No.6 the stone on the shore 400 yards north of No.1. Which of these sequences is correct we cannot know for certain. However, one known sequence of boundary marker stones on military land in Hong Kong, though dating from the later 19th century, is anticlockwise, and this appears both to have been a practice in other British colonies and, possibly, a British colonial default, so an anticlockwise numbering might therefore be a safe assumption.[20]

[19] Probably Captain Daniel Rainier of the 98th Regt, which was in HK from 1841 until 1846 and was one of the regiments that suffered worst, losing 400 effectives to death and disease (from a total of 700-800) during its stay. Rainer joined the 98th as a 2nd Lt in 1836, was made Lt in 1838, Captain in 1842, Major in 1850, Lt Colonel in 1853, Colonel in 1854 and was a Major-General in Peshawar 1865-68 and Lahore 1868-1870 in which year, or the year afterwards, he disappears from the record, possibly having died.

[20] http://gwulo.com/hong-kong-war-department-boundary-stones and, for Sydney, http://dictionaryofsydney.org/entry/sydneys_boundary_markers both accessed on 17.8.2016. Historically it seems the British default was

It is also certain that the stone served both as the northeast boundary marker of the barracks and as a trig point for the survey. For on the top of the hill, where a stone is marked, Collinson's large scale map clearly bears the legend "Station Lyeemoon Upper Hill". The stone is therefore unquestionably a station in a trignometrical survey, no matter its other roles as a marker of the cantonment boundary. This in itself is an interesting indication of the mutability of toponyms in the early days of colonial Hong Kong. We know, for example, that the names of some of the higher hills on the first version of Commander Belcher's 1841 survey of Hong Kong waters had changed by the time Lts Richard Collinson and Henry Kellett updated the survey in 1845. Here we have evidence that at some stage between 1846 and 1885 Upper Lyeemoon Hill was renamed Sywan Hill, though exactly when the change took place is unknown (on the matter of toponyms see more below).

Manifestly, however, the stone was both a boundary stone and a triangulation station. In terms of the priority between these functions what matters are the respective datings of Collinson's survey and the barracks boundaries. One possibility is that the delineation of the Saiwan Barracks will have come first since the barracks seem to have been first occupied c.1844, with construction commencing in late 1843.[21] There certainly appears to have been an earlier delineation of the boundaries predating the Collinson survey since the map has two boundaries for the Saiwan Cantonment, one in green marked "Old Boundary of Cantonment" and a second in red marked "Corrected Boundary of Cantonment". It is impossible now to decide when the first was set down, what we can tell, however, is that it did not seem to use boundary stones, since none are marked. It seems to have been set out as far as we can see from the map by the use of natural markers like stream edges and naturally occurring, conspicuous rocks. It is therefore probable given Collinson's arrival date that the definitive setting out of the Saiwan Cantonment land boundaries with boundary stones came after the barracks had been built and was coterminous with the conduct of the survey.[22] Why there was the rectification is unknown, though looking at the map and comparing the two boundaries, the new 'red' boundary, other than its trajectory down the stream from Chai Wan Gap to Sywan Bay, is manifestly one dependent on straight line survey methods as compared to the more 'naturally' based boundary lines of the

anticlockwise, working from an assumption that a starting point was north and east and the surveyor worked west, then south then east and north. This practice seems to have been of some antiquity in Europe, see Benet Salway, "Putting the world in order: mapping in Roman texts", Ch. 7 in **Talbert (2014)**. Current Hong Kong practice is the converse, see Cap 473: Code of Practice Land Survey Ordinance, Appendix B para 4.4.

[21] The Friend of China for 23rd November 1843 had a notice from the Army Commissariat inviting tenders for building Saiwan Cantonment.

[22] In the British National Archives there is a map, MPH 1/899/7 'Trace from the Contour Survey of the Cantonment at Sywan'. Reference table. Scale: 6.3 inches to 1,700 feet. Compass indicator. Signed by Edward Aldrich, Major CRE, 20 April 1844. This was probably supervised by Collinson, but may have been conducted by an independent survey party.

earlier, 'green' boundary. In that sense what this map may also be showing us is a determinate moment in the history of land surveying in Hong Kong when a reliance on more 'natural' markers – common enough in most traditional boundary systems – ceded ground to rigorously observed cadastral markings using surveying instruments tied into a triangulation system. This is another signal justification for the heritage importance of B.O. No.4.

The map on which the data appears, signed by Major Aldrich, is dated 1845 and the copy, intended to "Accompany Report No. 198" was despatched to London dated 18th July 1846. Lieutenant Collinson has also signed the map off, noting, under a rubric 'C', "Books 4, 5, 6 and Calculation Book 1, page 41, T.B. Collinson, May 31 1846" and this is countersigned by Major Aldrich April 1846. This gives a clear terminus ad quem, since the sign off is for the complete fair copy map, which Collinson will have rushed to finish before he left Hong Kong on 11th June 1846 for New Zealand **(Holdsworth and Munn 2012: 107)**.

The terminus a quo of when the survey was actually done, is harder to pin down. The insalubriousness of the new cantonment at Saiwan, in part related to the loss rate of the 98th Regiment, meant that the barracks swiftly fell into desuetude.[23] It may be possible to narrow things down therefore with reference to Captain Rainier's abandoned and dismantled house. We know that the 98th regiment left Hong Kong for India in last half of 1846. Given the appalling death rate they suffered, with over 500 either dead or sick between arriving back in Hong Kong in 1842 and their departure for India, it seems probable they were moved out of Sywan Barracks well before their scheduled embarkation date, probably in 1844 or 1845 **(Cook 1970: 36)**. We also know that Bernard Collinson did not arrive in Hong Kong until the very end of 1843 and is unlikely to have begun his survey work until 1844. So putting all the data together the probability is that the survey, post-dating the departure of the 98th, was undertaken in 1844 and at the latest very early 1845 and that the boundary stone must date from c. mid-1844 to the first months of 1845.

The detailed map also gives some further clues to the triangulation that Lt Collinson and his team undertook in this small area. It seems evident that Upper Lyeemoon Hill was an important station. On the map there are in total four trig points and a total of seven lines of bearing or bearing and distance. Only one of these trig points is marked on the smaller scale Ordnance Map of Hong Kong, on which the bounds of the map here discussed are marked, and that is the one on top of Saiwan Hill. Of the trig points on this larger scale map, two radiate from a secondary observation station at a height of 123', "Station on the Hong Kong side of the Lyeemoon", roughly where the HK Museum of Coastal Defence is today. It is tied by two lines of bearing and distance: a

[23] What is not known is when it was abandoned. It is thought to have been as early as 1847. By 1875 it is clear that the area had been unused for some years – see CO129/171, pp.96-175 where the site is described as "practically abandoned" at p.279v.

"Tangent to the Main Coast West of the Lyeemoon" and "To the Cone Peak (Devil's Peak) distance 1700 yards, height 725 feet". Interestingly it is not tied back to the Upper Lyeemoon Hill station nor to a trig point marked on the Chinese side of Lei Yue Mun "Station on the Chinese side of the Lyeemoon". The data effecting these ties doubtless appeared in the books Collinson refers to in his sign off under rubric 'C'.

The main Station Upper Lyeemoon Hill is linked by five lines of bearing and distance to topographical points on the main survey of which this is a part. The first working clockwise from north is a tangent to the main coast east of the Lyeemoon, then a tangent to the east point of Sywan Bay, next to Siwsywan Hill (Pottinger Peak) 2406 yards distant and 1022 feet high, SE Peak of Highest Hill 1129 yards distant and 1320 feet high and finally the Highest Peak (Mt. Parker) distance 1314 yards, height 1733 feet. There is another orphaned station, only this time with no lines of bearing, almost due west of Upper Lyeemoon Hill, on a small knoll on the flanks of Mt. Parker, with a spot height of 480 feet. A further research project is to try to match the data that can be culled from the larger scale maps of this survey with other, better documented contemporary British surveys to see if the first triangulation of Hong Kong can be reconstructed.

The best way of understanding how all that worked is to relate these lines of bearing with the main Collinson survey on which we can see that Pottinger Peak and Mt. Parker were two others of the main triangulation. In that sense this larger scale map of the Lei Yue Mun area gives us an interesting insight into the way in which at larger scale the survey may have been carried out using minor stations not shown in the main triangulation. There are large scale maps of Green Island and of Kellett Island, also marked on the larger Ordnance Map, which likewise indicate how they are tied in to the main triangulation. Indeed the Green Island map has an explicit inset showing "Triangulation showing the position of Green Island in the Harbour of Hong Kong", also showing a number of minor stations that do not appear on the main survey.[24] It is a major loss that either Bernard Collinson's survey data books have been lost, or they have disappeared into an archive without any means of finding them. How good it would be to recover the details of this first triangulation.

However, what detail we have allows yet another rather loose 'fix' on the dating of the map. The clue is Collinson's use of two names for what today we call Mt. Parker. For in Commander Belcher's 1841 survey, for some reason best known to Commander Belcher, he decided that the Mt. Parker was the highest hill on Hong Kong Island and accordingly named it "Highest Hill". Admiral Sir William Parker (1781-1866) was the Commander-in-Chief of the East Indies and China Station in 1841-1842, and it is clear that the naming of the mountain post-dated his time in Hong Kong. We know from the record that the first governor, Sir Henry Pottinger, was

[24] WO78/472 Plan of Green Island Hong Kong

extremely hesitant about settling on toponyms on Hong Kong's north shore, so it seems highly probable that the names with which we are familiar did not start to be given until Sir Henry had left in 1843.[25] A cross-bearing on this is the second edition of the Belcher chart, produced from the work of Richard Collinson and Henry Kellett in 1845, on which today's names first appear. It follows, if not with a great deal of weight, that Bernard Collinson's use of both "Highest Peak" and "Mt. Parker" suggests again the year 1845 when, evidently, toponyms were still fluid, but beginning to settle.[26] One can add that on the map of Green Island, of the same date as the map we are discussing, Victoria Peak is still identified as "Mt. Possession" and Mt. Davis as "West Hill", neither with any suggestion of the names they were to acquire within a year or so.

COMPLETED SURVEY AND DOCUMENTATION

With a clear identification and a probable date bracket for the stone, it became urgent that full documentation was completed. As with the unique Redoubt in which it was found, the one hundred and seventy or more year-old stone had been completely ignored by those responsible for Hong Kong's antiquities and monuments and was completely unprotected, whether by legislation or any more physical means. Its survival had been and would probably continue to be a matter of blind good fortune that, given the depredations of the television transposer-become-digital terrestrial TV fill-in station nearby and the imminent threat of the encroaching scrubland and tree, could not be relied upon to continue.

On 3rd November 2015, Dr. Davies and Dr. Holvert Hung of the Department of Real Estate and Construction, Mr Chan Yiu-hung and his assistant as photographers, and a professional survey team from KELand Surveying, Planning & GIS Co. Ltd. visited Saiwan Redoubt to fully document the marker stone (see **Appendix 1**).[27] The results of that most recent field visit were that the exact location of the Redoubt was plotted to the greatest accuracy possible using a Geo-referencing process in an ArcGIS platform (see **Appendix 2**). The survey professionals noted that significant changes to survey accuracy, datums and associated grids, and the much larger scales of modern surveys as compared with 1895, and especially with Collinson's 1845 survey, mean that we can largely ignore the relatively small discrepancies in positions noted as between today and earlier maps and

[25] see CO129/2 p.178 for Sir Henry Pottinger's hesitations about toponyms.

[26] In this regard on one of the ten panoramic sketches Collinson made of Hong Kong, he uses only the later toponym 'Mt Parker', see UK National Archives CO 700/HongKongandChina2, "Ten outline Sketches of the Island of Hong Kong, to accompany the Ordnance Map of Hong Kong. Royal Engineers Office, Hong Kong, 27th August, 1846." The authors are indebted to an anonymous reviewer for drawing their attention to this.

[27] All the geo-referenced maps in Appendix 1 are the product of the KELand team comprising: Sr Dr. Ken Ching Siu Tong, Sr Natalie Chan Wing Shan, Ms. Circle Yuen Ka Ying, Mr. Ho Chung Man, Mr. Chan Yuk Keung and Mr. Lee Ho Man.

plans. The 1895 plan is evidently of an extremely high order of accuracy and the mismatch between it and today's ArcGIS platform negligible. A similar comparison between today and the 1845 map is simply not possible to the same level of accuracy but the 'fit' at a discrepancy of around 20m is thought to be sufficiently good for the mismatch to fall within acceptable margins.

Complete documentation of the stone included the identification of the hitherto missing Arabic figure "4" alluded to on the 1895 plan. This was identified as a faint marking on the top of the stone as shown in Appendix 1. It was noted that the number is so inscribed that the crossing point of its vertical and horizontal strokes can also to serve as the zero point for a triangulation instrument. However, its use as such seems to have been a one-off. With the acquisition of the New Territories in 1898, a survey of the new domains had to be completed and be integrated with the existing survey of Hong Kong and Kowloon, which had been little updated since Lt Collinson's day.[28] The evidence argues that in the new triangulation Saiwan Hill was by-passed, and only Mt. Parker used, tied in to the New Territories triangulation via a trig point on the south-westernmost end of Black Hill (Ng Kwai Shan, 五桂山) **(Davies 2016)**.[29]

More recently a new Geodetic Survey Traverse Station, No 1004.03, has been created some 50m SSW of the old marker as shown in the final diagram in Appendix 2.

In addition to the Boundary Stone, close inspection of the 1895 plan of Saiwan Redoubt had also shown that, in order to establish the various levels with which the plan is peppered, including its height contours, the survey team that built the Redoubt had also installed a benchmark. During the November site visit this was also identified (Appendix 3).[30] Reconciliation of the vertical datums of Saiwan Redoubt and of the Boundary Stone is a matter of on-going work.

CONCLUSION

The conclusion we have drawn is that what has been found is a boundary marker stone (technically a cadastral boundary marker) and monumented trigonometric station installed by surveyors of the British Army Royal Engineers under Lt Thomas Bernard Collinson RE, to settle the definitive boundaries of the Saiwan Cantonment and complete the first triangulation of Hong Kong. The data suggests that this was most probably during 1844, but because of the Board of Ordnance

[28] For the need for a survey see J.H. Stewart Lockhart's Report on the New Territory, Supplement to the Hong Kong Government Gazette, No. 26, 28th April 1900, p.viii.

[29] See also, for evidence Saiwan Hill was not a trig point on the next map series to be produced, https://mapsengine.google.com/07550989709782409818-18169102623046931205-4/mapview/?authuser=0, which shows the 1:20000, Hong Kong and the New Territories - Sheet 19 Victoria Harbour (1930) with no trig point on Saiwan Hill.

[30] The sharp eyes of Sr Natalie Chan Wing Shan, who knew exactly what she should be looking for, spotted this extremely inconspicuous, rust-coloured, iron nail head in the stained, leaf mould covered concrete.

marking on the stone, it was in any event certainly before 1855. It is therefore the oldest known boundary stone on Hong Kong Island from the Victorian period. It is also the oldest monumented trigonometric station in Hong Kong, probably the oldest in China and as a result unique.

Government, newspaper and archival sources

Cap 473: Code of Practice Land Survey Ordinance, Appendix B para 4.4

The Friend of China

Hong Kong Government Gazette

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UK National Archives, CO129/171

UK National Archives, MPH 1/899/7

UK National Archives, WO 78/472

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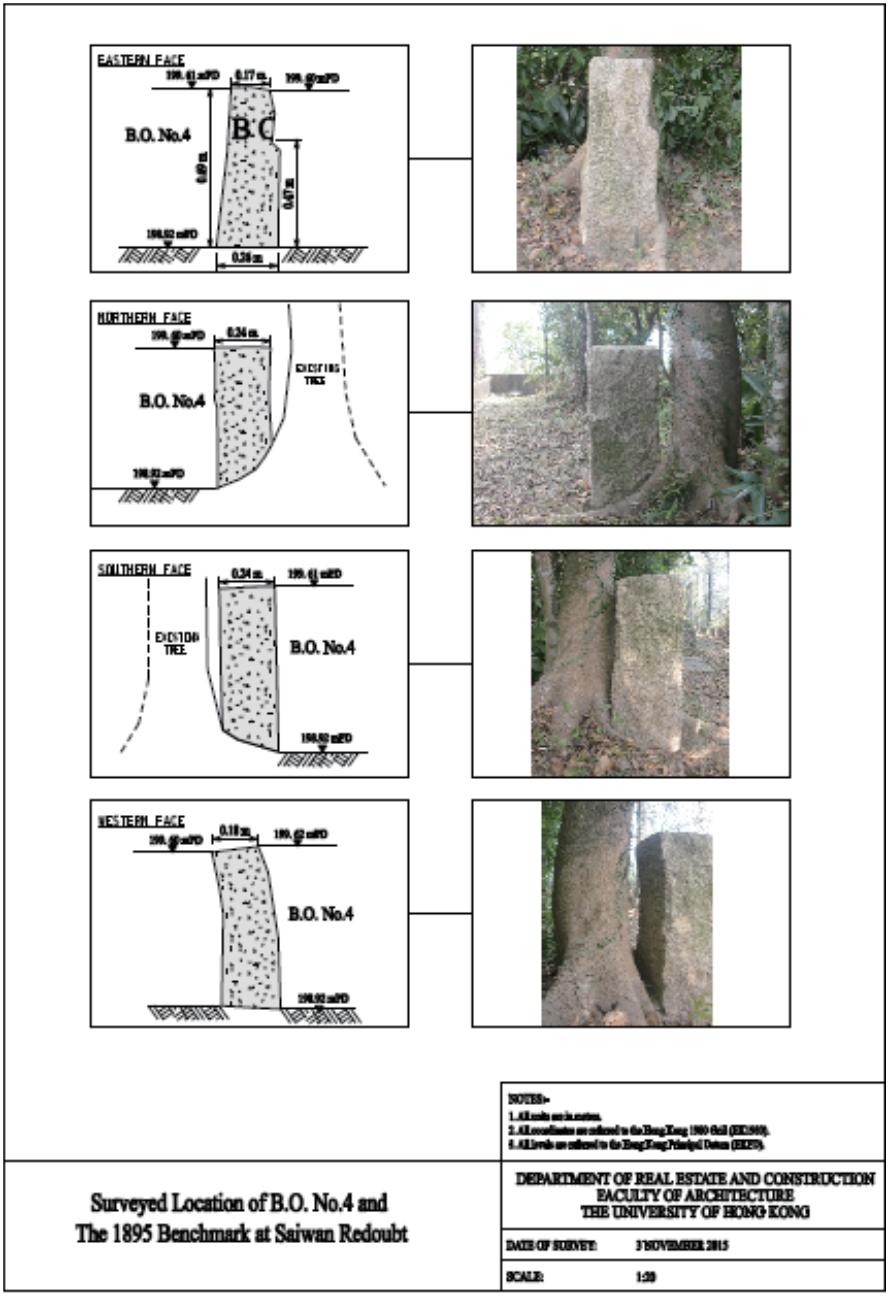
https://mapsengine.google.com/07550989709782409818-18169102623046931205-4/mapview/?authuser=0

