CB(1)1442/98-99(01)

For Discussion
On 11 June 1999

LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS

Managing Construction and Demolition Material Disposal

INTRODUCTION

This paper briefs Members on the management of construction and demolition material (C&DM) disposal, and sets out on going and planned improvement measures.

2. We face serious shortfalls in providing outlets for C&DM. Unless this is resolved we will experience significant increases in the amount of C&DM being dumped at landfills, thereby shortening their life and necessitating early identification of sites for new landfills.

BACKGROUND

3. From 1987 to 1998, the amount of C&DM generated annually by Hong Kong's construction industry increased more than 75% from about 6.8 million tonnes (Mt) to 11.9 Mt. Even during the recent economic downturn, the construction industry produce 32,700 tonnes of C&DM a day in 1998, 13% more than in 1997. This quantity is sufficient to fill an area the size of Happy Valley Racecourse to a height of over ten storeys high. The Waste Reduction Framework Plan (WRFP) launched in

November 1998 assumed we will successfully reuse and recycle at least 80% of C&DM. If this is not achieved the useful life of the landfills designed to hold municipal waste will be reduced.

4. C&DM is a mixture of inert and organic material arising from site clearance, excavation, construction, refurbishment, renovation, demolition and road works. The inert material, called public fill, is suitable for reuse in reclamation and site formation works at public filling areas[1] (PFA). Some of it can also be used for recycling into material for construction. Ideally, only the organic material called construction and demolition waste (C&D waste) should be disposed of at landfills.

5. In 1997, consultants engaged by the Civil Engineering Department (CED) recommended a management hierarchy of avoidance, minimisation, reuse/recycling, treatment and disposal for C&DM (extracts from Executive Summary at Annex A) similar to the WRFP.

Annex A

PUBLIC FILLING PROGRAMME

6. The percentage of reuse of public fill in reclamations has varied from 23% (1991), 35.1% (1994) to 78.5% (1998). The lower percentage in earlier years was mainly due to extensive use of marine sand for reclamation in airport-related infrastructure projects. The historical data for C&DM generation and reuse of public fill is at Annex B and C respectively. It is expected that the amount of public fill generated will remain stable at about 5.3 million cubic metres per annum by 2010.

Annex B & C

[1] A "Public Filling Area" is a designated part of a development project that accepts public fill - in lieu of general fill - as filling material for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued free of charge by Port Works Division of Civil Engineering Department.

7. Our policy is to maximise the reuse of public fill in land formation and reclamation projects to minimise its disposal at landfills. Greater use of public fill also reduces the need to extract marine sand for reclamation. This would not only conserve our limited natural resources but also helps to protect the marine environment. At present, there are two reclamation projects designated as PFA that accept public fill for reclamation. They are located at Tseung Kwan O Area 137 and Pak Shek Kok in Shatin.

8. The available public filling capacity for any one year depends on the programme of individual reclamation projects. Annex D lists the committed Public Works Programme (PWP) Category A reclamation projects and their public filling capacities. Besides using public fill for reclamation, it is also used to surcharge newly reclaimed land to accelerate the settlement. When the required settlement has been achieved, the public fill will be removed and deposited as fill in other reclamation projects. Although surcharging could offer year-to-year additional capacity as stockpile, it would not increase the overall public filling capacity as this is dictated by the overall capacity of reclamation projects.

Annex D

BARGING POINTS AND SORTING FACILITIES

9. Long haulage of public fill by truck to PFAs places additional burdens on the road network, such as that experienced at Wan Po Road in Tseung Kwan O. It also adds to air pollution. To reduce these impacts barging facilities, temporary and long-term, are set up at convenient locations close to the source of the material to encourage the use of marine transport. Maps showing the locations of the existing and proposed barging facilities are at Annexes E and F. Progress has been made in establishing temporary and long-term public filling outlets on Hong Kong Island.

Annex E & F

CED is also planning to establish C&DM sorting facilities at Tseung Kwan O and Chai Wan by 2000 and 2002 respectively.

DIFFICULTIES IN SECURING PUBLIC FILLING OUTLETS

10. In recent years, public concerns and objections have often delayed, reduced or stopped the implementation of planned reclamation projects in particular within the inner harbour area. This has disrupted the expected provision of new public filling areas and reduced the outlet capacity.

11. Based on the estimated capacity of committed reclamation projects, an acute capacity shortfall is anticipated by end-2000 if no further reclamation projects are approved. The recent approval of Tseung Kwan O Area 137 Reclamation Stage 2 has eased the situation. If reclamation projects that are already in PWP Category B (as in Annex G) proceed as planned, the situation could be less acute. We remain sensitive to concerns about reclamation and will keep these to the minimum necessary. However it is important that once particular reclamation projects are agreed we maximise the use of public fill in those projects. Due to the uncertainty associated with projects such as Green Island, South East Kowloon, Kowloon Point, Tsuen Wan Bay and Tseung Kwan O Area 131, they have not been included in the public filling programme.

Annex G

ISSUES TO BE ADDRESSED

12. Efforts to promote the beneficial reuse of C&DM have been hampered by the following -

(a) Delay in introducing the Landfill Disposal Charges

The delay in introducing landfill disposal charges means there has been little economic incentive to separate and sort C&DM or seek outlets other than the landfills.

(b) Too little use of reclamation capacity

Even though there might be sufficient reclamation capacity to accommodate the public fill generated, too little filling capacity is allocated to public fill. This is because projects are often approved on very tight timetables and public fill supplies are less easily guaranteed than marine sand. There are also uncertainties about the quantity of public fill available. In practice, this has meant that at the same time as importing marine sand, we have been sending public fill suitable for reclamation into our landfills.

(c) Mismatch of supply and demand

Inevitably, the rate of public fill generation fluctuates. When supply is greater than demand the excess goes to the landfills where it is lost forever. When the supply is less than demand, fill is imported or obtained from borrow areas.

(d) Lack of disposal control

In the past, most contracts for construction projects imposed upon

the contractor the responsibility to dispose of the C&DM generated without stating where and how it should be disposed.

(e) Inconvenient outlets

PFAs have in recent years tended to be some distance away from the main areas of public fill generation. Suitable sites in urban areas for establishing barging facilities are difficult to find.

(f) Inadequate provisions of off-site C&DM sorting facilities

Practical problems such as site constraints especially in urban areas do pose genuine difficulties in providing on-site sorting facilities. However, bad construction practices, poor site management, cost implications and the lack of education and awareness contribute to the problem.

IMPROVEMENT MEASURES

13. We are working on short, medium and long-term improvements -

- We are aiming to use all available public fill for land formation by improving planning and co-ordination. Improvements to the fill management database will allow us to forecast reliably both the supply and outlets for public fill.

- One aspect that needs to be examined relates to timing of reclamation projects. At present, normal practice is that

reclamation projects can proceed only after permanent land uses are decided. However, once the permanent use is decided, the need for the land is urgent and this becomes an argument against using public fill. It would be helpful if some reclamation projects could proceed prior to permanent usage being agreed. This would allow virtually the whole project to use public fill.

- Starting from April 1998, government contracts planning to import more than 300,000 m3 of fill have had to use public fill unless given special exemption by the Public Filling Sub-committee.

- A trip-ticket system will be implemented from 1 July 1999 to better manage the disposal of C&DM for government contracts2.

- Starting from March 1998, government demolition contracts have been required to conduct on-site sorting, and material separation at source where practicable.

- Off-site C&DM sorting facilities are being introduced in Chan Wan and Tseung Kwan O. If these prove successful, more similar facilities will be provided elsewhere in the urban area. We will also explore establishing off-site sorting facilities in more remote areas or at the landfills.

- Introducing landfill charges will undoubtedly deter dumping inert material at the landfills although the precise effects will depend on the fee level. The demand for off-site sorting facilities and public filling areas will grow as a result and we will need to counter the likely increase in fly tipping.

- We plan to improve the rates at which we recycle C&DM e.g. turn suitable materials into aggregates for concrete and asphalt, hard core for road foundations and reconstituted timber products for construction.

- There are inevitable mismatches between the production of public fill and demand for it in reclamation and site formation projects. One solution could be to stockpile surplus material on newly reclaimed land to accelerate consolidation and minimise the degree of post-development ground settlement. In the longer term a 'permanent' stockpile site or sites would be beneficial.

- Balancing the cut and fill in construction work could reduce significantly the quantity of C&DM produced. Whilst it would not be always possible to achieve a balance of earthwork production and requirement within a contract, it should be possible to balance the cut and fill requirements across a number of contracts within a region. This might require the establishment of a 'fill bank(s)', which in practice might be consolidated with the stockpiles.

- If we resolve the 'programme constraints' there will be no surplus public fill for the time being. However, in the longer term, we will consider using surplus public fill to restore exhausted quarries. This approach may be particularly attractive for restoring old quarry sites at the fringe of country parks.

- If the trip-ticket system using designated collection and delivery locations proves successful in respect of the government contracts,

---

[2] WB has issued a WBTC to implement a 'trip-ticket' system in government works contract tender after 1 July 1999 to better manage the disposal of C&DM.

we will work to extend the system throughout the industry.

