

## **CHAPTER 3**

### **Civil Engineering and Development Department**

<p><b>Greening works of the Civil Engineering and Development Department</b></p>
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**Audit Commission  
Hong Kong  
28 March 2007**

*This audit review was carried out under a set of guidelines tabled in the Provisional Legislative Council by the Chairman of the Public Accounts Committee on 11 February 1998. The guidelines were agreed between the Public Accounts Committee and the Director of Audit and accepted by the Government of the Hong Kong Special Administrative Region.*

Report No. 48 of the Director of Audit contains 8 Chapters which are available on our website at <http://www.aud.gov.hk>.

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# GREENING WORKS OF THE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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## **PART 1: INTRODUCTION**

1.1 This PART describes the background to the audit and outlines the audit objectives and scope.

### **Background**

1.2 The Government's objective on implementing greening works is to enhance the quality of the environment through active planting, proper maintenance and preservation of vegetation. Greening works have the following benefits:

- (a) improving the air quality because green plants would:
  - (i) absorb carbon dioxide and release oxygen by photosynthesis; and
  - (ii) absorb gaseous contaminants such as sulphur dioxide;
- (b) lowering the temperature in summer; and
- (c) beautifying the environment and enhancing the quality of life.

1.3 In recent years, the Government has taken measures with a view to bringing:

- (a) improvements in the quality of the areas with existing greening coverage; and
- (b) maximum greening opportunities during planning and development of capital works projects.

1.4 The Works Branch of the Environment, Transport and Works Bureau (ETWB) is responsible for strategic planning and overseeing the implementation of major greening works. The Civil Engineering and Development Department (CEDD — Note 1) is responsible for carrying out the majority of the greening works under capital works projects. During the four years from 2002-03 to 2005-06, the CEDD:

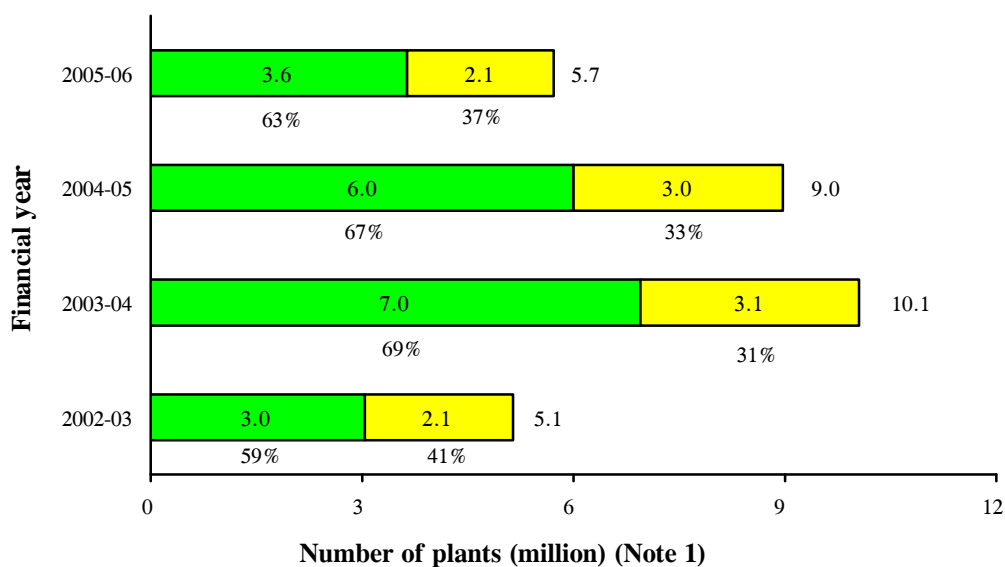
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**Note 1:** *The CEDD was formed in July 2004 by merging the former Civil Engineering Department and the Territory Development Department.*

- (a) provided for about 60% of plants under capital works projects (see Figure 1); and
- (b) spent an average of \$148 million a year on greening works.

**Figure 1**

**Plants provided by the CEDD and other works departments  
(2002-03 to 2005-06)**



Legend: ■ CEDD  
■ Other works departments (Note 2)

Source: ETWB records

Note 1: Types of vegetation planted included trees, shrubs, groundcover plants and annuals (i.e. flowering plants that have a one-year life span).

Note 2: Other works departments included the Architectural Services Department, Highways Department, Drainage Services Department and Water Supplies Department.

### ***Role of the CEDD***

- 1.5 In general, the CEDD carries out:
- (a) greening works during the implementation of infrastructure capital works projects;
  - (b) erosion-control planting works on slope surfaces, including:
    - (i) works on man-made slopes under the Landslip Preventive Measures Programme; and
    - (ii) works on eroded slopes of unleased government land outside country parks; and
  - (c) the development of Greening Master Plans for selected urban districts and implementation of the recommended greening measures contained therein.

1.6 After the completion of greening works, the CEDD hands over the plants and the associated facilities (such as irrigation systems and tree grilles) to the pertinent departments for maintenance (Note 2). According to ETWB Technical Circular (TC) (Works) No. 2/2004 of March 2004 (which is currently in force — Note 3), there are ten government departments responsible for maintaining greening works in different types of areas (see Appendix A).

### **Audit review**

1.7 The Audit Commission (Audit) has recently conducted a review to examine the economy, efficiency and effectiveness of the CEDD's administration of greening works. In the review, Audit has found that there are areas of improvement in administering future projects, based on the experience gained in the following works:

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**Note 2:** *Maintenance tasks include regular inspections, weeding, grass cutting, pruning of dangerous trees, watering, fertilising, replacement planting and tree preservation if necessary.*

**Note 3:** *The specifications of maintenance responsibilities were previously laid down in Works Branch TC No. 18/94 (for the period August 1994 to April 2002) and Works Bureau TC No. 14/2002 (for the period May 2002 to February 2004).*

- (a) greening works under a trunk road project in Ma On Shan (hereinafter referred to as Project A — PART 2);
- (b) greening works under a land development project in Kowloon East (hereinafter referred to as Project B — PART 3);
- (c) erosion-control planting (PART 4); and
- (d) Greening Master Plan projects (PART 5).

Audit has made a number of recommendations to address the issues.

### **General response from the Administration**

1.8 The **Director of Civil Engineering and Development** thanks Audit for reviewing the greening works of the CEDD. He agrees with the audit observations and will take the necessary action to implement the audit recommendations.

### **Acknowledgement**

1.9 Audit would like to acknowledge with gratitude the full cooperation of the staff of the CEDD during the course of the review.



## **PART 2: GREENING WORKS UNDER PROJECT A**

2.1 This PART examines the CEDD's implementation of greening works under Project A.

### **Greening works under Project A**

2.2 Project A involved the construction of a 3.2-kilometre trunk road in Ma On Shan. In March 1997, the CEDD commissioned a consultant (Consultant A) to conduct an Environmental Impact Assessment (EIA) study of the project. In the EIA study report, Consultant A:

- (a) noted that the trunk road would encroach into a woodland area of 5 hectares (ha); and
- (b) recommended that:
  - (i) 6.5 ha of land in the area should be landscaped to compensate for the loss of the woodland area; and
  - (ii) plants selected for landscaping should be similar to those of the nearby woodland.

2.3 In June 2000, the Public Works Subcommittee (PWSC) of the Finance Committee (FC) of the Legislative Council (LegCo) approved the upgrading of Project A to Category A of the Public Works Programme (PWP). The PWSC was informed that the estimated cost of greening works under Project A was \$53 million.

2.4 In December 2000, the CEDD awarded a contract (Contract A) for implementing Project A. The contract sum included \$40 million for greening works. In August 2004, upon the substantial completion of the construction works, the trunk road was open to traffic. In July 2005, the greening works were completed.

## Quantity of plants grown under Contract A

2.5 In the Bills of Quantities (BQs) of Contract A, the CEDD specified the provision of 2,816,100 plants for the project. However, Audit found that the actual number of plants grown under the contract was 869,100, accounting for only 31% of the quantity specified (see Table 1).

**Table 1**  
**Quantity of plants under Contract A**  
**(July 2005)**

Type of plant	Quantity in BQs (a) (Nos.)	Quantity planted (b) (Nos.)	Variance	
			(c) = (b) – (a) (Nos.)	(d) = (c) ÷ (a) × 100% (Percentage)
Groundcover plants	1,816,000	333,500	-1,482,500	-82%
Shrubs	930,400	495,700	-434,700	-47%
Palm trees	45,100	9,100	-36,000	-80%
<b>Sub-total</b>	<b>2,791,500</b>	<b>838,300</b>	<b>-1,953,200</b>	<b>-70%</b>
Other trees	24,600	30,800	+6,200	+25%
<b>Total</b>	<b>2,816,100</b>	<b>869,100</b>	<b>-1,947,000</b>	<b>-69%</b>

Source: CEDD records

Remarks: Photographs 1 and 2 show examples of groundcover plants and shrubs.