APPENDIX 1: Documentation of the stone showing the danger it is in from encroachment by a wild, natural growth tree in the wholly untended and neglected Saiwan Redoubt



Surveyed Location of B.O. No.4 and
The 1895 Benchmark at Saiwan Redoubt

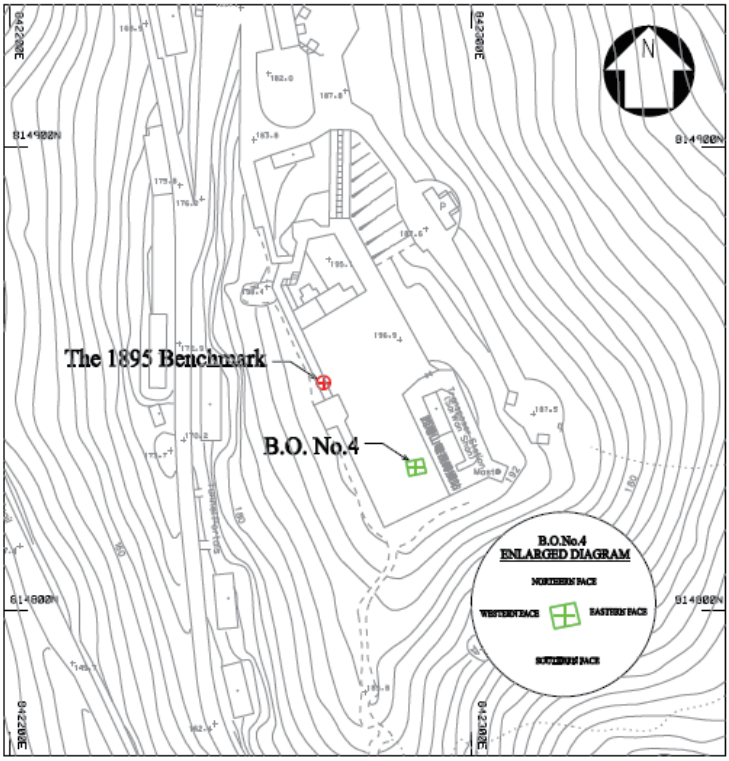
Image of the top of the stone and supporting image with "4" inscription highlighted (photograph Mr Chan Yiu-hung):

The stone's top

No.4 mark indicated

Diagonals showing how the cross point in the No.4 figure represents the centre of the stone's top to mark a triangulation station.

APPENDIX 2: 1895 plan geo-referenced using ARCGIS platform showing close fit given offsets inevitable from the rubber sheeting exercise from an ungridded survey era.



B.O. No.4 (Granite Stone) *Measured at the top of stone

HK 1980 GRID COORDINATES:

NORTHWESTERN CORNER:		NORTHEASTERN CORNER:	
NORTHING:	814830.929 m	NORTHING:	814830.949 m
EASTING:	842287.971 m	EASTING:	842288.215 m
HEIGHT:	199.60 mPD	HEIGHT:	199.60 mPD

SOUTHWESTERN CORNER:		SOUTHEASTERN CORNER:	
NORTHING:	814830.756 m	NORTHING:	814830.783 m
EASTING:	842288.032 m	EASTING:	842288.271 m
HEIGHT:	199.62 mPD	HEIGHT:	199.61 mPD

HEIGHT OF THE TOP OF STONE AS STATED IN 1895 MAP:
=655.35' (approximate 199.75 mPD)

The 1895 Benchmark (Nail on ground)

HK 1980 GRID COORDINATES:

NORTHING:	814849.175 m
EASTING:	842268.068 m
HEIGHT:	197.04 mPD

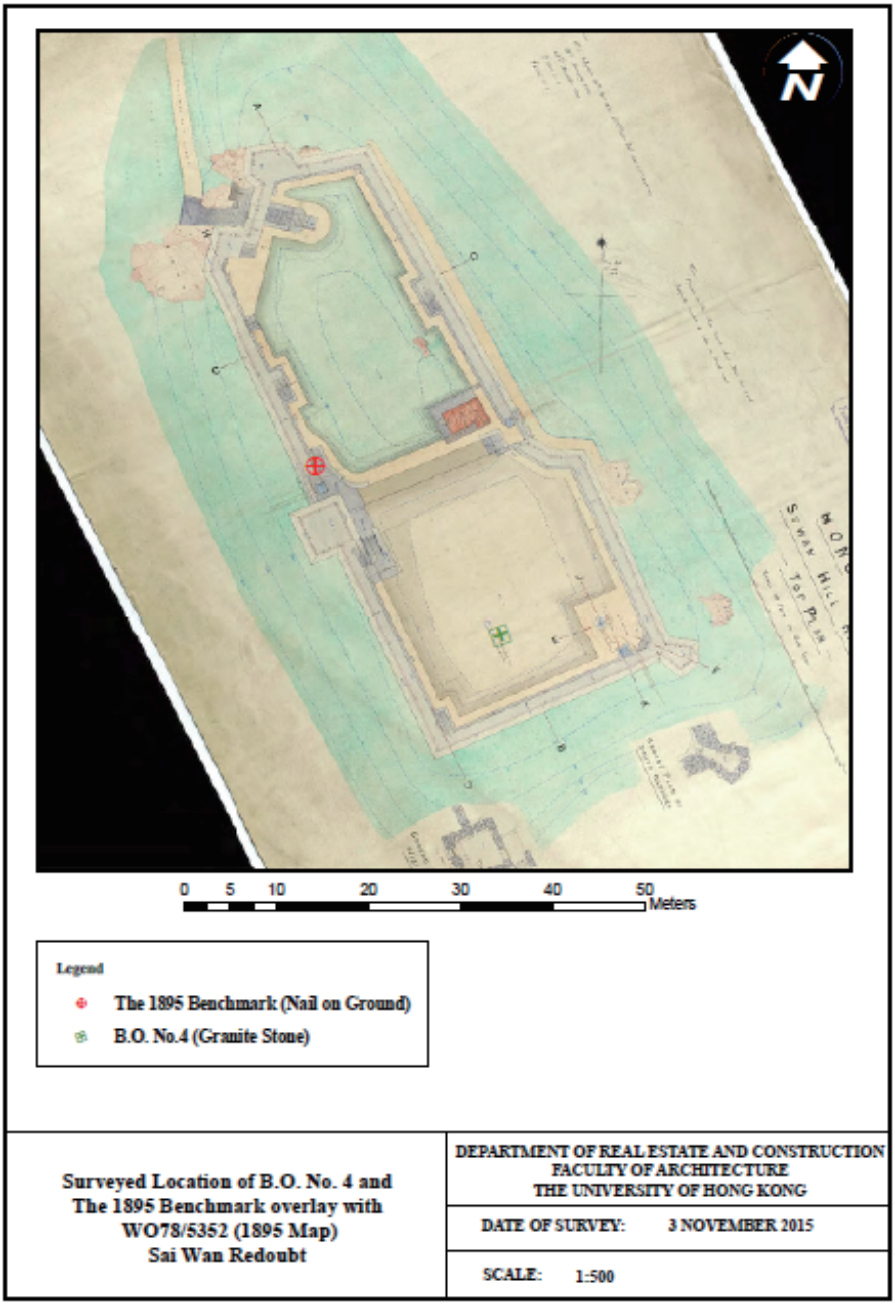
NOTES:-
1. All units are in metres.
2. All coordinates are referred to the Hong Kong 1980 Grid (HK1980).
3. All levels are referred to the Hong Kong Principal Datum (HKPD).
4. The basemap information was extracted from B1000 Basic Survey Sheet Nos. 11-SE-14A & C from Lands Department.

Surveyed Location of B.O. No.4 and The 1895 Benchmark at Saiwan Redoubt

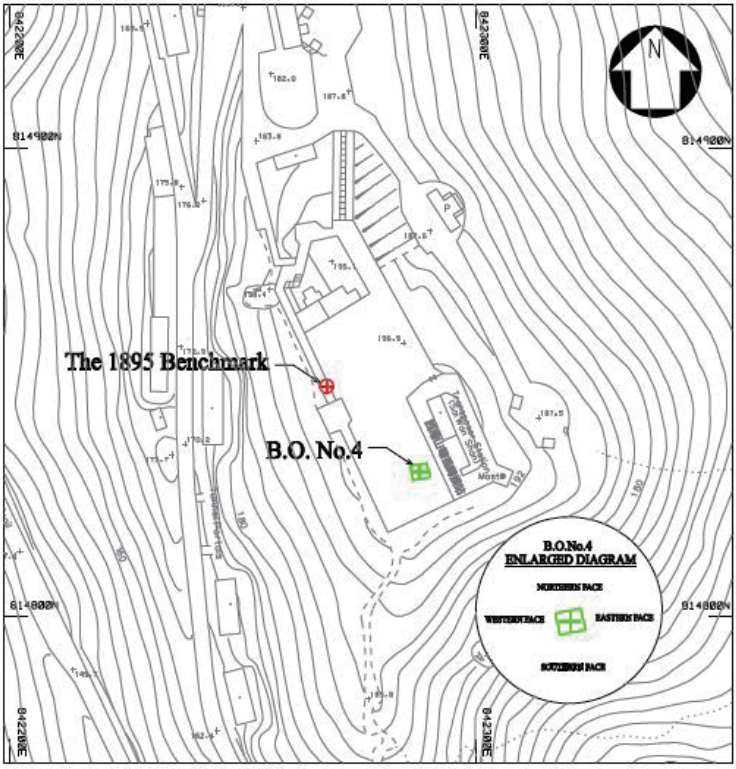
DEPARTMENT OF REAL ESTATE AND CONSTRUCTION
FACULTY OF ARCHITECTURE
THE UNIVERSITY OF HONG KONG

DATE OF SURVEY: 3 NOVEMBER 2015

SCALE: 1:1,000



Accurate survey of the position of boundary marker stone and benchmark.



B.O. No.4 (Granite Stone) *Measured at the top of stone

HK 1980 GRID COORDINATES:

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Surveyed Location of B.O. No.4 and The 1895 Benchmark at Saiwan Redoubt

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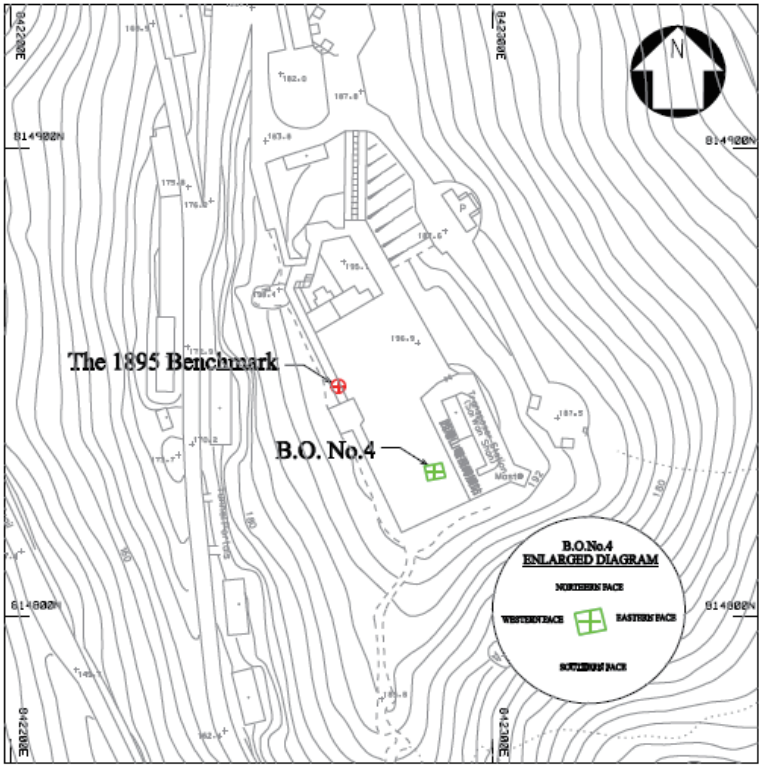
FACULTY OF ARCHITECTURE
THE UNIVERSITY OF HONG KONG

DATE OF SURVEY: 3 NOVEMBER 2015

SCALE: 1:1,000



B.O. No.4 (Granite Stone) *Measured at the top of stone

HK 1980 GRID COORDINATES:

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NORTHING:	814830.929 m	NORTHING:	814830.949 m
EASTING:	842287.971 m	EASTING:	842288.215 m
HEIGHT:	199.60 mPD	HEIGHT:	199.60 mPD
SOUTHWESTERN CORNER:		**SOUTHEASTERN CORNER:**	
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1. All units are in metres.
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3. All levels are referred to the Hong Kong Principal Datum (HKPD).
4. The basemap information was extracted from B1000 Basic Survey Sheet Nos. 11-SE-14A & C from Lands Department.

Surveyed Location of B.O. No.4 and The 1895 Benchmark at Saiwan Redoubt

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THE UNIVERSITY OF HONG KONG

DATE OF SURVEY: 3 NOVEMBER 2015

SCALE: 1:1,000

Placement of the benchmark and marker stone on a 1963 aerial photograph of Saiwan Redoubt.

Surveyed Location of B.O. No. 4 and The 1895 Benchmark overlay with 1963 Aerial Photo Sai Wan Redoubt

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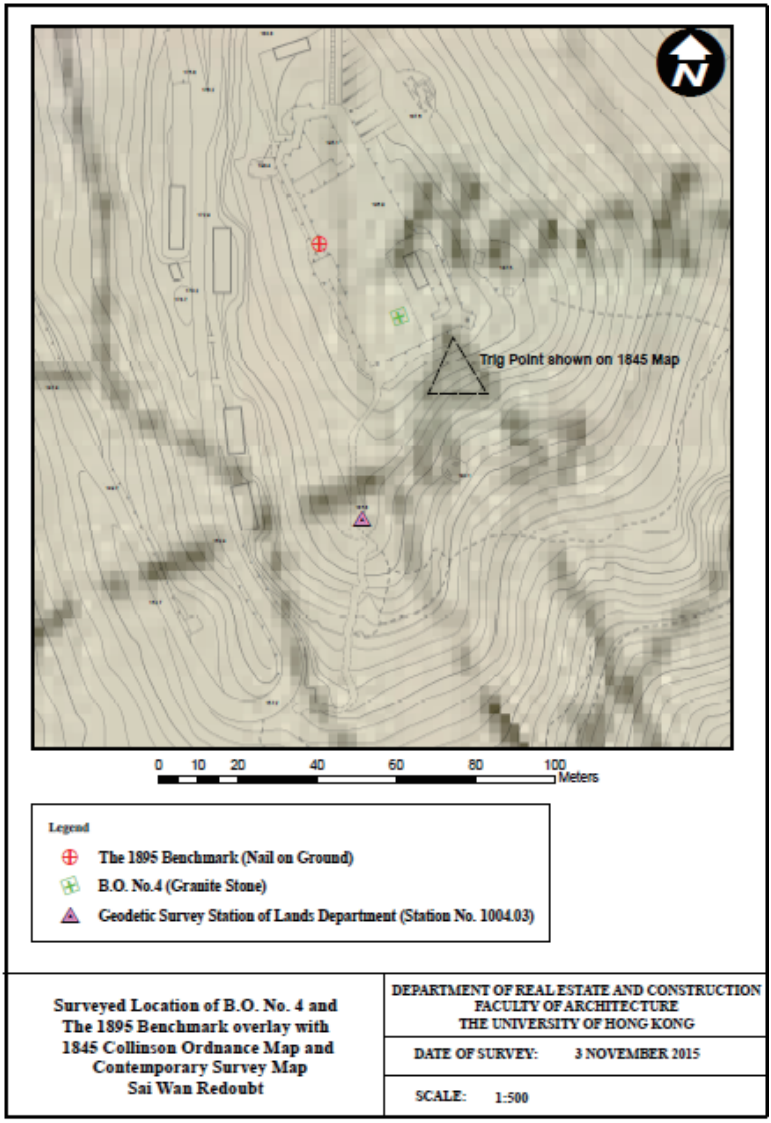
THE UNIVERSITY OF HONG KONG

DATE OF SURVEY: 3 NOVEMBER 2015

SCALE: 1:1,000

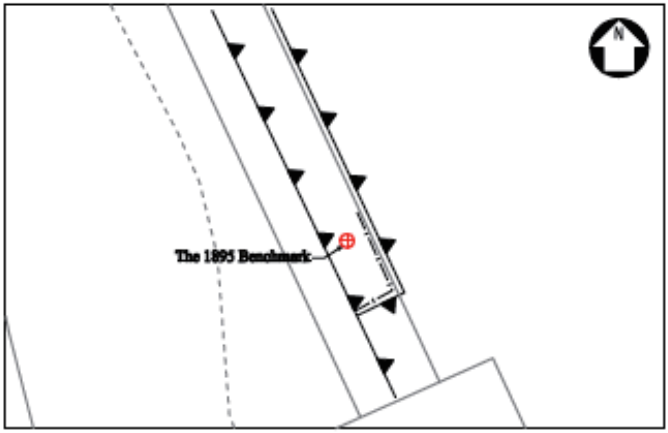
Location of the 1895 boundary marker stone on the most recent map of the area from the Survey & Mapping Office, Lands Department with the 1845 Collinson map overlaid:



Dr Ken Ching of KELand Surveying, Planning & GIS Co. Ltd. considers the 1845 map scale, after correlation, to be so small, (i.e. 1:5000) that the displacement between it and the modern map cannot be reconciled though is within margins of error and consistent with the marker stone also being the 1845 trig station. The 1895 plan is highly accurate by present day standards.

APPENDIX 3: Identification and documentation of the 1895 benchmark

Map of The 1895 Benchmark



Close-up Photograph

Station Sketch

NOTES:-
1. All units are in metres.
2. All coordinates are referred to the Hong Kong 1980 Grid (HK1980).
3. All levels are referred to the Hong Kong Principal Datum (HKPD).
4. The bearing information was extracted from 1:1000 Basic Survey Sheet [illegible] from Lands Department.