- We have initiated discussion with the industry on the causes and possible solutions to various aspects of the problem with waste generated by decoration and renovation works.

- The landfill operators need inert material every day to cover the municipal waste. Public fill can be used for this purpose in some circumstances.

WASTE REDUCTION COMMITTEE

14. The Waste Reduction Committee (WRC) which was established in February 1999 has identified the C&DM problem as the most pressing issue facing it. On 12 May 1999 the WRC established a Task Force for the Construction Industry, with membership from professionals, academia, government, developers and the construction industry. The Task Force has established three work groups to focus on

- maximising the use of public fill,

- new standards and specifications to promote recycling and reuse of C&DM and

- education programme on promoting C&D waste reduction.

LONG TERM SOLUTIONS

15. Hong Kong cannot continue to rely on reclamation to dispose of C&DM to the extent that it has in the past. It is also clear that improved management and greater recycling of C&DM alone will not remove the need to find disposal space. At best they will only defer the time when all potential shoreline reclamations are completed. Consideration will need to start soon on how C&DM is going to be handled in the longer term. There may be advantage in examining options for this in conjunction with planning for long term handling of dredged mud and municipal solid waste.

16. Members are invited to note the contents of this paper. The Administration welcomes members' comments and advice on the measures we are introducing to manage C&DM in the short to medium terms as well as on longer term planning.

Planning, Environment and Lands Bureau
June 1999

Annex A
附件 A

引言

1. 香港特別行政區政府土木工程署委託萬碩亞洲環保顧問工程公司進行一項名爲「公眾填土策略及計劃檢討」的研究工作。

2. 在策略檢討過程中採用了一些新名詞，其在本摘要中的解釋如下：

- 拆建物料是由地盤清理、挖掘工程、建造工程、翻新工程、拆卸工程及道路工程所產生的。根據一九九七年的統計資料顯示，目前的拆建物料以重量計約有百分之二十屬混合拆建廢料，其餘百分之八十屬公眾填料。
- 公眾填料屬惰性物料，不會分解或發出臭味，包括岩石及混凝土、拆樓後的瓦礫及挖掘出來的泥土。公眾填料可作一般填料即時再用，或經處理後再用（例如打碎岩石）。
- 過剩公眾填料的產生是因爲有太多公眾填料不能即時處理，換言之，可供再用公眾填料量有過剩的情況出現。
- 拆建廢料屬有機物質，包括竹枝、玻璃、塑料、木材、植物及其他可以分解及發出臭味的有機物料。
- 混合拆建物料是指混合了公眾填料及拆建廢料的物料。但由於混有拆建廢料，因此混合拆建物料在未經分類前並不適合再用。
- 公眾填土區是指發展項目中一個指定地方，可接受公眾填料代替一般填料，作填土物料之用。
- 拆建物料分類設施是指一系列可把混合拆建物料內公眾填料及拆建廢料分開的設備。
- 公眾填土躉船轉運站是一個策略性指定的公眾填料收集站，利用躉船把車輛運來的公眾填料轉運至海上公眾填土區。
- 緩衝儲存區是一個儲存填料需求量低時出現過剩公眾填料的地方。當需求量回升，存放的公眾填料便可立即供應所需。
- 卸泥場是供過剩公眾填料永久丟掉的指定地方，而這些公眾填料不能再被使用。

拆建物料管理的背景資料

3. 一九九二年，土地發展政策委員會通過填料管理委員會制訂的公眾填土策略。策略內容主要分爲三部分：

- 在策略性指定地方設立公眾填土區，爲全港不同地區產生的公眾填料隨時提供足夠的容量及方便的收集地點。
- 在新界東北部地區尋找一個合適的公眾填土區。
- 在遠離公眾填土區的地方設立臨時及長遠公眾填土躉船轉運站。

4. 此策略的實施，令屯門、將軍澳及白石角的公眾填土區，以及愛秩序灣公眾填土躉船轉運站得以運作。

九二年公眾填土策略檢討

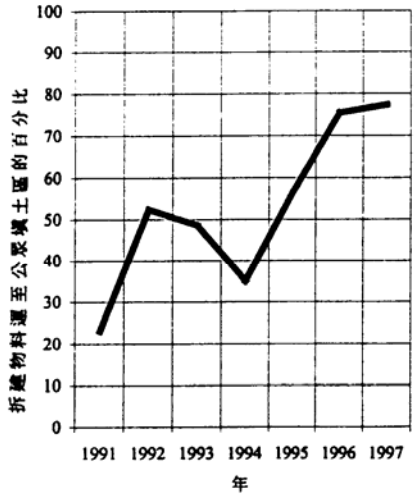
5. 香港建築界自九二年起蓬勃發展，拆建物料的數量亦與日俱增。到了一九九六年，香港已產生了超過六百萬立方米的拆建物料。

6. 公眾填料應運至公眾填土區用作填海物料，而拆建廢料則應運至堆填區傾卸。然而，過去大量公眾填料卻運到堆填區傾卸。這樣並不恰當，因爲公眾填料不但佔用了寶貴兼且昂貴的堆填區容量，大大降低了原本用作收集城市固體廢物的堆填區的整體使用年期。

7. 隨著公眾填土區的增加，在策略性堆填區傾卸的拆建物料比例已由九一年的百分之七十七下降至九六年的百分之二十五。此舉延長了原本用作處理城市固體廢物的策略性堆填區的使用年期。然而，大量的公眾填料被運到九二年所確認的公眾填土區時，填土區被填滿的速度較計劃中爲快。

公眾填土策略及計劃檢討 萬碩亞洲環保顧問工程公司

8. 土木工程署現時預測，到了二零零一年初或較更早的時間，現有公眾填土區的容量將會出現不足，因此展開本研究工作，以檢討九二年的策略及為九七年至二零一一年制訂一套長遠的全新公眾填土策略。新策略將會確保香港未來的拆建物料能以有利、有效及符合環保要求的方法管理。



圖一:九一至九七年在公眾填土區傾卸的公眾填料數量的百分比

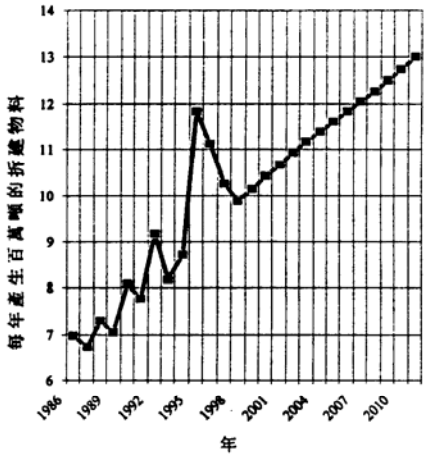
規劃模型

9. 為了計算未來可能產生的拆建物料數量，本研究設計了一個公眾填料規劃模型，協助土木工程署有效地策劃公眾填料的再用。此模型包括兩個子模型可提供整體預測。

10. 第一套子模型最初由香港理工大學發展，它可根據計劃中拆建建築物的建築樓面面積計算出可能產生的拆建物料數量。其中包括建築物的拆建量、主要土木工程項目的剩餘物及道路工程產生的物料。不過，此套子模型只適合預測短期資料，如未來的兩至三年。

11. 第二套子模型利用迴歸技術和根據土木工程署、填料管理委員會及環保署編製的紀錄，計算出可能產生的拆建物料數量。此套子模型在預測長期資料時比較準確，如未來四至十年。

12. 綜合兩套子模型的公眾填料規劃模型，會不斷加入填料管理委員會、屋宇署、規劃署、差餉物業估價署，以及房屋委員會和房屋協會轄下各個工程項目提供的新資料，令計算結果更趨準確。



圖二:根據公眾填料規劃模型計算所得的數據(八六至九六年為實際數字，九七至二零一一年為預測數字)

實地調查

13. 為了能夠為公眾填料規劃模型以及本研究工作提供更多最新資料，我們在現有公眾填土躉船轉運站及公眾填土區進行實地調查。此舉有助釐定各項標準，如運載公眾填料車輛的平均運送時間，公眾填料及拆建物料的成分及其來源的地域分佈。

公眾填土策略及計劃檢討 萬碩亞洲環保顧問工程公司

公眾填料的其他用途

14. 研究中一個計劃是把公眾填料作填海工程填料以外的其他用途，主要集中研究由公眾填料所生產的再造沙石，配合在混凝土及道路工程上使用的可行性。結論是，從工程角度看，再造沙石的用途可以接受，而商業上亦屬可行，則引入此等物料將可獲製造及使用混凝土的行業接受。

15. 本研究建議就此方面作進一步研究，並製作「示範」工程項目，向有關部門及行業介紹再造沙石的用途。同時，本研究亦建議可放寬次等級非結構性混凝土的不必要嚴厲規格，以便再造沙石的用途更趨廣泛。