**Photograph 1**  
**Groundcover plants**



*Source: ETWB records*

**Photograph 2**  
**Shrubs**



*Source: ETWB records*

2.6 As shown in Table 1, other than an addition of 6,200 trees planted, **there were shortfalls in three other types of plants, totalling 1,953,200** (comprising 1,482,500 groundcover plants, 434,700 shrubs and 36,000 palm trees) grown under Contract A. In December 2006, in response to the audit findings in paragraph 2.5, the CEDD informed Audit of the following:

- (a) ***Overestimation in BQs.*** There was an overestimation of 497,400 plants (**25% of the shortfall of 1,953,200 plants**) in the BQs of Contract A (see paras. 2.7 and 2.8); and
- (b) ***Design changes.*** There were design changes to the greening works after the award of Contract A (see paras. 2.9 to 2.11), resulting in a reduction of 1,455,800 plants (**75% of the shortfall**).

## **Audit observations**

### ***Room for improvement in checking BQs for greening works***

2.7 According to the CEDD's Project Administration Handbook:

- (a) the main functions of BQs are to:
  - (i) allow a comparison of tender prices submitted by tenderers; and
  - (ii) provide a means of valuing the works executed under a contract; and
- (b) **before BQs are issued to tenderers, a bulk checking process should be carried out to ensure the accuracy of the measured quantities and to eliminate any major errors. The check should cover items of large quantities or significant cost.**

2.8 In late 2003, when the planting works were in progress, the CEDD discovered the overestimation of 497,400 plants (see para. 2.6(a) — comprising 455,800 groundcover plants, 39,600 shrubs and 2,000 palm trees) in the BQs of Contract A. In December 2006, in response to Audit enquiry, the CEDD informed Audit that, before the award of Contract A in December 2000, the bulk checking of the BQs had been carried out. However, the CEDD said that it had not carried out sample checking on the bulk checking work. **Audit considers that there is room for improvement in the CEDD's checking of BQs before issuing them to tenderers.**

## Design changes after award of Contract A

2.9 In December 2006, the CEDD informed Audit that the following changes were made after the award of Contract A, resulting in a reduction of 1,455,800 plants (see Table 2).

**Table 2**

### Reduction in number of plants under Contract A

Reason	Number of plants reduced (increased)			
	Groundcover plants (Nos.)	Shrubs (Nos.)	Palm trees (Nos.)	Total (Nos.)
(a) Deletion of site office and storage areas from planting	181,600	13,000	—	194,600
(b) Design change for planting area adjacent to the site office and storage areas	522,600	(23,200)	—	499,400
(c) Design change for planting areas under bridge decks	68,400	219,800	34,000	322,200
(d) Design change due to unexpected high bedrock level	34,500	125,900	—	160,400
(e) Excision of greening works at a portion of the trunk road	20,800	45,300	—	66,100
(f) Reduction of planting area due to additional roadworks	198,800	14,300	—	213,100
<b>Total</b>	<b>1,026,700</b>	<b>395,100</b>	<b>34,000</b>	<b>1,455,800</b>

Source: CEDD records

2.10 According to the CEDD, the details of the changes were as follows:

- (a) ***Deletion of site office and storage areas from planting.*** Some planned planting areas were required by the contractor as works and storage areas for completing the outstanding works during the maintenance period (12 months after the substantial completion of the works). Consultant A also needed a site office for supervising the contractor's works and finalising the contract account. The planned greening works for the site office and storage areas were therefore deleted from Contract A, resulting in a reduction of 181,600 groundcover plants and 13,000 shrubs (see item (a) of Table 2). After the areas had been cleared, the CEDD instructed its landscape term contractor to plant 14,800 groundcover plants, 30,500 shrubs and 1,200 palm trees. The planting works were completed in August 2006 (see Photograph 3);
  
- (b) ***Design change for planting area adjacent to the site office and storage areas.*** The planting design of the area adjacent to the site office and storage areas was revised by replacing 522,600 groundcover plants with 23,200 shrubs (see item (b) of Table 2) to improve the amenity value. For urban-landscape designs, groundcover plants were usually used in the early planting stage to cover the bare soil surface. The amenity value of groundcover plants would diminish when trees and shrubs grew up. Therefore, groundcover plants were normally grown for short term. Trees and shrubs were instead planted where the site conditions permitted;
  
- (c) ***Design change for planting areas under bridge decks.*** Amenity planting was specified for areas under bridge decks in Contract A. The areas were originally heavily grown with plants and not easily accessible for inspections at the design stage. When the original vegetation was removed in the later stage of the civil works, it was found that amenity planting was not suitable having regard to the actual site conditions. The planting arrangement was therefore revised, resulting in a reduction of 68,400 groundcover plants, 219,800 shrubs and 34,000 palm trees (see item (c) of Table 2);
  
- (d) ***Design change due to unexpected high bedrock level.*** Under Contract A, an interchange area was formed by excavation of hills nearby. After the formation of the area, it was found that the actual bedrock level was higher than that envisaged during the design stage. The planting arrangement was therefore revised, resulting in a reduction of 34,500 groundcover plants and 125,900 shrubs (see item (d) of Table 2);

- (e) ***Excision of greening works at a portion of the trunk road.*** An access road would pass through a portion of the trunk road. As the access road construction programme had not been finalised at the pre-tender stage of Contract A, the greening works there were included tentatively in the contract, with a proviso for deletion in future. As the access road construction programme was still not yet finalised during construction, the CEDD did not instruct the contractor to carry out the greening works at this portion, resulting in a reduction of 20,800 groundcover plants and 45,300 shrubs (see item (e) of Table 2); and
- (f) ***Reduction of planting area due to additional roadworks.*** In response to strong public demand after the commencement of the Contract A works, the CEDD revised the project design such that a section of a new access road was constructed in a planned planting area. This led to a reduction of 198,800 groundcover plants and 14,300 shrubs (see item (f) of Table 2).

### Photograph 3

**Vegetation planted by CEDD term contractor  
after vacation of site office of Contract A  
(August 2006)**



Source: CEDD records

## **Audit observations**

### *Room for improvement in planning greening works*

2.11 **Audit considers that there is a need for the CEDD to identify lessons learnt from the reduction of 1,455,800 plants under Contract A, particularly those stated in paragraph 2.10(a) to (c), in planning greening works for future works contracts.**

### *Need for post-implementation review*

2.12 **In view of the significant variance between the greening works in the BQs and those actually carried out, there is a need for the CEDD to carry out a post-implementation review of the greening works under Contract A with a view to identifying areas for improvement.**

## **Use of foreign plants**

2.13 **To tie in with the design concept of a palm garden, the CEDD planned to plant various types of palm trees, including 67 Canary Date Palms (see Photograph 4 for an example), for Project A. From June to October 2004, the contractor planted 52 Canary Date Palms. However, in December 2004, it was found that 41 of these palm trees (79%) were infested by pests.**



**Photograph 4**

**Canary Date Palm**



*Source: CEDD records*

2.14 In December 2004, upon the CEDD's request, the Agriculture, Fisheries and Conservation Department (AFCD) conducted an investigation and found that:

- (a) the Canary Date Palms were infested by a pest (a beetle known as Red Palm Weevil) which could also attack other palm trees; and
- (b) according to the contractor, the Australian Canary Date Palms were supplied by a nursery in Guangdong Province.

2.15 In January 2005, in accordance with the AFCD's advice, the CEDD instructed the contractor to:

- (a) destroy all 41 pest-infested Canary Date Palms;
- (b) stop importing the Canary Date Palms which were susceptible to pest attack; and
- (c) apply pesticides to other palm trees and monitor the situation.

2.16 In March 2005, the CEDD accepted the contractor's proposal to replace the Canary Date Palms by other types of palm trees. Under Contract A, the contractor was responsible for the growth and healthy development of the plants for one year after the planting works (i.e. the establishment period). Therefore, the contractor bore the cost of replacing the infested Canary Date Palms.