Surveyed Location of B.O. No.4 and
The 1895 Benchmark at Saiwan Redoubt

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION
FACULTY OF ARCHITECTURE
THE UNIVERSITY OF HONG KONG

DATE OF SURVEY: 3 NOVEMBER 2015

SCALE: 1:100

Close-up of the benchmark showing the iron nail marking the centre and the roughly inscribed triangle (today very faint) enclosing it.

Surveying & Built Environment

A Preliminary Review of the Policy on Revitalisation of Old Industrial Buildings

Jimmy C.F. Leung* and Kenneth S.S. Tang**

ABSTRACT

This paper is an initial review the old industrial building revitalisation policy in terms of its policy objectives and implementation. The revitalisation policy measures have two categories, namely redevelopment and wholesale conversion. This paper focuses on the policy related to the latter. As there is still a large number of applications being processed by the government, this study is only preliminary in nature.

KEYWORDS

Industrial building, revitalisation of industrial buildings, rezoning

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INTRODUCTION

Industrial premises have been playing a very important role in the restructuring of Hong Kong's economy in the past few decades. According to a Planning Department's Report, about half of the industrial floor area is devoted to manufacturing and warehousing uses. The other half is occupied by uses such as offices, shops and services, showrooms, data centres, R&D and testing centres. **(Planning Department 2015)**. As the city grows, the old industrial areas, once located at the urban fringe, are now conveniently sited within the main urban areas. Given their accessibility, flexibility and, more important, affordability, industrial premises are home to many small and medium-sized enterprises and freelance artists. It is estimated that 27.2% of business establishments in Hong Kong are registered in industrial premises, of which more than half are trading firms and about a quarter are in Kwun Tong **(Leung, Tang and Bai 2015)**.

The transformation of industrial premises to other uses before 2000 was primarily through market forces. According to a study "Business Zone Concept and Guidelines for Rezoning of Industrial Land" commissioned by the Planning Department and completed in 1999, there was a high degree of mixed industrial, office and commercial uses particularly in newer industrial and industrial/office buildings. It was reported that manufacturing and manufacturing-related uses occupied less than half of the pre-1990 industrial stock and much less in the post-1990 stock **(Planning Department 1999)**. In the post-2000 period, the transformation was also aided by a series of planning and fiscal policies adopted by the government in the light of economic restructuring. Policy measures include rezoning of industrial land to other uses notably "Other Specified Uses (Business)" hereinafter referred to as "OU(B)", relaxation of uses permitted in industrial zones and the revitalisation of old industrial buildings. Since 2001, more than 200 hectares of industrial land have been rezoned to "OU(B)". At the same time, various uses like information technology and communication industries were added to Column 1 (always permitted uses) and public entertainment and educational institution uses (uses that required planning permission from the Town Planning Board) to Column 2 of the Notes attached to the statutory town plans. The intention is to enhance flexibility of uses permitted in industrial zones. Since 2015, art studios (excluding those involving direct provision of services or goods) have been progressively included as a Column 1 use in industrial-office buildings in "I", "OU(B)" and Residential (Group E) zones **(Development Bureau 2016a)**. Policy related to the revitalisation of industrial buildings promulgated in 2010 provided fiscal incentives to redevelopment and wholesale conversion of old industrial buildings with a view to optimising their use.

BACKGROUND

In the 2009-2010 Policy Address, the then Chief Executive announced that

"[N]ow that the economy is restructuring, the Government has the responsibility to examine whether the existing use of resources can support the new economic structure, and to prevent the factors of production from being tied up by outdated policies and economic structure." and "[T]he community widely supports the development of the six industries (medical services, environmental industries, testing and certification services, education services, innovation technology, cultural and creative industries), and has clearly reflected to the Government that land resources are crucial to their development. Meanwhile, there have been calls for realising the potential of old industrial buildings. Due to the constraints of the existing systems and policies, these valuable resources have not been fully utilised." **(Policy Address 2009-2010: para. 22 and 23)**.

A package of measures to release the potential of over 1,000 old industrial buildings by encouraging redevelopment (i.e., the demolition of an old building and erection of a new building) or the conversion of industrial buildings (i.e., minor alteration and refurbishment of an existing building) by owners were announced. The objectives and measures for revitalisation of industrial buildings promulgated in the Policy Address were subsequently articulated in more detail as follows **(Development Bureau 2009a)**:

1) The vacancy rate of industrial buildings is high and converting or redeveloping these buildings to other uses cannot keep pace with economic restructuring.

2) A large number of non-compliant uses are found in these buildings. Apart from the problem of land use incompatibility, fire safety is a major concern.

In the light of the above issues, the government initiated four new fiscal measures to optimise the use of industrial buildings through wholesale conversion. Owners may apply at a nil waiver fee for change in use of an entire existing industrial building during the lifetime of the building or until expiry of the current lease, whichever is earlier. The eligibility criteria are as follows:

"(a) Industrial buildings aged 15 years or above and situated in "Industrial", "Commercial" or "OU(B)" zones;

(b) Joint application by all owners of the building;

(c) There should be no increase in the total GFA and no excessive site coverage after the conversion, as well as the building height restriction under the planning regime;

(d) The building cannot be reverted to industrial use during the waiver period;

(e) Full market premium is payable when the buildings are redeveloped in future."

(Development Bureau 2009b).

These measures were effective from 1 April 2010 and valid for a period of 3 years up to 31 March 2013.

After a mid-term review of the revitalisation policy in 2011, the Government made a number of changes to the package of measures to facilitate revitalisation of older industrial buildings. These changes were technical in nature involving interpretation of building height, external wall and minor changes to the building frame. Besides, applicants for wholesale conversion of buildings were encouraged to procure certification of conversion works by the Building Environmental Assessment Method (BEAM) Plus Assessment conferred by the Hong Kong Green Building Council. The revised measures became effective from 1 April 2012 and at the same time the deadline for application was also extended from 31 March 2013 to 31 March 2016 **(Development Bureau 2011)**.

In 2013, the revitalisation measures were further refined in response to the difficulties raised by the applicants. The refinements are also technical in nature involving demolition and rebuilding up to 10% of the gross floor area of the existing building, building height restriction under the lease waived for certain roof-top utility installations, and payment of premium waived for installation of claddings or curtain walls protruding beyond the lot boundary on government land **(Development Bureau 2013)**.

In reply to Legislative Council's questions on 16 March 2016, the Secretary for Development cited the Planning Department's Area Assessments of Industrial Land in the Territory in 2009 and 2014 indicating that the vacancy rates of industrial buildings in "I" and "OU (B)" zones had decreased from 6.5% to 3.5% and from 8.4% to 6% respectively. The Government thus considered that

"the policy of revitalising industrial buildings through time-limited measures to optimise the use of old industrial buildings during the economic restructuring period has achieved the expected results. Therefore, the measures concerned will cease to be in force by the end of March this year as scheduled." **(Development Bureau 2016)**.

The policy subsequently lapsed at the end of March 2016.

PRELIMINARY REVIEW OF REVITALISATION POLICY

To revitalise old industrial buildings, the government tried to incentivise building owners by not charging short-term waiver fees for wholesale conversion of old industrial buildings. In spite of the fact that half of the industrial stock has been used for purposes other than industrial or storage, only 1% of the industrial premises has completed waiving land lease requirement. This is due to the enforcement policy of acting on complaints or inspections at a very limited number of target buildings **(Development Bureau 2009a)**. In other words, the waiver fees for most non-

industrial uses have not been collected in the past, notwithstanding the fact that the government is in a position to do so.

Policy objectives fulfilled?

The objective of the revitalisation policy was to optimise the use of industrial buildings in the light of economic restructuring by addressing two issues, namely vacant and under-utilised industrial premises, as well as non-compliant uses and fire safety concerns. There is no published data available on the extent of under-utilisation of industrial buildings. Anecdotal evidence suggests that even after the relocation of the production activities outside Hong Kong, many factory owners would still keep their industrial premises for such use as office, design, research and development, showroom and storage and few would sub-let the underutilised spaces. While the vacancy rate of 6.5% in 2008 quoted in the background brief on revitalisation of industrial buildings for the Legislative Council in October 2009 is not considered particularly high, the Development Bureau regards the total amount of 1.13 million m² of vacant space is considerable. In fact, vacancy rates for flatted factory and Industrial-Office (I/O) buildings and private storage premises published by the Rating and Valuation Department have been under 10% since 2005. While there is no hard and fast rule to interpret the vacancy rate, it is pointed out that "[I]n terms of interpreting the vacancy rates in Hong Kong the market in general considers above 10% high and under 5% tight." Anything between 5 to 10% is generally considered acceptable as premises under decoration are still regarded as vacant by the Rating and Valuation Department **(Leung, Tang and Bai 2015)**. As such, the absolute amount of vacant industrial premises may not be a good indicator on whether policy intervention is required.

As mentioned earlier, based on the decrease of vacancy rates, the government considered that the revitalisation policy to optimise the use of old industrial buildings had achieved the expected results and the measures ceased to be in force by the end of March 2016. In reaching this decision, it is not clear to what extent non-compliant uses and fire safety concerns, which also underpin the revitalisation policy, have been factored into the decision making process. The recent fatal fire outbreak in an old industrial building at Ngau Tau Kok clearly demonstrates that non-compliant uses and fire safety concerns are far from being resolved.

No doubt the revitalisation policy has helped address the issue of fire safety and non-compliant use by streaming industrial/storage uses and non-industrial uses into different buildings. Given the widespread use of industrial buildings for non-industrial/storage purposes, this streaming process through wholesale conversion and redevelopment will take time. There is therefore a case to argue for the continuation of the revitalisation policy. On the other hand, it would be difficult for the government to resolve these issues by instigating strict enforcement against non-compliance with lease conditions and/or other regulations. Manpower resources aside, it will have

an adverse impact on many SMEs that are operating in industrial premises.

A major benefit of revitalisation of industrial buildings is to arrest the process of urban decay through efforts of the building owners to upgrade the interior and exterior of old industrial buildings. The challenge is of course how industrial buildings under multiple ownership can be upgraded. With continuous aging of a large stock of industrial buildings, this is an area in need of policy intervention.

Implementation

The revitalisation policy involved a number of departments notably the Lands Department, Planning Department and Buildings Department. The Development Opportunities Office, a set-up within the Development Bureau, played an important co-ordinating role in providing a one-stop shop to facilitate applications for redevelopment or wholesale conversion of industrial buildings. The Development Opportunities Office was very responsive to feedback from applicants resulting in two rounds of revision of the policy measures as mentioned earlier.

Current state of play

Table 1 shows the implementation of the revitalisation policy at the end of March 2016. Of the 226 applications for wholesale conversion, 104 cases have so far been approved and 25 withdrawn or rejected. Of the 104 approved cases, 68 were executed, 13 were withdrawn after approval, 15 were terminated after execution (i.e., giving effect to the legal relevant documents) and 8 pending execution. There are still 97 cases being processed, which indicates that there is a last-minute rush of applications before the deadline. Given the large number of cases still being processed, just how many applications will eventually be executed and implemented remains to be seen.

Table 1: Applications under the Revitalisation Measures
(Position as at the end of March 2016)

	Wholesale Conversion	Redevelopment	Total
Applications received	**226**	**22**	**248**
Approved	**104**	**21**	**125**
Executed	*68*	*8*	*76*
Withdrawn by applicants after approval	*13*	*7*	*20*
Terminated after execution	*15*	*0*	*15*
Pending execution	*8*	*6*	*14*
Under processing	**97**	**1**	**98**
Withdrawn by applicants during processing	**20**	**0**	**20**
Rejected due to not meeting the eligibility criteria	**5**	**0**	**5**

Source: Implementation Progress available from the website of Development Bureau, http://www.devb.gov.hk/industrialbuildings/eng/implementation_progress/index.html

The Lands Department makes available on its website site information on executed special waiver cases[1] since 2010, with the latest situation as at June 2016[2]. **Table 2** provides an analysis of the cases in terms of uses applied for and geographic locations. There are a total of 88 special waiver cases executed, of which seven sites have two applications for different uses or the same uses with variation in details. In terms of uses applied for, the majority of 71 cases are generally for commercial and office uses, 16 for hotels and one for an educational institution. These cases are located in 15 districts throughout the Territory with 42 cases in Kwun Tong, 11 in Kwai Chung, 7 in Kowloon Bay, 6 in Cheung Sha Wan and the rest of the districts recording one to four cases (**Figure 1**).

[1] Waivers are temporary permissions granted by Lands Department to relax restriction under government leases or land grants. Special waiver here refers to the waiver for conversion of en entire existing industrial building. Please refer to Lands Administration Office, Lands Department, Practice Note Issue No. 1/2010A http://www.landsd.gov.hk/en/images/doc/2010A-1_text.pdf

[2] Details available from http://www.landsd.gov.hk/en/exc_mod/rcib_specialwaiver.htm

Table 2: An Analysis of the Executed Special Waiver Cases[3]

Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Uses Applied for								
Commercial/Offices	4	11	13	12	16	10	5	71
Hotel	-	-	2	6	4	2	1	16
Educational	-	-	1	-	-	-	-	1
Total No. of Cases	**4**	**11**	**16**	**18**	**20**	**12**	**6**	**88**
Districts								
Kwun Tong	4	5	8	7	13	2	3	42
Kowloon Bay	-	2	-	-	1	3	1	7
San Po Kong	-	-	-	-	1	-	-	1
Cheung Sha Wan	-	1	2	1	1	1	-	6
Tai Kok Tsui	-	-	1	-	-	-	-	1
Lai Chi Kok	-	-	-	-	-	1	-	1
Kwai Chung	-	1	-	6	2	2	-	11
Tsuen Wan	-	-	1	-	-	-	1	2
Tuen Mun	-	1	-	-	1	1	-	3
Sha Tin	-	-	2	-	1	1	-	4
Wong Chuk Hang	-	1	1	1	-	1	-	4
Chai Wan	-	-	1	-	-	-	1	2
Shau Kei Wan	-	-	-	1	-	-	-	1
Fanling	-	-	-	1	-	-	-	1
Sheng Shui	-	-	-	1	-	-	-	1
Total No. of Cases	**4**	**11**	**16**	**18**	**20**	**12**	**6**	**88**

[3] Data source: Lands Department (2016).

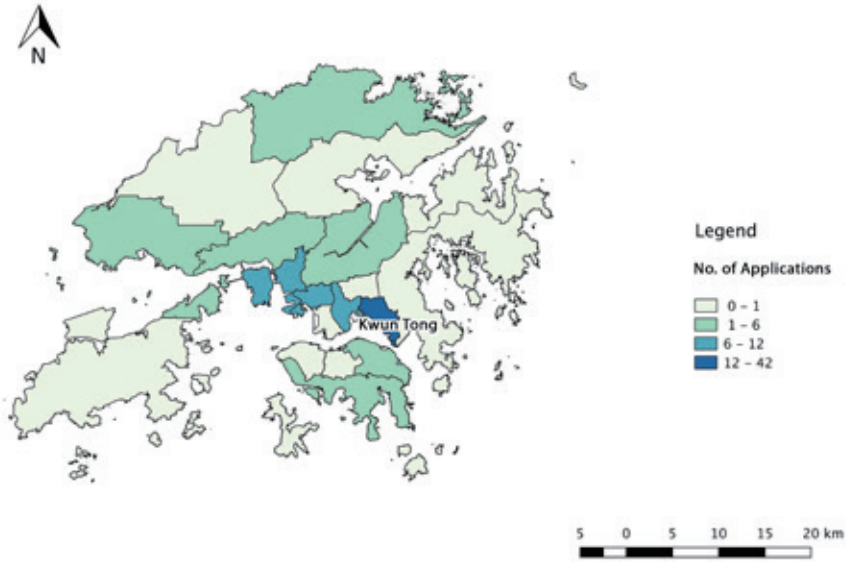

Figure 1: Geographic Location of Executed Special Waiver Cases

Processing time for applications

The time taken for approval has been an issue among applicants for wholesale conversion of industrial buildings. **Chan, Cheung and Wong (2015)** pointed out that "the current application for change of land use is not flexible and the process is too complicated and lengthy." **(Chan, Cheung and Wong 2015: 51)**. In the absence of date of application for wholesale conversion cases, an assessment of the time taken for processing applications cannot be made. However, difficulties in overcoming various technical issues in the conversion of old industrial buildings leading to the revision in 2011 and 2013 seemed to demonstrate that the process was not straightforward. Delay in obtaining permission will obviously have cost implications.

Conversion time

Eight industrial buildings converted under the revitalisation policy have been examined regarding the duration from waiver approval date to completion of conversion. The time taken ranges from 0 to 4 years with an average of 2 years, during which no income will be received by the building owners (**Table 3**). There is a case where no time was taken for the conversion. This seems to suggest that the original industrial building was designed and built to the standard of an office building, thus benefiting the most from the revitalisation policy.

The cost for converting an old industrial building into other uses satisfying current planning and building standards can vary quite significantly as shown in **Table 4**. The construction cost on a per square foot basis ranges from HK$818 to HK$2,056 depending on, for example, whether new lifts or a centralised air-conditioning system are to be installed. Compared to the average construction cost of HK$3,410 per square foot for office buildings and HK$3,600 per square foot for retail malls[4], the costs for conversion can be substantial and in one case more than half of the costs for new office buildings.