16. 然而，從公眾填料中生產的再造沙石，需要拆建物料分類設施的協助，以便能把在公眾填料中不適合用作製造再造沙石的物料分隔開來。

17. 陸上填土方面，建築地盤或填土計劃可以採用公眾填料代替一般填料，在只需薄層填土物料時，可能出現施工技術上的困難，但仍然可行

18. 至於海上填土方面，如屬枯竭了的採泥坑或受污染的泥坑，則不適合以公眾填料作回填物料，因為此舉會佔用原來被指定接收傾卸泥漿的容量。回填這些泥坑是政府政策，但由於很難找到更合適的方法處理挖掘的泥漿，因此，用泥漿作回填之用會比較適合。

19. 公眾填料的另一個用途，是在指定的海上地點，用大石塊及巨礫，築起人工暗礁--
漁農處目前進行的人工暗礁研究將可提供合適的地點。

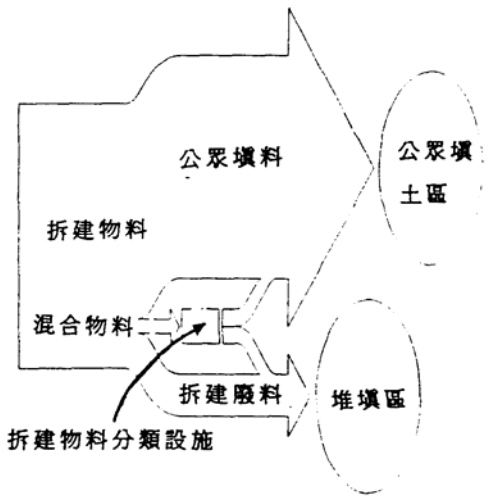
拆建物料分類設施

20. 如上面所述，拆建物料分類設施可以協助由公眾填料中，把惰性物料分類出來，再經打碎及篩分的過程，製成再造沙石，即使生產再造沙石的建議暫時不獲支持，拆建物料分類設施的設立仍是需要的。

21. 策略性堆填區對接收的廢料有嚴格規定，只准許在容積上包含不超過百分之二十惰性物料的拆建物料傾卸。而公眾填土區亦根據傾卸泥土執照的規定設有自己的接收標準，因此，會出現部分拆建物料不獲這兩類設施接受。

22. 就是這些包含了拆建廢料及公眾填料的混合拆建物料需要拆建物料分類設施將各種成分分類。

23. 目前，由於全港各拆建地盤未能完全分隔惰性物料及非惰性物料，因此產生混合拆建物料。未能完全分隔的原因很多，主要是市區內地盤規模較細未能把不同物料分開存放，而設計師及地盤管理人員缺乏物料分類意識亦是因素之一。此外，在人口稠密的市區地盤內使用大型分類設施，亦不符合環境及社會因素的要求。



圖三: 使用拆建物料分類設施的流程

24. 在新界東南堆填區內已有一部附有分類功能的建築廢料分類處理設施。此設施試用了近三年，一直爲堆填區提供再造沙石作填料之用，同時亦提供再造沙石給運輸通道及臨時排水工程所用。此舉不但爲城市固體廢料騰出寶貴容量，同時亦減低了堆填區對開山闢石的需求。

25. 本研究評估過拆建物料分類設施的操作後，製作出一個全新的概念設計，作爲整個公眾填土策略的一部分。新概念設計包括了各項環境緩解措施及方法，可提高能源效益及減低噪音和塵埃的產生。

26. 由於在引入堆填區收費計劃前很難估計需要分類物料的實際數量，因此，繼續使用新界東南堆填區試用中的分類處理設施，會較即時興建處理量仍是未知之數的新拆建物料分類設施爲佳。

27. 拆建物料分類設施的選址亦是本研究中一個主要課題，香港適合興建此類設施的地方甚少。至於爲新公眾填土區選址則不屬本研究範圍之內，因爲公眾填土一般屬於填海工程的一部分，而且受有關工程計劃進度影響。

28. 因此，本研究建議的地點必須能在公眾填土策略執行期間被使用，亦要在環境、工程技術、規劃、後勤及社會上獲得接納。這些地點亦須接近產生拆建物料的主要地區，以減低運送時的影響。

29. 爲拆建物料分類設施／緩衝儲存區選址時，本研究在新界三個策略性堆填區及九龍安達臣石礦場或其附近地方，找到了一些合適的土地。雖然使用這些地方，可能出合約問題需要解決，但當堆填區收費計劃推出後，拆建物料分類設施的需求便會大增。

公眾填土躉船轉運站

30. 策略中另一主題是爲公眾填土躉船轉運站提供一個合適的設計，以及在全港各策略性地點選址興建。由於大部分公眾均認爲公眾填土躉船轉運站都是骯髒及嘈雜的運作，因此成爲一個爭論性問題。

31. 本研究亦爲新一代公眾填土躉船轉運站提供了概念設計，其中包括將轉運站與其他設施共同使用，以及嚴格的環境緩解措施，以控制塵埃、噪音及景觀方面的影響。例如，在傾卸台四周裝設連灑水設備的彈性膠布以減少塵埃飛揚的情況，在轉運站周圍提供隔牆以減低塵埃及噪音對公眾的影響，以及在傾卸台上加設上蓋以減低塵埃及對景觀影響。

32. 在公眾填土躉船轉運站，由拆建地盤運載的公眾填料會卸落在大型躉船上，然後運至海上公眾填土區。在現有公眾填土躉船轉運站，運載的物料會先由監督人員檢查，才卸下躉船，以確保只接收合適的公眾填料。

33. 本研究建議在香港島最少提供三個公眾填土躉船轉運站，以減低經過道路及海底隧道的交通流量，而且利用躉船運載大量物料會較陸路運輸爲佳。本研究亦在九龍、新界及大嶼山建議了其他地點。

緩衝儲存區

34. 在目前及建議的填海工程採用的公眾填料數量只佔整體填料需求的小部分，可望在不影響工程的規定下，填海工程目前留作容納公眾填料的容量增加。可是公眾填料的供應量要配合所需的計劃進度。

35. 填海工程一般在較短時間內需要大量填料，但公眾填料的供應量並不穩定。這是大部分填海工程不願意採用公眾填料的最常見的原因，因爲公眾填料的供應量沒有保證。

公眾填土策略及計劃檢討 萬碩亞洲環保顧問工程公司

36. 為解決這個問題，本研究建議興建緩衝儲存區，以控制公眾填料的供應情況，使公眾填料可按需要供應給快速發展項目使用。作為策略中一部分，緩衝儲存區可以是臨時的，如拆建物料分類設施的緩衝儲存區，亦可屬永久性的，如卸泥場的緩衝儲存區。

卸泥場

37. 策略亦建議一套應變計劃，以應付計劃中填海工程未能容納所有產生公眾填料的情況。應變計劃是把過剩公眾填料以符合環保要求的方法傾卸，形成一個改良環境的新地形，並作日後有利之用。

38. 本研究發現可以在一些細小離島傾卸過剩公眾填料，但考慮過在沒有界定土地最終用途之前及其可能產生的環境影響，本研究建議在未確定土地用途及發展計劃之前，不宜在這些地點傾卸過剩公眾填料，除非有進一步的調查證明。

39. 結果，可供考慮的適合選址只有陸上地點。新界西的丹桂村採泥區及丹桂村石礦場目前及計劃中沒有任何用途，因此建議選用。兩個地點均鄰近郊野公園及處於綠帶區內，如有需要，在經過進一步研究後，其中一處可作過剩公眾填料的緩衝儲存區及卸泥場使用。

40. 卸泥場當填至協定高度時，便應加以綠化及種植一些配合四周環境的植物，以便與鄰近郊野公園協調。

41. 建議內容主要是，傾卸過剩公眾填料的地點應按四周地勢環境填土及修整，再種植與周圍同類的植物。此舉不但可以為過剩公眾填料提供一個卸泥場，同時亦可提高環境稍遜地區的自然風貌。

42. 所有建議的地點均經過適當的初步環境、陸路及海上交通影響評估。經選定作進一步研究的地點，應按法定程序及規定接受更詳細的評估

新策略及計劃

43. 在一九九七年五月環保署出版的減少廢物計劃初稿中，建議了一個包括避免、減少、再用/再造、處理、棄置的廢物管理分層程序。

圖四: 廢物管理分層程序

44. 本研究建議香港的拆建物料亦可採用此廢物管理分層程序，但必須按香港需要作出修訂。「避免」及「再造」對減少拆建物料數量的幫助雖然有待進一步研究，但應屬有限；而政府已在草擬減少廢物計劃中評估過「減少」的作用；由於公眾填料屬惰性物料，不會大量分解，因此無需在「棄置」前進行「處理」。結果，「再用」成為在香港有效管理公眾填料的最佳方法。

45. 公眾教育及政府的「示範工程」，加上制訂政策，將有助減少拆建物料的產生，同時亦有助推廣地盤內的物料再用。在預計可能產生的拆建物料中，只有小部分可以作再造沙石及人工暗礁，因此需要其他建議配合。

46. 雖然填土策略可有效管理預計中所產生的拆建物料，但土木工程署預測，大型填海工程可能會有延誤引致容納此等物料容量短缺。為此，本研究亦建議了一個應變計劃，即分層程序中的「棄置」。當然，這個選擇看似可行，但亦須經過詳細的環境及交通影響評估才可實施。