### **Audit observations**

#### *Need to improve pest control over imported plants*

2.17 In 2004, some of the imported palm trees planted under Contract A were infested by pest and had to be destroyed (see paras. 2.13 to 2.15). Audit noted that, in January 2005, the AFCD issued guidelines to relevant government departments on the importation of palm trees, advising that the departments concerned should take precautionary measures, particularly if the trees come from places where the Red Palm Weevil infestation was known to have occurred. **There is a need for the CEDD to comply with the AFCD guidelines in future.**

#### *Need for guidelines on use of native plant species*

2.18 One of the recommendations of the EIA study for Project A was that plants selected for landscaping should be similar to those of the nearby woodland (see para. 2.2(b)(ii)). Audit examination revealed that, under Contract A:

- (a) for slope planting, 43% of the plants were native species and the remaining 57% were foreign species; and
- (b) for amenity planting near residential areas, 20% of the plants were native species and the remaining 80% were foreign species.

2.19 In December 2006, in response to Audit enquiry, the CEDD informed Audit that:

- (a) there was no guidance on the ratio of native to foreign plant species for greening works of a capital works project at that time; and
- (b) planting themes were developed for the amenity planting. A mixture of foreign and native plants were selected to match with the themes and increase the amenity value.

2.20 In June 2006, the CEDD issued guidelines on the use of native plant species for erosion-control planting (see para. 4.23). Depending on the specific site conditions, the guidelines stated that the use of native plant species should account for 25% to 50% of the total plant mix. **Audit considers that there is merit for the CEDD to consider issuing similar guidelines on the use of native plant species for greening works under works projects.**

### **Maintenance cost of greening works**

2.21 In accordance with Financial Circular No. 5/86 of April 1986 (Note 4), a project department should:

- (a) estimate the recurrent cost requirement for a capital works project by including cost information obtained from the relevant government departments; and
- (b) provide the PWSC and the Financial Services and the Treasury Bureau (FSTB) with the recurrent cost information in the funding application for the project.

Based on the recurrent cost information, appropriate provisions would be made in the government financial forecasts and plans.

2.22 In the paper of June 2000 for upgrading Project A to Category A of the PWP, the PWSC was informed that the estimated recurrent cost for Project A was \$30.7 million a year. In arriving at this estimate, the CEDD only included the recurrent cost of maintaining the **highway structures** by the Highways Department (HyD), the Drainage Services Department and the Transport Department. **The recurrent costs of maintaining the greening works were not included.**

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**Note 4:** *This circular was replaced by Financial Circular No. 2/2005 of June 2005 (which is currently in force) which includes the provisions stated in paragraph 2.21.*

2.23 In May 2002, the ETWB issued Works Bureau TC No. 14/2002 (Note 5). Under the TC, the HyD was responsible for maintaining the landscaped areas on registered slopes assigned to it, and the Leisure and Cultural Services Department (LCSD) was responsible for maintaining other landscaped areas. The estimated annual recurrent costs of maintaining the greening works of Project A by the HyD and the LCSD were \$0.6 million and \$0.4 million respectively.

2.24 In August 2002, the FSTB laid down a new requirement that project departments should obtain the maintenance departments' consent to absorb the recurrent cost arising from their projects before seeking capital funding for the projects. In 2004, the CEDD incorporated this requirement into its Project Administration Handbook.

2.25 Regarding the maintenance of the Project A greening works on registered slopes, the HyD could absorb the recurrent cost within its provision for highway maintenance. **Regarding the maintenance of the greening works in other landscaped areas, the LCSD initially informed the CEDD that it would have difficulty in maintaining the works without extra financial provision.** After repeated discussions, in June 2006, the LCSD agreed to absorb the maintenance cost. In December 2006, the LCSD took over the maintenance of the greening works, which was originally scheduled for handing over in March 2006.

## **Audit observation**

### *Need to provide full recurrent cost information*

2.26 In the CEDD's estimation of the recurrent cost requirement for Project A in 2000, the CEDD did not include the recurrent cost of maintaining the greening works. **Audit considers that the CEDD should have also included the cost of maintaining greening works in estimating the recurrent cost requirements of Project A. Financial Circular No. 2/2005 has laid down the requirement for providing recurrent cost information (see Note 4 to para. 2.21). The requirement stated in the Project Administration Handbook (see para. 2.24) is also relevant.**

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**Note 5:** *Before May 2002, Works Branch TC No. 18/94 stipulated that the Leisure and Cultural Services Department should be responsible for maintaining vegetation on all landscaped areas and the HyD for maintaining hard landscape features such as tree grilles in such areas.*

## **Audit recommendations**

**2.27 Audit has recommended that the Director of Civil Engineering and Development should:**

- (a) take measures to strengthen the checking of BQs for accuracy, such as those involving greening works, in works contracts (see para. 2.8);**
- (b) give due consideration to the following factors in estimating the quantities of greening works in works contracts:**
  - (i) the availability of site office and storage areas for planting during the contract period (see paras. 2.10(a) and 2.11);**
  - (ii) the need to plant more trees and shrubs instead of groundcover plants in areas under urban-landscape designs (see paras. 2.10(b) and 2.11); and**
  - (iii) the suitability of amenity planting under bridge decks (see paras. 2.10(c) and 2.11);**
- (c) conduct a post-implementation review of the greening works under Contract A (see para. 2.12);**
- (d) comply with the AFCD's guidelines when importing palm trees in future (see para. 2.17);**
- (e) consider, in collaboration with the Secretary for the Environment, Transport and Works, issuing guidelines on the use of native plant species for greening works under works projects (see para. 2.20); and**
- (f) remind CEDD staff to:**
  - (i) provide full recurrent cost information in the funding application for a capital works project in accordance with Financial Circular No. 2/2005 (see para. 2.26); and**
  - (ii) obtain the maintenance departments' consent to absorb the maintenance costs prior to seeking funding for a capital works project, as provided for in the Project Administration Handbook (see para. 2.26).**

## Response from the Administration

2.28 The **Director of Civil Engineering and Development** agrees with the audit recommendations mentioned in paragraph 2.27. He has said that:

- (a) a major objective of the greening works under Project A is to compensate for the loss of 5 ha of woodland area as identified in the EIA study. The CEDD has provided 6.5 ha of landscaped area as recommended in the EIA study;
- (b) the CEDD will take measures to strengthen the checking of the accuracy of BQs, such as those for greening works. Bulk checking of BQs is an established practice among works departments for all contracts. The practice helps avoid significant variance between the estimated and actual cost of a project. For Project A, the estimated greening works cost (i.e. \$40 million — see para. 2.4) accounted for about 3% of the contract sum;
- (c) the CEDD will carry out a post-implementation review of Contract A greening works with a view to identifying areas for improvements, including measures to reduce design changes and ensure greater accuracy in the quantity;
- (d) the choice of plant species depends on whether the main planting objective is for amenity or ecological purpose. The CEDD will work with the ETWB to issue guidelines on the choice of suitable native species for greening works;
- (e) the CEDD will continue to comply with relevant circulars and guidelines issued by bureaux and government departments, including the AFCD's guidelines on importing palm trees issued in January 2005, Financial Circular No. 2/2005 issued in June 2005, and future guidelines on the use of native plant species; and
- (f) the CEDD will remind its staff of the requirement of including recurrent cost information in the funding application and obtaining the maintenance departments' consent to absorb the maintenance cost prior to seeking capital funding for a works project.

2.29 The **Secretary for the Environment, Transport and Works** accepts the recommendation mentioned in paragraph 2.27(e). She has said that:

- (a) the recommendation is in line with the ETWB's greening strategy;

- (b) since September 2006, the ETWB has posted a list of recommended native plant species onto the government intranet for reference by the government departments concerned; and
- (c) the ETWB has informed all approved landscape contractors of the list of recommended native plant species with a view to enhancing the market availability of such species.

2.30 The **Director of Agriculture, Fisheries and Conservation** has said that the AFCD will assist the CEDD and the ETWB in preparing guidelines on the use of native plant species for greening works.

2.31 The **Director of Leisure and Cultural Services** agrees with the audit recommendations mentioned in paragraph 2.27(f). He has said that:

- (a) the LCSD will maintain greening works in areas under its maintenance responsibility if there is recurrent cost provision for them; and
- (b) the recommended measures mentioned in paragraph 2.27(f)(ii) would help establish a proper communication between the project department and the maintenance department.