[4] **Langdon & Seah, Hong Kong Limited and Langdon & Seah China Limited (2016)**. The construction costs (including building and services) for high rise offices of prestige quality ranges from HK$ 29,800 -36,700 per square meter and HK$ 32,600 – 38,700 for high end retail malls. The costs are at 4th Quarter 2015 levels. Available at http://www.langdonseah.com/en/cn-hk/publications/filter/all/cn-hk

Table 3: Attributes of Selected Wholesale Conversion of Industrial Buildings

District	Development	Exterior	Issue of Occupation Permit	Waiver Approved Date	Conversion Completion [Target]	Years	GFA (ft²) [GFA under GBP]	Actual Face Rental ($/ft² (G))	Typical Floor Area (ft²)(G)	Ceiling Height (Slab to Slab) (m)	Take Up % (approx.) [Q2 2016]
Kwun Tong	Pioneer Place	Window walls	5/1973	Q3 2012	Q3 2014	2	230,130	19-20	21,093	3.38	64.99%
	SML Tower	Window walls	2/1997	Q3 2014	Q3 2014	0	95,714	15.5-18.5	8,600	3.15	100.00%
	Wong Tze Building	Granite	5/1988	Q4 2011	Q3 2014	2.75	[110,518]	17.5-20	7,200	3	94.53%
	The Mark	Curtain walls	5/1995	Q4 2013	Q4 2014	1	76,000	18-24	3,563	3	83.33%
	The Rays	Window walls	1/1990	Q1 2011	[Q2 2015]	4	126,905	16-18	7,285	2.95 - 3.0	44.82%
	KOHO	Window walls	6/1998	Q2 2014	[Q2 2015]	1	227,212	20-22	16,151	3.08 – 4.27	92.55%
Kwai Chung	KC100	Curtain walls	11/1972	Q2 2013	[Q2 2015]	1.75	300,000	22-23	24,663	3.8 – 4.88	76.23%
Kowloon Bay	New Bright Building	N/A	7/1985	Q3 2014	[Q1 2016]	2.5	[246,660]	18-20 (landlord indication)	26,012	3.2	N/A

Sources: Brochures, Newspapers, BRAVO and JLL

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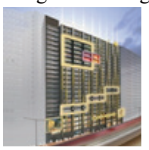
Table 4: Wholesale Conversion Cost for Selected Industrial Buildings

	Genesis Wong Chuk Hang	KOHO Kwun Tong	Pioneer Place Kwun Tong	KC 100 Kwai Chung
				
Completion Date	Q4 2014	Q2 2015	Q3 2014	Q1 2015
Unit Cost ($ /ft²)	**818**	**880**	**1,043**	**2,056**
Conversion Works				
Repartitions	√	√	√	√
Green balconies	√	X	√	X
Internal decoration	√	√	√	√
New lifts/ escalators	X	√	A new lift, new escalators serving G/F to 1/F	New lifts, new escalators serving G/F to 2/F
Curtain Wall	X	√	√	√
A/C System	Centralized system (G/F- 3/F); Split-type (other upper floors)	Fan-coil	Fan-coil	Centralized system with fan-coil units
Aluminum suspended ceiling	X	X	-	√
Raised Floor	X	X	100mm	150mm

Sources: Newspapers, BRAVO, website of Hip Shing Hong and JLL

Development risk

Table 3 also shows that four buildings have recorded over 90% occupancy rate. On the other hand, the leasing of three buildings after conversion is not satisfactory with take-up rate for one building of less than half and two others of about three quarters two years after their conversion. There may be different reasons why leasing is not going well for these buildings but it demonstrates that there is development risk involved. Rentals range from $15 to $24 on a per square foot per month basis, which is generally higher than $10-12 for industrial buildings **(DTZ, Cushman & Wakefield 2016)**.

There are 15 special waiver cases executed for hotel use including one site with two applications. Ten applications were executed in 2013 and 2014 when the tourism industry was booming but in 2015, total visitor arrival declined 2.5% year on year. While the total visitor arrival dropped 7.4% in the first six months of 2016 compared to the same period a year earlier, visitors from Mainland China decreased by the larger drop of 10.6% **(Hong Kong Tourism Board 2016)**. The reduction of overnight visitors from the Mainland was 6.7% for the corresponding period. However, the overall decline of overnight visitors recorded was only 2.1%, due to growth in visitors from the short haul market and elsewhere outside the Mainland. With the drop in overnight visitors coming to Hong Kong, the business prospects of hotels converted from industrial buildings is less certain. The risk of conversion to hotels, which involves substantial upfront investment and recurrent operation/maintenance costs, will be high.

From the building owners' perspective, the revitalisation policy provides an unprecedented opportunity to upgrade their buildings. However, this generally involves quite substantial costs and the development risk involved can be high.

Impacts on tenants of industrial buildings

The increase in prices for industrial buildings in recent years has been attributed to the introduction of the revitalisation policy, high liquidity and low interest rates, etc. **(Leung, Tang and Bai 2015: 23)**. Quantitative analysis to examine the relationship of the various factors in explaining the price hike will certainly merit a separate study.

As for tenants operating in industrial buildings targeted for wholesale conversion or redevelopment, they have had to move out of these premises. This has resulted in many complaints from art groups as they have had to move to another premises once conversion or redevelopment begins. More often than not, they will face higher rentals for their premises in the district. **Table 2** shows that in Kwun Tong 42 special waiver cases have been executed, albeit not all concerned buildings will eventually be converted. The impact on existing tenants in the district is not hard to imagine.

CONCLUDING REMARKS

As some 97 applications for wholesale conversion are still being processed, it is not certain how many cases will ultimately be approved and implemented. With over 200 applications for wholesale conversion, the response is considered very positive in light of the 420 industrial buildings under single ownership (excluding those in industrial estates, those under management of the Housing Authority and specialised factories under non-"I" and "OU(B)" zones) **(Leung, Tang and Bai 2015: 48)**. For those converted buildings, the policy objectives of optimising the use of space for higher value added uses and addressing non-compliant uses and fire safety have been achieved. Besides, the old industrial buildings after conversion will result in an improvement in the physical environment of the industrial areas thus helping to alleviate urban decay. Compared to redevelopment, there will be much less construction waste. The lifespan of industrial buildings can be extended after conversion.

From the building owners' perspective, the time taken for application and conversion, the conversion costs, and the market risk involved can be quite daunting. It is not surprising to see that 13 cases have been withdrawn after approval and 15 cases terminated after execution of the special waiver. From the eight cases studied, the leasing of buildings after conversion varies among different buildings and the development risk involved can be high.

From the perspective of the tenants particularly those small and medium-sized enterprises and freelance artists, the policy has led to higher rentals. Wholesale conversion of industrial buildings will lead to termination of tenancies. It is in districts like Kwun Tong and Kwai Chung, where most of the conversions take place, that those operating in buildings due for redevelopment or conversion are most adversely affected.

Notwithstanding the possible side-effect of price surges and to a much lesser extent rental increases, there is a strong case to argue for reinstating the revitalisation policy for wholesale conversion of old industrial buildings. In the future, it is necessary to look into ways to fine-tune policy measures to minimise impacts on small operators in industrial premises. More needs to be done to identify ways to facilitate wholesale conversion for buildings under multiple ownership in order to achieve the objectives of optimising the use of industrial premises and addressing the issues of non-compliant uses and fire safety.

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Surveying & Built Environment

A Coasian Perspective on Informal Rights Assignment among Waste Pickers in Hong Kong

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KEYWORDS

Coase theorem, informal sector, waste picker, property rights

ABSTRACT

In light of the Coase theorem, this study examines the property rights arrangements of an informal recyclables retrieval system established by the elderly in urban Hong Kong. Unlike developing countries, the social and institutional arrangements of this fast-paced, first world city sustain this informal system without any direct intervention by the state. As the informal system augments a gap in the recyclables collection process, some manifestations of agreements and further innovations among the waste pickers were discovered.

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INTRODUCTION

In a prosperous city like Hong Kong, what mechanism sustains an informal recyclables retrieval system run by mostly elderly waste pickers? How do property rights arrangements operate among the pickers and the pickers with their patrons and buyers? It is an interesting institutional phenomenon to observe how waste pickers, normally the elderly and poor in this society, have been able to run a parallel economy in the recycling business for decades. They contribute to filling in a gap in the recycling system. Unlike the informal sector in developing countries, which is organized in a manner to lower the transaction cost (e.g. cooperatives or direct government intervention (see for instance **Chua (2016)** for a case in the Philippines or **Diaz (2011)** in Brazil), this informal system in Hong Kong sustains itself. This paper elaborates on this trend in light of the Coase theorem, which states that when rights are somehow delimited and the transaction cost is driven low enough, there will be market transactions (originally from **Coase 1959: 27, Cheung 1990**).

Relevant to the built environment, this phenomenon affects the cleanliness and environmental sustainability of a packed urban ecology like Hong Kong. It is also significant because a big percentage of the recyclables of municipal waste (household and commercial) seem to be collected and transmitted to the recyclers in this manner, so it is an important link to ensure a complete recycling process path in the city. In many developing countries, a larger portion of recyclables is collected by the informal over the formally state provided sector **(Wilson 2010)**. The informal sector includes those whose services the state does not directly hire. This initial study attempts to give an outline of the extent to which this sector is involved in the system, but this time from the angle of Hong Kong as an overall well to do city. Even though Hong Kong has a modernized, formal recycling sector, a large part of its collection of recyclables in the commercial and recycling level is carried out by the informal sector.

No direct study has been carried out of the institutional arrangements of the informal rights and prevailing system among the waste pickers. Studies in this area (for instance **Lou 2007 a & b**) mostly focus on the welfare of the elderly involved. Despite this sad social reality for the poorest, this study will nevertheless focus on the informal institutional configurations that sustain it. Hopefully, the knowledge gained will enable the authorities to address more effectively the underlying social issues.

THEORETICAL SETTING

The framework of this paper revolves around one of the theorems attributed to 1991 Nobel Prize winner, Ronald H. Coase. The so-called Coase theorems were not officially formulated by Coase but in the works of scholars, notably **Stigler (1966), Cheung (1990)**, and **Lai and Lorne (2015)**, who extracted them from Coase's milestone works. Among these, the specific Coase theorem of interest at this point was derived by

Cheung (1990, 1998) from the article entitled "The Federal Communications Commission" **(1959)**, from which he found this general idea, "delimitation of rights is an essential prelude to market transaction." **(Coase 1988: 158)**. This simple and yet profound statement alludes to the observation that clearer rights delimitation lowers the transaction cost **(Cheung 1998)** and hence allows and sustains market transactions.

In the recycling industry, an interesting twist is the property rights arrangement of the resource being traded. Due to the green trend and increased awareness about recycling, some types of "rubbish" have been gaining economic value in recent decades. Even so, however, although rubbish consists of objects that have been disposed of *de jure* by their original owners, changes to their property rights arrangements depend on the manner in which the objects were disposed of and then reclaimed by those collecting them. Historically, property rights disputes in scavenging are not new (cf. **Downs and Medina 2000**), so here it will be useful to review some relevant property rights concepts in neo-institutional economics.

We begin by remembering that property rights are social arrangements to use, derive income from, and alienate certain resources which can be manifested in personal or non-personal dimensions like time, location or product (**Alchian and Demsetz 1973, Cheung 1974, Bose and Blore 1993**). Generally, the different property rights regimes can be classified into: the dichotomous common-private rights and the tripartite common-communal-private property paradigm. The first is championed by Nobel Prize winner E. Ostrom, while the latter is favoured by **Alchian, Demsetz (1973)** and **Cheung (1990). Lai and Ho (2016)** gave a good summary of the two. In both regimes, it is evident that there exist different ways of handling resources as their property rights status changes.

In the case of waste pickers, it is important to understand concepts of "access" and "withdrawal". **Schlager and Ostrom (1992: 250)** defined access as "the right to enter a defined physical property" while withdrawal is "the right to obtain the 'products' of a resource," which in our case are the recyclables. Itinerant waste picking always involves a place where the waste is located and the waste constitutes what is to be withdrawn. The manner of access to the place where the waste is located thus determines the manner in which withdrawal of the recyclable is ratified. An example would be where waste, once disposed of by owners, can become communal property under some social norms (say according to the order of discovery). **Alchian and Demsetz (1973)** note that "under a communal rights system, a person has the private right to the use of a resource once it is captured or taken, but only a communal right to the same resource before it is taken.". Thus if anyone has access to the communal waste as a member of the community and may extract material from it, then she/he gains a private right to its use as a recyclable: a mode that therefore works well in many instances in extracting and selling recyclables.

In integrating all these notions, **Chua (2016)** adapted **Lai and Ho's (2016)** framework in interpreting Hong Kong's military heritage, which took *de jure* rights to be connected to the type of property rights regime and the de facto rights to the nature or mode of physical access. **Lai and Ho (2016)** took the tripartite regime and integrated them in *de jure* rights and *de facto* access modes to produce a matrix of different property rights scenarios. **Table 1** shows a simplified version of this matrix using different scenarios after rubbish has been disposed of with respect to the manner in which the disposing was done **(Chua 2016)**. The manner of disposal eventually affects the access to the resource and its *de jure* status.

Table 1 A matrix of property rights and physical access to resources of rubbish.

De facto **access to the rubbish (physical access)**	*De jure*, **legally recognized to or enforceable property rights over the rubbish (legal/social rights)**	
	Common property	Communal and Private property rights (individuals/ state)
Open Access	Rubbish located on the streets/ public rubbish bin/ uncontrolled open dumpsite	
Partial Access	Rubbish in semi-public space/ semi-open dumpsite	Rubbish collected by public dump trucks/ Original owner of rubbish gives to picker (but may give it to any other picker if the usual one is not around)
Closed Access	Rubbish to be recovered in a landfill/ well-secured private facility	Rubbish (recyclables) bought/ recovered from a recovery facility

It would be interesting to apply such a property rights matrix to analyze rubbish—specifically recyclables—as that is treated by the informal sector. For instance, the potential status change of the recyclable from the time the recyclables have been brought out by the patrons to the time they are picked up by the waste picker or placed in his/ her usual station can be numerous. The complexity can even be compounded when considering the many types of informal sector that could exist, depending on at which point of the waste collection process they come into the picture. To name but a few: itinerant waste buyers, street waste picking, municipal waste collection crew and the waste picking from dumps **(Wilson 2006)**. Nonetheless, the focus of this study is on the elderly street waste pickers, who are not necessarily independent from the building cleaners, who also collect recyclables for extra income **(EPD 2012)**. These informal sectors are especially involved in waste retrieval, have been seen as marginalized and in many instances in history the informal systems have bred violence **(Downs and Medina 2000)**.

Despite this, the informal sector in solid waste management has been recognized since the beginning of the last decade or so as assuming varied forms **(cf. Budlender 2009)**. Some studies noted its economic and environmental significance in a number of developing

countries **(Gunsilius et al 2010, Chikarmane 2014, Budlender 2009)**. Admittedly, even for developed countries, some such informal systems of retrieval can still be unsightly and have room for improvement. However, informal sectors serve in the extraction of recyclables.

HONG KONG STREET WASTE PICKERS

Hong Kong is an affluent international city with around 7 million inhabitants with an impressively wealthy public service system. Since 1997, it has been a Special Administrative Region within China. By 2014, it had a high volume of waste disposal, which could reach up to 9,782 metric tonnes of total municipal waste, excluding construction and special waste, per day **(EPD 2014)**.

Despite the affluence of the city, it has an aging population many of whom are poor. Already a fifth of the population is above 60 years old **(Census 2015)**. Many of them are in the low income brackets. Waste picking by the poorest elderly people, who have a low opportunity (time) cost, has been a high visibility feature of the town's bustling streets for decades. Views of old ladies pushing carts of cardboard or newspaper are widespread. Old people stacking styrofoam or cardboard boxes near the vicinity of markets or commercial areas are also conspicuous. Understandably, many find this phenomenon a sign of lack of care for the aged, ironic in a supposedly world class city like Hong Kong.

Nevertheless, it appears that this sector has been a vital component in the waste recovery route of the city. **Figure 1** shows how the scavenging system acts as a link between the generator and the recyclable material collectors. This reality was recognized early on. In 1992, Mr. S.H. Chan, the then Assistant Secretary for Environment, mentioned the impracticality of collecting stations due to space constraints and lack of public awareness of recycling in Hong Kong **(Furlong 1992)**, which makes this waste picking sector socially and environmentally even more relevant as a private enterprise without state support.

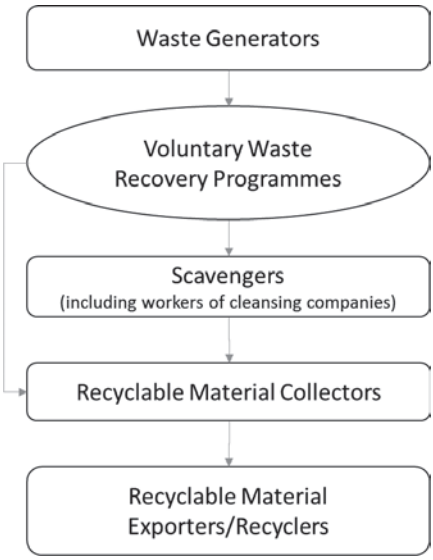

Figure 1 The Key Players of Local Waste Recovery (source website: http://www.wastereduction.gov.hk/sites/default/files/wr_msw.pdf)

PRIVATE ZONING BY WASTE PICKERS

In the face of this social irony, it is interesting how this phenomenon is confined to and sustained by this group and how they spatially zone themselves within the metropolis. Data on how many elderly people in total participate in this retrieval system are not available. But in **Lou's (2007a)** pioneer study, 47% of the people interviewed had been engaging in this collection activity for more than 3 years. It seems that the system they configure depends on the territory of their patrons and what collectable products are abundant. A group of them could be collecting styrofoam boxes while another would be collecting newspapers or combinations of these. **Lou (2007a: 135)** said, "the scope of their collecting usually covered several blocks from where they lived, and centered on spots such as the market, grocery shops, public rubbish bins, or newspapers given by neighbors." These waste pickers go to these establishments for their daily supply of recyclables (at no monetary cost).

It is interesting to note that by law, the commercial and industrial establishments must hire a company to collect their rubbish, however there is a slight mix-up when we talk about establishments attached to residential buildings **(EPD 2012)**. We can arrive at a rough idea of the scope of the system if we assume that the 189 "wet markets" run/managed by the Food and Environmental Hygiene Department, Housing Department and The Link Real Estate Investment Trust **(Food Wise 2014)**, covering approximately 276 square kilometers of land **(Hong Kong Special Administrative Government 2014)**, each have groups of elderly collecting recyclables. This does not include other private supermarkets/ establishments, and the more nomadic waste pickers.

In another case, an elderly picker said that in a given place usually 8 to 10 persons give them newspapers of around 5-6 catties[2] per week **(Lou 2007b)**. The elderly pickers after some time settle in one location, often slightly distant from their residence. For newcomers, they would normally observe first if someone else has already been collecting in a particular place. At times there can be territorial clashes **(Lou 2007b)**.