47. 公眾填土策略的主要內容包括：

- 土木工程署利用公眾填料規劃模型計劃有效管理香港的拆建物料。
- 在目前及計劃中的填海工程，增加公眾填土區的容量。
- 利用公眾填土躉船轉運站的策略性網絡，以有效及符合環保的方法，把公眾填料由產生地區運載至再用地點。
- 設立拆建物料分類設施，爲混合拆建物料提供出路，令策略性堆填區及公眾填土區可以嚴格執行各自的物料接收標準。
- 提供緩衝儲存區，存放公眾填料，以便有需要時使用，更可以爲即時需要大量填料的發展項目供應所需物料。
- 如公眾填料長期出現供應過剩，有需要時計劃及執行一套應變計劃。

重要建議概要

48. 重要建議有以下各點：

- 定期修訂公眾填料規劃模型，令預測拆建物料生產量的計算工作更趨準確。
- 增加目前及計劃中填海工程公眾填土區容量的建議，需要根據不同工程項目作出更詳細的研究。
- 進一步研究拆建物料分類設施的設計及興建，以確保混合拆建物料的成分可以有效分隔。
- 應進一步研究生產循環再造沙石的建議，以提高有關私人機構採用的興趣。
- 建議在九龍安達臣道石礦場或附近地方以及三個策略性堆填區內或其附近地方興建一個或多個拆建物料分類設施，但需要作進一步研究，包括詳細的環境及交通影響評估。
- 建議在丹桂村採泥區及石礦場傾卸過剩公眾填料，以及興建一個永久緩衝儲存區，但需要進一步研究，包括詳細的環境及交通影響評估。
- 在全港各地，特別是在香港島，設立策略性公眾填土躉船轉運站。柴灣、西營盤及鴨利洲均是適合興建長遠轉運站之用。
- 以本研究提供的概念設計爲新設立的公眾填土躉船轉運站作基礎。此舉有助把污染程度減至最低，加強海濱區各轉運站的共用，以及確保公眾填土躉船轉運站融入周圍發展。
- 採用廢物管理分層程序，並集中在最大可行性的「減少」及「再用／再造」兩方面，因爲它們有很大的發展潛質。
- 本研究大力建議進一步研究編製一份有關辦公室設計及地盤管理的工作守則，以避免及減少拆建物料的產生。同樣，政府亦應進一步擬定指明地盤內爲物料分類的技術通告，處理拆建物料的分隔及規定。

結論

49. 本研究總結出，目前及計劃中的填海工程應可容納未來預算的公眾填料。但所有工程必須按計劃進行才可達到以上結果。如果工程施工出現延誤，便會出現過剩公眾填料。

50. 爲免出現上述情況，目前及計劃中填海工程應爲公眾填料預留更多容量。爲了令各工程項目經理接受此建議，公眾填料的供應量必須穩定，因而需要設立緩衝儲存區。

51. 最後結論，如果建議的策略及計劃得以實施，香港現時及未來產生的拆建物料問題便可解決。只要以符合環保要求的方法進行，建議不但爲新闢拓土地提供填料，同時亦可省回策略性堆填區的寶貴容量，從而令其使用年期得以延長。

Annex A
附件 A

Introduction

1. The Civil Engineering Department of the Government of the Hong Kong Special Administrative Region appointed Mouchel Asia Limited to undertake a Study entitled "Review of the Public Filling Strategy and Programme".

2. Some new terminology has been developed as part of the Strategy and the following definitions are used in this Summary:

- *Construction & Demolition (C&D) Material* arises from site clearance, excavation, construction, refurbishment, renovation, demolition, and roadworks. Based on 1997 statistical data, C&D Material comprises around 20% C&D Waste and 80% Public Fill by weight.
- *Public Fill* is inert and does not decompose or cause any bad smells. It comprises rock and concrete, debris from demolitions, and excavated soil. Public Fill is suitable for immediate reuse as general fill, or reuse after processing (such as rock breaking).
- *Surplus Public Fill* arises if there is more Public Fill generated than can be dealt with at any given time, i.e., it is surplus to the Public Fill which can currently be reused.
- *C&D Waste* is organic in nature and comprises bamboo, glass, plastics, timber, vegetation and other organic material which will decompose and can cause bad smells.
- *Mixed C&D Material* is a mixture of Public Fill and C&D Waste, and as such it is unsuitable for reuse, prior to sorting.
- A *Public Filling Area* is a designated part of a development project which accepts public fill in lieu of general fill as a filling material.
- A *C&D Material Sorting Facility* is a collection of plant which physically separates Mixed C&D Material into its Public Fill and C&D Waste components.
- A *Public Filling Barging Point* is a strategically located Public Fill reception facility which utilises barge transportation to transfer Public Fill from road vehicles to marine based Public Filling Areas.
- A *Buffer Storage Area* is a stockpiling facility which accepts Surplus Public Fill during periods of low demand. When demand increases Public Fill can then be supplied immediately.
- A *Disposal Site* is needed when there is chronic generation of Surplus Public Fill which cannot, by definition, be reused. In this situation, the Surplus Public Fill will need to be permanently disposed of in a designated area.

History of C&D Material Management

3. In 1992, the Land Development Policy Committee endorsed the Public Filling Strategy which had been developed by the Fill Management Committee. The Strategy had three key components:

- The development of Public Filling Areas at strategic locations to provide sufficient capacity and convenient outlets at all times for the Public Fill generated in different regions of Hong Kong.
- The identification of a suitable Public Filling Area in the Northeast New Territories.
- The establishment of temporary and long term Public Filling Barging Points in areas where there are no close-by Public Filling Areas.

4. The implementation of this Strategy resulted in continued operation of Public Filling Areas in Tuen Mun, Tseung Kwan O and Pak Shek Kok, and of Aldrich Bay Public Filling Barging Point.

Review of the Public Filling Strategy and Programme Mouchel Asia Ltd

Review of the 1992 Public Filling Strategy

5. The continuing successful development of Hong Kong since 1992 has led to an increase in C&D Material - in 1996 over six million cubic metres of this material was generated.

6. Public Fill should be delivered to Public Filling Areas for reuse as reclamation material, and C&D Waste should be delivered to landfill for disposal. However, in the past, large quantities of Public Fill have been disposed of at landfill sites. This is undesirable because the Public Fill occupies valuable and expensive landfill space, and thus significantly reduces the overall lifespan of the landfill which was designed to accept Municipal Solid Waste.

7. With the development of more Public Filling Areas, the quantities of C&D Material disposed of at the strategic landfills has fallen from 77% of the total in 1991 to 25% of the total in 1996. This has contributed to prolonging the lifespan of the strategic landfills for the proper disposal of Municipal Solid Waste. However, by diverting more Public Fill to the Public Filling Areas identified in 1992, the available capacity has been used more quickly than planned.

8. The Civil Engineering Department now anticipate that there will be a shortfall of capacity at the existing Public Filling Areas in early 2001, or even sooner, and so have commissioned this Study to review the 1992 Strategy and to formulate a new long term Public Filling Strategy covering 1997 to 2011. This new Strategy will ensure that all of Hong Kong's forecast C&D Material is managed in a beneficial, efficient and environmentally friendly way.

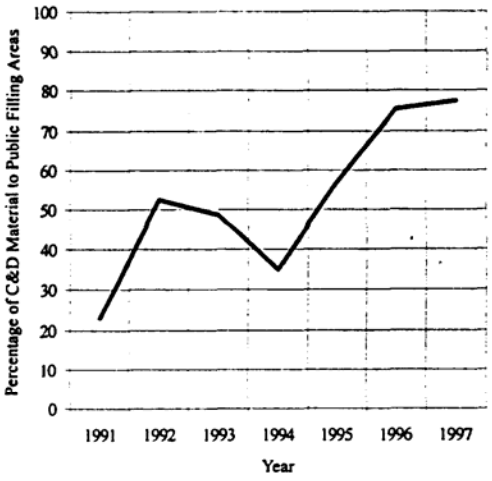


Figure 1 *Percentage by weight of C&D Material disposed of at Public Filling Areas from 1991 to 1997.*

Planning Model

9. In order to determine the likely quantities of C&D Material arising in the future, the Public Fill Planning Model was developed to assist the Civil Engineering Department in planning for the beneficial reuse of Public Fill. The model uses two sub- models which combine to produce an overall forecast.

10. The first sub-model was originally developed by the Hong Kong Polytechnic University and is used to predict C&D Material arisings given the gross floor area of buildings scheduled for construction or demolition. It includes data for building construction and demolition, surpluses from major civil engineering projects, and the contribution from roadworks. However, this sub-model is only accurate for the short term, i.e., in the next 2 to 3 years.

11. A second sub-model was thus developed and uses regression techniques to predict C&D Material arisings from past data compiled by the Civil Engineering Department, the Fill Management Committee and the

Review of the Public Filling Strategy and Programme Mouchel Asia Ltd

Environmental Protection Department. This sub-model is more accurate in the longer term, i.e., in the next 4 to 10 years.