## **PART 3: GREENING WORKS UNDER PROJECT B**

3.1 This PART examines the CEDD's administration of greening works under Project B.

### **Guidelines on slope greening works**

3.2 In July 1993, in view of public concerns over the adverse visual impact of large cut slopes, the ETWB issued Works Branch TC No. 25/93 (which is currently in force) stipulating that, in designing new slopes, besides stability, due consideration should be given to minimising adverse visual impact. In this regard, the TC outlines the following design principles:

- (a) ***Improving the surface treatment for rock slopes.*** Whenever possible, in designing a rock slope layout, sufficient space at the toe of the proposed slope should always be allowed to provide flexibility in cutting the slope to a flatter gradient. This will also provide space for constructing planting beds or protective tree barriers should a highly fractured rock face be encountered;
- (b) ***Avoiding large slopes.*** Designers of capital works projects should bear in mind that large slopes are expensive to construct and maintain. It is also difficult to construct them satisfactorily to blend with the environment. These slopes may sometimes be avoided or reduced in size by amending the project layout;
- (c) ***Preserving vegetation on slopes.*** One important consideration is to identify and preserve, wherever practical, mature trees on slopes and near their crests and toes. Whenever possible, vegetation should be used as the primary surface protection for all the slopes formed; and
- (d) ***Avoiding the use of chunam or sprayed concrete finishes.*** The use of chunam (Note 6) or sprayed concrete finishes on slopes should only be considered as a last resort, and only after other techniques have been explored and found not practical.

### **Proposed greening works for Project B**

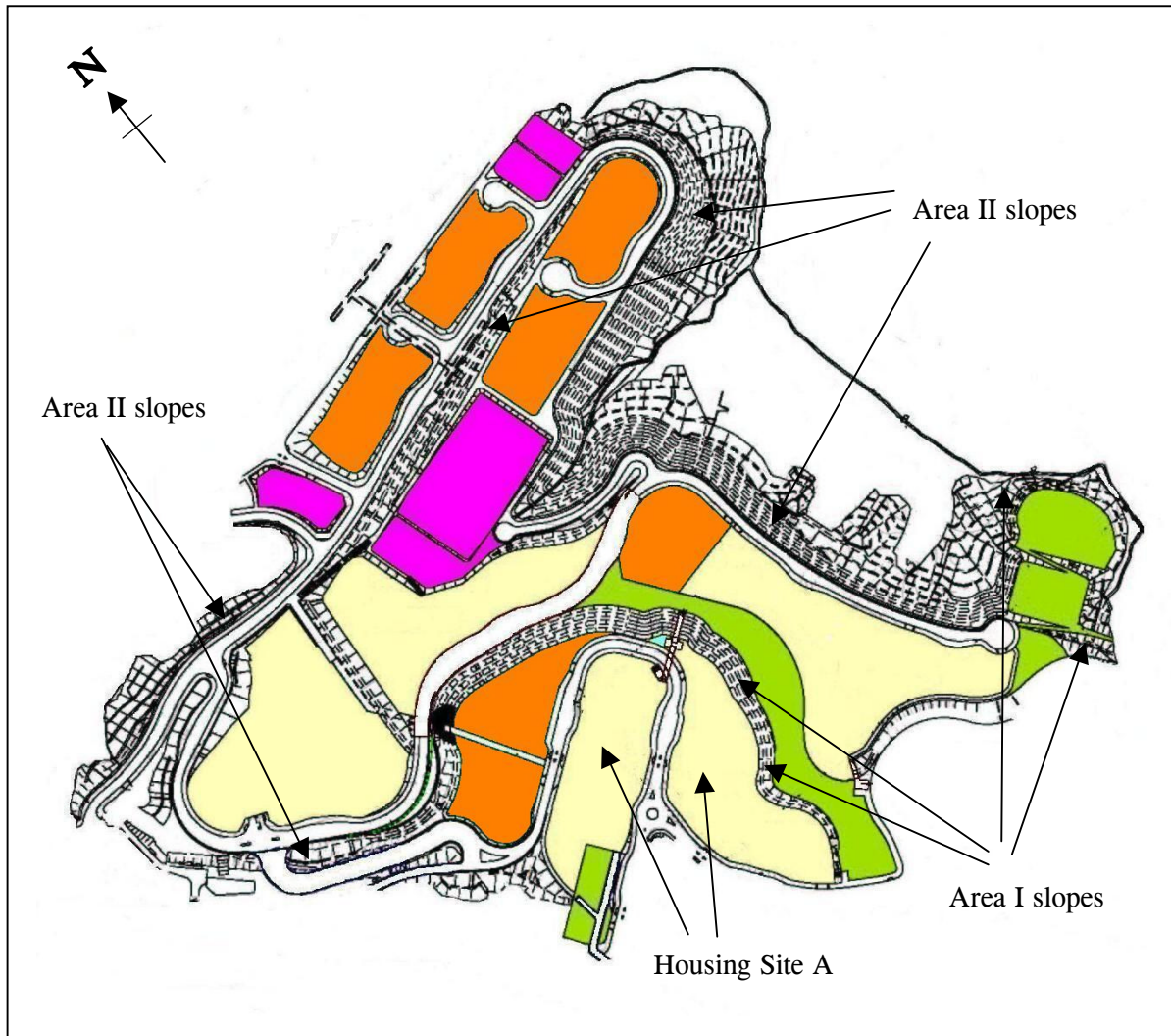
3.3 Project B involved the provision of 20 ha of land and infrastructures for housing, school and recreational developments. The site was located on the hillsides in Kowloon East. The CEDD was responsible for the project. The site formation works would result in the formation of cut slopes. A layout plan of the project is shown in Figure 2.

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**Note 6:** *Chunam is a durable and impermeable material used for covering slope surfaces.*



**Figure 2**  
**Project B layout plan**



- Legend:
- |  |  |
|--|--|
| <span style="display: inline-block; width: 20px; height: 10px; background-color: yellow; border: 1px solid black;"></span> Housing sites | <span style="display: inline-block; width: 20px; height: 10px; background-color: green; border: 1px solid black;"></span> Open space                                 |
| <span style="display: inline-block; width: 20px; height: 10px; background-color: orange; border: 1px solid black;"></span> School sites  | <span style="display: inline-block; width: 20px; height: 10px; background-color: pink; border: 1px solid black;"></span> Government, institution and community sites |

Source: CEDD records

Note: Area I slopes refer to those slopes facing Housing Site A. Other slopes are collectively referred to as Area II slopes.

3.4 In August 1997, the CEDD commissioned a consultant (Consultant B) to carry out an EIA study of Project B. In the EIA study report, Consultant B:

- (a) said that:
  - (i) the site formation works would result in the formation of large cut slopes at the back of the development;
  - (ii) the appearance of the slopes as well as their safety should be considered and an integrated geotechnical and landscape design would be used; and
  - (iii) the inclination of the slopes allowed the formation of level strips of ground (i.e. berms) at 10-metre intervals which could be used for greening works; and
  
- (b) recommended that:
  - (i) every effort should be made to form planters on the berms so that trees, shrubs and trailing plants (Note 7) could be grown, which would minimise the adverse visual impact of the rock slopes; and
  - (ii) the berm planters should be constructed concurrent with the site formation works. This would facilitate the planting works and ensure planting at an early time.

## **Implementation of the greening works**

### *Consultations on greening works*

3.5 In December 1999, the CEDD consulted relevant departments, including the LCSD, the HyD and the Housing Department (HD), on a review report of Project B (including the proposed greening works). In January 2000, the LCSD and the HD gave comments on the proposed greening works. Their comments, together with the CEDD's response, are summarised in Table 3.

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**Note 7:** *Trailing plants are plants which naturally extend and droop over surfaces.*

Table 3

## Comments on proposed greening works

HD/LCSD's comments	CEDD's response
(a) The HD noted that large parts of the project area would have fresh rock. It asked the CEDD the extent to which the vegetation proposed would cover such area.	The CEDD drew the HD's attention to the drawings enclosed in the review report.
(b) <b>The LCSD said that it would not take up the maintenance responsibility of the landscaped area on slopes with a gradient greater than 1 in 5.</b>	The CEDD noted the LCSD's comments.

Source: CEDD records

3.6 In early November 2000, the CEDD consulted the LCSD and the HyD on the greening works design of Project B because the latter two departments would be responsible for maintaining the works in accordance with Works Branch TC No. 18/94 (see Note 5 to para. 2.23).

3.7 In late November 2000, the LCSD informed the CEDD that:

- (a) in accordance with Works Branch TC No. 18/94, the greening works to be handed over to the LCSD for maintenance needed its agreement. It was not the LCSD's practice to maintain greening works for slopes with a gradient steeper than 1 in 5; and
- (b) **the gradients of the slopes with greening works to be handed over to the LCSD (i.e. the Area I and Area II slopes in Figure 2) were steeper than 1 in 5. Hence, these works fell outside the LCSD's horticultural maintenance responsibility.**

Between January 2000 and July 2001, the CEDD and the LCSD discussed the issue further, but could not reach agreement.