[2] 1 catty = 0.60479 Kg

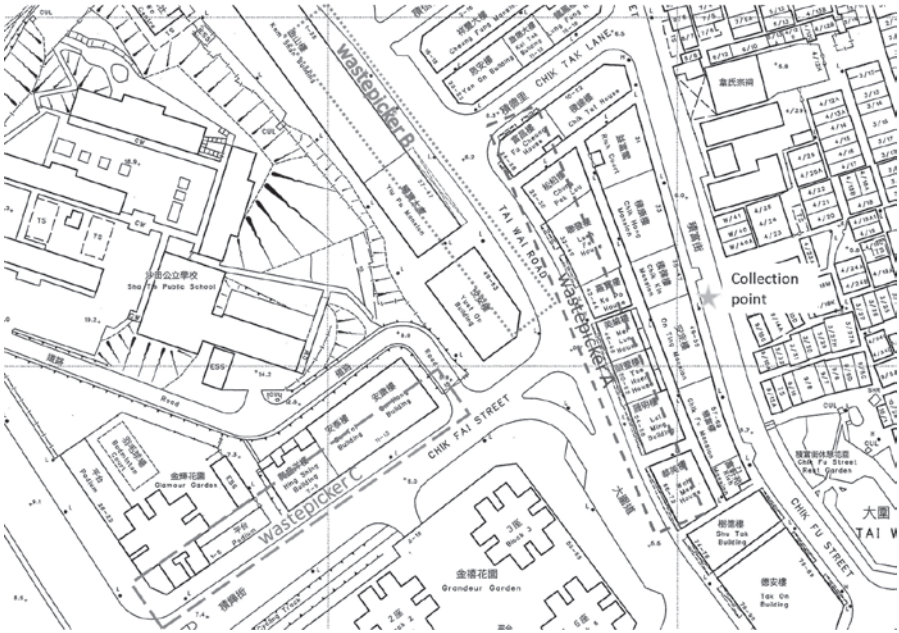

Figure 2 Different territories among 3 major waste pickers

Figure 2 shows a map of Tai Wai district with some annotations of the source patrons of three primary waste pickers in the area. The neighborhood is in the vicinity of the Tai Wai MTR (formerly KCR) railway station and is full of commercial premises ranging from household trinkets to medicine to high-end jewelry. From the map can be seen how there is no major overlap among the zones of waste pickers A, B and C. There appear to be agreements with their patrons that a specific waste picker would collect their cardboard boxes or other recyclables. **Table 2** shows the estimated amount of recyclables per day declared by the waste pickers themselves.

Table 2 Distribution of recyclables by waste pickers A, B, and C

Waste picker	Amount collected	Remarks
A	80 kg/day	Waste collected included cardboard, polystyrene, some tin and plastic containers.
B	<155kg/day	
C	>25kg/day	

There is a degree of exclusivity among waste pickers and their patrons who give them their recyclables. Mutual benefits and compassion seem to be at play here. However, the patrons would not hesitate to give to another waste picker the allotted spoils whenever the usual one does not come for the day.

Although violence did occasionally occur, these informal rights of private zoning adopted by the pickers lessen some transaction costs of violence. An unofficial agreement among the competing parties seems to exist. It must be apparent to them that violence is costlier, as North, Wallis, and **Weingast argued (2009)**.

WHRE DO THE RECYLABLES GO?

The companies that collect and sort the recyclables from the pickers ship them to recyclable material exporters/ recyclers. For instance, Hong Kong in 2014 exported more than 4 megatonnes of waste to China alone; around a fifth of this is paper recyclables whose value is around a billion HK dollars for the year **(EPD 2014)**.

The waste pickers gather at locations where the buyers meet them (see map in **Figure 2**). Collection points, like one shown in **Figure 3**, can be seen in the streets where the pickers bring their collection for the day to be sold. Note the weighing scale beside the collection truck in the picture. At certain hours of the day (or night), waste pickers—the majority elderly—throng to these trucks bringing their collected goods. Prices of the recyclables vary. In 2014, the value of recycled paper is estimated to be around HKD1,429 (or USD180)/ tonne; polystyrene has a higher value at around HKD6,000/tonne **(EPD 2014)**. These companies may be able to collect from each elderly picker 200-500 kg/ day of each type of recyclable. They in turn send them to local or external companies for recycling.

Figure 3 Collection point for waste pickers

At other times processing is also done prior to delivery. **Figure 4**, a photo taken in Wan Chai, shows compacted waste being hauled into the truck for delivery to the mainland for recycling. Beforehand, one may see crowds of elderly waste pickers lining up to the "processing centre" to sell their catch of the day.

Figure 4 Motorised collection of waste manually gathered in Wan Chai

Collection and transportation of large volumes of municipal recyclables are facilitated by this informal system, though to what extent is still for further study. Unlike in developing countries (see **Gunsilius et al 2011**), no study is readily available in comparing the current amount retrieved by the informal and formal sector in Hong Kong. Nevertheless, even if it is a painful social-moral issue, this system seems to be thriving and serving a purpose at present.

COASE THEOREM IN ACTION

After delimitation of rights, the "third" Coase theorem as interpreted by **Lai and Lorne (2013)** predicts a trend to investment and innovation promoting a more dynamic market transaction, which shifts the production function upwards, granted there is room for improvement as is obvious in our study. In another Hong Kong example, the conferring of license rights on marine fish culture promoted innovation in culture methods and species and did not simply constrain rent dissipation (**Lai 1993, Lai and Yu 2002**). Therefore, it could be expected that there might be examples of similar innovation in rubbish collection that will further enhance the welfare of the people involved.

In the case of Hong Kong, despite the meager and varying income of the waste pickers **(Lou 2007a)**, there is a proliferation of four-wheel or two-wheel push carts that facilitate transporting the recyclables from one place or another (see **Figure 4**). For reference, a brand new four-wheel push cart may cost around USD 30.00—not so large an amount but not cheap relative to a picker's income. A group of waste pickers may own more than one old one. A certain stability in the property rights regime must exist to give these persons' the incentive to invest in such equipment.

Figure 5 Cardboard and styrofoam boxes and parked push carts

A time investment in preparing or pre-processing the goods before they are sold to waste buyers is another feature of the pickers' work. Normally this is done in an alley or corner obviously not legally owned by the pickers but occupied *de facto*. Such informally acquired rights allow the pre-processing to happen. Cardboard boxes are soaked in water so that they weigh more and, since the buyer pays by weight, the result if the trick is not detected, is more income. Dishonest as this may seem, this practice can be observed behind the scenes. The real economic benefit is not so much cheating, as the buyers are no fools and almost certainly factor the practice into their pricing structure, but they also benefit from a systematic bundling of waste paper into units that reduces their transaction costs of handling, dust control, and transportation as well as the direct cost of fire insurance.

It is also interesting to note again the existence of organized, fixed collection points to which pickers bring the rubbish to be picked up by trucks. This is the driving element of the whole system without which the entire activity is not viable. Nevertheless, it also assumes that the property rights on the rubbish changes from a purely common property at point of disposal to a scenario with more exclusivity once the picker has selected out the recyclables (see **Table 1**), such that gaining income from selling these items is now possible, and in fact, sustainable. Despite the absence of formal ownership, that the waste picker receives money for the selected and delivered recyclables clearly identifies that de facto possession via acquisition has become a form of de jure possession at the point of sale. The recipient of the money in exchange of the recyclables is clearly identifiable despite the absence of formal ownership on these commodities.

EXTERNAL INTERVENTIONS/ INFRASTRUCTURE

In many developing countries, some relatively direct interventions like cooperatives or some form of legal recognition are set up in order to reduce the transaction costs of operating these informal systems. Such costs are costs of violence and accidents associated with competition for waste. Countries like Brazil **(Dias 2011)**, Philippines **(Jaymalin 2010)**, and other places **(Samson 2009)** have some success stories to show. Thus

these interventions help improve the economic operations in these countries and the welfare of the waste pickers.

In the case of Hong Kong, the constitutionally capitalist regime does not seem to have any form of direct support for the informal scavengers. However, there is an existing, unrelated but general public infrastructure that somehow underpins this parallel economy. For example, Hong Kong has a very good public health system. In cases of injury, public hospitals offer fully adequate, state-of-the-art services. Obviously, there are gaps as the elderly waste pickers may have to depend on good Samaritans to contact the hospitals in case of emergencies. In addition the streets are structured such in a way to be 'friendly' to the carts hauling their "commodities". The lowness of the income itself also keeps out younger and stronger competitors, who have more opportunity in other labor-intensive services like tramway or road repairing. Travelling on public transport for those above 65 is also generously subsidized so that they each pay only $2 per trip on most public buses and trains.

Figure 6 shows a chart comparing the possible additional income of the waste pickers with the incremental social security allowance they could receive if they were not able to do the extraction of recyclables. The graph assumes a constant amount of recyclables throughout the year (very conservative estimate of 25-kg/day/picker) and it uses the price value per tonnage of exporting these recyclables as shown in the EPD website[3]. The purpose of the graph is to compare what an abled-bodied elderly waste picker can earn from this informal industry vis-à-vis being completely disabled while receiving a higher allowance. It is not the intention of this paper to glorify such hazardous work of elderly people, but it appears that the transaction cost to get into this unregulated profession—give and take some uncertainties in the business— is comparatively lower than the possible monetary rewards. Here, it is assumed that they can establish themselves in their "waste picking territories". This makes the informal system more sustainable even if the income bracket is relatively low in Hong Kong standards.

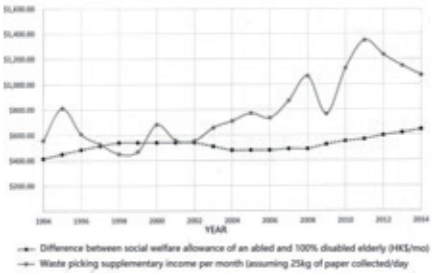

Figure 6 Comparison of social welfare benefits with waste picking income

Another interesting angle in this Coasian analysis is whether the price of the product—recyclables in this case—has an effect on the innovation or number of waste pickers. Although it is difficult to directly measure how the waste pickers' innovation/ investment change through time with respect to the value of the recyclables, we can still see a general increase

[3] https://www.wastereduction.gov.hk/en/assistancewizard/waste_red_sat.htm

of commercial recyclers to whom these pickers sell their catch. Such companies are usually in addition to the pickers not their competitors. **Figure 7** shows that the nominal value of the paper recyclables has increased over the years. At the same time, a steady number of new players has come into the picture in the last decade — except for a surge in 2005. This could indirectly indicate a positive growth in the informal waste picking industry. The representation however is merely a sample of 130 companies registered in the HK Companies Registry, which are also found in the EPD directory collecting and/or recycling paper which includes cardboard. Nevertheless, we can still infer that there could be more opportunities and some form of incentive for waste pickers to continue and even grow in the industry. Interestingly, there is marked volatility and, what is more interesting, a clear decrease in the number of new companies as the nominal price of waste paper has gone up. The decrease could be due to the possibility that the market has already saturated. The increase in price indicates that business is going well in this field but it is more difficult for new players to enter the market. Further and better research in this is worth undertaking.

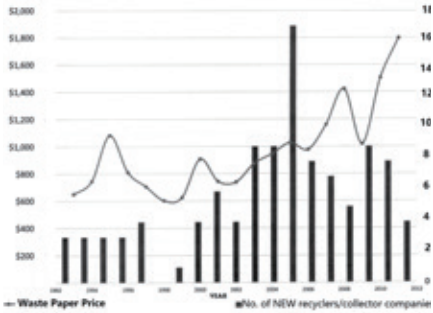

Figure 7 Relation of the price of recyclable with the new companies entering the paper recycling industry

Table 3 provides a summary of how these designations of informal rights have contributed to innovation. It also provides a comparison in Hong Kong of another informal sector and with waste pickers from a nearby developing country. It is interesting that less direct aid from the state is needed by waste pickers in Hong Kong to sustain the informal system than in a developing country. At the same time, it shows how the state and some private entities have contributed directly or indirectly to lessen other costs to keep this system sustainable.

Table 3 Exclusive Rights and innovation for recycling waste

	Means of Controlling Access	Internal Innovations	External interventions/ Infrastructures that lessen transaction cost	Source
Hong Kong Street Waste Pickers	Zoning by might and informal agreements	1. Carts 2. Processing (e.g. watering cardboard)	Health service Street infrastructure	
Hong Kong Marine Fish	License (renewable but non-transferrable)	Mass production of standard-size fish for Chinese restaurants	Government ordinance on licence that lowers policing cost	Lai (1993)
Philippines- Linis Ganda (focus on Eco aides) NGO cooperative	Cooperative helps coordinate with waste buyers, neighborhoods, and gated communites	More dignified title, "eco aide", Carts, uniform, fixed route	Education on Recycling practices; Fund for loans (including emergency loans)	Mwedzi (2013)

CONCLUSION

The above-mentioned "Coase theorem" emphasizes the importance of some specification in rights designation if trade and innovations are to occur with a degree of organization. The delimitation of these rights needs not always be within a legal or even permanent framework. In Hong Kong, the informal agreements among elderly waste pickers help sustain a parallel recycling sector, which gives rise to a licit but not necessarily socially accepted economy of recycled rubbish by senior citizens. Unlike the cases in many developing countries, where a more direct intervention by the state drives transaction cost for such operations, in Hong Kong the government and some private groups have indirectly set up some physical and social infrastructure to reduce transaction costs to sustain trade and basic welfare. Some manifestations of innovation have been seen in term of transport and pre-processing of recyclables. A mutually beneficial relationship between patrons and waste pickers has been evidently maintained.

Nevertheless, the harsh reality of elderly people taking up unsafe work not on a par with human dignity has to be addressed. The gap in the recycling process that this informal system fills may need a replacement fill provided by a change in behavior and environmental culture within the city. It is not improbable to think that sooner or later, a more entrepreneurial approach, which need not be state-controlled could satisfy the current mismatch.

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Surveying & Built Environment

Remembrance of an Intellectual Giant: Professor Douglass North

Lennon H.T. Choy[1]

Taking advantage of economist Steven N.S. Cheung's (Cheung hereafter) conference on "Economic Explanations" in Shenzhen, the Ronald Coase Centre for Property Rights Research at The University of Hong Kong invited a group of scholars to come over to Hong Kong for a mini-conference on November 23, 2015. During that morning the participants vigorously discussed the ideas of Douglass North (North hereafter), co-recipient of the 1993 Nobel Memorial Prize in Economic Sciences, and their application to economic development and economic stagnation in China. Then that evening came the startling sad news of North's death.

North had hosted my Senior Fulbright Scholar programme at Washington University in St. Louis (WUSTL hereafter) back in 2009. Whenever I was around him, I felt myself in the presence of an intellectual giant.

Having read the obituary of North written by **Cheung (2015)** as well as a handful of others in his memory, my own fond recollections were awakened. It happened that Alexandra and Lee Benham, best friends and colleagues of North in St. Louis for more than 30 years, stayed in Hong Kong for a fortnight in November 2015, so I asked them to share stories of North with me. On Thanksgiving evening, seeing turkey and pumpkin pies on the dining table, Alexandra lamented that they had been celebrating Thanksgiving with the Norths over the past 30 years. It was the first of many memories they shared with me.

Famous as a Nobel laureate and renowned for his work on institutions, North was also well known in China as the chairman who hired Cheung at the economics department of the University of Washington in Seattle (UW Seattle hereafter) and who promoted Cheung to full professorship there. North created the basic definition of "institution" now in use: the rules of the game in a society that shape human interactions **(North 1990)**. A major book written by **North and Thomas (1974)**, The Rise of the Western World, led to the

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term "rise" becoming a frequently used term in Mainland Chinese newspapers and media.

Figure 1: Douglass North (1920-2015) in Coase's 2008 Chicago conference (photo taken by an anonymous participant)

North was born in Massachusetts, USA in 1920. His father was a prominent figure in the Insurance industry, and the family moved around a lot including to Canada, Switzerland, and various cities in the United States. He had an affluent but challenging childhood, and grew into an elegant and eloquent man that his friends knew.

At various times he owned two ranches and also a small private airplane. He had three sons, one of whom is a judge, one a psychologist, and one an ecologist. His first wife was engaged in politics. His second wife, Elisabeth Case, was an editor at Cambridge University Press. She edited many of his books. North loved good food and wine. He was one-quarter Italian and so had a particular passion for Italian cuisine. He was invited to Hong Kong on several occasions and developed a special enthusiasm for Cantonese food too.

North pondered one major question throughout his lifetime: Why do some countries become rich while others remain poor? North became an intellectual giant in his field, yet in his early days he was trying to decide on future directions and long considered becoming a professional photographer. It is surprising to learn from North that he only obtained a bare pass in his first degree at Berkeley.

At the start of World War II, North wanted to serve his country, but as a conscientious objector he did not want to bear arms. Hence he joined the Merchant Marine. The ship he served on was in the Pacific theatre, mainly engaged in voyages carrying military cargo between the U.S and Australia. Because North was the only person on board with a college education, the captain immediately assigned him the job of ship's navigator. So North taught himself navigation on that first voyage. During the last year of the war, he taught others navigation at the Maritime Service Officers' School. Later in life he also became a pilot and flew small airplanes.

During his long wartime service

at sea, North read widely. He had discovered Karl Marx's works during his undergraduate years, and Marx remained his favorite. In fact, at that time North was an avowed socialist, a position he continued to hold until he met Donald F. Gordon at UW Seattle in the 1950s. Although Gordon published little, he was widely appreciated as an astute observer and commentator on the state of economics. Gordon became North's daily chess opponent, and they played chess for two hours every day. In the course of the games, they would talk casually about economics. North gradually came to see that Marx's ideology was inconsistent and eventually abandoned it. Yet the most important influence Gordon had on North was on methods in economic history. He helped persuade North that even if it is difficult to obtain historical statistics, an empirical component must be incorporated in any study.

North made several major contributions to economics. First, he revolutionized the research methods of economic history. Together with Robert Fogel, with whom he shared the 1993 Nobel Prize in economics, North was a major proponent of what has come to be called cliometrics. As the name suggests, cliometrics uses economic theory plus quantitative methods to explain historical issues. In his seminal study of the history of ocean shipping **(North 1968)**, North boldly argued that increases in shipping productivity were not primarily the result of technological advances in construction and propulsion systems. Rather they were due to reductions in piracy, which eliminated the need to carry large numbers of guns and sailors to defend ships. Improved efficiency of the shipping industry - the workflows of loading and unloading goods at ports – also played a part.

North was highly praised for his contributions to cliometrics, but he commented jocularly in private that he was ignorant concerning mathematics. In his paper on the history of ocean shipping, the mathematical portion was handled by Fogel.

There was an interesting anecdote about North and Fogel. While North was co-editor of The Journal of Economic History, he received Fogel's railroad paper. This article hypothetically compared two USAs, one in the 19th Century with the railroad industry in operation, and another counterfactual one without the railroad system. Fogel argued that the railroads had produced great benefits but the reported benefits were exaggerated. He concluded that railroads had not been indispensable to economic development in the US.

