

## **CHAPTER 3**

### **Architectural Services Department**

<p><b>Maintenance and refurbishment of government buildings and facilities</b></p>
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**Audit Commission  
Hong Kong  
22 March 2005**

*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. 44 of the Director of Audit contains 8 Chapters which are available on our website at <http://www.aud.gov.hk/>

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# MAINTENANCE AND REFURBISHMENT OF GOVERNMENT BUILDINGS AND FACILITIES

## Contents

	<b>Paragraph</b>
<b>PART 1: INTRODUCTION</b>	1.1
Maintenance and refurbishment of government buildings and facilities	1.2
Term contracts	1.3
Audit review	1.4 – 1.5
Acknowledgement	1.6
<b>PART 2: REFURBISHMENT AND MINOR BUILDING WORKS</b>	2.1
Refurbishment and planned maintenance	2.2 – 2.6
Implementation of new refurbishment works	2.7 – 2.8
<i><b>Audit observations</b></i>	2.9 – 2.11
<i><b>Audit recommendations</b></i>	2.12
Response from the Administration	2.13
Minor building works	2.14 – 2.18
Implementation of new minor building works	2.19 – 2.21
<i><b>Audit observations</b></i>	2.22 – 2.25
<i><b>Audit recommendations</b></i>	2.26
Response from the Administration	2.27 – 2.28
<b>PART 3: MANAGEMENT OF WORKS ORDERS</b>	3.1
Maintenance term contracts and design-and-construct term contracts	3.2 – 3.7
Project administration procedures	3.8 – 3.12
Audit examination of works orders	3.13 – 3.20

	<b>Paragraph</b>
<i><b>Audit observations</b></i>	3.21 – 3.33
<i><b>Audit recommendations</b></i>	3.34
Response from the Administration	3.35
Assurance on quality of maintenance works	3.36
Audit examination of reports on checks of works quality	3.37 – 3.38
<i><b>Audit observations</b></i>	3.39
<i><b>Audit recommendations</b></i>	3.40
Response from the Administration	3.41
<b>PART 4: MEASUREMENT AND PAYMENT FOR WORKS ORDERS</b>	4.1
Measurement and payment procedures	4.2 – 4.6
Preparing and revising cost estimates of works orders	4.7 – 4.13
<i><b>Audit observations</b></i>	4.14 – 4.15
<i><b>Audit recommendations</b></i>	4.16
Response from the Administration	4.17
Submission of dimension books by contractors	4.18 – 4.19
<i><b>Audit observations</b></i>	4.20 – 4.25
<i><b>Audit recommendations</b></i>	4.26
Response from the Administration	4.27
Checking and adjustment of contractors' claimed values	4.28 – 4.32
<i><b>Audit observations</b></i>	4.33 – 4.36
<i><b>Audit recommendations</b></i>	4.37
Response from the Administration	4.38

	<b>Paragraph</b>
<b>PART 5: A CASE STUDY ON MAINTENANCE OF GOVERNMENT BUILDINGS</b>	5.1
Star Ferry Carpark Building	5.2
Maintenance works for the carpark building	5.3 – 5.8
<i>Audit observations</i>	5.9 – 5.12
<i>Audit recommendations</i>	5.13
Response from the Administration	5.14

	<b>Page</b>
<b>Appendices</b>	
A : Organisation structure of Architectural Services Department	58
B : Audit examination of term contracts	59
C : Management structure of the Property Services Branch	60
D : Works orders outstanding	61
E : Analysis of extensions of time granted to contractors	62
F : Checking of contractor's claimed values	63
G : Previous term contracts not yet finalised	64
H : Acronyms and abbreviations	65



## **PART 1: INTRODUCTION**

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

### **Maintenance and refurbishment of government buildings and facilities**

1.2 The Architectural Services Department (ArchSD) provides professional services for the design, construction and maintenance of government buildings and facilities (Note 1). The Property Services Branch of the ArchSD (see organisation structure in Appendix A) is responsible for planning and implementing maintenance works (Note 2). The Director of Architectural Services is the Controlling Officer of the following financial allocations for funding the maintenance works (Note 3):

- (a) ***Repairs and general maintenance.*** They are funded by Head 25 (ArchSD) Subhead 218 (operational expenses on maintenance of government buildings) of the General Revenue Account. The estimated expenditure for 2004-05 is \$476 million. The works, which may be initiated by end-users or by the ArchSD, include routine maintenance such as water seepage repairs and emergency repairs;
  
- (b) ***Refurbishment and planned maintenance.*** They are funded by Head 703 (Buildings) Subhead 3004GX block allocation (refurbishment of government buildings for items in Category D (Note 4) of the Public Works Programme) of the Capital Works Reserve Fund (CWRP). The estimated expenditure for 2004-05 is \$1,132 million. Refurbishment and planned maintenance works are

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**Note 1:** *Government buildings include government offices buildings, government quarters and civic centres. Government facilities include public swimming pools, playgrounds and public toilets.*

**Note 2:** *The implementation of maintenance works requires input by related disciplines such as building services and quantity surveying, in addition to building works. The related services are available from other departments such as the Electrical and Mechanical Services Department, or other Branches of the ArchSD such as the Quantity Surveying Branch.*

**Note 3:** *The ArchSD also provides maintenance services to subvented schools, hospitals, etc. under other financial allocations controlled by the Education and Manpower Bureau, the Hospital Authority and other government departments.*

**Note 4:** *Category D projects are minor works items each costing not more than \$15 million under a block allocation.*

mainly proposed by the ArchSD. They comprise the following works which are too large for funding by the General Revenue Account maintenance vote mentioned in (a) above:

- (i) **Refurbishment.** This mainly involves renewing and/or replacing building elements and facilities such as lifts, electrical wiring and drainage pipes; and
  
- (ii) **Planned maintenance.** This mainly involves internal and external redecoration of buildings such as repainting of external walls and replacing floor tiles. Buildings which have not been decorated or repaired comprehensively for a number of years may be selected for planned maintenance; and
  
- (c) **Minor building works.** They are funded by Head 703 (Buildings) Subhead 3101GX block allocation (minor building works for items in Category D of the Public Works Programme) of the CWRF. The estimated expenditure for 2004-05 is \$600 million. Minor building works, which are mainly requested by bureaux/departments (hereinafter referred to as user departments), include alteration, addition, improvement, and fitting-out works to enhance building/facility conditions and the standard of accommodation. Some examples of minor building works are improvement works to markets and swimming pools, and construction of refuse collection points, public toilets and local open spaces.

## Term contracts

1.3 The ArchSD employs term contractors to carry out maintenance works. Ordering works under term contracts (Note 5) could save time in preparing capital works contract documents, and provide flexibility in varying the scope and/or design of the works during construction (Note 6). The ArchSD has let:

- (a) ten maintenance term contracts for carrying out building and electrical installation works;

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**Note 5:** *The period of a term contract is normally two to three years.*

**Note 6:** *The ArchSD also lets lump sum contracts and quotation contracts to implement maintenance works.*



- (b) four term contracts for the design and construction of minor works; and
- (c) three term contracts for the design and construction of fitting-out works.