*Funding approval for the project*

3.8 In February 2001, the PWSC approved the upgrading of Project B to Category A of the PWP. In seeking the approval, the Administration informed the PWSC that the estimated cost of greening works was \$20.9 million.

*Inter-departmental meeting on maintenance issue*

3.9 In July 2001, the CEDD convened an inter-departmental meeting to discuss the maintenance issue. At the meeting, the LCSD agreed to maintain the greening works on the Area I slopes (which were formed below the platforms to be allocated to the LCSD for district open-space development — see Figure 2). **However, the CEDD and the LCSD could not reach agreement on the maintenance responsibility for the greening works on the Area II slopes.**

3.10 In late July 2001, the CEDD invited tenders for the works under Project B. The CEDD informed the ETWB of the issue of maintenance responsibility for the greening works. In August 2001, the ETWB informed the CEDD that the issue was under active consideration by the relevant bureaux and departments and that a solution would be worked out soon.

*Award of works contract*

3.11 In November 2001, the CEDD awarded a contract (Contract B) for Project B. The contract sum included \$24.6 million for greening works.

*HyD taking over maintenance of greening works on the Area II slopes*

3.12 In May 2002, the ETWB issued Works Bureau TC No. 14/2002 which set out the following guidelines:

- (a) **Maintenance responsibility.** The HyD would maintain greening works on slopes of which the HyD was responsible for maintenance; and
- (b) **Resolution of maintenance issue.** The department responsible for the planning, design and construction of the landscape works should consult the relevant maintenance department concerned on matters relating to future maintenance. In case where there was any difference in opinions among departments, the following arrangements should be adopted:

- (i) any unresolved issue should be promptly brought to the attention of the directorate officers, or if warranted, the Directors of the departments concerned for an early resolution of differences; and
- (ii) if the Directors of the concerned departments still could not reach agreement for a resolution, the unresolved matter should be brought up to the Policy Secretaries, with the supporting documents for a final decision.

These guidelines were later incorporated in ETWB TC (Works) No. 2/2004 which is currently in force. This TC further provides that the project department should obtain the in-principle agreement of the maintenance departments at an early stage to minimise the impact on projects due to changes in maintenance requirements.

3.13 In February 2003, the CEDD discussed with the HyD whether it would agree to maintain the greening works on the Area II slopes in accordance with Works Bureau TC No. 14/2002. In March and May 2003, the HyD informed the CEDD that, due to recurrent budget constraints, if the HyD was to take up the maintenance responsibility, it would require the following design changes:

- (a) using drought tolerant plant species which needed little maintenance; and
- (b) deleting the works for the irrigation system which might not be cost effective.

3.14 In July 2003 and April 2004, after consulting the ETWB and noting that the HyD's proposed changes would have no major contractual implications, the CEDD issued variation orders for the revised greening works. For consistency, the revised works covered both the Area I and Area II slopes. In the event, the revised works resulted in an additional capital cost of \$3.5 million (Note 8). The CEDD estimated that there would be a reduction in the maintenance cost.

#### *HD's views on greening works*

3.15 In March 2004, when the CEDD arranged for the handing over of Housing Site A to the HD, the HD said that the Area I slopes were extensive and would form the backdrop of Housing Site A. In June 2005, the HD expressed the following concerns over the appearance of the slopes to the CEDD:

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**Note 8:** *The additional cost was mainly due to the need to use deeper planters for the drought tolerant plants.*

- (a) the slopes (see Photograph 5) were massive and over 40 metres high. They would be the permanent views of a large number of residents. Aesthetically they were barren and, environmentally, their reflective surface would not be conducive to dissipation of heat. This would adversely affect the microclimate of the site; and
- (b) the planters provided on the slope berms might not be effective for covering the massive slopes.

3.16 The HD suggested that, while it was difficult to plant vegetation on rock slopes, the CEDD should explore ways to enhance the greening provisions on the Area I slopes as greening and environmental improvement were world trends.

**Photograph 5**

**Area I slopes in Project B  
(January 2007)**



Source: CEDD records

3.17 In March 2006, the CEDD, the HD, the LCSD and the Housing, Planning and Lands Bureau (HPLB) agreed that greening-enhancement works should also be applied to other slopes of Project B. They agreed that the works should include:

- (a) addition of water retaining substance to the soil mix;
- (b) provision of water points/irrigation systems; and
- (c) provision of pocket planters (in addition to the berm planters already constructed).

3.18 The CEDD estimated that the additional capital and recurrent costs of the greening-enhancement works would be \$8.5 million and \$0.6 million respectively. In August 2006, the CEDD indicated that there were no funds available for the works. The HPLB proposed the creation of a new PWP item for beautification of the environment of public housing estates in Kowloon East. The works would be funded under this PWP item when created. As at January 2007, the creation of the new PWP item for the greening-enhancement works was in progress. Meanwhile, by late 2006, the Contract B greening works were substantially completed.

### **Audit observations**

#### *Need for early resolution of maintenance responsibility*

3.19 Audit noted that, in November 2001, the CEDD awarded Contract B before resolving the issue of maintenance responsibility for the greening works on the Area II slopes. In December 2006, in response to Audit enquiry, the CEDD informed Audit that:

- (a) Project B formed a site for a major housing project for a population of 35,000. The target dates had to be met;
- (b) any change to the greening works could be accommodated under the terms of the contract. The cost of the greening works concerned (with maintenance responsibility not resolved in 2001) accounted for about 1% of the total contract cost; and
- (c) it was not uncommon for an issue of this nature and scale to be resolved during construction.

3.20 In Audit's view, the CEDD should have taken more effective action to resolve the issue of maintenance responsibility for the greening works before the award of Contract B in November 2001 (see paras. 3.5 to 3.10).

3.21 Audit noted that the ETWB issued new guidelines (ETWB TC (Works) No. 2/2004) on early resolution of maintenance responsibility issue, which would help improve the situation in future (see para. 3.12).

*Need for improving the appearance of slopes in greening works*

3.22 Audit noted that greening-enhancement works were needed for the slopes recently formed under Project B (see paras. 3.15 to 3.18). In February 2007, in response to Audit enquiry, the CEDD informed Audit that:

- (a) the greening works under Contract B met the maintenance requirements of the LCSD and the HyD; and
- (b) the greening-enhancement works were to meet growing public aspirations for a better living environment.

**Audit considers that the CEDD and the HD should make concerted efforts to maximise greening opportunities in future slope formation works near public housing sites, taking into account public aspirations and the latest landscape technology.**

**Audit recommendations**

3.23 Audit has *recommended* that the Director of Civil Engineering and Development should:

- (a) on the maintenance requirements of a project involving greening works, remind CEDD staff to comply with ETWB TC (Works) No. 2/2004 on the need to:
  - (i) obtain in-principle agreement from the relevant maintenance departments at an early stage; and
  - (ii) bring up the issue to the pertinent Policy Secretaries at an early stage if the issue of maintenance responsibility cannot be resolved (see paras. 3.20 and 3.21); and



- (b) **take measures, in collaboration with the Director of Housing, to maximise greening opportunities for slope formation works near public housing sites to improve slope appearance (see para. 3.22).**

### **Response from the Administration**

3.24 The **Director of Civil Engineering and Development** agrees with the audit recommendations mentioned in paragraph 3.23.

3.25 The **Director of Leisure and Cultural Services** has said that the recommended measures mentioned in paragraph 3.23(a) would facilitate early discussions among the government departments concerned on the design and maintenance of greening works.

3.26 The **Secretary for Housing, Planning and Lands** and the **Director of Housing** have said that:

- (a) the proposed greening-enhancement works are to meet the growing public aspirations for a better and greener living environment; and
- (b) the proposed inclusion of the works under a new PWP item mentioned in paragraph 3.18 is one of the options considered and the proposal is under discussion with the relevant government departments.

## **PART 4: EROSION-CONTROL PLANTING**

4.1 This PART examines the CEDD's administration of erosion-control planting.

### **Administrative arrangements for erosion-control planting**

4.2 Erosion-control planting is part of the CEDD's on-going slope afforestation programme to re-establish vegetation over bare and badly eroded slopes after hill fires or tropical storms. On average, the CEDD plants about one million seedlings for erosion control every year.

4.3 The erosion-control planting works are funded under a Capital Works Reserve Fund block vote (Note 9). The CEDD carries out the planting works through a two-year landscape term contract. In 2005-06, the expenditure on the erosion-control planting works was about \$13 million.

4.4 On average, the CEDD issues about 20 works orders under the landscape term contract for erosion-control planting every year. Each works order usually covers a planting area of 100,000 to 200,000 square metres. The CEDD field staff are responsible for carrying out on-site measurement (mainly counting) of the seedlings planted and checking the associated works. Based on the measurement results, the CEDD landscape architects assess the value of the works for making payments to the contractor.