North was greatly excited by this paper and wanted to publish it as soon as possible. However, the Journal's co-editor considered Fogel's approach too unconventional and wanted to reject it. North finally went out for a social evening with his co-editor, shared a lot of wine, and finally persuaded him to accept Fogel's article on condition that North would accept another paper the other editor wanted but North did not. The publication of the railroad article did much to launch Fogel's career **(Fogel 1962)** and he subsequently wrote on many important issues in American history such as slavery. After North

and Fogel were jointly awarded the Nobel Prize, North joked with friends that the bottle of wine it had taken to get his co-editor's agreement that evening was the most expensive wine of his life – it cost North half the Nobel Prize money!

Another of North's contributions to economics lies in his building a "Washington school of thought" in Seattle, the details of which are recounted in **Cheung's (2015)** article. Nevertheless, there are still stories to tell about how North left UW Seattle and moved to WUSTL, part of the story of the development of new institutional economics.

North nurtured scholars whom he saw as having outstanding ability and was impervious to criticisms of those he championed. Such traits were seen in his publishing Fogel's railroad paper **(Fogel 1962)** and his hiring of Cheung from the University of Chicago. Yoram Barzel in his tribute to North **(Barzel 2015)** mentioned that North was attacked at UW Seattle as being too dictatorial and exercising favoritism towards certain people. **Cheung (2015)** did not deny that he was one of those beneficiaries and could thereby focus on his academic career and nurture a new generation of outstanding economists such as John Umbeck, Chris Hall, and Ben T. Yu.

While serving as chair of economics at UW Seattle, North showed an independent approach especially in recruitment and promotion. It was that approach that was to cause problems. He had rejected the employment of a young graduate from a renowned institution, holding that this person had only an impressive title not the ability to achieve any remarkable result. Years later, his prediction was shown to be sound. A contrary case involved a colleague up for tenure whom North favoured, but whom others considered mediocre and not worthy of tenure. How did North win the battle? Promotion to tenure was by and large determined by external reviews from renowned scholars in relevant fields. By-passing the promotion committee, North privately asked Milton Friedman at the University of Chicago, a renowned economist and Nobel laureate, to write a reference letter. Friedman's letter was very positive, and the promotion committee's objections were overridden.

After North's victory, substantial changes took place in the governance of the department, and North decided to seek options at other universities. During that period, economic history was not considered mainstream. It was fortunate that a new chaired professorship in the social sciences had just been created at Washington University in St. Louis - the Henry Luce Chair in Law and Liberty. Learning that North was on the market and that this chair was not yet committed, the Benhams enthusiastically promoted the idea of offering it to North. They argued that his work was of such quality that he was likely to win the Nobel Prize. The WUSTL hiring committee did offer the chair to North, and he accepted. And ten years later, the prediction came true.

The chair that North held at WUSTL was situated in the faculty of Arts and Sciences. This was highly appropriate, as his contributions were promoting the growth and development of the broad field of new institutional economics. With his wide intellectual interests, North contributed to economics, political science, law, history, and cognitive science. He enjoyed discussion and always made himself available. When I was at WUSTL, I often saw North in the mornings through his open office door, reading assiduously. He became a leading intellectual magnet and interdisciplinary presence at WUSTL. Many scholars consider **North's (1981)** book on economic history his most important work. But the Benhams believe that his most significant work was done during his time at WUSTL. I concur with their views and believe that his book on institutions **(North 1990)** is the most important one.

This book sets out a framework of institutional analysis. Using property rights and transaction costs as tools, it explains why institutions evolve (or not) and hence why economic performance in different countries differs. Coase carried new institutional economics into the study of law, and North brought it into political science, history, sociology, and the humanities.

While working with Coase in Chicago in 2008, I carried out a simple citation study of the economics literature for him. Considering only published books, **North's (1990)** book was ranked sixth among all the most cited ones. In first position, of course, is **Marx (1867)**. When I talked to North over lunch about this finding, I told him my conjecture that the success of his book could be attributed to his opening statement which gave 'institution' a formal definition. He gave me a nod of consent, and went ahead to plan the opening of his next book.

North customarily circulated drafts of his works widely for comments. He always considered the comments he received with care. After making revisions, he would then circulate a revised version and repeat the process until he was finally satisfied. While he was at Stanford, where he spent many academic terms, he held a two-day workshop on his work, the outcome of which was a book published in 2009 **(North et. al 2009)**. He was then 86 years of age.

For me, North's quest for knowledge of the world and his open interaction with other scholars were admirable. In stark contrast, some scholars like to work behind closed doors and may decline to participate in workshops. Only after their papers are published are they available to share their work. Nevertheless, whenever they are challenged with hard questions about their articles, they often reply that the review process is over and refuse to make clarifications. Such an approach strays far from the broad enthusiastic pursuit of knowledge that North employed. Sadly, this other approach is partly an outcome of the way in which universities now compete for ranking.

Coase and North, founders of the field of new institutional economics, were

awarded Nobel Prizes in 1991 and in 1993, respectively. Coase retired from his faculty position at the University of Chicago in the 1980's, while North remained active on the faculty at WUSTL until 2014. North's dynamic presence at WUSTL helped make it a centre of institutional analysis for all the social sciences. In fact, the Coases even seriously considered moving to St. Louis, but due to various reasons, the idea never bore fruit.

In September 1997 the inaugural meeting of the International Society for New Institutional Economics (ISNIE hereafter) was held in St. Louis, organized by the Benhams. Coase served as the founding president. North followed as the second president, and Oliver Williamson (Nobel laureate in 2009) was the third. Recalling the period when they worked to have North offered a position at WUSTL, the Benhams said that they had not been predicting any specific directions for his future work, but believed that North would continue to create major innovative developments in the social sciences. And those developments indeed were striking. In 2008 ISNIE awarded the Benhams the "Lifetime Achievement Award" in acknowledgement of their contribution to promoting institutional analysis.

Cheung (2015) mentioned that North and he had some mutual distancing for some time, though I know little about this. I remember when I first met North in 2006 at the ISNIE meetings in Barcelona, he was such an amiable fellow that his charisma filled the air everywhere. During a long discussion with him, I had a sudden impulse to mention Cheung. To my surprise, North immediately changed the topic, and I was left puzzled. At that time, Cheung also rarely mentioned North in his columns. It was not until 2007, when I organized a visit for the Benhams to meet Cheung in Shenzhen that North asked them to give his regards to Cheung.

Subsequently Cheung wrote an article **(Cheung 2008)** for Coase's 2008 Chicago conference on China. I believe this article overcame the distance between Cheung and North. On July 14, 2008, after a brief introduction by Coase, a two-hour video was shown in which Cheung presented his paper to the conference. I was sitting in front of North and saw him watching the entire video attentively, nodding from time to time. I could imagine North listening to young Cheung at UW Seattle decades earlier, appreciating a remarkable talent. In the subsequent days of the conference, I heard North mention "Steve" (Cheung's name) many times. Whenever I talked of Cheung with North, he no longer displayed any unease. And perhaps some Chinese participants told Cheung about North's admiration of his presentation, which may be why Cheung started to write about North again in his column. Doesn't that exemplify the power of good research? A good scholarly article not only survives through time, it can also create unexpected reconnections.

Before his death, North was working on a new book with John Wallis of the University of Maryland, his former student at UW Seattle. North had a

great interest in China and were it not for health concerns, he might have visited China several more times after 2008.

Rest in peace, Douglass North. Intellectual giant, may your spirit ascend like your airplane and soar high.

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Surveying & Built Environment

Regulations of Collective Investment Scheme and Real Estate: A Tale of Two Jurisdictions

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ABSTRACT

This technical note discusses some recent court cases on the "collective investment scheme" (CIS).

KEYWORDS

Collective investment scheme, real estate

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INTRODUCTION

The phrase "collective investment scheme' (CIS) is legal jargon. Usually, any examples will appear in the form of unit trusts, mutual funds, exchange-traded funds ("ETFs"), hedge funds, hedge fund-of-funds, futures and options funds, currency funds, and even real estate investment trusts ("REITs") **(Legislative Council Secretariat 2013, Lee & Foo 2010, Kansaku 2007)**. For most property professionals, at first sight the tendency is to connect CIS to property funds or REITs. However, if our practitioners are not familiar with this concept, they may easily fall into the traps exemplified in two recent sagas in the territory. Before we revisit some real-life examples, it is more pertinent to spell out the nature of CIS.

NATURE OF THE COLLECTIVE INVESTMENT SCHEME

Alongside with equity securities and debt securities, any CIS is classified as one of the generic class of "securities".[1] Broadly speaking, a CIS can be characterized as follows:-[2]

1. There is an arrangement in respect of property;

2. Participants do not have day-to-day control over its management even if they have the right to be consulted or to give directions about its management;

3. The property is managed as a whole by or on behalf of the person operating the arrangements, and/or all the contributions of the participants and the profits/income will be pooled together; and,

4. Participants aim to participate in or receive profits, income or other returns from the acquisition or management of the property **(Securities and Futures Commission 2016a)**.

"Property" includes, inter alia, "money, goods, choses in action and land, whether in Hong Kong or elsewhere…" (Emphasis added).[3] This broad interpretation covers real estate in Hong Kong and overseas **(Securities and Futures Commission 2016b)**.

In Hong Kong, the sale, marketing, distribution, and management of a CIS is regulated by the Securities and Futures Commission ("SFC") pursuant to the Securities and Futures Ordinance (the "SFO") (Cap.571).[4] Accordingly, it is a criminal offence for someone to:

- market an individual CIS (which is not authorised by the SFC) to the investing public (i.e., the general public) other than professional investor;[5]

- issue any marketing materials with

[1] SFO, Schedule 1.

[2] Sophisticated readers may read Schedule 1 of the SFO for the interpretation as to CIS (an extract of which is appended hereto).

[3] SFO, Schedule 1, Part I 'Interpretation', section 1 'Interpretation of this Ordinance'

[4] SFO, section 103: Offence to issue advertisements, invitations or documents relating to investments in certain cases. The empowerment is given by s.105.1

[5] Ibid.

an offer to acquire an interest or participate in a CIS in Hong Kong;[6] and

- conduct a business of promoting interests in a CIS without a licence or registration.[7]

In the circumstances, if a private individual is desirous of marketing a CIS to the public, that CIS needs prior authorization from the SFC.[8] If the CIS is not authorized, it can only be subscribed to by professional investors through a licensed corporation or registered institution.[9] If someone intends to sell, market or distribute any CIS (whether authorized or not), they need be properly licensed for Type 1 (dealing in securities), Type 4 (advising on securities) and/or Type 9 (asset management) regulated activities, in order legally to conduct the regulated business of promoting, giving advice on, and managing a CIS in Hong Kong under the present licensing regime of the SFO.[10]

Case 1: The Sale of the Apex Horizon (Legislative Council Secretariat, 2013)

In May 2013, Pearl Wisdom Limited, a wholly owned subsidiary of Cheung Kong (Holdings) Limited, (collectively, "CKH") came to an agreement with the SFC to reverse its sale of 360 units at The Apex Horizon, a hotel apartment/ suite development in Kwai Chung, New Territories.

On 18 February 2013, CKH decided to sell all the hotel apartments/suites at that hotel development. Because of the property market upswing, all units were sold out immediately. Later, however, the SFC decided to investigate the overall management scheme. The financial regulator took the view that the offer to purchase hotel apartments/suites at The Apex Horizon "appeared to be an invitation to acquire an interest in or to participate in a CIS as defined in the SFO". The rationale behind the SFO's decision was that the hotel apartment operator at its sole discretion would have the day-to-day management of the suites by managing and supervising the hotel apartment block and above all, arranging guests to different apartments/suites.

CKH disagreed. It argued that the buyers did have de facto day-to-day control over their properties and that it was therefore no more than an investment in real estate. The outcome, however, was that CKH and the SFO compromised and the incident culminated in the reimbursement of all deposits and part payments to the purchasers by the developer. Evidently

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[6] Ibid.; *Securities and Futures Commission v Pacific Sun Advisors Limited & Mantel, Andrew Pieter* (2015) 18 HKCFAR 138.

[7] SFO, section 114.

[8] The authorization details of CIS are set out at the Code on Unit Trusts and Mutual Funds. The relevant forms can be obtainable from http://www.sfc.hk/web/EN/forms/products/forms.html.

[9] Readers may refer to section 1 of Part 1 of Schedule 1 of the SFO, section 3 of the Securities and Futures (Professional Investor) Rules, and the Paragraph 15 of the Code of Conduct for the Persons Licensed by or Registered with the Securities and Futures Commission for the interpretation of "Professional Investors".

[10] See SFO, Schedule 5 for interpretation of each regulated activity.

this outcome does no more than indicate what could be called a fuzzy boundary between a CIS and, as CKH argued, an arrangement that was not a CIS. Without the case going to court and a legally clear decision having been made, exactly where that boundary remains uncertain.

Case 2: HKSAR v IPFUND Asset Management Limited: Management of Commercial Properties

In HKSAR v IPFUND Asset Management Limited ("D1") and Ronald Sin Chung Yin (D2)[11] (Securities and Futures Commission, 2016c), D1 and D2 were acquitted of carrying on Type 1 (dealing in securities) regulated activity without a licence, contrary to sections 114(1)(a) and 114(8) of the SFO. The prosecution case was that the defendants operated or managed a CIS involving 16 retail properties and invited investors for investment. The learned judge held that all the properties in question were owned by shell companies that were private companies. By way of definition, the shares of private companies are not "securities" under the SFO. Therefore, the defendants were not managing a CIS.

The IPFUND case shows that, before jumping to a conclusion whether a property investment scheme is or is not a CIS, we have to find out how the scheme actually operates. In that case,

- D1 was a legal entity principally engaged in managing property investments.[12]
- D1 was an investment manager for and on behalf of the participants or the investors.[13]
- D2 was its senior officer involved in making investment decisions for D1.
- The subject matters were retail shops.[14]
- The Property Investment Guidelines compiled by D1 set out the potential property projects for investment and the investment rules to be binding on the participants/investors. However, not all the investors had signed accepting such Guidelines.
- The shell companies were used to hold the legal title of the investment properties. Once the properties were sold out, the shell companies would be de-registered. D2 might or might not be the director and/or shareholder of those shell companies.[15]
- A contractual arrangement existed between D1 and the participants/investors.[16] In the event that there was any profit from acquisition of the property, D1 would be entitled to 5% therefrom as administrative fees.[17]
- Each participant/investor was to make monetary contribution towards

[11] DCCC 23/2015 (HH Chan).

[12] DCCC 23/2015 at para. 201.
[13] DCCC 23/2015 at para. 51.
[14] DCCC 23/2015 at para. 26.
[15] DCCC 23/2015 at para. 201.
[16] DCCC 23/2015 at para. 195.
[17] DCCC 23/2015 at para. 196.

> their portion of entitlements to the retail properties (including, the down payment of the property and 5% or 10% over the property price of their entitlements to the property). [18]

In IPFUND, judging from the modus operandi, it is not difficult to identify the four elements of CIS, as explained in the beginning of this technical note. Nevertheless, the learned judge acquitted D1 and D2, for the reason that the term "securities" as defined in the SFO does not include "shares or debentures of a company that is a private company within the meaning of section 11 of the Companies Ordinance (Cap 622)" (Emphasis added).[19] However, a mutual fund (as a kind of CIS) is also structured in the form of a company incorporated **(Appleby 2016)**. Further, the property investment scheme as operated by D1 and D2 does have many commonalities of the CIS. So here again we have an area of uncertainty with respect to what is and what is not a CIS under real estate dealings.

CIS IN THE UNITED KINGDOM

The question is, therefore, whether the sort of uncertainties that we have seen to be manifest in Hong Kong with respect to CIS obtained elsewhere. In order to better study the very nature of a CIS, it is accordingly worthwhile to study section 235 of the Financial Services and Markets Act 2000 ("FSMA"), the comparable legislation in the UK, and some relevant court judgments. As stipulated in the FSMA, a CIS shares the following characteristics to CIS in Hong Kong:-

1. any arrangements with respect to property of any description, including money;

2. the purpose or effect is to enable participants to receive profits or income arising from the acquisition, holding, management or disposal of the property or sums paid out of such profits or income;

3. participants do not have day-to-day control over the management of the property, whether or not they have the right to be consulted or to give directions; and

4. the contributions of the participants and the profits or income out of which payments are to be made to them are pooled and/or the property is managed as a whole by or on behalf of the operator of the scheme.

By comparing the above with our legislation, the key difference is that the law draftsmen in England has adopted a wider meaning and drafted "at a high level of generality", especially "any arrangements with respect to property of any description" **(Dunne 2014)**.[20] The question necessarily arises as to how this higher level of generality plays out with respect to the sort of ambiguities that we have seen to be connected to the Hong Kong formulation. Two cases are of interest.

[18] DCCC 23/2015 at para. 37.
[19] SFO, Schedule 1.
[20] *Financial Services Authority v Fradley* [2005] EWCA Civ 1183 at para. 32 (Arden LJ).

Case 1: Financial Services Authority v Fradley

In this case, Arden LJ (as she then was) directed that:-

> "[T]he application of section 235 [regarding the CIS] depends on the specific facts of the case and in the event of a dispute those facts will have to be determined by a court of law on the evidence before it. Once those facts are found, then it is unlikely that an appellate court will set those findings aside unless the judge was plainly wrong... section 235 must not be interpreted so as to include matters which are not fairly within it."[21] (Emphasis added.)

Likewise, if CIS is not authorised or recognised by the Financial Conduct Authority of the UK ("FCA"), this CIS will be regarded as an Unregulated CIS **(Financial Conduct Authority 2016)**. This Unregulated CIS cannot then be promoted to the investing public other than the following types of investors by those who have been authorised or exempted by the FCA:-

- certified high net worth investors;
- sophisticated investors;
- self-certified sophisticated investors;
- existing investors in UCIS; and
- the Undertakings for the Collective Investment of Transferable Securities ("UCITS"). **(Financial Conduct Authority 2016)**

[21] *Financial Services Authority v Fradley* [2005] EWCA Civ 1183 at para. 32 (Arden LJ).