The maintenance term contracts and design-and-construct term contracts cover different geographical areas.

### **Audit review**

1.4 The Audit Commission (Audit) recently conducted a review of the maintenance works implemented by the ArchSD. The review focused on the following aspects:

- (a) the refurbishment programme compiled by the ArchSD and the minor building works requested by user departments (see PART 2);
- (b) the management of works orders of the term contracts (see PART 3);
- (c) the measurement and payment for the works orders (see PART 4 — Note 7);  
and
- (d) a case study on the maintenance of government buildings (see PART 5).

1.5 The audit has found that there is scope for improvement in planning and implementing the maintenance works.

### **Acknowledgement**

1.6 Audit would like to acknowledge with gratitude the full cooperation of the staff of the ArchSD during the course of the audit review.

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**Note 7:** *In March 1994, Audit conducted a review of the measurement and payment for works orders of the ArchSD's term contracts. The ArchSD had subsequently taken measures to address the problems. This audit has reviewed the current position and made recommendations for further improvement.*

## **PART 2: REFURBISHMENT AND MINOR BUILDING WORKS**

2.1 This PART examines the refurbishment programme compiled by the ArchSD and the minor building works requested by user departments.

### **Refurbishment and planned maintenance**

2.2 ***CWRF Head 703 Subhead 3004GX.*** Due to ageing and weathering, major elements of government buildings such as plumbing, external wall finishes, electrical wiring and roof waterproofing may deteriorate before they reach the end of their useful life. The CWRF block allocation, Head 703 (Buildings) Subhead 3004GX (refurbishment of government buildings for items in Category D of the Public Works Programme) funds such maintenance works identified in surveys conducted by the ArchSD. The works include the following two main categories:

- (a) ***Refurbishment.*** Refurbishment works include replacing and/or renewing deteriorated building elements and facilities to enhance health and hygiene, public safety and security, and upgrade building standards. Photograph 1 shows the refurbishment works for a swimming pool; and

#### **Photograph 1**

#### **Refurbishment works for a swimming pool**



*Source: ArchSD records*

- (b) **Planned maintenance.** Planned maintenance works include internal and external redecoration of buildings. The maintenance cycle would depend on the usage of buildings. For instance, planned maintenance works for public libraries and toilets may be carried out once every year, while those for other government buildings may be carried out once every four years. The maintenance cycle for lower grade quarters in remote areas may be six to seven years. Photograph 2 shows the maintenance works for the exterior of a community hall.

**Photograph 2**

**Maintenance works for the exterior of a community hall**



Source: ArchSD records

2.3 **Approval of annual estimate.** In the Annual Estimates exercise, the ArchSD compiles a refurbishment programme for bidding for funds under Subhead 3004GX. The refurbishment programme comprises refurbishment and planned maintenance works, as follows:

- (a) **New refurbishment works.** New items are individually listed in order of priority (Note 8);

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**Note 8:** *In drawing up the programme, priority is given to projects with public safety, hygiene or health implications.*

- (b) ***New planned maintenance works.*** These items are not individually listed as there are many small value items involved; and
- (c) ***Carry-over items.*** These are items carried over from previous years.

The Public Works Subcommittee (PWSC) recommends the proposed CWRP block allocation to the Finance Committee of the Legislative Council for funding approval.

2.4 ***Approval of annual refurbishment programme compiled by ArchSD.*** After funding approval by the Finance Committee, the ArchSD submits the refurbishment programme to the Accommodation Strategy Group (ASG — Note 9) for approval. The Director of Architectural Services is delegated the authority by the Secretary for Financial Services and the Treasury to revise the refurbishment programme and the estimates of individual items provided that:

- (a) for each refurbishment programme, the cumulative number of items varied (i.e. deferred, deleted, advanced, added or replaced) should not exceed 1/4 of the total; or
- (b) the revision to the estimates of the individual items would not increase the block allocation.

The Director of Architectural Services, as Controlling Officer of Subhead 3004GX, is authorised to approve expenditure for individual items not exceeding \$15 million.

2.5 ***Approved estimate and actual expenditure under Subhead 3004GX.*** Table 1 shows the approved estimates and the forecast and actual expenditures for the carry-over items and the proposed new items under Subhead 3004GX for the financial years 2002-03 and 2003-04.

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**Note 9:** *The ASG is chaired by the Deputy Secretary for Financial Services and the Treasury (Treasury)3. Its members include the Director of Architectural Services, the Government Property Administrator and the Principal Assistant Secretary for Financial Services and the Treasury (Treasury)E.*

Table 1

## Approved estimate and actual expenditure under Subhead 3004GX

Subhead 3004GX	2002-03				2003-04			
	Forecast expenditure (Note 1)	Actual expenditure	Actual expenditure over/(under) forecast expenditure		Forecast expenditure (Note 1)	Actual expenditure	Actual expenditure over/(under) forecast expenditure	
	(a)	(b)	(c) = (b) - (a)		(d)	(e)	(f) = (e) - (d)	
	(\$M)	(\$M)	(\$M)	(%)	(\$M)	(\$M)	(\$M)	(%)
<b>(A) Carry-over items</b>								
Items carried over from previous years	1,200	1,527	327	27%	1,837	2,048	211	11%
<b>(B) New refurbishment and planned maintenance works proposed</b>								
(i) Proposed refurbishment works	870	446	(424)	(49%)	305	87	(218)	(71%)
(ii) Proposed planned maintenance works	458	539 (Note 2)	81	18%	158	156	(2)	(1%)
Subtotal	1,328	985	(343)	(26%)	463	243	(220)	(48%)
<b>Total (A) + (B)</b>	<b>2,528 (Approved estimate)</b>	<b>2,512</b>	<b>(16)</b>	<b>(0.6%)</b>	<b>2,300 (Approved estimate)</b>	<b>2,291</b>	<b>(9)</b>	<b>(0.4%)</b>

Source: ArchSD records

Note 1: A breakdown showing the forecast expenditures for the carry-over items and the proposed new items was submitted to the Legislative Council Secretariat for PWSC Members' reference in considering the block allocation. Upon funding approval by the Finance Committee, the total of the forecast expenditures became the approved estimate of the block allocation. The forecast expenditures also facilitated the ArchSD in exercising management and financial control over the block allocation.

Note 2: The expenditure included \$55 million for upgrading fire services installation.

2.6 Table 1 shows that:

- (a) **for carry-over items (see Item (A) of Table 1), the actual expenditures were more than the forecast expenditures.** In 2002-03, this amounted to **\$327 million** (27% of the forecast expenditure of \$1,200 million). In 2003-04, this amounted to **\$211 million** (11% of the forecast expenditure of \$1,837 million); and
  
- (b) **for proposed refurbishment works (see Item (B)(i) of Table 1), the actual expenditures were less than the forecast expenditures.** In 2002-03, this amounted to **\$424 million** (49% of the forecast expenditure of \$870 million). In 2003-04, this amounted to **\$218 million** (71% of the forecast expenditure of \$305 million).

