

**For discussion  
on 24 January 2005**

**LEGISLATIVE COUNCIL  
PANEL ON ENVIRONMENTAL AFFAIRS**

**Progress Report on the Management of  
Construction and Demolition Materials**

**Purpose**

This paper reports on the progress in implementing the measures to tackle the problem of construction and demolition (C&D) materials.

**Background**

2. At the meeting held on 27 October 2003, we briefed Members on the problem of C&D materials and the measures taken to tackle the problem vide Paper CB(1) 351/03-04. In summary, C&D materials are a mixture of inert materials, which are also known as public fill, being waste arising from construction, excavation, renovation, demolition, and roadworks. The composition of C&D materials changes from time to time as it depends highly on the nature and scale of the construction works that generate the materials. In recent years, the composition of C&D materials is as follows-

- (a) *soft inert materials* such as soil, earth and slurry – these materials account for some 70% of all C&D materials, and they can only be reused as fill materials in reclamation and earth filling works;
- (b) *hard inert materials* such as rocks and broken concrete – these account for 12 – 15% of all C&D materials. Some can be reused in reclamation works while others can be recycled as aggregates for concrete production or as granular materials for road sub-base and drainage bedding layers; and

(c) non-inert waste like metals, timber and packaging waste – these account for 15 - 18% of all C&D materials. Some can be recycled if they are not contaminated while the contaminated ones can only be disposed of in landfills.

3. There is an increasing trend in the quantity of C&D materials generated from local construction activities. In 1995, 11.7 million tonnes of C&D materials were produced. By 2000, the amount reached 13.8 million tonnes. In 2002, the amount grew further to 15.8 million tonnes. The total volume generated in 2004 reached a record high of 20.5 million tonnes. This is equivalent to filling up the Happy Valley Racecourse to a height of 27 storeys.

4. In managing this huge volume of C&D materials, our primary objective is to prevent the inert materials from being disposed of in landfills<sup>1</sup>, which are designed for the disposal of municipal solid waste. Prior to 2002, we did not have much difficulty in achieving our objective of diverting inert materials away from landfills because there were sufficient reclamation projects to absorb them as fill materials.

5. Owing to the suspension of almost all reclamation projects, the generation of public fill has far exceeded demand in recent years (see details at Annex A). Since the end of 2002, we have been relying on two temporary fill banks at Tseung Kwan O and Tuen Mun<sup>2</sup> to stockpile the surplus public fill temporarily for later use. At end-2004, we reached a critical situation whereby the remaining capacities of fill banks at Tseung Kwan O and Tuen Mun were only about 4 million tonnes and 1 million tonnes respectively. It is estimated that the capacities of the two fill banks will be exhausted by late 2005. In addition, these fill banks are only temporary facilities and need to be cleared to release the land concerned for subsequent development. If no new outlets can be identified before the temporary fill banks are filled up, all the public fill will need to be disposed

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<sup>1</sup> The three landfills are located at Tseung Kwan O, Nim Wan in Tuen Mun and Ta Kwu Ling in North District. They occupy a total of 270 hectares of land, cost \$6 billion to build and over \$400 million a year to operate. When planned in the 1980s, they were expected to serve our waste disposal need until 2020. However, with the increasing volume of municipal solid waste in recent years, we project that the landfills would be filled up by 2015.

<sup>2</sup> The capacities of the two fill banks at Tseung Kwan O and Tuen Mun are 10.8 million tonnes and 7.5 million tonnes respectively.

of at landfills which will significantly reduce the remaining lifespan of landfills to about 4 to 6 years.

### **Measures Taken To Tackle the Problem**

6. The following paragraphs report on the updated position of measures that we have taken to manage C&D materials-

#### **(a) Minimizing C&D Materials**

7. The Government has been taking the lead in minimizing C&D materials at source. Currently, all contractors of Government works contracts are required to prepare and implement waste management plans in accordance with our specifications. In particular, they need to carry out on-site sorting and implement a trip-ticket system to ensure that different types of C&D materials go to the appropriate reception sites. We have also included environmental performance in the “Pay for Safety and Environment Scheme” so as to provide the contractors with the financial incentive to implement waste management plans and other environmental improvement measures satisfactorily. We have been working closely with the Provisional Construction Industry Coordination Board (PCICB), the Working Group on Construction Waste under PCICB and the industry in encouraging the private sector to do the same.

#### **(b) Reusing Inert C&D Materials in Local Reclamation Projects**

8. We have urged all project proponents to use public fill as far as practicable. Owing to various reasons, most of the planned reclamation projects have been suspended, seriously reducing our capabilities in handling public fill. Penny’s Bay Reclamation Stage 2 is the only major local reclamation project which will reuse public fill in the coming years. It is estimated that the project will absorb 23.4 million tonnes of public fill. The intake of public fill commenced in February 2004 and will last until early 2008.

#### **(c) Reusing Public Fill in Reclamation Projects in the Mainland**

9. In November 2002, we met with the State Oceanic Administration

(SOA) of the Central People's Government to discuss cross-boundary disposal of dredged mud and beneficial reuse of public fill in Mainland reclamation projects. Subsequent meetings were held resulting in the signing of the framework Co-operation Agreement on Cross-boundary Marine Dumping between SOA and ETWB on 31 March 2004.