### ***1997 and 1998 CEDD technical checks***

4.5 In April 1997 and August 1998, the CEDD technical audit team (Note 10) carried out two technical checks on the monitoring of erosion-control planting works. The findings are summarised as follows:

- (a) both technical checks found that:

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**Note 9:** *Works departments may carry out minor works projects as Category D items under this vote. The Director of Civil Engineering and Development has the delegated authority to approve funding for Category D projects of not more than \$10 million each.*

**Note 10:** *The CEDD technical audit team was headed by a Senior Engineer, with one Engineer and one inspectorate/technical officer as team members.*

- (i) the quantities of seedlings entered into the site measurement book were always identical to the quantities stated in the contractor's invoices or in the provisional BQs of the works orders; and
  - (ii) there were no records showing that field staff had carried out independent on-site measurement; and
- (b) the 1998 technical check also found that there was no random check of hidden works (i.e. works which could not be verified after completion, such as the application of fertilisers) to ensure that the works had been properly carried out.

4.6 In November 1998, the Kowloon Development Office of the CEDD (then responsible for administering the landscape term contract) informed the technical audit team that Field Officers:

- (a) had been reminded of the need to carry out adequate site measurement to verify the quantities of works done; and
- (b) would carry out spot checks to verify hidden works and materials supplied by the contractor.

4.7 Up to December 2006, the CEDD technical audit team had not carried out further technical checks on the monitoring of erosion-control planting works. In December 2006, in response to Audit enquiry, the CEDD informed Audit that:

- (a) in planning technical checks, the CEDD technical audit team prepared an annual programme based on factors such as contract complexity, works progress, and compliance by the supervising staff as observed in the previous technical checks. Given these requirements and the limited resources, the technical audit team would usually choose to check capital works projects which were of larger value, technically more complicated and contractually problem-prone; and
- (b) as the Kowloon Development Office had addressed the issue of site supervision of erosion-control planting works (see para. 4.6), the technical audit team did not carry out another check on this area due to the limited resources.

#### ***2004 CEDD review***

4.8 In December 2004, the CEDD senior management directed a review of the site supervision procedures of erosion-control planting. The review:

- (a) found that:
  - (i) the technical audit team's findings in 1997 and 1998 (see para. 4.5) were still valid;
  - (ii) as there were only two Field Officers responsible for on-site measurement and checking of erosion-control planting, they had not carried out surveys to ascertain the extent of the planting works; and
  - (iii) there were no documented procedures on how the spot checks of the contractor's works should be carried out; and
- (b) recommended the establishment of a documented spot-checking system for both the seedling planting and the associated hidden works.

4.9 Since November 2006, after two trials in 2005 and 2006, the CEDD had implemented the following new site supervision procedures:

- (a) a Works Supervisor/Field Officer would be responsible for checking and witnessing the delivery of seedlings and other materials for hidden works to the planting area. The responsible officer should submit his measurement and checking records to the relevant landscape architect. During the contractor's planting of seedlings and carrying out of the hidden works, the Works Supervisor would carry out random checks;
- (b) upon completion of the planting works, the CEDD Survey Division would estimate the number of seedlings planted and advise the landscape architect of the results; and
- (c) the Field Officers would continue to be responsible for the field supervision of the technical aspects of the works.

### **Audit observation**

#### ***Need to take prompt action for improvement measures***

4.10 In view of the CEDD technical audit team's findings in 1997 and 1998, in November 1998, the CEDD reminded its staff of the need to carry out adequate site measurement and checking of erosion-control planting works. In the 2004 review, the CEDD found that the technical audit team's findings in 1997 and 1998 were still valid (see paras. 4.5 to 4.8). In 2006, the CEDD implemented new site supervision procedures in this

regard. **Audit considers that earlier action could have been taken to make improvements in the light of the CEDD technical audit team's findings in 1997 and 1998.**

### **Contract-price fluctuation adjustment**

4.11 According to the Project Administration Handbook, a term contract with a contract period of more than 21 months should adopt a contract-price fluctuation adjustment system. Under this system, the final payment to the contractor shall be adjusted by changes in the labour and material costs as reflected by the relevant indices compiled by the Census and Statistics Department (C&SD). The salient points of this system include:

- (a) before inviting tenders, the CEDD selects from the C&SD's labour and material cost indices those relevant cost elements for preparing a Schedule of Proportion;
- (b) in submitting their tenders, tenderers need to assign a weighting percentage to each cost element in the Schedule of Proportion; and
- (c) the final payment to a contractor will be adjusted based on the weighting percentages stated in the Schedule of Proportion and changes in the corresponding cost indices.

4.12 In September 2003, the ETWB issued ETWB TC (Works) No. 21/2003. The TC advised works departments that:

- (a) contracts with tender invitations issued after October 2003 should use a new series of labour and material cost indices (the 2003-based indices) compiled by the C&SD; and
- (b) the old cost indices (the 1995-based indices) would be phased out in due course.

4.13 In August 2004, the CEDD invited tenders for a new two-year term contract to provide landscape service from October 2004 to October 2006. The CEDD specified in the contract that the 2003-based indices should be used for contract-price fluctuation adjustments. **However, the CEDD provided the tenderers with a Schedule of Proportion adapted from the previous term contract. This Schedule of Proportion contained two cost elements which had been included in the 1995-based indices, but were not included in the 2003-based indices.** In October 2004, the CEDD awarded the new term contract.

4.14 In late 2005, the CEDD discovered the inconsistency mentioned in paragraph 4.13. After consulting the Legal Advisory Division of the ETWB, the CEDD entered into a supplementary agreement with the contractor and a new Schedule of Proportion would be used for contract-price adjustment purposes.

## **Audit observations**

### *Need to comply with technical circular requirements*

4.15 In December 2006, in response to Audit findings in paragraphs 4.13 and 4.14, the CEDD informed Audit that:

- (a) ETWB TC (Works) No. 21/2003 (which set out the requirement to use the 2003-based indices) was promulgated after the CEDD had commenced to prepare the landscape term-contract tender documents;
- (b) the Schedule of Proportion in the tender documents should have been amended to incorporate the new requirement; and
- (c) since 2006, the CEDD had strengthened the vetting of tender documents, as follows:
  - (i) the preparation of draft tender documents would be based on sample documents of the relevant type of contract. The Project Engineer would highlight amendments to the sample documents and prepare a summary of the amendments with justifications;
  - (ii) tender documents should be checked against the approved draft ones before issue to tenderers; and
  - (iii) the carrying out of the above-mentioned procedures by the officers concerned would be properly documented.

4.16 **Audit considers that the CEDD should closely monitor the implementation of the 2006 vetting procedures to minimise inconsistency in contract documents.**

## **Erosion-control planting on hillsides of Lantau**

4.17 In November 2004, a large hill fire destroyed a shrubland and parts of a forest on Lantau. In December 2004, the CEDD found that the affected areas (hereinafter referred to as the Lantau site) of 175 ha were susceptible to soil erosion and were visually intrusive.

4.18 In January 2005, the CEDD created a minor works item under Category D of the PWP (under delegated authority — see Note 9 to para. 4.3) for erosion-control planting at the Lantau site at a cost of \$7 million. The CEDD assessed that any delay in completing the planting works would increase the risk of erosion during the rainy season. The planting works, commencing in February 2005, were completed in September 2005.

### ***Public consultations on greening works***

4.19 According to ETWB TC (Works) No. 34/2003 of December 2003 (which is currently in force) on community involvement in greening works of capital works projects, works departments should:

- (a) consult District Councils on the preliminary designs of greening works of capital works projects prior to tender invitation;
- (b) invite the community to participate in planting works near or after the completion of the capital works projects; and
- (c) comply with the above-mentioned requirements for implementing capital works projects in the PWP (including Category D projects) irrespective of the mode of delivery (excluding planting on man-made slopes under the Landslip Preventive Measures Programme).

4.20 Regarding the creation of PWP Category D works items, Financial Circular No. 8/2001 of August 2001 (which is currently in force) stipulates that:

- (a) Controlling Officers should exercise their delegated authority in a transparent and accountable manner;
- (b) Controlling Officers should not approve expenditure proposals until they are satisfied that all the preparatory administrative and legal procedures have been completed. Similar rules apply in respect of public consultation with District Councils; and

- (c) in preparing a paper seeking funds for a Category D works item costing \$5 million or more, officers concerned should adopt the format of a PWSC paper with a public consultation paragraph.