### **Implementation of new refurbishment works**

2.7 According to paragraph 2.6(b), in 2002-03 and 2003-04, there was significant underspending for new refurbishment works (under Subhead 3004GX) proposed by the ArchSD. Audit has examined the refurbishment programmes to ascertain the progress. Table 2 shows the result of the audit examination.

**Table 2**  
**Implementation of new refurbishment works**

New refurbishment works	2002-03		2003-04	
	Item	Forecast expenditure under the approved estimate	Item	Forecast expenditure under the approved estimate
	(Nos.)	(\$M)	(Nos.)	(\$M)
<b>(A) New refurbishment items proposed</b>	<b>454</b>	<b>870</b>	<b>281</b>	<b>305</b>
<b>(B) Progress of implementing new refurbishment items during the year:</b>				
<b>(i) Not implemented</b>				
(a) Items deleted	112	111	5	7
(b) Works not yet commenced	118 (Note 1)	229	177 (Note 2)	185
<b>Subtotal</b>	<b>230</b>	<b>340</b>	<b>182</b>	<b>192</b>
<b>(ii) Implemented</b>	224	530	99	113

Source: ArchSD records

Note 1: Up to end of November 2004, the disposition of the 118 refurbishment items was as follows:

- (a) for 101 items, deletion from the refurbishment programme had been made;
- (b) for 2 items, works had not yet been commenced; and
- (c) for 15 items, works had been commenced.

Note 2: Up to end of November 2004, the disposition of the 177 refurbishment items was as follows:

- (a) for 60 items, deletion from the refurbishment programme had been made;
- (b) for 97 items, works had not yet been commenced; and
- (c) for 20 items, works had been commenced.

2.8 As shown in Table 2, many new refurbishment items proposed by the ArchSD were not implemented as planned during the year:

- (a) in 2002-03, 230 (51%) of the 454 proposed new items were not implemented; and
- (b) in 2003-04, 182 (65%) of the 281 proposed new items were not implemented.

Most of these items were deleted from the refurbishment programmes (Note 10) which originally formed the basis of the ArchSD's bid for funding under Subhead 3004GX. As a result, a significant amount of the funds provided for implementing these items during the year was not actually utilised for the purpose. **In 2002-03, this amounted to \$340 million (39%) out of \$870 million provided for the proposed items. In 2003-04, this amounted to \$192 million (63%) out of \$305 million provided for the proposed items.**

### **Audit observations**

#### ***Implementation of new refurbishment works***

2.9 According to the ArchSD's Local Manuals (hereinafter referred to as the project administration manuals):

- (a) project officers are expected, for estimation and fund bidding exercise, to provide a timescale covering investigation, planning and construction for refurbishment projects;
- (b) only items (or part thereof) that can be substantially completed in the next financial year should be included in the fund bidding exercise; and
- (c) a planned programme for these projects permits the correct sum to be provided for each financial year in which expenditure would be incurred.

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**Note 10:** *For many deleted items, no justification was given in the submission paper seeking the Director of Architectural Services' approval for deletion from the refurbishment programme. For some items, the reasons included (a) venue in good/acceptable condition, (b) redevelopment of venue, (c) works not required, and (d) works included in other projects. For example, an item for renovating a public toilet in South Bay, with funding of \$0.5 million in 2002-03, was deleted because the condition of the public toilet was good with no imminent need for refurbishment. Another item for replacing the roof decking of the Hung Hom Indoor Games Hall, with funding of \$1.9 million in 2003-04, was deleted because the defects were rectified under a warranty.*



2.10 As mentioned in paragraph 2.8, many new refurbishment items proposed by the ArchSD were not implemented as planned and were deleted from the refurbishment programmes. **In order to enhance accountability (Note 11) and management control, Audit considers that the ArchSD should critically review the effectiveness of the existing measures for identifying refurbishment works needed for implementation in the ensuing financial year for the purpose of bidding for funds.**

***Funding for carry-over items***

2.11 As mentioned in paragraph 2.6(a), in 2002-03 and 2003-04, the actual expenditures for the carry-over items exceeded the forecast expenditures by \$327 million (27% of the forecast expenditure of \$1,200 million) and \$211 million (11% of the forecast expenditure of \$1,837 million) respectively. Surplus funds were made available to finance the carry-over items, as many proposed new refurbishment items were not implemented (see para. 2.8). **Audit considers that the ArchSD should take necessary measures to ensure that, as far as possible, the total actual expenditure will not exceed the total forecast expenditure for carry-over items under the approved estimate.**

**Audit recommendations**

2.12 **Audit has recommended that the Director of Architectural Services should:**

- (a) **critically review the effectiveness of the existing measures for identifying refurbishment works needed for implementation in the ensuing financial year for the purpose of bidding for funds; and**
- (b) **take necessary measures to ensure that, as far as possible, the total actual expenditure will not exceed the total forecast expenditure for carry-over items under the approved estimate.**

**Response from the Administration**

2.13 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 2.12. He has said that:

- (a) the ArchSD will critically review the effectiveness of the existing measures for identifying refurbishment works for the purpose of bidding for funds;

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**Note 11:** *For the consideration of the block allocation by the PWSC, the Administration submits a full list of items to the Legislative Council Secretariat for Members' reference.*

- (b) the ArchSD considers that with better coordination and communication with the user departments at the Annual Estimates stage, the management control over the implementation of refurbishment works can be improved;
- (c) the selection criteria have been refined in 2004-05, and projects affecting public safety, health and hygiene are accorded higher priority. This helps in securing user departments' support for the projects to be carried out;
- (d) the ASG meeting for vetting the 2005-06 refurbishment programme was advanced to January 2005 as compared to the usual meeting date of March/April in the previous years. With early endorsement from the ASG on the refurbishment projects, extra time can be allowed for planning and project implementation in the following year;
- (e) disturbances (such as noise and dust generated during the works) and difficulties in arranging works without affecting user departments' operation have often resulted in much longer time to complete the works, and occasionally, cancellation of the proposed projects;
- (f) in 2002-03 and 2003-04, the Government launched an initiative to create job opportunities. The financial provision for Subhead 3004GX in these two years was double that of the normal allocation. The ArchSD took the opportunity to clear the backlog of maintenance works which had been deferred due to site constraints and restrictions imposed by the user departments. With the cooperation from the user departments and the effort of the staff, the ArchSD was able to complete a large number of the carry-over projects in these two financial years. This explained why the total actual expenditure for carry-over items in 2002-03 exceeded the forecast expenditure by 27%. In 2003-04, it was anticipated that the financial provision for 2004-05 would be back to normal. Accordingly many of the proposed projects were not implemented to avoid an overly large financial commitment to be carried over to 2004-05; and
- (g) the ArchSD will attempt to forecast more accurately the apportionment between new items and carry-over items to ensure that the total actual expenditure will not exceed the total forecast expenditure for carry-over items under the approved estimate.