12. The Public Fill Planning Model, which combines the two sub-models, is designed to be continuously updated to improve the accuracy of its forecasts, using data from the Fill Management Committee, the Buildings Department, the Planning Department, the Ratings and Valuation Department, and data from projects administered by the Housing Authority and Housing Society.

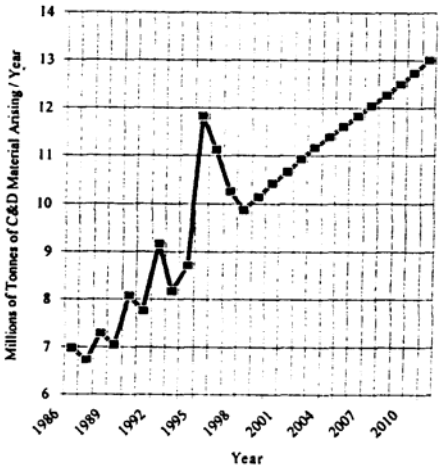


Figure 2 : Actual (1986 to 1996) and Forecast (1997 to 2011) Output from the Public Fill Planning Model

Field Surveys

13. In order to provide additional up-to-date information for the Public Fill Planning Model, and the study in general, field surveys were undertaken at existing Public Filling Barging Points and Public Filling Areas. This helped to determine parameters such as the average turnaround times for vehicles depositing Public Fill, and the composition and geographical location of Public Fill and C&D Material arisings.

Alternative Uses of Public Fill

14. One of the options examined is the use of Public Fill other than as fill material in marine reclamation projects. This option focussed upon the production of recycled aggregates from Public Fill material and their potential use in concrete and roadworks. It was concluded that as long as the use of recycled aggregate was acceptable from an engineering point of view, and it was commercially viable to use, it is likely that introduction of such material would be accepted by both the concrete producing and concrete using industries.

15. It was recommended that further study be undertaken and that "demonstration" projects be set up to introduce the potential of recycled aggregate to the relavent authorities and industry. It was also suggested that unnecessarily stringent specifications for low grade non-structural concrete be relaxed to allow the more widespread use of recycled aggregate.

16. It was noted, however, that in order to produce recycled aggregate from Public Fill, C&D Material Sorting Facilities would be required in order to separate the usable aggregate from components of Public Fill unsuitable for use as aggregate.

17. On land, it is possible to use Public Fill instead of general fill material at construction sites or land raise schemes although there may be engineering difficulties where only a shallow thickness of fill material is required.

18. At marine sites, such as exhausted borrow pits or contaminated mud pits, it is not recommended to use Public Fill as backfilling material as this will occupy the capacity designated for mud disposal. While

Review of the Public Filling Strategy and Programme Mouchel Asia Ltd

it is Government policy to backfill used pits, the preferred fill material is dredged mud which is difficult to dispose elsewhere.

19. One other potential use of Public Fill, especially oversized blocks and boulders, is the creation of artificial reefs at designated marine sites - the Artificial Reef Deployment Study is now being undertaken by the Agriculture and Fisheries Department and will recommend suitable sites.

C&D Material Sorting Facilities

20. As mentioned above, C&D Material Sorting Facilities would be required to produce aggregates from Public Fill if this was required, however, C&D Material Sorting Facilities would also be needed even if recycled aggregate production is not to be promoted.

21. The strategic landfills have strict criteria for the acceptance of waste - only C&D Material containing not more than 20% by volume of inert material (Public Fill) may be disposed of. However, Public Filling Areas have acceptance criteria according to the Conditions of the Dumping Licence and so it is possible that some C&D Material is not acceptable at either facility.

22. It is this mixed C&D Material, comprising both C&D Waste and Public Fill which requires separation at C&D Material Sorting Facilities into its constituent parts.

23. At present, Mixed C&D Material arises because of inadequate separation of inert and non-inert materials at the construction and demolition sites throughout Hong Kong. There are many reasons why this occurs but most are related to the small size of the urban sites which do not allow separate stockpiling of different materials, and to the lack of awareness by both designers and site managers as to the benefits of source separation. Also, the operation of large scale sorting plant on site would not be environmentally or socially acceptable in heavily populated urban areas.

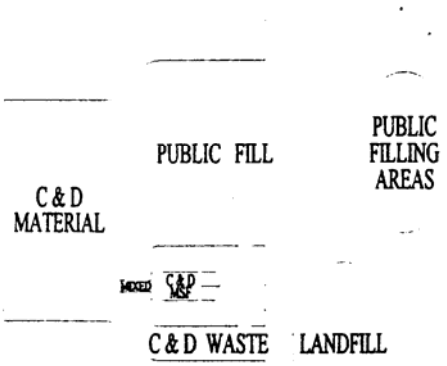


Figure 3 : Flow diagram showing use of a C&D Material Sorting Facility (C&DMSF)

24. At the Southeast New Territories Landfill a Construction Waste Recycling Facility with sorting capability has been operated on a pilot scale for almost three years and has been providing recycled aggregates for use in landfill site operations as well as recycling material from haul roads and temporary drainage works. This releases valuable capacity for Municipal Solid Waste and also reduces the need to quarry virgin materials for use in the landfill.

25. The operation of C&D Material Sorting Facilities was assessed and a new conceptual design produced as part of the overall Public Filling Strategy. The new conceptual design incorporates environmental mitigation measures and methods to improve energy efficiency, while reducing the inherent noise and dust generation.

26. Since the actual quantities of material which requiring sorting are difficult to estimate prior to the introduction of the Landfill Charging Scheme, it seems prudent to consider continuing the operation of the pilot Recycling Facility at the Southeast New Territories Landfill rather than to immediately construct new C&D Material Sorting Facilities for which the throughput is presently unknown.

27. The location of C&D Material Sorting Facilities was a major aspect of this study as Hong Kong has little suitable land for siting C&D Material Sorting Facilities, and even less surviving natural environment to lose to development of Public Fill disposal sites. New sites for Public Filling Areas were not included in this site search since Public Filling Areas are usually part of planned reclamations and are therefore dependent upon associated project schedules.

28. Recommendations were therefore needed for sites which would not only be available during the implementation of the Public Filling strategy, but would also be acceptable on environmental as well as engineering, planning, logistical and social grounds. These sites also needed to be close to the main areas generating C&D Material in order to reduce transport impacts.

29. For the siting of C&D Material Sorting Facilities / Buffer Storage Areas, suitable areas of previously used land were identified - in or near the three strategic landfills in the New Territories, and also at Anderson Road Quarry in Kowloon. Although it is envisaged that there will be contractual difficulties to be overcome should these sites be used, there is likely to be a much greater need for C&D Material Sorting Facilities in the future soon after landfill charging is introduced.

Public Filling Barging Points

30. Another key requirement of the Strategy is to provide a suitable design and to locate acceptable sites for Public Filling Barging Points at strategic locations throughout Hong Kong. This was a contentious issue as many members of the general public have the perception that operations at Public Filling Barging Points are dirty and noisy.

31. A conceptual design was provided for a new generation of Public Filling Barging Points which may incorporate joint site use as well as stringent environmental mitigation measures to control dust, noise and visual impact. For example, flexible plastic sheeting with water sprays surrounding the tipping chute to reduce dust, the provision of baffle walls around the site perimeter to reduce dust and noise, and the provision of a full canopy over the tipping area to reduce dust and visual impact.

32. At Public Filling Barging Points, Public Fill is brought from construction and demolition sites and loaded into large barges which are then transported to marine based Public Filling Areas. At existing Public Filling Barging Points, the incoming material is inspected by supervisory staff prior to being tipped which ensures that only suitable Public Fill is accepted.

33. It was recommended that at least three Public Filling Barging Points should be provided on Hong Kong Island in order to reduce road traffic through the cross harbour tunnels and also because barge transportation is more efficient than road transport for this type of bulky material. Other sites were also recommended in Kowloon, the New Territories and Lantau.

Buffer Storage Areas

34. The quantity of Public Fill used in ongoing and proposed reclamations is only part of the fill requirement and there is considerable scope for increasing the capacity currently allocated to Public Fill in reclamation projects without affecting engineering requirements. The only limiting factor was seen to be the supply of Public Fill to match the required programme.

35. Reclamations generally require large quantities of fill material in a relatively short period of time whereas Public Fill is generated at variable rate. This was one of the most cited reasons for the reluctance to use Public Fill in such projects, ie, that the supply of Public Fill could not be guaranteed.

36. To resolve this problem, Buffer Storage Areas were recommended. By regulating the supply, Public Fill can be delivered on demand for fast-track developments. As a necessary part of the strategy, Buffer Storage Areas can either be temporary, such at those at C&D Material Sorting Facilities, or permanent, such as those at Disposal Sites.

Disposal Sites

37. The recommended strategy requires that a contingency plan be put in place in the event that all the Public Fill generated cannot be accommodated in planned reclamation projects. The contingency plan is to dispose of Surplus Public Fill in an environmentally acceptable manner to form a new and improved landscape, allowing for beneficial afteruse.

38. For the disposal of Surplus Public Fill, a number of land reclamations were identified at some of the smaller Outlying Islands, but with no end use defined, and considering the environmental impact which would be involved, these sites were not recommended unless potential land use issues and development plans could be identified in further studies.