4.21 In the paper for creating a Category D works item for the erosion-control planting works at the Lantau site, the CEDD said that it had not carried out any public consultations as it did not envisage that there would be public objection to the works done in the public interest.

4.22 In February 2005, a LegCo Member expressed the following concerns over the planting works at the Lantau site:

- (a) there was no prior consultation on the planting works; and
- (b) there was a risk in planting a large number of foreign seedlings without a detailed study of their impact on the ecosystem.

4.23 To address the concerns over plant species for erosion-control planting works, the CEDD consulted the AFCD and academic experts. In March 2005, the CEDD reviewed the planting proposal for the Lantau site and included about 240,000 native plants in the plant mix. In June 2006, the CEDD issued guidelines on the use of native plant species for erosion-control planting. Depending on the specific site conditions, the guidelines stated that native plant species should account for 25% to 50% of the total plant mix.

## **Audit observations**

### ***Room for improvement in conducting public consultations***

4.24 As mentioned in paragraph 4.21, the CEDD had not carried out public consultations on the erosion-control planting works at the Lantau site. Audit noted that, in November 2005, the CEDD consulted the Islands District Council on another erosion-control planting works on Lantau, and received strong support. **In view of the requirements laid down in ETWB TC (Works) No. 34/2003 (see para. 4.19) and Financial Circular No. 8/2001 (see para. 4.20), there is merit for the CEDD to conduct public consultations on major erosion-control planting works in future.**



***Need to strengthen monitoring of erosion-control planting works***

4.25 In February 2005, the CEDD issued a works order under the landscape term contract for the planting of some 540,000 seedlings for the first phase of planting works at the Lantau site (see para. 4.18). In April 2005, the works were completed at a cost of \$2.3 million.

4.26 In mid-April 2005, there were media reports that many seedlings at the Lantau site began to wither shortly after planting. In late April 2005, the CEDD carried out a site inspection and found that about 30% of the seedlings were in poor condition and had to be further observed. Nevertheless, in early May 2005, the CEDD issued a certificate of completion for the planting works.

4.27 In mid-May 2005, the CEDD received an enquiry about the planting practice at the Lantau site. During a subsequent site inspection, the CEDD found that the contractor's workers had disposed of the plastic wrappings for the seedlings in the soil. In June 2005, the CEDD:

- (a) issued a letter requiring the contractor to properly dispose of surplus materials and rubbish in accordance with the contract provisions;
- (b) agreed with the contractor that some 55,000 seedlings (about 10% of the 540,000 seedlings planted — see para. 4.25) had to be replanted at the contractor's cost;
- (c) instructed the contractor to keep records of all waste relating to seedling planting (including the plastic wrappings) for the CEDD's checking; and
- (d) arranged the CEDD field staff to conduct random checks to ensure that no plastic wrappings were improperly left on the site.

4.28 **Audit considers that there is room for improvement in the CEDD's monitoring of the term contractor's works. The 2006 site supervision procedures mentioned in paragraph 4.9 would help improve control over contractors' works.**

**Audit recommendations**

4.29 **Audit has recommended that the Director of Civil Engineering and Development should:**

- (a) promptly implement improvement measures to address the CEDD technical audit team's findings in future (see para. 4.10);
- (b) remind CEDD staff to comply with new requirements laid down in technical circulars (see paras. 4.13 and 4.15);
- (c) closely monitor the implementation of the 2006 procedures for vetting tender documents to ensure compliance by CEDD staff (see para. 4.16);
- (d) consider issuing guidelines for conducting public consultations on major erosion-control planting works (see para. 4.24); and
- (e) closely monitor the implementation of the 2006 site supervision procedures for erosion-control planting to ensure compliance by CEDD staff (see paras. 4.9 and 4.28).

### **Response from the Administration**

4.30 The **Director of Civil Engineering and Development** agrees with the audit recommendations in paragraph 4.29. He has said that:

- (a) continuous improvement of site supervision of erosion-control planting works has been the CEDD's standing commitment. In 1997-98, the then Territory Development Department instructed Field Officers to carry out adequate checks on site to verify the works, although it did not have Works Supervisors and survey teams on its establishment. Since 2004, with the merging of the Territory Development Department with the Civil Engineering Department to form the CEDD, the CEDD has decided to involve its Works Supervisors and survey teams in supervising erosion-control planting works. The CEDD has put in place clear supervision procedures; and
- (b) the CEDD will conduct public consultation for erosion-control planting works of more than \$3 million.

## **PART 5: GREENING MASTER PLANS**

5.1 This PART examines the CEDD's development and implementation of Greening Master Plans (GMPs) for urban districts.

### **Developing and implementing GMPs**

5.2 In August 2004, the Government set up a GMP Committee to coordinate the preparation and implementation of GMPs for selected urban districts. The GMP Committee is chaired by the Director of Civil Engineering and Development. Its members include representatives of 16 bureaux/departments and advisors from professional bodies and academia.

5.3 For a selected urban district, a GMP defines the overall greening framework by identifying suitable locations, desirable themes and species for planting. A GMP includes recommendations on greening measures in a district and serves as a guide to all parties involved. There are three levels of measures, namely:

- (a) ***Short-term measures.*** Short-term measures include greening opportunities consistent with the district layout and posing no conflict with the existing land use and/or traffic arrangements. They can be implemented within one to two years;
- (b) ***Medium-term measures.*** Medium-term measures include greening opportunities associated with the renewal and redevelopment of a district; and
- (c) ***Long-term measures.*** Long-term measures depict the greening vision setting aside constraints such as land availability, congested underground installations and overhanging signboards. Realisation of this vision will have implications on planning and land administration policies and may involve innovative methods and techniques.

*GMPs for Tsim Sha Tsui and Central*

- 5.4 In August 2004, the GMP Committee decided to:
- (a) develop GMPs for eight selected urban districts (Note 11) by phases; and
  - (b) give priority to developing GMPs for Tsim Sha Tsui and Central for the following reasons:
    - (i) both districts had a relatively low greening coverage;
    - (ii) Central was a core business centre and Tsim Sha Tsui was a tourist district; and
    - (iii) a GMP study for Tsim Sha Tsui would tie in with an area-improvement study being conducted by the Planning Department at that time.

5.5 In September and December 2004, the CEDD commissioned two consultancy studies for developing GMPs, one for Tsim Sha Tsui and one for Central. When developing the Tsim Sha Tsui and Central GMPs, the CEDD conducted consultations with the parties concerned, such as the relevant District Councils, the Town Planning Board and the Harbourfront Enhancement Committee, and obtained their general support. The CEDD finalised the GMPs taking into account the suggestions received. In September 2005, the GMP Committee approved the two GMPs.

5.6 The CEDD selected six pilot greening schemes recommended in the Tsim Sha Tsui GMP for implementation. In November 2005, the CEDD completed these schemes (see Photograph 6 for one of the schemes).

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**Note 11:** *The eight districts were Tsim Sha Tsui, Central, Mong Kok, Hung Hom, Kwun Tong, Causeway Bay, Wan Chai and Sheung Wan.*

**Photograph 6****Pilot greening scheme implemented at Kowloon Park Drive**

*Source: CEDD records*

5.7 In April 2006, the FC approved \$38.4 million for implementing the greening works under the Tsim Sha Tsui and Central GMPs. In May 2006, the CEDD awarded a contract in the sum of \$18.6 million for carrying out the greening works for the two districts (Note 12). According to the GMPs, upon the completion of the contract works in 2007, the districts would have the following:

- (a) for Tsim Sha Tsui, 600 trees and 160,000 shrubs of selected species planted to reflect its overall theme and characteristics as a popular shopping and tourist district; and

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**Note 12:** *The contract sum does not cover the cost of supportive works (such as utilities diversion) which are to be carried out by other works agents.*

- (b) for Central, 300 trees and 50,000 shrubs of selected species planted to reflect its role as the financial centre of Hong Kong.

5.8 To enlist the private sector's support for the Government's greening initiatives, the CEDD liaised with private developers to implement greening and/or street-landscape works. Two developers responded positively and undertook to provide resources to implement two street-landscape improvement projects, one on Hollywood Road and another one on Chater Road/Queen's Road Central. The two projects were scheduled for completion in 2007.