### **Minor building works**

2.14 ***CWRF Head 703 Subhead 3101GX.*** The CWRF block allocation, Head 703 (Buildings) Subhead 3101GX (minor building works for items in Category D of the Public Works Programme), is provided to fund minor building works, such as alteration, addition, improvement and fitting-out works. Minor building works enhance the standard and the condition of buildings or facilities. They are mainly requested by user departments. Photograph 3 shows minor building works for dangerous goods stores.

**Photograph 3**

**Minor building works for dangerous goods stores**



*Source: ArchSD records*

2.15 ***Approval of annual estimate.*** In the Annual Estimates exercise, the ArchSD calls for bids from user departments for items to be funded under Subhead 3101GX. The user departments submit bids for new items each costing more than \$1 million, and list them in order of priority. For new items not exceeding \$1 million, the ArchSD provides a lump sum estimate because of the many small value items involved. The Government Property Agency also provides a lump sum estimate for new fitting-out works. The ArchSD seeks funding for new items and items carried over from previous years. The PWSC recommends the proposed CWRF block allocation to the Finance Committee for funding approval.

2.16 ***Delegated authorities for authorising minor building works.*** The delegated authorities for authorising minor building works under Subhead 3101GX are as follows:

- (a) the Deputy Secretary for Financial Services and the Treasury (Treasury)<sup>3</sup>, on the advice of the ASG (Note 12), may authorise minor building works not exceeding \$15 million;
- (b) the Director of Architectural Services, on the advice of the Minor Building Works Committee (MBWC — Note 13), may authorise minor building works (other than fitting-out works) not exceeding \$10 million;
- (c) the Government Property Administrator may authorise fitting-out works not exceeding \$10 million (Note 14); and
- (d) the Assistant Director (Property Services) may authorise minor building works (other than fitting-out works) not exceeding \$1 million (Note 15).

2.17 ***Approved estimate and actual expenditure under Subhead 3101GX.*** Table 3 shows the approved estimates and the forecast and actual expenditures for the carry-over items and the proposed new items under Subhead 3101GX for the financial years 2002-03 and 2003-04.

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**Note 12:** *The ASG is chaired by the Deputy Secretary for Financial Services and the Treasury (Treasury)<sup>3</sup>. The ASG agrees on the criteria for prioritisation of proposals for minor building works funded under Subhead 3101GX.*

**Note 13:** *The MBWC is chaired by the Director of Architectural Services. Its members include the Assistant Director (Property Services), the General Engineering Services Manager and the Government Property Administrator or his representative. The MBWC considers proposed minor building works (other than fitting-out works) exceeding \$1 million each. It also determines the priorities for the works.*

**Note 14:** *The Deputy Secretary for Financial Services and the Treasury (Treasury)<sup>3</sup>, on the advice of the ASG, approves fitting-out works with estimated expenditures between \$10 million and \$15 million.*

**Note 15:** *The Senior Maintenance Surveyors of the ArchSD may authorise minor building works (other than fitting-out works) not exceeding \$100,000.*

Table 3

## Approved estimate and actual expenditure under Subhead 3101GX

Subhead 3101GX	2002-03				2003-04			
	Forecast expenditure (Note 1)	Actual expenditure	Actual expenditure over/(under) forecast expenditure		Forecast expenditure (Note 1)	Actual expenditure	Actual expenditure over/(under) forecast expenditure	
	(a)	(b)	(c) = (b) - (a)		(d)	(e)	(f) = (e) - (d)	
	(\$M)	(\$M)	(\$M)	(%)	(\$M)	(\$M)	(\$M)	(%)
<b>(A) Carry-over items</b>								
Items carried over from previous years	398	538	140	35%	335	451	116	35%
<b>(B) New minor building works proposed</b>								
(i) Proposed items with project estimates > \$1M	356 (Note 2)	81	(29)	(8%)	385 (Note 2)	98	(161)	(42%)
(ii) Proposed items with project estimates \$1M		246				126		
Subtotal	356	327	(29)	(8%)	385	224	(161)	(42%)
(iii) Proposed fitting-out works	288	35	(253)	(88%)	60	80	20	33%
<b>Total (A)+ (B)</b>	<b>1,042 (Approved estimate)</b>	<b>900</b>	<b>(142)</b>	<b>(14%)</b>	<b>780 (Approved estimate)</b>	<b>755</b>	<b>(25)</b>	<b>(3%)</b>

Source: ArchSD records

Note 1: A breakdown showing the forecast expenditures for the carry-over items and the proposed new items was submitted to the Legislative Council Secretariat for PWSC Members' reference in considering the block allocation. Upon funding approval by the Finance Committee, the total of the forecast expenditures became the approved estimate of the block allocation. The forecast expenditures also facilitated the ArchSD in exercising management and financial control over the block allocation.

Note 2: There was no separate breakdown between proposed new items with project estimates > \$1 million and proposed new items with project estimates \$1 million.

2.18 Table 3 shows that:

- (a) **for carry-over items (see Item (A) of Table 3), the actual expenditures were more than the forecast expenditures.** In 2002-03, this amounted to **\$140 million (35%** of the forecast expenditure of \$398 million). In 2003-04, this amounted to **\$116 million (35%** of the forecast expenditure of \$335 million);
- (b) **for proposed new items with project estimates exceeding \$1 million, and those not exceeding \$1 million (see Item (B)(i) and Item (B)(ii) of Table 3), the actual expenditures were less than the forecast expenditures.** In 2002-03, this amounted to **\$29 million (8%** of the forecast expenditure of \$356 million). In 2003-04, this amounted to **\$161 million (42%** of the forecast expenditure of \$385 million); and
- (c) **as regards new fitting-out works (see Item (B)(iii) of Table 3),** in 2002-03, the actual expenditure was less than the forecast expenditure by **\$253 million (88%** of the forecast expenditure of \$288 million), and in 2003-04, the actual expenditure was more than the forecast expenditure by **\$20 million (33%** of the forecast expenditure of \$60 million — Note 16).

### **Implementation of new minor building works**

2.19 According to Table 3, for proposed new items with project estimates of more than \$1 million under Subhead 3101GX (see Item (B)(i) of Table 3), in 2002-03 and 2003-04, the actual expenditures were only **\$81 million** and **\$98 million** respectively, which were relatively low when compared to the actual expenditures for proposed new items with project estimates not exceeding \$1 million. Audit examined those items with project estimates of more than \$10 million to ascertain the progress. The result of the audit examination, as shown in Table 4, indicated that:

- (a) in 2002-03, there were 30 such items with total forecast expenditure of \$125 million (i.e. 35% of \$356 million provided for all the proposed new items — see Table 3 Item B(i) & (ii)); and
- (b) in 2003-04, there were 42 such items with total forecast expenditure of \$141 million (i.e. 37% of \$385 million provided for all the proposed new items — see Table 3 Item B(i) & (ii)).