39. As a result, terrestrial sites remain as the only suitable option for consideration. Tan Kwai Tsuen Borrow Area and Tan Kwai Tsuen Quarry, in the Western New Territories, have no current or planned use and were recommended. Adjacent to one of the Country Parks and in greenbelt zoning, it was recommended that one of these sites, after further study, could be used as a Buffer Storage Area and Disposal Site for Surplus Public Fill should this need arise.

40. Once filled to agreed contours, the Disposal Site should be landscaped and revegetated with indigenous species to blend in with the adjacent Country Park.

41. The overall recommendation was that using Surplus Public Fill, the site should be filled, recontoured to blend with surrounding landforms, and then revegetated with indigenous species. The overall aim of this process would be not only to provide disposal space for Surplus Public Fill, but also to enhance the natural environment in an area of degraded landscape.

42. All suggested sites were assessed using preliminary environmental, road traffic and marine traffic impact assessments where appropriate. Detailed assessments would be undertaken in accordance with statutory procedures and requirements for those recommended sites which are selected for further study.

Review of the Public Filling Strategy and Programme Mouchel Asia Ltd

The New Strategy and Programme

43. The avoid, minimise, reuse / recycle, treat, and dispose waste management hierarchy has already been recommended for Municipal Solid Waste in the Draft Waste Reduction Plan published by the Environmental Protection Department in May 1997.

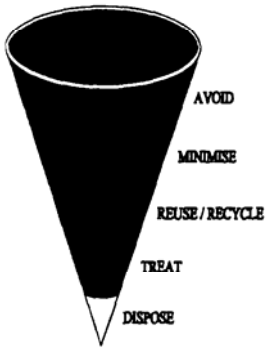


Figure 4 : The Waste Management Hierarchy

44. It has been recommended in this Study that Hong Kong also adopts this waste management hierarchy for C&D Material but tailor it to Hong Kong needs; "Avoidance" and "Recycling" would have limited overall effect on reducing quantities of C&D Material, although should be examined further; "Minimisation" is already being addressed by Government in the Draft Waste Reduction Plan; and it is not necessary to "Treat" Public Fill prior to "Disposal" since the material is inert and will not decompose significantly. Thus, "Reuse" provides the greatest potential to efficiently manage the Public Fill generated in Hong Kong.

45. Public education and Government demonstration projects, backed up by policy decisions, are necessary to reduce C&D Material at source. This would also help promote the reuse of materials on site. The production of recycled aggregates and artificial reefs would only constitute a small percentage of the total predicted arisings of C&D Material and so other recommendations were needed.

46. Althought the Strategy will effectively manage forecast arisings, any slippage of the major reclamation projects could result in a shortage of capacity as predicted by Civil Engineering Department. For this reason a contingency option - the "dispose" level in the hierarchy - was also recommended. This option appears practicable but, of course, would only be implemented after detailed environmental and traffic impact assessments have been completed.

47. The Public Filling Strategy includes the following key elements :

- The use of the Public Fill Planning Model by the Civil Engineering Department to plan for the effective management of C&D Material arising within Hong Kong.
- Increasing the capacity of Public Filling Areas within existing and planned reclamations.
- The use of a strategic network of Public Filling Barging Points to transport Public Fill from areas of generation to areas of reuse in an efficient and environmentally acceptable manner.
- The provision of C&D Material Sorting Facilities to provide an outlet for Mixed C&D Material, and thus enable the Strategic Landfills and the Public Filling Areas to strictly enforce their own acceptance criteria.
- The provision of Buffer Storage Areas to stockpile Public Fill when necessary and so enable it to be supplied on demand to developments which require large volumes of fill material immediately.
- The preparation and implementation, if necessary, of a Contingency Plan in case of a chronic surplus of Public Fill.

Summary of Main Recommendations

48. The main recommendations are as follows:

- The Public Fill Planning Model should be regularly updated to improve the accuracy of its forecasts of C&D Material arisings.
- The options for increasing the capacity of Public Filling Areas within existing and planned reclamations needs to be examined in greater detail on a project by project basis.
- Further Study is needed into the design and construction of C&D Material Sorting Facilities to enable mixed C&D Material to be separated as efficiently as possible.
- Further study into recycling and aggregate production, should be undertaken since there is likely to be a positive response from related private sector industries.
- Recommended locations for the siting of one or more C&D Material Sorting Facilities in or close to Anderson Road Quarry in Kowloon, and in or close to the three Strategic Landfills. Further study including detailed environmental and traffic impact assessments is necessary.
- Tan Kwai Tsuen Borrow Area and Quarry are recommended for the disposal of Surplus Public Fill, and for the siting of a permanent Buffer Storage Area. Further study including detailed environmental and traffic impact assessments is necessary.
- Strategic Public Filling Barging Points are needed throughout Hong Kong, but especially on Hong Kong Island where Chai Wan, Sai Ying Pun and Ap Lei Chau are recommended as long term facilities.
- New Public Filling Barging Points should be based on the conceptual designs given in the Study. This will reduce pollution levels to a minimum, encourage joint use of the waterfront sites and ensure the Public Filling Barging Points blend in with surrounding developments.
- The Waste Management Hierarchy should be adopted with particular emphasis on the minimise and reuse/recycle aspects since it is considered that it is in these areas where there is the greatest scope for further action.
- Further study is highly recommended into the development of a Code of Practice aimed at office-based design and site-based management to avoid and minimise C&D material generation. Similarly, Technical Circulars to specify on-site sorting, segregation and the regulation of disposal of C&D Material should be further developed by the Government.

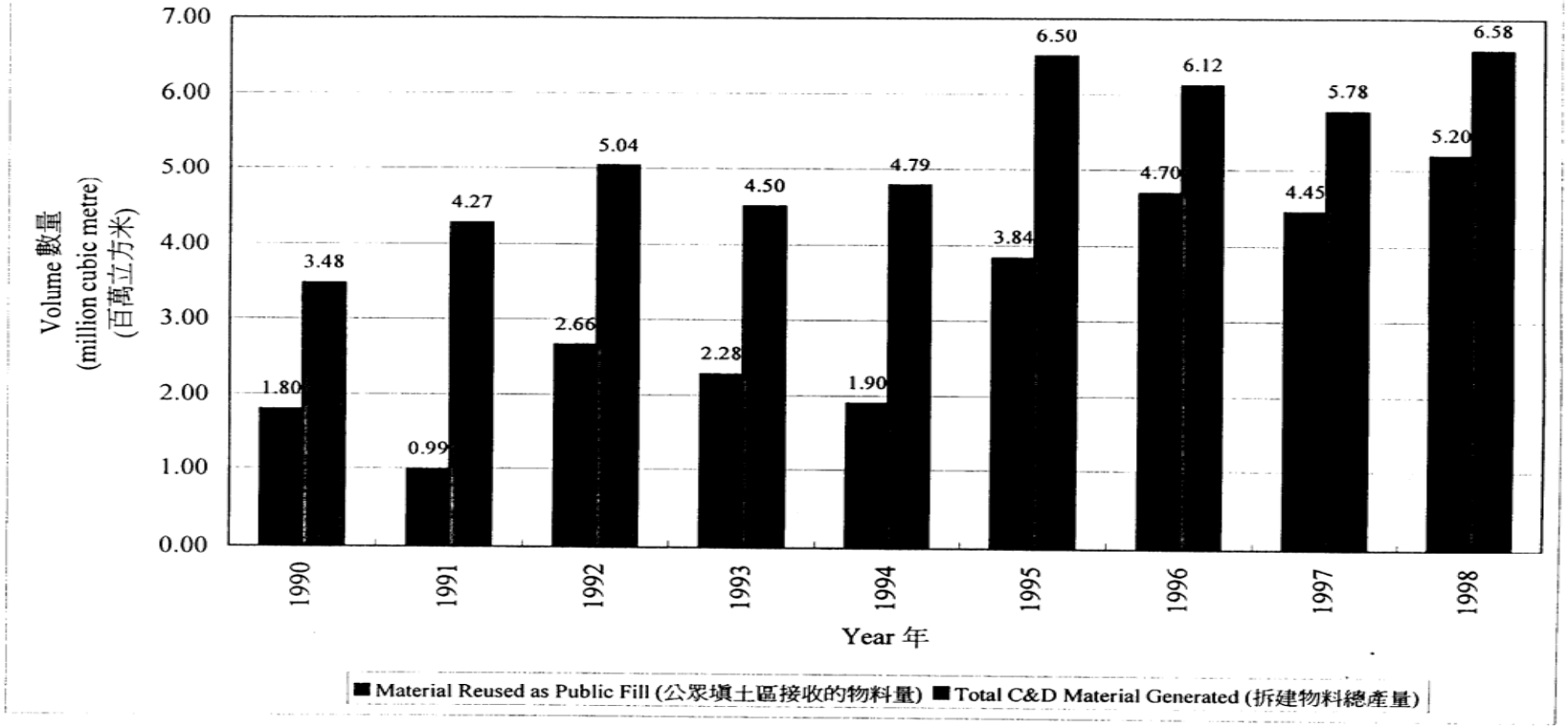
Conclusions

49. The Study concluded that present and planned marine reclamation projects should be able to accommodate the forecast amounts of Public Fill. However, this is dependent upon all projects progressing according to schedule. It is likely that delays in the implementation of these projects will occur in which case there may well be a surplus of Public Fill.