Case 2: Land Banking in UK: Asset Land Investment Plc & Another v The Financial Conduct Authority[22]

This is the first-ever case in CIS which has reached the highest level court in that jurisdiction. The judges of the UK's Supreme Court have unanimously ruled that the property investment scheme as depicted in the instant case is a CIS. The scheme operation as depicted in that judgment was straightforward in that:

- The defendant was owned as to 95% by Mr. Banner-Eve and his spouse. Mr. Banner-Eve had also controlled its day-to-day activities.[23]
- With an ultimate goal to re-zone the lands for housing development and better market value, the defendant bought three adjoining parcels of greenfield land for consolidation into a single site. After acquisition of the parcels, the defendant subdivided the resulting whole into plots and sold them to different investors.[24]
- The sale of plots was mainly through tele-marketing. Most prospects would have "extravagant expectations" about the potential profits within a year or two.[25]
- An interested investor would have to pay a 10% deposit of the total price, after which the investor had to remit the balance of payment. Following the final payments, investors would receive copies of the contract for

[22] [2016] UKSC 17.
[23] [2016] UKSC 17 at para. 22.
[24] [2016] UKSC 17 at para. 66.
[25] [2016] UKSC 17 at para. 67.

the purchase of his plot(s). Upon completion of all formalities, investors would hold the legal title and keep a certificate of title from the Land Registry. The defendant only retained title to the access roads between the plots and other common spaces.[26]

- Generally, the investor would receive profit from his share of the price realised for the site as a whole.[27]

The decisions were contributed respectively by Lord Carnwath SCJ and Lord Sumption SCJ. In his judgment the latter retold the legislative history of section 235 and analysed the scheme in detail. The reasoning of His Lordship is summarised below:-

- "Arrangements": this did not only refer to contractual or other legal arrangements but also an understanding of the parties as to how the scheme would operate.[28]

- "Property": this was the whole site intended for rezoning and subsequent sale for development so that investors could derive the profit on a pro-rata basis thereafter.[29]

- "Control" of property: this means the ability to decide what was to happen, not only the legal ability to decide. The question was "in whom would control be vested were control to be required."[30]

- "Managed as a whole": this was the subject of the scheme or, more precisely, the site. The defendants had two vivid duties and functions in relation to managing the site or scheme - namely negotiation with the planning authority and finding a developer for the whole site.[31]

- "Management": a CIS may still exist even if the investors legally own their physical assets but their rights are limited by the collective nature of the scheme. There are two reasons. First, where the contributions and the profits/income are pooled, this will necessarily imply a loss of control in favour of the operator. Secondly, in case of no pooling, there is an equivalent loss of control to the operator due to his powers of managing the whole property.[32]

BY WAY OF CONCLUSIONS

The laws governing CIS in both jurisdictions appear very similar. Alongside the two case studies that we have revisited, the UK's Supreme Court decision for Asset Land may serve as useful material for our lessons. After perusal of this article, it is the author's hope (whether it can be realised or not) to ram home a message for the readers that, for our property professionals, they should be mindful of the need to be licensed by or registered with the SFC prior to engaging in any schemes that may be considered as embodying elements of a CIS.

[26] [2016] UKSC 17 at para. 67.
[27] [2016] UKSC 17 at para. 69.
[28] [2016] UKSC 17 at para. 91.
[29] [2016] UKSC 17 at para. 93.
[30] [2016] UKSC 17 at paras. 94 and 95.
[31] [2016] UKSC 17 at para. 97.
[32] [2016] UKSC 17 at para. 98.

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LIST OF CASES

Year	Cases
2016	*Asset Land Investment Plc & Another v The Financial Conduct Authority UKSC 17/2016*
2015	*Securities and Futures Commission v Pacific Sun Advisors Limited & Mantel, Andrew Pieter 2015/18 HKCFAR 138*
2015	*HKSAR v IPFUND Asset Management Limited and Ronald Sin Chung Yin DCCC 23/2015*
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Securities and Futures Commission (2016c), "Defendants Acquitted of Unlicensed Dealing," Accessed on 22 April 2016 at http://www.sfc.hk/edistributionWeb/gateway.

Extract of Schedule 1 of the SFO regarding the Interpretation of Collective Investment Scheme

"(a) arrangements in respect of any property-

(i) under which the participating persons do not have day-to-day control over the management of the property, whether or not they have the right to be consulted or to give directions in respect of such management;

(ii) under which-

(A) the property is managed as a whole by or on behalf of the person operating the arrangements;

(B) the contributions of the participating persons and the profits or income from which payments are made to them are pooled; or

(C) the property is managed as a whole by or on behalf of the person operating the arrangements, and the contributions of the participating persons and the profits or income from which payments are made to them are pooled; and

(iii) the purpose or effect, or pretended purpose or effect, of which is to enable the participating persons, whether by acquiring any right, interest, title or benefit in the property or any part of the property or otherwise, to participate in or receive-

(A) profits, income or other returns represented to arise or to be likely to arise from the acquisition, holding, management or disposal of the property or any part of the property, or sums represented to be paid or to be likely to be paid out of any such profits, income or other returns; or

(B) a payment or other returns arising from the acquisition, holding or disposal of, the exercise of any right in, the redemption of, or the expiry of, any right, interest, title or benefit in the property or any part of the property; or

(b) arrangements which are arrangements, or are of a class or description of arrangements, prescribed by notice under section 393 of this Ordinance as being regarded as collective investment schemes in accordance with the terms of the notice,

but does not include-

(i) arrangements operated by a person otherwise than by way of business;

(ii) arrangements under which each of the participating persons is a corporation in the same group of companies as the person operating the arrangements;

(iii) arrangements under which each of the participating persons is a bona fide employee or former employee of a corporation in the same group of companies as the person operating the arrangements, or a spouse, widow, widower, minor child (natural or adopted) or minor step-child of such employee or former employee;

(iv) franchise arrangements under which the franchisor or franchisee earns profits or income by exploiting a right conferred by the arrangements to use a trade name or design or other intellectual property or the goodwill attached to it;

(v) arrangements under which money is taken by a solicitor from his client, or as a stakeholder, acting in his professional capacity in the ordinary course of his practice;

(vi) arrangements made for the purposes of any fund or scheme maintained by the Commission, or by a recognized exchange company, recognized clearing house, recognized exchange controller or recognized investor compensation company, under any provision of this Ordinance for the purpose of providing compensation in the event of default by an exchange participant or a clearing participant;

(vii) arrangements made by any credit union in accordance with the objects thereof;

(viii) arrangements made for the purposes of any chit-fund permitted to operate under the Chit-Fund Businesses (Prohibition) Ordinance (Cap 262);

(ix) arrangements made for the purposes of the Exchange Fund established by the Exchange Fund Ordinance (Cap 66);

(x) arrangements which are arrangements, or are of a class or description of arrangements, prescribed by notice under section 393 of this Ordinance as not being regarded as collective investment schemes in accordance with the terms of the notice;"

Surveying & Built Environment

The Valuation of Upstairs Commercial Property with Direct Access to Ground Floor Level based on the Principle in *Stokes v Cambridge*

Hing Fung Leung*

ABSTRACT

This technical note explains the principle for the valuation of exclusive access in *Stokes v Cambridge*; identifies the difficulties in the valuation of upstairs commercial property with direct access to ground floor level in Hong Kong; analyses in detail how the principle established in *Stokes v Cambridge* may be used in the valuation of upstairs commercial property with direct access to ground floor level; and identifies the issues, if any, in applying the Stokes principle for the valuation of such kind of property.

KEYWORDS

Stokes principle, Upstairs commercial properties; direct access; comparables; open market value

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INTRODUCTION

Commercial property in Hong Kong, such as a Chinese restaurant, can sometimes be found situated upstairs with a direct access to the ground floor level. Sometimes the property may include the entire ground floor area also being used for the same commercial purpose. Otherwise, however, the property of interest here only comprises the upper floors and the direct access, usually in the form of a staircase, leading to the ground floor level, with the remaining ground floor area being used by another owner. In the latter situation the access will occupy part of but not the entire ground floor area. The two situations are respectively represented diagrammatically in **Figures 1** and **2** below. The latter kind of property is not as common so when valuation of such property is called for, valuers will often face difficulty because of the limited availability of suitable comparables. In those situations the valuation approach may need to be adjusted in order to obtain the market value of such property. A suggested approach is by treating the property as comprising two elements: an upper floor area without direct access and the direct access. The questions become: how to find out the market value of an upstairs property without direct access and the market value of the direct access?

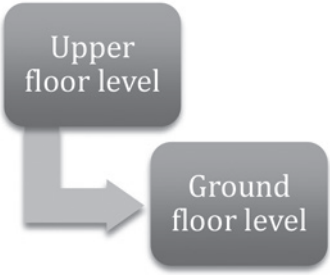

Figure 1: Property comprising upper floor area, direct access and entire ground floor area (the upper floor level, direct access and entire ground floor together form the property)

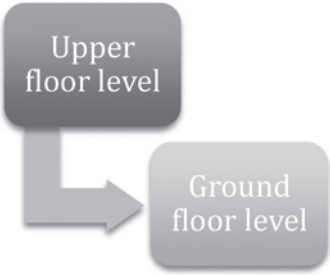

Figure 2: Property comprising upper floor area and direct access leading to ground floor level but which access would not occupy the entire ground floor area (the lighter colour is intended to show that the ground floor area other than the area occupied by the direct access does not form part of the property)

In the U.K. case *Stokes v Cambridge*[1], the English Lands Tribunal set out a principle based on which the value of an exclusive access to a piece of land to public means of transport could be assessed ('the Stokes principle"). The original principle has nothing to do with valuation of commercial property upstairs but there is a question as to whether the Stokes principle may assist in the valuation of direct access to ground floor level for upstairs commercial property in Hong Kong, such that one of the above two difficulties could be resolved.

The major question this technical note intends to address is: would the principle for valuation of exclusive access as set out in Stokes be useful in the valuation of direct access between the ground floor level and upstairs commercial property in Hong Kong, thus assist in the valuation of upstairs commercial property with direct access to ground floor level?

UPSTAIRS COMMERCIAL PROPERTY

Commercial property located on a level above a ground floor not occupied by the same owner or user of the level above is common in Hong Kong as it is in many cities. Naturally there must be access from the ground floor level leading to the property or else the property will be of no value. The access could be a direct one, sometimes a direct and exclusive one, but most upstairs commercial property has access shared with other properties on the same and/or other levels.

A typical situation is where an upstairs commercial property shares the access with other properties through the use of a lift, escalator or staircase, which serve the various floors of the same building, with one or more units on any floor sharing the same lift, escalator or stair. Commercial property as such is common in Hong Kong as elsewhere and there will be no problem at all to locate comparables for this kind of property for valuation purposes. This is not the type of property under discussion in this technical note and there is no need for the principle in Stokes to assist in this situation.

The more difficult case is that of an upstairs commercial property with a direct access leading to ground floor level. This is less common. Appropriate comparables for this kind of property are difficult to find and therefore, for the purpose of this technical note, what will be discussed will be limited to this kind of commercial property.

[1] *Stokes v Cambridge* [1962] 13 P. & C.R. 77.

SUGGESTED APPROACH IN THE VALUATION OF UPSTAIRS COMMERCIAL PROPERTIES WITH DIRECT ACCESS TO GROUND FLOOR LEVEL

As mentioned above, the biggest problem in the valuation of the kind of property as shown in **Figure 2** is the lack of appropriate comparables for similar type of property.

A suggested way of valuation is by splitting the value into:

The value of the commercial property at the upper level without direct access to ground floor level (1) + The value of the direct access (2)

On may consider that (1) above is not difficult to assess because of the abundance of comparables which have access other than direct access to ground floor level. Whether this kind of comparable is appropriate in this situation will be looked into by reference to the case of *Bright Dragon Properties Limited v Director of Lands*[2] below.

The remaining question is how to assess the value of (2). It is in the assessment of this value that the Stokes principle may play a role. Let's now look at the principle.

THE STOKES PRINCIPLE

Stokes is a case involving compulsory purchase of 12.6 acres of land ("the subject land"). In that case the parties agreed that the assumption for the valuation was industrial development subject to "conditions requiring satisfactory access to the land and provision of estate roads".

The most important issue concerned the only possible access over adjoining land in different ownership, one of which is the subject land. It is on the approach of valuation for this access that the English Lands Tribunal has expressed an important principle.

The author has attempted to search the situation of the subject land as at today from Google search and a probable location has been identified as shown in the map below:

[2] LDLR 3/2007.

Figure 3: Current approximate location of the subject land in *Stokes v Cambridge*

In **Figure 3** above, the subject land is the area of industrial development (the area without much greenery in the figure) to the south-east of Milton Road. At the time of the compulsory purchase the area was land-locked such that there was no access to it. The planning authority, by direction of the Ministry of Transport, had forbidden access from Milton Road to the subject land. Therefore the only possible access would have been via what is now Nuffield Road which would allow proper access from Green End Road. In the case this strip of land providing access was described as "brown land". In order to decide how much Cambridge Corporation should properly compensate the owner of the subject land, which would be compulsorily purchased for industrial development, an important question was how much a willing buyer would pay for the purchase of the brown land so that the subject land could be put to proper use, having regard to the use of industrial development.

The Claimant claimed for compensation of £90,840 whilst the District valuer of the Respondent offered £12,500.

The valuations of the two parties are reproduced as follows:

The Claimant (Stokes)[3]:

	£	£
12.6 acres @ £10,000 per acre	126,000	
Defer for two years @ 6% = 126,000 × .8899964 = £112,139, say		112,000
Less:		
(a) Estimated cost of roads, sewers, fencing, consents and contingencies, as agreed with city surveyor—less half-cost of constructing access road from Green End Road to a point where it enters the land to be acquired (referred to on plan D.J.1 as R.4 and R.3 in the case)	24,200	
Less		3,373
		20,827
Engineers' and quantity surveyors' fees @ 10%	2,083	
		22,910
Defer 1½ years @ 6%		.91
	20,848 say	20,850
		91,150

[3] *Stokes v Cambridge (1962)* 13 P. & C.R. 77 at p.80

(b) Cost of acquiring access road
(It being assumed for the purpose of this valuation that a fair and equitable approach to this aspect of the matter would be to assess the value of the land required for the proposed access road, and apportion the figure between Stokes, the claimant, and the Cambridge Corporation as owners of the land (edged green on plan M.66 which accompanied the letter from Stokes to the district valuer of March 10, 1961 in the case.)
(Only 0.1 acre was designated as "area primarily for residential use", the remaining 0.6 acre being designated as "statutory allotments.")

The valuation therefore falls to be further adjusted as follows:

Less 0.1 acre @ £5,000 per acre	£500	
0.6 acre @ £200 per acre	120	
	£620 Half cost =	310
		£ 90,840

The Respondent (Cambridge Corporation)[4]:

	£	£
11.6 acres @ £6,000 per acre	69,600	
Defer four years @ 6% Years purchase	.79	
Value of deferred realisation	54,984	
Less developer's profit, etc., @ 15%	8,247	
For 11.6 acres	46,737	
But say @ £4,000 per acre		46,400
Deduct:		
(a) Estimated cost of roads, sewers, fencing, consents and contingencies:		
	£	
Construction	24,200	
Engineers' and quantity surveyors' fees 10%	2,420	
	26,620	
Defer 1½ years @ 6%	.91	
		24,224
Value of land with necessary access for industrial Development	22,176	
(b) Estimated cost of purchasing access for industrial development:		
	£	
(i) Value of land with Necessary access	22,176	
Less (ii) Value as accommodation land, 12.6 acres @ £200 per acre	2,520	
Increase in value due to access	19,656	
Allocate one-half for purchase		9,828
		£12,348
		Say £12,500

[4] *Stokes v Cambridge (1962)* 13 P. & C.R. 77 at p.82.

Both parties adopted a similar approach in that the amount of compensation was the market value of the subject land (based on industrial use[5]) less the cost of acquiring the access, i.e. the brown land.

There are a number of issues between the parties. First, the retail value[6] of the subject land for industrial development as at the date of compulsory purchase. Should the unit price of it be £10,000 or £6,000? Second, the area so valued. Third, should the retail value of the land be deferred for two years or four years? Fourth, what would a purchaser at the material date have allowed for the cost of acquiring access? Fifth, who would pay for making the access road? [7]

For the purpose of the present discussion the most important issues are the last two, which relate to the value of the access, and how it may affect the value of the subject land.

The principle was effectively elaborated by the English Lands Tribunal:

"The value we have to determine is that of the subject land in the open market at the date of service of the notice to treat, subject to the statutory considerations. That value largely depends upon the price a prospective purchaser at that date would have expected to pay for access. There are thus two hypothetical transactions, one depending upon the other. The primary transaction is the purchase of the subject land itself; the secondary transaction, without which the primary transaction cannot fructify, is the purchase of the brown land. It is implicit in the rules under the 1919 Act that in relation to the primary transaction the identity, resources or motives of any particular vendor or purchaser must be ignored; the value to be determined is the value in the market. But there is no market for this access, except to a prospective developer of the subject land."[8]

The tribunal went on to say,

"In the light of these considerations we think a prospective purchaser of the subject land would be more optimistic about the price he would be obliged to pay for access than is the district valuer. The exact proportion of the eventual profit he would expect to pay away is a matter for conjecture, but in all the circumstances we think a half is too much; we shall substitute one-third, on the basis that the corporation would not contribute to the cost of roadmaking."[9]

[5] In this respect obviously the assumption is land with proper access.

[6] "Retail value" is the term originally used in the case of Stokes. For the purpose of the present discussion one may take that to mean "open market value" in the present context.

[7] *Stokes v Cambridge (1962)* 13 P. & C.R. 77, at p.83.

[8] Ditto, at p.91.

[9] Ditto, at pp.91-92.

The tribunal thus came to a value of £23,615, with details as follow:

	£	£
11.6 acres @ £7,000 per acre	81,200	
Defer three years @ 6%	0.84	
Value of deferred realisation	68,208	
Less developer's profit, etc., 15% of £68,208	10,231	
		57,977
Deduct estimated cost of roads, sewers, fencing, consents and contingencies	24,224	
Value of land with necessary access for industrial development		33,753
Deduct estimated cost of purchasing access for industrial development		
Value of land with necessary access	33,753	
Less value as accommodation land, 12.6 acres @ £200	2,520	
Increase in value due to access	31,233	
Allocate one-third to purchase of access		10,411
		23,342
Add claimant's surveyor's fees in accordance with scale 5A of the scale of charges of the Royal Institution of Chartered Surveyors		273
Total compensation		£23,615[10]

It could thus be seen that the value of the access allocated by the tribunal is 1/3 of the value of the subject land as enhanced by the availability of the access which enables the subject land to be put to proper use, in this case industrial development. In the discussion below let's call this value the "enhanced value".