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**Note 16:** *In 2002-03, the forecast expenditure of \$288 million for new fitting-out works was grossly overestimated. Upon Audit's enquiry, the ArchSD said that because of down-sizing of government departments, there was a substantial decrease in the number of requests for fitting-out of offices in 2002-03. In 2003-04, the forecast expenditure for new fitting-out works was substantially reduced to \$60 million.*

Table 4

**Implementation of new minor building works  
with project estimates exceeding \$10 million**

New minor building works	2002-03		2003-04	
	Item	Forecast expenditure under the approved estimate	Item	Forecast expenditure under the approved estimate
	(Nos.)	(\$M)	(Nos.)	(\$M)
<b>(A) Proposed new items with project estimates &gt; \$10 million (Note 1)</b>	<b>30</b>	<b>125</b>	<b>42 (Note 2)</b>	<b>141</b>
<b>(B) Progress of implementing new items during the year:</b>				
<b>(i) Not implemented</b>	<b>27 (Note 3)</b>	<b>113</b>	<b>33 (Note 4)</b>	<b>117</b>
<b>(ii) Implemented</b>	<b>3</b>	<b>12</b>	<b>9</b>	<b>24</b>

Source: ArchSD records

Note 1: The proposed new items included improvement works to markets and swimming pools, and construction of refuse collection points, public toilets and local open spaces.

Note 2: Audit excluded from the analysis 8 proposed items for fire services upgrading works as no funding was sought for these items in 2003-04, although they were included in the ArchSD submission.

Note 3: Up to mid-December 2004, the disposition of the 27 minor building works items was as follows:

- (a) 5 items were implemented in 2003-04;
- (b) 1 item was included in the 2004-05 refurbishment programme under Subhead 3004GX; and
- (c) 21 items were not yet implemented.

Note 4: Up to mid-December 2004, the disposition of the 33 minor building works items was as follows:

- (a) 3 items were implemented in 2004-05;
- (b) 3 items were included in the 2004-05 refurbishment programme under Subhead 3004GX;
- (c) 1 item was not approved; and
- (d) 26 items were not yet implemented.

2.20 As shown in Table 4, many minor building works proposed by the user departments were not implemented as planned during the year:

- (a) in 2002-03, 27 (90%) of the 30 proposed new items were not implemented; and
- (b) in 2003-04, 33 (79%) of the 42 proposed new items were not implemented.

Upon Audit's enquiry, the ArchSD said that for many of these items, the user departments did not submit the applications to the ArchSD for implementation of the items. Audit noted that, for example, some of the items were not ready for implementation because of land allocation problem or the scope of works not yet finalised by user departments (Note 17).

2.21 As a result, a significant amount of the funds provided for implementing these items during the year was not actually utilised for the purpose. In 2002-03, this amounted to \$113 million (90%) out of \$125 million provided for the proposed items (see Items (A) and (B)(i) of Table 4). In 2003-04, this amounted to \$117 million (83%) out of \$141 million provided for the proposed items (see Items (A) and (B)(i) of Table 4).

## Audit observations

### *Implementation of new minor building works*

2.22 Subhead 3101GX provides annual funding for implementing minor building works. For the consideration of the block allocation by the PWSC, the Administration submits a full list of block allocation items to the Legislative Council Secretariat for Members' reference.

2.23 Audit noted that after the annual estimate had been approved, many of the proposed items were not implemented as planned. Some items were subsequently withdrawn because they were not ready for implementation. According to the ArchSD, it was not uncommon that items proposed by user departments in the Annual Estimates exercise were not implemented.

2.24 In 2004-05, after the Annual Estimates exercise, it was noted that the carry-over items required a larger allocation of funds. A new arrangement for the vetting of minor building works projects was therefore introduced, which was intended primarily to ensure

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**Note 17:** For example, an item for constructing a refuse collection point cum public toilet and seized goods stores at the Yuen Long Industrial Estate, with funding of \$3.8 million in 2002-03, was withdrawn because of land allocation problem. Another item for upgrading of refuse collection points, with funding of \$5.4 million in 2003-04, was not implemented because the scope of works had not been finalised by the user department.



effectiveness in allocation of funds for the minor building works projects due to limited funding. In 2005-06, the new arrangement was conducted as part of the Annual Estimates exercise for ensuring proper scrutiny and prioritisation of the projects, as well as ensuring that funds are committed only for projects which are ready to proceed within the year. **Audit considers that the ArchSD should closely monitor the effectiveness of the new arrangement to ensure that minor building works proposals are properly scrutinised in the Annual Estimates exercise. Audit also considers that the ArchSD should critically assess whether an item is ready for implementation in the ensuing financial year for the purpose of bidding for funds.**

### ***Funding for carry-over items***

2.25 As mentioned in paragraph 2.18(a) above, in 2002-03 and 2003-04, the actual expenditures for the carry-over items exceeded the forecast expenditures by \$140 million (35% of the forecast expenditure of \$398 million) and \$116 million (35% of the forecast expenditure of \$335 million) respectively. Surplus funds were made available to finance the carry-over items, as many new minor building works proposed by the user departments were not implemented (see para. 2.20). **Audit considers that the ArchSD should take necessary measures to ensure that, as far as possible, the total actual expenditure will not exceed the total forecast expenditure for carry-over items under the approved estimate.**

### **Audit recommendations**

- 2.26 **Audit has recommended that the Director of Architectural Services should:**
- (a) **closely monitor the effectiveness of the new arrangement for the vetting of minor building works projects for ensuring that minor building works proposals are properly scrutinised in the Annual Estimates exercise;**
  - (b) **critically assess whether a minor building works item is ready for implementation in the ensuing financial year for the purpose of bidding for funds; and**
  - (c) **take necessary measures to ensure that, as far as possible, the total actual expenditure will not exceed the total forecast expenditure for carry-over items under the approved estimate.**

### **Response from the Administration**

2.27 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 2.26. He has said that:

- (a) the ArchSD agrees that there is the need to critically assess whether a minor building works item is ready for implementation in the ensuing financial year for the purpose of bidding for funds. It is being practised for the 2005-06 project submissions;
- (b) the ArchSD now conducts initial vetting of the list of projects submitted by the user departments under the new arrangement introduced in 2004-05 (see para. 2.24);
- (c) in the Annual Estimates exercise, the ArchSD will advise the user departments of the need to clear land issues, schedule of accommodation approval, recurrent cost provision, etc. before submitting their projects for bidding for funds;
- (d) the new arrangement for the vetting of minor building works proposals will improve the situation that proposed projects are implemented in accordance with the submitted programme in the long term. This will improve the cashflow forecast and expenditure monitoring of the projects;
- (e) there is still a need for flexibility, as minor building works are susceptible to revisions in project scope and programme; and
- (f) the ArchSD will review the effectiveness of the new arrangement for the vetting of minor building works proposed by the user departments for the purpose of bidding for funds.