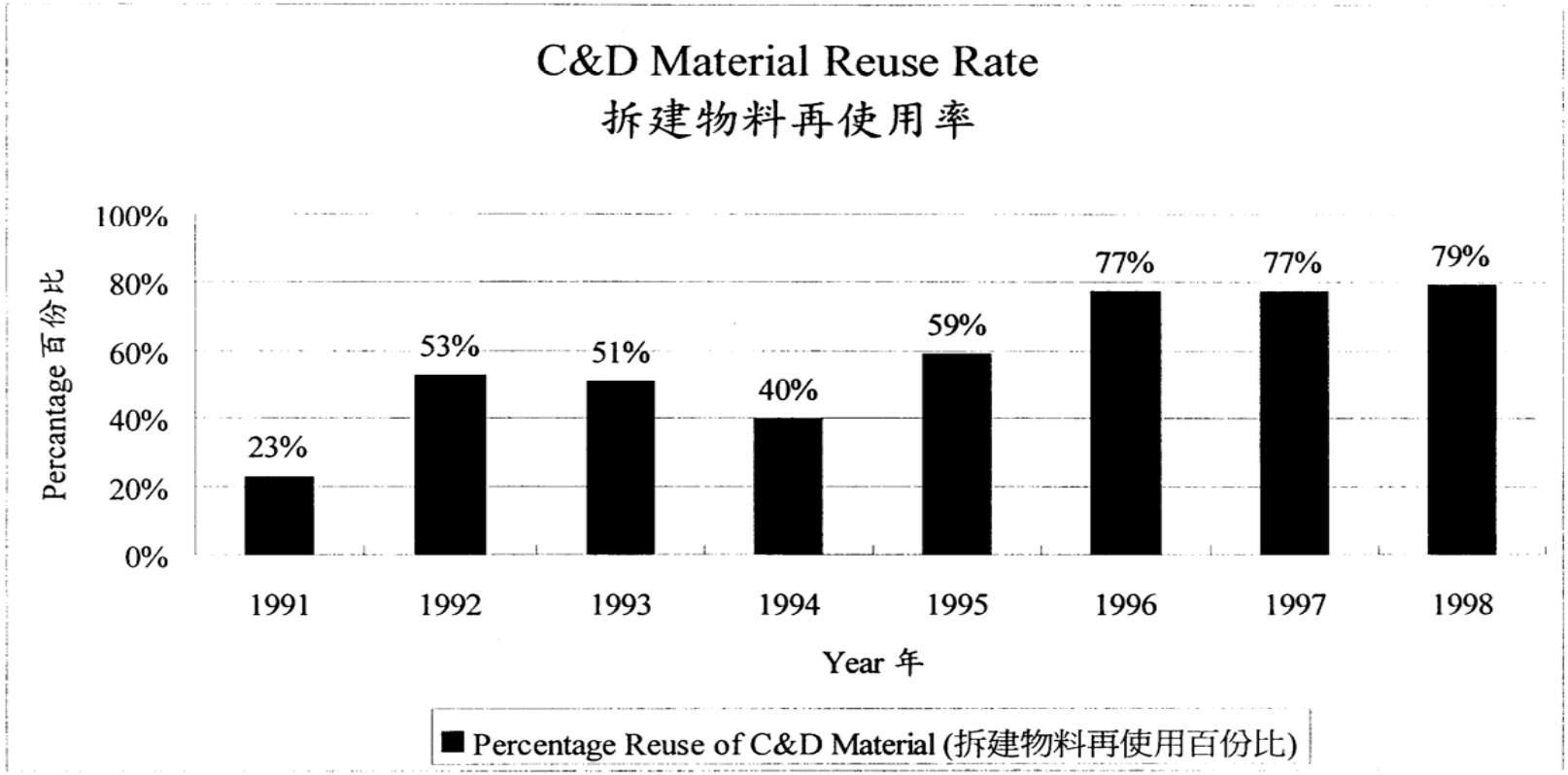
50. To avoid this scenario becoming reality, a greater allocation of void space needs to be given to Public Fill within the existing and planned reclamations. In order for this to be acceptable to project managers, the supply of Public Fill must be reliable. To achieve this, Buffer Storage Areas will be required.

51. In conclusion, if the recommended Strategy and Programme is implemented, it will be possible to deal with current and forecast arisings of C&D Material within Hong Kong. This can be undertaken in an environmentally acceptable way which will not only provide fill material for new land formation but will also save valuable capacity in the strategic landfills and thus extend their lifespan.

Construction and Demolition Material Generation and Reuse
(1990 - 1998)
1990 - 1998 拆建物料產量及再使用量



Annex B
附件 B


C&D Material Reuse Rate
拆建物料再使用率
Percantage 百份比
100%
80%
60%
40%
20%
0%
23%
53%
51%
40%
59%
77%
77%
79%
1991
1992
1993
1994
1995
1996
1997
1998
Year 年
Percentage Reuse of C&D Material (拆建物料再使用百份比)

Annex C
附件 C

Annex D
附件 D

Approved Reclamation Projects and their Public Filling Capacity
已核准填海工程及其公眾填土容量

公眾填土工程項目 Public Filling Programme Items	1999年1月1日預計公眾填土容量（立方米） Estimated Available Public Filling Capacity1 as at [1] January 1999 (cubic metre)		1999年6月1日剩餘容量百份比 Percentage of Remaining Available[2] Capacity as at 1 June 1999	預計停止接收公眾填土日期 Expected Closure Date[3]	預計接收公眾填土日期 Expected Period for Accepting Public Fill[4]
	填海容量 Reclamation Volume	預載容量 Surcharging Volume			
白石角填海工程二期第一階段 Pak Shek Kok Reclamation Stage II Phase I	64 萬 0.64M	30 萬 0.30M	5%	1999 年 9 月 September 1999	

[1] Public fill is sometimes stockpiled as surcharging on newly reclaimed land to accelerate the settlement process. After it has achieved the required settlement, the public fill will be removed and deposited in other reclamation. Since the material will eventually be used in future reclamation projects, the capacity was not considered as available capacity but use to smooth out fluctuation in the amount of public fill produced.
有時公眾填料會被貯存在新填海區的土地上作爲預載的用逞，以加速其沉降。一旦達致所需的沉降水平，公眾填料會被運往其它填海區作爲填料。由於用作預載的公眾填料最終仍需卸置在其後的填海工程上，因此其容量不能列爲真正的公眾填料容量，只能用作紓緩因公眾填料供應的波動所引發的需求。

[2] The percentages are based available capacity only, i.e. the reclamation volume.
剩如容量百份比及根據有關工程項目在 1991 年 1 月 1 日的填海容量計算。

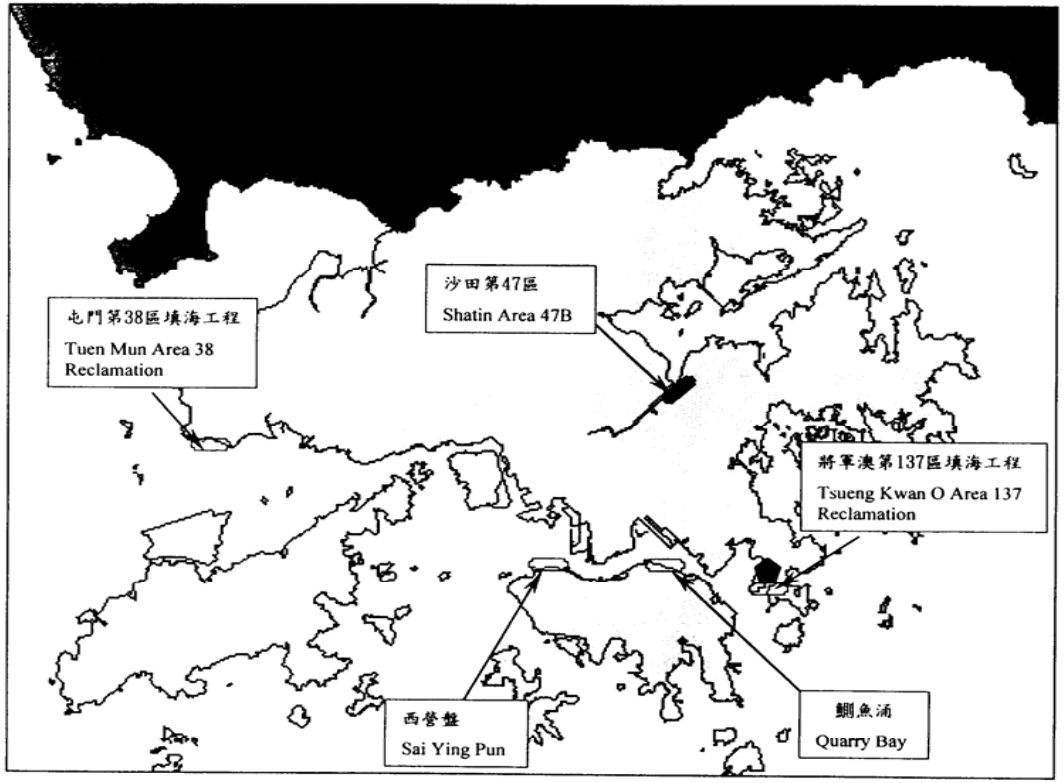
[3] The expected closure date take into consideration the need to stockpile public fill for surcharging
預計停止接收公眾填土日期已包括因接收預載所需的公眾填料。

