

**Working Group Report on Public Fill
Dated 5 July 1999**

A) Construction and Demolition Material - Scale of Problem

- 1) For the past few years, every day there are over 33,000 tonnes of surplus construction and demolition material coming from around 1,000 sites in Hong Kong, this trend is unlikely to change, as a matter of fact, despite the economical downturn, the construction and demolition material seems to be on the rise. The latest figure (May 1999) is over 33,000 tonnes/day.
- 2) Over 80% of this material is inert (namely rock, soil, broken concrete and demolition material that can be utilised in other construction projects), whereas only 20% is biodegradable stuff like timber, bamboo etc.
- 3) The bulk inert material comes mainly from excavation to form road embankments; tunneling; or underground structures and most of the time this is inevitable. There is room to recycle part of the public fill or reduce amount of construction and demolition material. Even if we can reduce those by half (an unlikely huge task), we will only be solving 10% (½ of 20%) of the problem.
- 4) Due to incomplete separation of material at construction and demolition sites, everyday roughly 7,000 tonnes of construction waste were sent to landfill, the remaining 26,000 tonnes go to public filling area. Assuming we can be more effective in the long run to separate mixed construction and demolition material, we may be able to reduce amount sent to landfill, but that will only mean we have to find more public filling area to house those rock and soil.
- 5) No matter which way we look at it, in the medium term (next 5 - 7 years), we need to find a solution to the 9M tonnes (= 5 million m³) a year problem.

B) Why the Urgency

- 1) The available public filling area, even taking into account the Tseung Kwan O Area 137 stage 2 and Pak Shek Kok stage 2 phase 2, can only accommodate 10.55 million m³, just sufficient to receive material up to the end of year 2000.

- 2) If nothing is done right now, in two years' time all these public fills have to go to landfill.
- 3) At present the three landfills are receiving a total of 16,000 tonnes daily, but if all fill material is going there, this will mean an additional 26,000 tonnes per day, and all the landfills will be filled up in less than 5 years! No matter how high a landfill charge we are going to impose, this is not going to solve the problem if there is nowhere else for the material to go.
- 4) Given that it usually takes a few years' lead time for any project from inception to a stage ready to receive fill, the problem is imminent.

C) Cause of the Problem

- 1) In theory, since these inert material can be used in construction projects, and with so many reclamation projects being carried out in recent years, the problem of surplus material should not have arisen.
- 2) However, when designing any reclamation project, most designers were not keen to use public fill material (either due to lack of incentive or more convenience in contract administration), instead, most of the time marine sandfill is the preferred option. It will demand a lot of initiative from Government to have this concept changed.
- 3) The very nature of tight programme of all projects in Hong Kong renders a cut and cover earthwork balance impossible (take an extreme example, the New Airport needed over 100 million m³ of sand fill, if we are to utilise public fill, this will take a minimum of 20 years! Likewise, for Terminal 9, a total of 37 million m³ of fill material is required, which is equivalent to 7½ years of public fill). This is not to say that we cannot improve the situation. Regrettably, the issue of how to dispose the surplus material is never given sufficient attention. Co-ordination between Government, private developers (CT9 etc), KCRC and MTRC on this matter is non-existent.
- 4) Technically one way to ease the mis-match problem is to allocate some buffer material storage area, but finding a suitable site for such purpose and also the viability economically is yet to be reviewed.
- 5) The government policy of not starting any project without land used being identified (hence funding is not allocated) adds to the problem. The obvious example is Penny's Bay reclamation (total fill requirement > 30

million m³). If it is decided that this location is to be the future Disney Land, the developer will surely wish the land be reclaimed soonest, with the benefit of hind sight, we may ask why wasn't the reclamation pushed ahead 5/6 years ago, then we should be able to utilise most public fill material to form the land. However, if we don't do anything now, in another 5 or 6 years' time, we will probably be making the same remark again on another project, probably a housing related one, in anticipation of population increase.

D) Public Filling Area Vs Disposal at Landfill

- 1) For each tonne of public fill dumped in landfill, it costs Hong Kong HK\$200 (including capital cost, operating cost and land cost of landfill) whereas
- 2) Cost of using those material in reclamation is around HK\$60 - 80/tonne. This figure has already included all the capital costs and Government supervision cost.
- 3) In addition, we have not calculated the value of land to the society after completion of reclamation, versus that dumping at landfill sites, once the space is filled up, it is gone forever.
- 4) Therefore it is obvious that we should try our utmost to discourage disposal of fill material at landfill sites and direct all those quantity to public filling areas.

E) Landfill Charging System

- 1) Whatever the level of landfill charge implemented (say HK\$100 / tonne), in the long run this will not generate a lot of revenue for the Government.
- 2) The reason is simple, assuming that Main Contractors (not lorry drivers) have to pay for such charge on a chit system, once the level of landfill charge is known, the contractors will allow for such cost in the tender. As over 70% of projects undertaken in Hong Kong is one way or the other financed by the Government, so the money Government received from the landfill charge will be offset by the higher capital cost of contracts. The only impact will be on private developers, but the impact will be minor. It should be borne in mind that sufficient long lead time (9 - 12 months) to impose landfill charge should be allowed for so that contractors and private sectors can accommodate such change.

- 3) Thus the function of landfill charging system is to deter people from using landfill for material that can be used elsewhere; it will encourage recycling and reduction in production of waste.
- 4) We wish to reiterate that this will only reduce perhaps 3 - 5% of total construction and demolition waste. There is no substitute at this moment for public filling site; in fact, the less we dump to landfill, the more space we need to find for public filling site.

F) Short Term Solution

- 1) There are areas already earmarked for reclamation, but due to various reasons including lengthy process in funding approval as well as public objection, project was not pushed ahead. The areas we are able to identify are:
 - i) Tuen Mun Area 38 stage 2 and
 - ii) Penny's Bay reclamation. These two projects can in theory absorb over 10 million m³ of public fill and give the society a little breathing space to look for a medium to long term solution.
- 2) Review and revise building regulations to help to reduce construction and demolition material.

G) Long Term Solution

- 1) Setting up facilities like buffer storage area to ease mis-match problem
- 2) One proposal is actually to form a man-made island using, contaminated / uncontaminated mud, public fill, construction waste etc, and this area may be an ideal site for future landfill
- 3) Government should start to implement the 'land bank' policy using public fill, as we all now realise, this is cheapest solution overall
- 4) Encourage with incentive on site sorting in public and private projects to reduce material going to landfill
- 5) Better planning in future to optimise cut and fill balance
- 6) Better design to minimise construction and demolition material
- 7) Transporting public fill to nearby Mainland China areas for reclaiming land
- 8) Research and implement new building materials and technology that would reduce construction and demolition material

H) Recommendation

- 1) Move ahead on implementation of project for Tuen Mun Area 38 stage 2 and Penny's Bay reclamation ASAP.
- 2) Look for other possible sites that reclamation is already earmarked but not pushed ahead for other reasons.
- 3) Convince Government departments and consultant engineers to incorporate public fill in their design for reclamation and increase the usage of public fill in reclamation.
- 4) Start a high level discussion with MTRC, KCRC, and other utility companies and private developers.
- 5) Start study on long term solution.

Waste Reduction Committee