2.28 The **Secretary for Financial Services and the Treasury** agrees with the audit recommendations mentioned in paragraphs 2.12 and 2.26. He has said that:

- (a) the new arrangement for the vetting of minor building works proposals is indeed for ensuring proper scrutiny and prioritisation of the projects, as well as ensuring that funds are committed only for projects which are ready to proceed within the year; and
- (b) the new arrangement will continue to be monitored and refined as necessary.

## **PART 3: MANAGEMENT OF WORKS ORDERS**

3.1 This PART examines the management of works orders issued under the maintenance term contracts and the design-and-construct term contracts.

### **Maintenance term contracts and design-and-construct term contracts**

3.2 ***Maintenance term contracts.*** The ArchSD has let ten maintenance term contracts, covering different geographical areas, for carrying out building works and electrical works. Eight contracts commenced in April 2004 and two in July 2002.

3.3 Since eight of the contracts only commenced in April 2004, there were not many works orders and minor works orders (Note 18 ) completed under these contracts. Therefore, Audit has mainly focused on the works orders issued under the two contracts commenced in July 2002 and eight previous contracts, the contract periods of which for issuing works orders had ended (hereinafter referred to as “elapsed contracts” — Note 19, and see Appendix B for details).

3.4 ***Design-and-construct term contracts.*** The ArchSD has also let seven design-and-construct term contracts, with four for minor works and three for fitting-out works, covering different geographical areas. In order to obtain a sufficient number of works orders for fruitful analysis, Audit has mainly focused on three ongoing contracts (commenced in 2002) and four elapsed contracts (see Appendix B for details).

3.5 In 2003-04, about 23,500 works orders and 328,000 minor works orders were issued under the ten maintenance term contracts. About 1,700 works orders were issued under the seven design-and-construct term contracts.

3.6 ***Project management teams.*** The Property Services Branch of the ArchSD is responsible for administering the term contracts. Within the Branch, there are maintenance groups, each headed by a Senior Property Services Manager. The Senior Property Services Manager is responsible for maintaining government properties within an area covered by a maintenance or a design-and-construct term contract. He oversees three to four Property Services Managers. Each Property Services Manager heads a team of site inspection staff

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**Note 18:** *Works orders are those for works which cost \$1,000 or more, and minor works orders are those which cost less than \$1,000. The audit mainly focused on the management of works orders.*

**Note 19:** *The eight elapsed contracts were awarded in mid-2001. Most of the works orders of these contracts had been completed.*

comprising Senior Property Services Officers/Property Services Officers. The teams are responsible for preparing cost estimates, issuing works orders, inspecting works quality, and confirming completion of the works. The teams are only responsible for building works. Building Services Engineers and Building Services Inspectors are seconded from the Electrical and Mechanical Services Department for implementing electrical works. The management structure of the Property Services Branch is shown in Appendix C.

3.7 **Quantity surveying services.** The Quantity Surveying Branch provides quantity surveying services for the building works. The services include preparing contract documents, checking quantities of works measured by the contractors, and processing payment applications. Quantity surveying services for electrical works are provided by Building Services Engineers and Building Services Inspectors seconded from the Electrical and Mechanical Services Department.

### **Project administration procedures**

3.8 **Period allowed for completion of works orders.** According to the ArchSD's project administration manuals, works orders issued should have "days for completion/date of completion" entered. The term contractors are required to provide programmes for monitoring the progress of the works. Where agreement has been reached for a revised programme, the "days for completion/date of completion" should be revised. The number of days is counted from the date of issue of the works order to the date of completion (Sundays and public holidays are included).

3.9 **Granting of extension of time.** Upon receipt of a contractor's claim for extension of time (EOT), the claim is considered in a Monthly Progress Meeting attended by project staff and the contractor. The site supervisory staff should record all the factors, due to no fault of the contractor, which affect the progress of the works. If the EOT application is approved by the Senior Property Services Manager, the project officer revises the date of completion accordingly thereafter, but in any case before certifying completion.

3.10 **Completion of works orders.** The project staff is required to confirm with the contractor the completion date of a works order. On completion of the works, the project staff reviews the scope and cost estimates of the works, and issues written instruction (amendment record) as necessary. Completion certificate may be granted only when the outstanding items are minor and not affecting the normal use of the building. The outstanding items, if any, should be completed according to an agreed programme.

3.11 The certification of completion also triggers the following actions to be carried out by the project staff:

- (a) settling the outstanding interim payments due to the contractor;
- (b) producing a reminder to the contractor for submission of dimension books (Note 20) on completed works;
- (c) recovering the interim payment on a completed works order (for which dimension books have not been submitted within the specified period);
- (d) imposing liquidated damages on works orders not completed within the specified period;
- (e) batching, sampling and checking of works orders (Note 21), leading to finalisation of the account and release of final payment to the contractor; and
- (f) generating management reports on the status of the works.

3.12 The ArchSD officers have to confirm with the contractor the completion date and certify the completion of a works order as soon as the works are completed.

### **Audit examination of works orders**

#### ***Works orders not yet completed after the target completion dates***

3.13 For the 17 term contracts selected for audit examination, as at 4 October 2004 (date of data download for analysis), there were many works orders not yet completed (hereinafter referred to as works orders outstanding), although the target completion dates had elapsed. Table 5 is a summary of the analysis (see Appendix D for details).

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**Note 20:** *On completion of a works order, the contractor is required to submit dimension books detailing the measurement of the works done. The details of the dimension books are calculated and analysed by the ArchSD's computer for producing a bill containing the claimed values.*

**Note 21:** *The ArchSD uses a batch payment system to process the completed works orders. The ArchSD batched the works orders and sample checked them for accuracy of the measurements submitted by the contractor.*

**Table 5**  
**Works orders outstanding**  
**(position as at 4 October 2004)**

<b>Contract</b>	<b>Works orders</b>		<b>Total</b>	
	<b>With cost estimate &lt; \$50,000</b>	<b>With cost estimate \$50,000</b>		
	<b>(a)</b>	<b>(b)</b>		<b>(c) = (a)+ (b)</b>
	<b>(Nos.)</b>	<b>(Nos.)</b>		<b>(Nos.)</b>
<b>Maintenance term contract (10 nos.)</b>	2,571	1,254	3,825 (Note 1)	
<b>Design-and-construct term contract (7 nos.)</b>	37	455	492 (Note 2)	
<b>Total</b>	<b>2,608</b>	<b>1,709</b>	<b>4,317</b>	

Source: ArchSD records

Note 1: About 79,400 works orders were issued under the ten maintenance term contracts.

Note 2: About 1,800 works orders were issued under the seven design-and-construct term contracts.

3.14 As shown in Table 5:

- (a) for the ten maintenance term contracts, there were 3,825 works orders outstanding as at 4 October 2004; and
- (b) for the seven design-and-construct term contracts, there were 492 works orders outstanding as at 4 October 2004.

### ***Works period overrun***

3.15 Audit analysed the works orders costing \$50,000 or more with certified completion date after 31 March 2003 (Note 22). Audit noted that there was a high

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**Note 22:** The analysis also included works orders outstanding as at 4 October 2004.

percentage of the works orders with overrun (i.e. the certified completion date was later than the original target completion date). Table 6 is a summary of the extent of overrun of these works orders.