#### *GMPs for other urban districts*

5.9 At a GMP Committee meeting in March 2005, the Committee noted that the following major factors should be considered when selecting a district for developing a GMP:

- (a) ***Existing level of greening.*** The level of greening varied widely among different districts, i.e. less satisfactory in some old districts such as Kowloon City, Yau Ma Tei, Tsim Sha Tsui and Mong Kok, but generally acceptable for New Towns like Tai Po and Tseung Kwan O. In order to raise the overall level of greening, priority for GMP development should be given to districts with lower level of greening coverage;
- (b) ***Potential for greening enhancement.*** To produce noticeable results, resources should be concentrated in districts where more public spaces were available, thereby offering higher potential for carrying out greening enhancement works in the short term and medium term;
- (c) ***Public demand for greening.*** Priority should be given to districts where there was high public demand for greening;
- (d) ***Urban redevelopment projects.*** The GMP development programme should match with the major urban redevelopment projects which could provide valuable opportunities for raising the level of greening in the districts concerned; and
- (e) ***Planning studies.*** The GMP development work would be more effective if it was carried out in collaboration with other planning studies. This would avoid duplication of efforts on common tasks, such as collection of background information.

5.10 Based on the factors as mentioned in paragraph 5.9, the GMP Committee considered that:

- (a) resources for developing GMPs should be concentrated in the Metroplan areas covering Kowloon Peninsula and Hong Kong Island; and
- (b) given the changing environment, the priority proposed above should be subject to regular reviews.

5.11 In October 2006, in a paper submitted to the PWSC, the Administration:

- (a) sought funding of \$18.1 million for the CEDD to carry out two consultancy studies (Study A and Study B) for developing GMPs for the following five selected urban districts:
  - (i) Study A — for Mong Kok and Yau Ma Tei; and
  - (ii) Study B — for Sheung Wan, Wan Chai and Causeway Bay; and
- (b) informed the PWSC that the CEDD would complete GMP developments for other selected urban districts (Note 13) in about four years, i.e. by late 2010.

In December 2006, the FC approved the funding. In January 2007, the CEDD commenced the studies which were targeted for completion in December 2007.

## **Audit observations**

### *Need to monitor progress of developing GMPs*

5.12 During 2005 and 2006, the CEDD briefed the LegCo Panel on Planning, Lands and Works on the progress of GMP development. While the Panel Members in general welcomed the GMP initiatives, they requested the Administration to:

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**Note 13:** *According to a progress report of the GMP Committee of October 2006, twenty districts were initially selected, including Aberdeen, Chai Wan, Kennedy Town, North Point, Quarry Bay, Sai Ying Pun and Shau Kei Wan on Hong Kong Island, and Cheung Sha Wan, Diamond Hill, Ho Man Tin, Hung Hom, Kowloon Bay, Kowloon City, Kowloon Tong, Kwun Tong, Lam Tin, Ngau Tau Kok, San Po Kong, Sham Shui Po and Wong Tai Sin in Kowloon.*

- (a) expedite the progress of implementation;
- (b) accord priority to districts with low greening coverage; and
- (c) consider implementing the greening measures in partnership with other organisations.

5.13 In developing the Tsim Sha Tsui and Central GMPs, the CEDD encountered the following challenges:

- (a) there were community expectations that the Government should implement high quality and sustainable greening works; and
- (b) some proposed greening works were impeded by site constraints, such as underground utilities and traffic signs.

5.14 With the FC's funding approval in December 2006, the CEDD aimed to complete the GMP consultancy studies for the five selected districts by December 2007. The CEDD also undertook to complete GMP development for 20 other selected districts by 2010 (see para. 5.11(b)). **In view of the LegCo Members' request (see para. 5.12(a)), the CEDD needs to closely monitor the development and implementation of the GMPs.**

#### *Room for improvement in GMP consultancy study arrangements*

5.15 At a PWSC meeting in October 2006, a LegCo Member considered that the four-year period required for developing GMPs (for 25 selected districts) was too long, and suggested that the planning of greening works for different districts could be undertaken concurrently. The two consultancy studies (Study A and Study B — see para. 5.11(a)), which commenced in January 2007, each covered more than one district. **Audit considers that there is merit for the CEDD to develop GMPs concurrently by covering more than one district in each GMP consultancy study, because this may help save cost in common tasks (such as tendering and contract administration).**

#### *Need for partnership with private sector*

5.16 As shown in the two street-landscape improvement projects in Central (see para. 5.8), there are benefits for the CEDD to seek opportunities for partnership with the private sector in implementing greening works, as follows:



- (a) the private sector's participation can help speed up the implementation of greening measures; and
- (b) the private sector sometimes provides financial resources for some works. This would augment the Government's limited resources.

**The CEDD should continue to look for opportunities for partnership with the private sector in GMP implementation in future.**

### **Audit recommendations**

**5.17 Audit has recommended that the Director of Civil Engineering and Development should:**

- (a) **closely monitor the development and implementation of the GMPs for the 25 selected districts (see para. 5.14);**
- (b) **try to cover more than one district in each GMP study to achieve economy of scale (see para. 5.15); and**
- (c) **continue to seek opportunities for partnership with the private sector in GMP implementation (see para. 5.16).**

### **Response from the Administration**

**5.18 The Director of Civil Engineering and Development agrees with the audit recommendations mentioned in paragraph 5.17. He has said that:**

- (a) it is necessary to closely monitor the programme and progress of GMP development. The CEDD has been doing so through its project monitoring mechanism and regular reporting of progress to high-level committees, including the Steering Committee on Greening; and
- (b) there is merit in developing GMPs concurrently by covering more districts in a GMP study. The feasibility of this approach depends on whether adequate landscape expertise is available in the market, whether the resulting programme can meet public demand, and the availability of adequate in-house staff resources to manage such studies. After a recent review, the CEDD is actively considering developing GMPs for more districts concurrently so as to complete

them in less than the four years committed. The CEDD will closely monitor the formulation of GMPs to ensure that they are completed in good time.

5.19 The **Secretary for the Environment, Transport and Works** has said that:

- (a) to meet public aspirations for early development and implementation of GMPs in urban districts, the ETWB will accelerate the programme as far as practicable; and
- (b) the ETWB will optimise the packaging of the GMP consultancy studies to achieve the best possible economy of scale.

**Appendix A**  
(para. 1.6 refers)

**Maintenance responsibilities for greening works**

<b>Maintenance departments</b>	<b>Types of areas responsible</b>
Highways Department	<ul style="list-style-type: none"> <li>(a) Within the boundary of expressways</li> <li>(b) Landscaped deck/noise enclosure of public roads without pedestrian or vehicular access</li> <li>(c) Registered slopes (Note) on unallocated government land maintained by the department</li> </ul>
Leisure and Cultural Services Department	<ul style="list-style-type: none"> <li>(a) Along non-expressway public roads outside country parks, including planting on roadside planters at the bottom of registered slopes and unregistered man-made slopes</li> <li>(b) Public road structures with pedestrian or vehicular access (e.g. planting on the roof or inside of footbridges, covered walkways, landscaped decks or noise enclosure cum open space)</li> </ul>
Housing Department	<ul style="list-style-type: none"> <li>(a) Public Housing</li> <li>(b) Registered slopes on unallocated government land maintained by the department</li> </ul>
Agriculture, Fisheries and Conservation Department	Along non-expressway public roads within country parks
Architectural Services Department	Registered slopes on unallocated government land maintained by the department
Drainage Services Department	<ul style="list-style-type: none"> <li>(a) The department's stormwater drainage systems and facilities</li> <li>(b) Drainage reserve on unallocated government land</li> </ul>
Government Property Agency	Government buildings managed by the Agency
Home Affairs Department	Along footpaths within village environs and access roads maintained by the department

**Appendix A**  
(Cont'd)  
(para. 1.6 refers)

<b>Maintenance departments</b>	<b>Types of areas responsible</b>
Lands Department	(a) Registered slopes on unallocated government land maintained by the department  (b) All other unleased and unallocated government land not maintained by other government departments
Water Supplies Department	Waterworks reserve on unallocated government land

*Source: ETWB TC (Works) No. 2/2004*

*Note: Registered slopes refer to man-made slopes registered with the Lands Department.*

**Acronyms and abbreviations**

AFCD	Agriculture, Fisheries and Conservation Department
Audit	Audit Commission
BQs	Bills of Quantities
C&SD	Census and Statistics Department
CEDD	Civil Engineering and Development Department
EIA	Environmental Impact Assessment
ETWB	Environment, Transport and Works Bureau
FC	Finance Committee
FSTB	Financial Services and the Treasury Bureau
GMP	Greening Master Plan
ha	hectares
HD	Housing Department
HPLB	Housing, Planning and Lands Bureau
HyD	Highways Department
LegCo	Legislative Council
LCSD	Leisure and Cultural Services Department
PWP	Public Works Programme
PWSC	Public Works Subcommittee
TC	Technical Circular