It must be noted that in arriving at this conclusion, the tribunal said very clearly that the allocation of 1/3 of the enhanced value of the subject land as the value of the access in this case "is a matter for conjecture". It is therefore suggested that this factor may vary according to the circumstances of different cases and would surely involve an element of subjectivity.

[10] *Stokes v Cambridge (1962)* 13 P. & C.R. 77, at pp.91-91.

APPLYING THE STOKES PRINCIPLE TO PROPERTIES IN HONG KONG

Ultimately the English Lands Tribunal in Stokes held, amongst others, that[11],

(1) With regard to the land required for access to the land in question it would be a mistake of law to pay any regard to the fact that the corporation was the owner of the access land, but that otherwise the actual position had to be considered through the eyes of a prospective purchaser, and this included the fact that the owner of the access land also owned certain other land then allocated for allotments but which might be re-zoned as industrial, especially if the land now under consideration was developed for industry first;

(2) The price of the access land would be £10,411, being one-third of the increase in value of the land acquired attributable to the access.

Let's now look at the principle in Stokes were it to be applied in Hong Kong. What kind of property should it apply to and would any problems arise?

In Hong Kong, a common situation involving disputes over land value is in land resumption cases. There is at present only one case in Hong Kong related to the application of the Stokes principle held in the Lands Tribunal: *Bright Dragon Properties Limited v Director of Lands*[12].

Bright Dragon is a case involving resumption of a property ("the subject property") used as a Chinese restaurant at its upper floors with a direct access in the form of a staircase to the ground floor level, which was primarily a shop area owned by a different owner (other than the area occupied by the landing of the staircase). The subject property therefore comprises the upper floors and the direct access to the ground floor level including a small area which forms the landing of the staircase which abuts the street. This small area, though owned by the owner of the ground floor, was an area to which the Claimant was entitled to a right of use under the relevant deed of assignment. The parties had no dispute that in principle the Claimant was entitled to compensation in respect of this small area under the Lands Resumption Ordinance. The issue was the open market value of it.

[11] Ditto, at p.77.

[12] *Bright Dragon Properties Limited v Director of Lands* LDLR 3/2007.

A diagrammatic representation of the ground floor level is shown below:

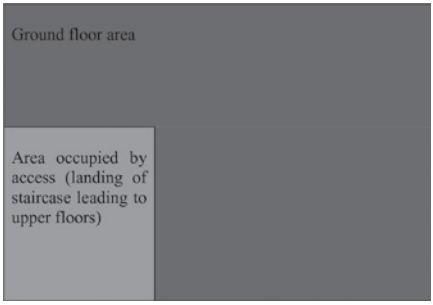

Figure 4: Diagrammatic representation of the area at ground floor level occupied by direct access to upstairs in Bright Dragon

Under section 10(2)(a) of the Lands Resumption Ordinance[13], the basis of compensation should be the market value of the property as at the date of resumption, i.e. 25 May 2005 in the case.

In assessing for the amount of compensation, the parties in Bright Dragon attempted to apply the Stokes principle to arrive at the market value of the property. In effect, what the parties did was to make use of the Stokes principle, which originally applied to land and access basically at the same level, in a situation where the access is linking a property at upper floors to ground floor level.

The Tribunal referred to the decisions of Stokes[14],

(i) that the value of the subject land depended upon the cost of the access;

(ii) that the cost of the access would be a proportion of the gain in value of the subject land resulting from its potential for development; and

(iii) that a reasonable proportion of the gain should be paid to the owner of the access strip and was assessed to be one-third.

An important consideration by the parties' expert was that in Stokes, the access was waste land and therefore had no value. However, in Hong Kong, and indeed in Bright Dragon, the ground floor area occupied by the access was obviously not waste land and should be of some value. The question is whether this value should be taken into account in the valuation of the access, other than 1/3 of the enhanced value.

Whilst the Lands Tribunal agreed with the view of the Respondent's Expert ("RE") that "a relatively higher price will be demanded by the owner (of the ground floor) if the ground floor shop can form an entrance providing an upper floor shop premises with a direct access from the street and hence increase the value of the upper floor shop premises"[15], the tribunal referred to a passage from the book Statutory

[13] Cap 124, Laws of Hong Kong.

[14] *Bright Dragon Properties Limited v Director of Lands* LDLR 3/2007 at p.20

[15] Ditto, at p.19.

Valuation **(Baum and Sams 1997: 173)**,

> "Exactly the same logic may be applied to the valuation of the access land itself. The value of the access strip is that which would be paid in negotiation, the existing use value of the land fixing a minimum price, the total gain in value of the back land due to the prospects of development fixing a maximum, and the relative negotiating strength of the parties determining the settlement price. The purchase of both access and back land simultaneously should not lead to a variation of these principles although it is arguable that the purchaser would require an element of profit for site assembly." (Author's emphasis added)

In other words, in the case of a property as in Bright Dragon, the value of the access will fall between the value of the existing use value of the area as access at ground floor level and the total gain in the value of the upper floors as a result of the availability of the access. The logic is obvious: the owner of the ground floor would ask at least for the existing use value of the area to be occupied by the access whilst the owner of the upper floor area would want to pay only a part of the enhanced value of the upper floor area due to the availability of the access.

THE APPROACH ADOPTED BY PARTIES IN BRIGHT DRAGON

The Applicant's expert opined that he was not going to rely on the Stokes case to advance the Applicant's claim[16].

RE however suggested an approach by first getting the market value of a composite property comprising upper floors and ground floor area and a direct access to the ground floor (as appropriate comparables for such kind of property are readily available). The value of the ground floor area, RE suggested, should be deducted from this market value, followed by a further deduction of 1/3 of the enhanced value due to the access. The last item of deduction, RE explained, was due to the fact that a fraction of 1/3 of the increases in value of the upper floors was to be "paid away" for the acquisition of the G/F shops/ entrance for the provision of direct access to street, hence it should be further deducted from the price of the composite property.

In other words, RE suggested working out from comparables:

V = Vc – Vg – 1/3 enhanced value

Where:

V is the value of the upstairs property with direct access to the ground level (to be assessed)

Vc is the value of the property

[16] *Bright Dragon Properties Limited v Director of Lands* LDLR 3/2007 at p.36

comprising upper floors, direct access from upper floors to ground floor and ground floor area serving commercial use

Vg is the value of the entire ground floor area based on commercial use including the area occupied by the access

It can be seen that as Vg is based on the entire ground floor area including the area occupied by the access, by deducting value of this area and then 1/3 of the enhanced area, there is apparently double deduction beyond the principle in Stokes and this is not consistent with what was explained in Baum's publication above.

As elaborated by **Baum and Sams (1997)** and analysed above, the value of the area occupied by the access (one may consider the green area in **Figure 4** above) should have a value between the existing use value and the enhanced value due to the access. The amount to be deducted should be one between these two values but RE's suggestion amounts to a deduction of both of these two values.

The Respondent attempted to support this approach by reference to a passage in the book The Law of Compulsory Purchase and Compensation of the learned author **Barnes (2014)**[17], which considers the situation where the land to be used as access was of some value before being used as access, says,

> "The above explanation (on the Stokes case) assumes that the land which provides an access, and so unlocks the development value of other land, has itself no significant value save for its potential to provide the access. Of course this may not be so and it could be that the land providing the access had a value for a use which would be lost if it came to be used as an access to other land, and in that case the value of that use would have to be brought into the bargaining and the analysis…. Suppose that plot A contains a house with a road frontage. It has adjoining it a strip of land within its curtilage used as an off-road parking space and a garden shed. Plot B is open land behind plot A and could be developed by building a house on it save that it has no access to the road. The land adjoining plot A could be used to provide that access if the garage and shed were removed. Plot B has a value of £30,000 as grazing and amenity land and £150,000 for development by a house. The strip adjoining plot A has a value of £10,000. Logic suggests that before he would sell his strip to the owner of plot B to be used as an access the owner of plot A would seek a half of the development value of plot B plus a recompense for the loss to him of the strip. The bargaining might then be that the owner of plot A sold the strip for a half of the development value of plot B (50 per cent of (£150,000 - £30,000)), that is £60,000, plus the value to him lost on the strip of £10,000, a total sale price of £70,000."

[17] **Barnes (2014: p. 413, §14.15)**

The Applicant in Bright Dragon submitted[18] that the example suggested by **Barnes (2014)** only tells one side of the picture; the owner of plot B may not be too concerned about the loss of the strip to the owner of plot A, not to mention whether he would forsake 50% of the development value; the owner of plot B would only be concerned about how much he can afford to pay. It is obvious where the owner of Plot A is asking for a price which exceeds the enhanced value of Plot B (due to the availability of the strip on Plot A as an access), the owner of Plot B will not be interested in purchasing Plot A as this will leave him/her with no profit. This is consistent with the rule in Stokes that ultimately, the existing use value of the access is not a factor of concern for the owner of Plot B to buy the access, though the minimum price one could expect the owner of Plot A to ask for is the existing use value of the access[19].

The Applicant referred to a number of authorities to show that in past cases, the consideration of the enhanced value of the subject land, instead of the existing use value, is always the governing factor in deciding the value of the access even though the parties were well aware of the existing use value of the access[20]. The cases are summarised by the Lands Tribunal as below[21]:

"(a) *Chapman, Lowry & Puttick Ltd v Chichester District Council* [1984] 47 P&CR 674 in which the land acquired had a special suitability for the purpose of providing access to the rear land. The existing use value of the land (being agreed at £200) was disregarded in favour of the Stokes v Cambridge value of £25,000 as the award by the English Lands Tribunal.

(b) *Ozanne and Others v Hertfordshire County Council* [1988] 2 EGLR 213 in which a ransom strip provided the only satisfactory means of access to land ripe for development. The value of the ransom strip for agricultural purposes was agreed to be £5,500. In the judgment at 217, the claimant's calculation of £1.24 million (at 215) was awarded and this £5,500 did not enter into picture.

(c) *Crown House Developments Ltd v. Chester City Council* [1997] 1 EGLR 169 in which a ransom strip was acquired for the development of the subject land. The English Lands Tribunal found, at 174, that although a developer of the subject land would probably accept that access through the strip would be "preferred", he

[18] In this case the author was the Applicant's counsel

[19] *Bright Dragon Properties Limited v Director of Lands* LDLR 3/2007 §84 on p.40

[20] *Chapman, Lowry & Puttick Ltd v Chichester District Council* [1984] 47 P&CR 674; *Ozanne and Others v Hertfordshire County Council* [1988] 2 EGLR 213; *Crown House Developments Ltd v. Chester City Council* [1997] 1 EGLR 169 and *Persimmon Homes (Wales) Ltd v Rhondda Cynon Taff County Borough Council* [2005] RVR 59.

[21] *Bright Dragon Properties Limited v Director of Lands* LDLR 3/2007 pp. 40-42.

would have investigated other means. Then the Tribunal held at 176:

> "Mr Guise (for the claimant) added a nominal sum of £100 to his *Stokes v Cambridge* share to reflect the value of the land taken; it seems to me however that if one is using the *Stokes v Cambridge* approach to arrive at a value of a ransom strip then as long as the resulting value is greater than the existing use value the latter value becomes irrelevant. Although the amount involved is trivial I would exclude it as a matter of principle."

(d) *Persimmon Homes (Wales) Ltd v Rhondda Cynon Taff County Borough Council* [2005] RVR 59 in which land was acquired for access to adjoining housing development. In the award by the English Lands Tribunal, the parties' agreed nominal value of £500 for amenity purposes was replaced by £1,139,000 following the Stokes case."

The Lands Tribunal ultimately came to the view that:

> "Having considered all these cases and reviewed the principle of the Stokes case where the owner of the access land held the only key to development of the subject land, we consider the further deduction of the 1/3 of the increases in value by (RE) is not reasonable. This is particularly the case that in the present case, the common staircase and the main entrance that provided access to the Upper Floors were so decorated that they looked like the exclusive entrance to the Upper Floors. In any event, the Upper Floors were not as in the Stokes case without access."

Ultimately the Lands Tribunal did not rely on the Stokes principle to award the compensation in the case. However, based on the discussion in the case, there emerge a number of important issues if the Stokes principle were to apply in Hong Kong.

ISSUES ARISING IN THE APPLICATION OF THE STOKES PRINCIPLE

From the above analysis, there arise two important issues when the Stokes principle is to be applied to the valuation of upstairs commercial property having a direct access to ground floor level:

1. In Hong Kong, any ground floor area of commercial property is always of value. Therefore there is always an existing use value before the particular part of the ground floor area is used as direct access to upstairs. The Stokes case has not dealt with the situation where the land to be used for access is of significant value. The author would suggest that the existing use value can be ignored where the enhanced value of the upstairs property exceeds this existing use value. This is concisely summaried in the judgment of Crown House Developments Ltd:

   "…that if one is using the *Stokes v Cambridge* approach to arrive at a value of a ransom strip then as long as the resulting value is greater than the existing use value the latter value becomes irrelevant."

2. Even if Stokes were to be applied in Bright Dragon, it is suggested that the correct approach for assessing value of the property with direct access to ground level should be:

V = Vc – Vg-a – 1/3 enhanced value

Where:

V stands for the value of the property with direct access to ground level to be assessed

Vc is the value of composite property with upper floors, ground floor and an access linking the two whilst the direct access only occupies part of the ground floor commercial area (found from comparables)

Vg-a is the value of the ground floor commercial area (excluding the area occupied by the direct access)

The amount of 1/3 of the enhanced value with represent the price that the access will be paid for.

Moreover, the approach would not be of any use where the existing use value of the area to be used as access exceeds the enhanced value. It is because under this situation the owner of the ground floor will not be willing to sell the area for access to the upstairs property, rendering the development impossible.

The approach will further be obstructed by the fact that when assessing for the enhanced value, according to Stokes, the assessment has to be based on a property without access at all (a land-locked situation), which is virtually non-existent amongst upstairs commercial properties. This will make Stokes principle become actually an academic exercise subject to many subjective adjustments.

CONCLUSION

There is no doubt that the attempt to apply the Stokes principle for valuing upstairs commercial property with direct access to ground floor level is a constructive move that may assist in ascertaining the appropriate market value of such kind of property. However, as analysed above, the valuation of the direct access based on Stokes involves quite a number of subjective elements. First, the factor of 1/3 to the enhanced value is a subjective assessment of what the owner of the subject land will pay for in the circumstances of Stokes and is therefore subject to change under the particular circumstances of different cases. Second, to ascertain the enhanced value, one has to find out the value of the subject land before it is enhanced by the availability of the direct access, which value should be based on a property without access at all under Stokes. Appropriate comparables for upstairs commercial property without access are difficult, if not impossible, to find in reality.

On the other hand, the Hong Kong case of Bright Dragon does clarify that the existing use value of the land to be used as direct access would not be a governing factor in deciding the market value if the land were to be used as direct access, save that if the existing use value of the land to be used as direct access exceeds the enhanced value, no buyer will be willing to purchase the land as direct access, thus there will be no development of the subject land in result.

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LIST OF CASES

2007	*Bright Dragon Properties Limited v Director of Lands* LDLR 3/2007
2007	*Crown House Developments Ltd v. Chester City Council* [1997] 1 EGLR 169
2005	*Persimmon Homes (Wales) Ltd v Rhondda Cynon Taff County Borough Council* [2005] RVR 59
1988	*Ozanne and Others v Hertfordshire County Council* [1988] 2 EGLR 213
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Surveying & Built Environment

The Surveyor and Built Heritage Conservation

Lawrence W.C. Lai

How can a surveyor contribute to built heritage conservation planning and management?

Before recollecting the potential role of the modern surveyor in conservation, it is necessary to trace the history of the surveyors who actually shaped the modern urban and rural environment throughout the world. At the street corner of the junction of Perth, Australia, stands a statue of a 19th Century naval officer: John Septimus Roe (1797-1878),[1] the first Surveyor General of the Swan River Settlement (today Perth) in Australia. In Roe's day a surveyor like him was usually the first to determine the layout of a town or region and the lot plans for its settlement: in effect a town planner.[2] So in the past, especially in what is today the developing world, when many of the old buildings that are today our heritage were planned and built, the land surveyor, who was as much also a *bona fide* town planner, often had a military background. Roe was a classic example of this. Thus, any heritage study or assessment of buildings that ignores cadastral details, details that usually have a long history, will likely be incomplete and even inauthentic.

While built heritage conservation surely requires special knowledge and ways of appreciation that go beyond the skills and training of most surveyors, this does not make the surveyor a peripheral agent in conservation planning and management.

Even at the most basic level where heritage conservation is treated as just another form of real estate to plan for, develop, and manage, there is still a need to include all surveying specialties in the picture.

Built heritage is after all built property with spatial, cadastral, structural, facility, land tenure, and value dimensions, some of which are historical and, hence, actually part of the heritage in question.

The overall project conceptualization in any heritage conservation exercise would be a task for the planning and

[1] See **Horden (2011)**.

[2] See **Lai and Davies (2016)**. The best references for the works of the surveyor in the British Empire and the U.S. are, respectively, **Home (1997)** and **Price (1995)**.

development surveyor. For what is involved is coordinating land, building, and estate surveyors, especially when the conservation project in question forms part and parcel of a wider scheme.

The ascertaining of the spatial, cadastral, and even structural dimensions of the building in question is the domain of the land surveyor. The interpretation of maps and aerial photographs and other remote-sensing images, along with the identification and appreciation of the location and functions of a building, are areas in which a land surveyor can assist a heritage conservation expert. The presentation of conservation concepts in map and other media based on GIS data is also something to which a land surveyor can make a big contribution.

The examination of the physical status of a building and recommendations for and supervision of its rehabilitation and/or adaptation with the proper facilities for a modern viable use is the domain of a building surveyor. In turn the building surveyor may need the assistance of a quantity surveyor for project control when the scale and magnitude of the project are large enough. For cost control and administering contracts are important elements in ensuring heritage projects stick within budget.

An estate surveyor is indispensable for investigating land ownership matters, conducting a feasibility study, writing a valuation report[3] on an existing and/or adapted use, drafting lease documents, selecting tenants, and overseeing a property's management for its new role as a heritage site.

Knowledge, skill, technique, and an awareness of all surveying branches are indispensable for sound heritage conservation research. Research on Hong Kong's built heritage conservation efforts, informed and conducted by surveying, is gathering momentum.[4]

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[3] The methodology of **Yung et al (2016)** involved the valuation of the AAB items.

[4] Some examples are **Lai et al (2016)** and **Yung et al (2016)**.

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