**Table 6**  
**Extent of overrun of works orders**  
**(with cost estimate \$50,000 or more and completion date after 31 March 2003)**

Contract	Works orders completed on time	Works orders with overrun (Note 1)				Total	Liquidated damages deducted											
		< 90 days	90 - < 180 days	180 days	Subtotal		Works orders	Amount										
		(a)	(b)	(c)	(d)		(e) = (b) + (c) + (d)	(f) = (a) + (e)	(g)	(h)								
	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)	(Nos.)
<b>Maintenance term contract (10 nos.)</b>	2,132 (42%)	969 (19%)	598 (12%)	1,355 (27%)	2,922 (58%)	5,054 (100%)	53	\$801,000										
<b>Design-and-construct term contract (7 nos.)</b>	203 (23%)	274 (31%)	143 (16%)	260 (30%)	677 (77%)	880 (100%)	14	\$292,000										
<b>Total</b>	<b>2,335 (39%)</b>	<b>1,243 (21%)</b>	<b>741 (13%)</b>	<b>1,615 (27%)</b>	<b>3,599 (61%) (Note 2)</b>	<b>5,934 (100%)</b>	<b>67</b>	<b>\$1,093,000 (say \$1.1M)</b>										

Source: ArchSD records

Note 1: For works orders outstanding as at 4 October 2004, the overrun periods were counted up to that date.

Note 2: Of the 3,599 works orders with overrun, 3,532 (98%) works orders were granted EOT.

3.16 As shown in Table 6:

- (a) for the ten maintenance term contracts, 27% of the works orders had works period overruns of 180 days or more (see column (d));

- (b) for the seven design-and-construct term contracts, 30% of the works orders had works period overruns of 180 days or more (see column (d)); and
- (c) of the 3,599 works orders (see column (e)), the overrun of 67 was partly or wholly attributable to the contractors. The ArchSD imposed liquidated damages of \$1.1 million (see column (h)) on the contractors. For the remaining number of works orders, the ArchSD granted EOTs to the contractors.

3.17 Audit examined 20 works orders with works period overrun of 180 days or more (see column (d) of Table 6). Audit found that:

- (a) most of the overruns resulting in the grant of EOTs were due to insufficient coordination between the ArchSD and the user departments in determining the works periods (see Appendix E for details); and
- (b) in many cases, no details were given on how the EOTs were assessed.

***Works period overrun not fully covered by EOTs or liquidated damages***

3.18 The overrun period of a works order is normally covered by the EOT granted or the liquidated damages imposed on the contractor, or both. However, the overrun periods of 511 works orders (431 works orders from the ten maintenance term contracts, and 80 works orders from the seven design-and-construct term contracts) were not fully accounted for by the EOTs granted and/or by the liquidated damages imposed. In October 2004, upon Audit's enquiry, the ArchSD said that 246 (48%) of the 511 works orders had not yet been finalised.

3.19 The remaining 265 works orders had all been finalised. Assuming that the number of days of overrun not covered by EOT or liquidated damages was delay attributable to the contractors, the potential additional liquidated damages that could be imposed on the contractors was about \$3 million (see Table 7 for details).



Table 7

**Works period overrun not fully covered  
by extension of time or liquidated damages**

Contract	Works orders with overrun not fully covered by EOT or liquidated damages	Potential additional liquidated damages (Note)
	(Nos.)	(\$)
<b>Maintenance term contract (10 nos.)</b>	250	1,671,100
<b>Design-and-construct term contract (7 nos.)</b>	15	1,346,400
<b>Total</b>	<b>265</b>	<b>3,017,500</b>

Source: ArchSD records

Note: The liquidated damages for a works order are calculated as follows:  
(original cost estimate ÷ days for completion) × days of delay × 10%.

*In calculating the potential additional liquidated damages, it is assumed that the number of days of overrun not covered by EOT or liquidated damages is equal to the number of days of delay.*

***Certification of completion of works orders***

3.20 According to the project administration manuals, the ArchSD is required to confirm with the contractor the completion date and certify the completion of a works order as soon as the works are completed. Upon confirmation with the contractor, the project staff inputs the completion date into the computer for generating the completion certificate (Note 23). Audit analysed the time difference between the dates of input of completion dates and the actual completion dates for the works orders. As shown in Table 8, of the 75,501 works orders completed, 19,603 (26%) works orders had a time difference of 90 days or more, and 7,188 (9.5%) works orders had a time difference of 180 days or more.

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**Note 23:** A completion certificate is normally issued within a week after the completion date of the works order has been input into the computer, due to batch processing.

**Table 8**  
**Certification of completion of works orders**

Contract	No. of works orders completed	Works order with input date after completion date by 90 days or more (Note)	Works order with input date after completion date by 180 days or more
	(a)	(b)	(c)
	(Nos.)	(Nos.)	(Nos.)
<b>Maintenance term contract (10 nos.)</b>	74,493	19,376 (26%)	7,126 (9.6%)
<b>Design-and-construct term contract (7 nos.)</b>	1,008	227 (22.5%)	62 (6.2%)
<b>Total</b>	<b>75,501</b>	<b>19,603 (26%)</b>	<b>7,188 (9.5%)</b>

Source: ArchSD records

Note: The numbers of works orders given in column (b) include those in column (c).

### **Audit observations**

#### ***Works orders not yet completed after the target completion dates***

3.21 As mentioned in paragraph 3.13, as at 4 October 2004, there were many works orders outstanding. Audit was particularly concerned with the large number of these works orders (about 90 to 500 works orders) relating to the eight elapsed maintenance term contracts (see Appendices B and D).

3.22 **Audit considers that the ArchSD should critically review the reasons for the delay in completing these works orders and take necessary measures to complete them promptly. This is particularly important for the elapsed term contracts.**

### ***Works period overrun***

3.23 As shown in Table 6 in paragraph 3.15, a high percentage of the works orders costing \$50,000 or more had works period overrun of 180 days or more. The percentage was 27% for the maintenance term contracts, and 30% for the design-and-construct term contracts.

3.24 It is undesirable to have lengthy works period overrun, as this may affect the operations of user departments and may result in contractual claims. **Audit considers that the ArchSD should strengthen its control procedures to minimise the works orders overrun.**

### ***Period allowed for completion of works orders***

3.25 As mentioned in paragraph 3.17, the works period overrun was mainly due to insufficient coordination between the ArchSD and user departments in determining the works periods (see Appendix E). As the overruns were not caused by the contractors, EOTs were granted.