[4] The expected period of accepting public fill include the time needed to stockpile public fill for surcharging
預計接收公眾填土日期已包括因接收預載所需的時間。

公眾填土工程項目 Public Filling Programme Items	1999 年 1 月 1 日預計公眾填土容量（立方米） Estimated Available Public Filling Capacity as at 1 January 1999 (cubic metre)		1999 年 6 月 1 日剩餘容量百份比 Percentage of Remaining Available Capacity as at 1 June 1999	預計停止接收公眾填土日期 Expected Closure Date	預計接收公眾填土日期 Expected Period for Accepting Public Fill
將軍澳第 137 區填海工程第一期 Tsueng Kwan O Area 137 Reclamation Stage I	241 萬 2.41M	110 萬 1.1M	42%	1999 年 11 月 November 1999	
白石角填海工程第三期 Pak Shek Kok Reclamation Stage III	98 萬 0.98M	--			1999 年 10 月至 2000 年 7 月 October 1999 to July 2000
東涌發展第三期甲填海工程 [5] Tung Chung Development Phase 3A Reclamation	50 萬 0.5M	96 萬 0.96			1999 年 10 月至 2000 年 7 月 October 1999 to July 2000

[5] We are working with the Territory Development Department to increase the volume of public fill used in reclamation from 0.5 million to 2.1 million cubic metre.
我們正與拓展署合作將該項填海工程的公眾填料使用量由五十萬增加至二百一十萬立方米。

臨時躉船轉運站及物料分類設施的位置
Locations of Temporary Barging and Sorting Facilities



說明

Legend:

現有臨時躉船轉運站

Existing temporary barging point

建議臨時躉船轉運站

Proposed temporary barging point

建議臨時物料分類設施

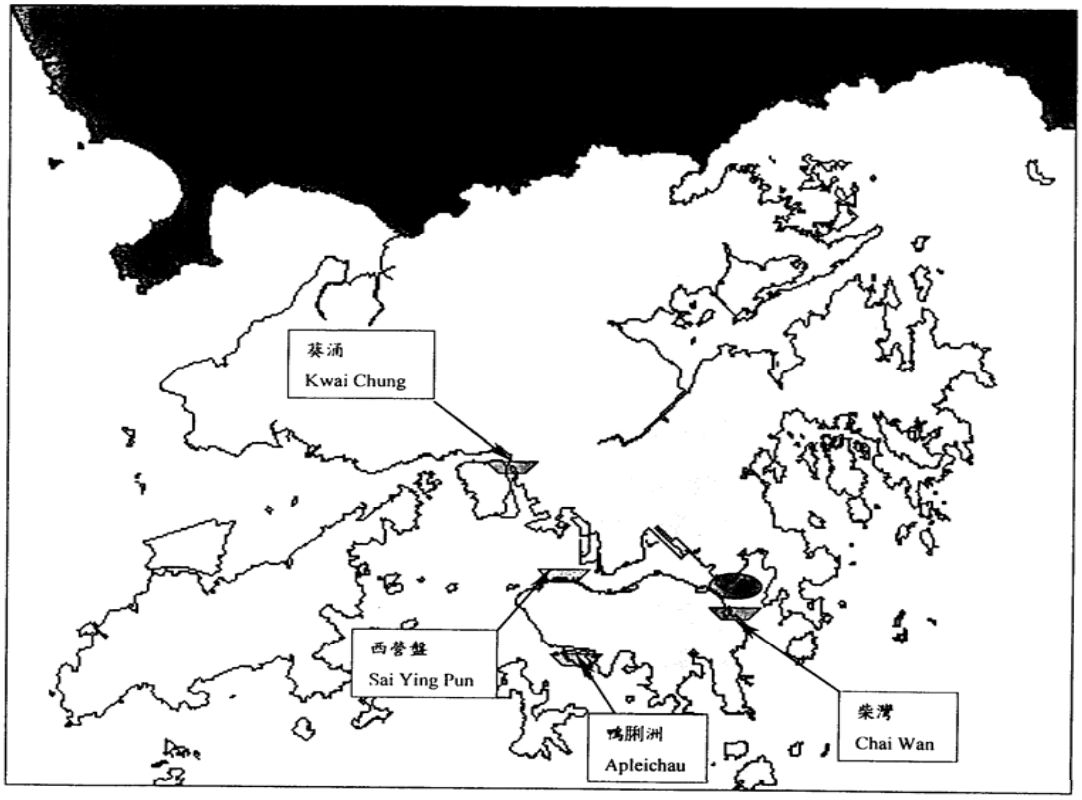
Proposed temporary sorting facility

Annex E
附件 E

公眾填土工程項目 Public Filling Programme Items	1999 年 1 月 1 日預計公眾填土容量（立方米） Estimated Available Public Filling Capacity as at 1 January 1999 (cubic metre)		1999 年 6 月 1 日剩餘容量百份比 Percentage of Remaining Available Capacity as at 1 June 1999	預計停止接收公眾填土日期 Expected Closure Date	預計接收公眾填土日期 Expected Period for Accepting Public Fill
佐敦道填海工程三期 Jordan Road Reclamation Phase III	35 萬 0.35M	--			2000 年 5 月至 2001 年 8 月 May 2000 to August 2001
白石角填海工程二期餘下工程 Pak Shek Kok Reclamation Stage II Remaining Works	195 萬 1.95M	--			2001 年 1 月至 2003 年 3 月 January 2001 to March 2003
將軍澳第 137 區填海工程第二期 [6] Tseung Kwan O Area 137 Reclamation Stage II	300 萬 3.0M	--			1999 年 12 月至 2000 年 10 月 December 1999 to October 2000

[6] The Public Works Sub-Committee has endorsed the proposed reclamation project on 26 May 1999 and the Finance Committee will discuss the funding application on 11 June 1999.
工務小組委員會於 1999 年 6 月 25 日的會議上已通過建議批准該項填海計劃，而財務委員會將於 1999 年 6 月 11 日的會議上討論有關的撥款申請。

建議永久躉船轉運站及物料分類設施的位置
Locations of Proposed Long-term Barging and Sorting Facilities



說明

Legend:

仍在審議階段的擬建永久躉船轉運站

Proposed Long-term barging point under consideration

仍在審議階段的擬建永久物料分類設施

Proposed Long-term sorting facility under consideration

Annex F
附件 F

Annex G
附件 G

Planned Reclamation Projects and their Public Filling Capacity
計劃中填海工程及其公眾填土容量

計劃中公眾填土工程項目 Planned Public Filling Programme Items	預計公眾填土容量（立方米） Estimated Available Public Filling Capacity[1] (cubic metre)		預計接收公眾填土日期 Expected Period for Accepting Public[2] Fill
	填海容量 Reclamation Volume	預載容量 Surcharging Volume	
鋼線灣前期工程 Telegraph Bay Advanced Work		22 萬 0.22M	2000 年 1 月至 2000 年 8 月 January 2000 to August 2000
將軍澳市中心填海工程第三期第二階段 Tsueng Kwan O Town Centre Reclamation Phase III Stage II	143 萬 1.43M		2000 年 11 月至 2001 年 9 月 November 2000 to September 2001
北青衣填海工程 North Tsing Yi Reclamation	50 萬 0.5M		2001 年 1 月至 2003 年 6 月 January 2001 to June 2003
竹篙灣填海工程 Penny's Bay Reclamation	890 萬 8.9M		2001 年 1 月至 2005 年 6 月 January 2001 to June 2005
屯門第 38 區填海工程第二期 Tuen Mun Area 38 Reclamation Stage II	260 萬 2.6M		2001 年 7 月至 2005 年 7 月 July 2001 to July 2005

[1] Public fill is sometimes stockpiled as surcharging on newly reclaimed land to accelerate the settlement process. After it has achieved the required settlement, the public fill will be removed and deposited in other reclamation. Since the material will eventually be used in future reclamation projects, the capacity was not considered as available capacity but use to smooth out fluctuation in the amount of public fill produced.
有時公眾填料會被貯存在新填海區的土地上作爲預載的用逞，以加速其沉降。一旦達致所需的沉降水平，公眾填料會被運往其它填海區作爲填料。由於用作預載的公眾填料最終仍需卸置在其後的填海工程上，因此其容量不能列爲真正的公眾填料容量，只能用作紓緩因公眾填料供應的波動所引發的需求。

[2] The expected period of accepting public fill include the time needed to stockpile public fill for surcharging.
預計接收公眾填土日期已包括因接收預載所需的時間。