10. We are now actively discussing the implementation details with the South China Sea Branch (SCSB) of SOA with a view to identifying pilot reclamation projects in the Mainland for reusing public fill generated in Hong Kong. We aim to commence the export of public fill in 2005.

11. Upon implementation of the export scheme, all surplus public fill delivered to the fill banks or barging points will be directly loaded onto barges for delivery by sea to the Mainland reclamation sites. We will also make use of the opportunity to clear the stockpiled materials from the two temporary fill banks.

#### (d) Processing/Recycling Hard Materials

12. So far, about 3.5 million tonnes of high quality hard inert materials have been delivered to the Shek O and Lam Tei Quarries for processing into aggregates for concrete and asphalt production. We envisage that another 4 million tonnes of hard materials will be processed in 2005.

13. Since the commencement of operation in July 2002, the temporary C&D materials recycling facility in Tuen Mun has processed about 1.1 million tonnes of hard inert materials into 0.44 million tonnes of recycled aggregates for use in over 90 government projects. We will continue to promote the use of recycled aggregates in government projects and set an example for the private sector to follow.

#### (e) Reusing Soft Inert Materials in lieu of Dredged Mud in the Capping Layer of the Contaminated Mud Pits in East Sha Chau

14. We have taken the initiative to use soft inert C&D materials to replace dredged mud for capping of contaminated mud pits at East Sha Chau. The capping layer is an essential part of the mud pits as it prevents the contaminated mud in the mud pits from dispersing. In the past, clean

dredged mud from the sea would be used for capping. As the soft inert materials are excavated soil, which have similar properties as dredged mud, we consider that they could be used to replace dredged mud for the capping work. Apart from accommodating 7.2 million tonnes of soft inert materials, this measure will also reduce the need for dredged mud.

15. To ensure that the soft inert materials are clean and that the operation would not lead to other environmental problems, the Civil Engineering and Development Department has been carrying out a number of measures. For instance, stringent inspection is being carried out at the reception facilities and only clean excavated soil is delivered to East Sha Chau. The remaining inert C&D materials is delivered to the fill banks for stockpiling. Floating substances, if any, are collected. The Environmental Protection Department has been closely monitoring the operation under the Dumping at Sea Ordinance. We commenced operation in October 2003 and about 1.8 million tonnes of natural excavated materials have been reused as capping material so far.

#### (f) Introducing Construction Waste Disposal Charging

16. The introduction of construction waste disposal charging will provide an economic incentive for developers and construction contractors to reduce C&D materials. The Waste Disposal (Amendment) (No.2) Bill 2003 which provides the legal framework for the charging scheme was passed by the Legislative Council in July 2004. The subsidiary Regulations setting out details of the charging scheme were passed in early January 2005. We aim to implement the construction waste disposal charging scheme in summer 2005. While this measure may not help alleviate the imminent crisis that we are facing, we believe it would nevertheless help encourage the construction industry to minimize the generation of all types of C&D materials in the long run.

#### (g) Contingency Measure

17. To extend the service lives of existing fill banks, we will increase the height of stockpiling platform and extend the stockpiling area. These additional filling capacity will extend the lifespan of the fill banks to mid-2006 the latest. The fill banks cannot be extended further in the same

manner due to engineering and safety reasons.

#### (h) Other Measures Considered

18. We undertook in Paper CB(1) 351/03-04 to explore the use of public fill for backfilling quarries and marine borrow areas to provide outlets for public fill.

19. Three quarries that still require public fill for rehabilitation are Anderson Road Quarry, Shek O Quarry and Lam Tei Quarry. The total fill requirement is only about 3 million tonnes and about 97% of the fill required will be obtained from the by-products of quarry operation. It is therefore not an effective option to absorb the surplus public fill.

20. The feasibility of using public fill to restore the East Lamma Channel Marine Borrow Area which was previously used for extracting sand fill for Benny's Bay Reclamation Stage 1 has also been considered. Owing to the high percentage of fine content in public fill, compounded with strong tidal currents, great water depths of over 70m and close proximity to fish culture zones, only a small selected portion of the material (3.6 million tonnes as against an annual quantity of about 18 million tonnes) can be used to meet the controlled disposal requirement at a very high estimated project cost of \$1.8 billion. It is therefore unlikely to be a cost-effective option that can immediately address the problem we face.

#### Conclusion

21. Even with all measures throughout the territory in place, the two existing fill banks will be exhausted by mid-2006. We will try to pursue export of public fill for beneficial reuse in Mainland reclamation projects as a major outlet for our surplus public fill.

**Environment, Transport and Works Bureau  
January 2005**

**Generation and Demand of Public Fill from 2002 to 2005**

Generation and demand of public fill from 2002 to 2005 are set out below:-

Year	2002	2003	2004	2005 (projected)
Total Generation of Construction & Demolition Materials, i.e. public fill and waste (million tonnes)	15.8	19.6	20.5	21.8
Total Generation of Public Fill (million tonnes)	12.1	17.2	18.1	19.7
Total Demand of Public Fill (million tonnes)	11.4	9.1	13.6	15.7
Total Surplus of Public Fill (million tonnes)	0.7	8.1	4.5	4.0