3.26 ***Setting of days for completion.*** Audit noted that there were no documented justifications to support the original period for completion (i.e. days allowed for completion) entered in the works orders. There was no indication whether the user departments had been consulted. **In order that the user departments' operational needs are taken into account in determining the works period, Audit considers that the ArchSD should consult with the user departments before issuing the works orders to the contractors.**

3.27 ***Granting of extension of time.*** In most of the EOT applications, the contractors cited generalities rather than specific reasons for the overruns. In most cases, there was no documentation of the assessments by the project officers of the EOTs to be granted. As shown in columns (e) and (g) of Table 6 in paragraph 3.15, of the 3,599 works orders with overruns, the overruns of only 67 (2%) works orders were assessed as partly or wholly attributable to the contractors. For the remaining 3,532 (98%) works orders, EOTs were granted. **Audit considers that the ArchSD should review the justifications for granting EOTs to contractors, and tighten the control where necessary.**

### ***Works period overrun not fully covered by EOTs or liquidated damages***

3.28 As mentioned in paragraph 3.18, there were 511 works orders with overrun periods not fully accounted for by the EOTs granted and/or by the liquidated damages imposed. If the overruns were attributable to the contractors, potential additional liquidated damages could be imposed on them.

3.29 Upon Audit's enquiry, the ArchSD said that 246 of the 511 works orders had not yet been finalised, and the ArchSD was dealing with the issue. **Audit considers that, for**

these works orders, the ArchSD should critically assess whether the overruns not yet accounted for were attributable to the contractors.

3.30 For the remaining 265 works orders, Audit noted that they had all been finalised. **Audit considers that, for these works orders, the ArchSD should take immediate action to impose liquidated damages on the contractors, where appropriate (see para. 3.19).**

3.31 **Audit also considers that the ArchSD should strengthen its procedures so as to ensure that the works period overruns are fully covered by the EOT granted and/or by the liquidated damages imposed, before finalising the works orders.**

#### ***Certification of completion of works orders***

3.32 As mentioned in paragraph 3.20, for some of the works orders of the 17 term contracts, there were significant time differences between the dates of inputting the completion dates into the computer (for issuing the completion certificates) and the actual completion dates of the works.

3.33 **Audit considers that the ArchSD should strengthen its procedures so as to ensure that the project officers confirm with the contractors the completion dates so that the completion certificates can be issued promptly (see para. 3.11).**

#### **Audit recommendations**

3.34 **Audit has *recommended* that the Director of Architectural Services should:**

- (a) **critically review the reasons for the delay in completing works orders and take appropriate measures to speed up the progress;**
- (b) **avoid delay to completion of works orders by:**
  - (i) **consulting with user departments on the period allowed for completion before issuing the works orders to the contractors; and**
  - (ii) **strengthening the ArchSD's control procedures;**
- (c) **tighten the ArchSD's procedures of granting EOTs to contractors to ensure that:**

- (i) **assessments of the EOTs granted are properly carried out by the project officers; and**
- (ii) **the justifications for the EOTs granted are documented;**
- (d) **strengthen the control procedures so as to ensure that the works period overrun of a works order is fully covered by the EOT granted and/or by the liquidated damages imposed, before finalising the works orders;**
- (e) **critically assess whether the unaccounted for works period overruns of the 511 works orders are delays attributable to the contractors, and impose liquidated damages as appropriate;**
- (f) **strengthen the control procedures so as to ensure that, as stipulated in the project administration manuals, the project officers confirm with the contractors the completion dates and issue the completion certificates of works orders promptly; and**
- (g) **in managing the ArchSD's maintenance term contracts and design-and-construct term contracts, consider setting measurable quality targets so as to ensure that:**
  - (i) **the works orders are completed on time; and**
  - (ii) **the completion dates of works orders are input into the computer as soon as the works are completed.**

### **Response from the Administration**

3.35 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 3.34. He has said that:

- (a) the ArchSD is aware of the deficiencies identified in the audit report, and improvement measures are in hand with the objective of providing a better service to the user departments. In 2003, the ArchSD obtained the Finance

Committee's funding approval to enhance the ArchSD's computerised system for better management of the maintenance works;

- (b) the enhancement of the computer system, which is scheduled for completion by August/September 2005, will provide:
  - (i) automatic alert/reminder/escalation functions to track works orders with overrun;
  - (ii) automatic deduction of liquidated damages from contractors; and
  - (iii) electronic document management facilities;
- (c) there are many factors resulting in the longer time required to complete the works orders, including:
  - (i) supervisory input and contractor performance;
  - (ii) late handover of premises by user departments to contractors to commence works;
  - (iii) user departments' requests for revisions to project scope and programme, and/or repeated requests for altering previously agreed designs;
  - (iv) user departments restricting the works schedules due to noise problems; and
  - (v) stretching of the supervisory staff resources due to the large number of works orders processed each year; and
- (d) the ArchSD has set up a repair call centre to centrally process, record and monitor the progress of minor repairs. The computerised call centre has enabled the deployment of the limited staff resources to other more important duties requiring technical knowledge and input.

### **Assurance on quality of maintenance works**

3.36 **Technical Assurance Audit Team.** A Technical Assurance Audit Team, mainly composed of Chief Property Services Officers and other supporting staff, is formed in the Property Services Branch of the ArchSD to ensure and maintain uniformity and consistency of standards, particularly assurance on the quality of the maintenance works. The site supervisory staff are required to attend and provide assistance to the Technical Assurance Audit Team, which undertakes technical assurance audits on aspects such as works quality, cost estimation, and interim payment certification. The technical assurance audit findings are submitted to the Technical Assurance Director (the Assistant Director of the Property Services Branch) for review.

### **Audit examination of reports on checks of works quality**

3.37 Audit reviewed the reports on the checks of works quality of the works orders (a total of 179) of two maintenance term contracts, on which the Technical Assurance Audit Team had conducted checks in early 2004. Audit noted that:

- (a) all of the checks were conducted after the completion of the works;
- (b) more than half of the checks were carried out three months after the completion of the works; and
- (c) about 70% of the checks were carried out on minor works orders (i.e. cost estimates less than \$1,000).

3.38 In August 2001, at a meeting of a working group for reviewing the procedures on batching, sampling and finalisation of works orders/minor works orders, concerns were expressed that the technical assurance checks only covered completed works orders. While agreeing that the technical assurance checks should continue to cover completed works orders, the working group decided that quality control inspections should be carried out by site supervisory staff for works in progress.

### **Audit observations**

3.39 **As the technical assurance audits are independent examinations of the quality of the maintenance works, Audit considers that they should cover the following critical work stages:**

- (a) **during the works period.** This helps check the quality of works and the contractor's performance, particularly in respect of works which may later be concealed, or works which have been substantially delayed;
- (b) **right after completion.** This helps check whether the site supervisory staff have pre-maturely certified the completion of the works orders; and
- (c) **right after the expiry of the defects liability period.** This helps check that there are no outstanding defects rectification works.

**Audit also considers that more technical assurance audits should be carried out on works orders costing over \$10,000.**

### **Audit recommendations**

3.40 **Audit has *recommended* that the Director of Architectural Services should carry out technical assurance audits covering the following critical work stages:**

- (a) **during the works periods (particularly in respect of works which may later be concealed, or works which have been substantially delayed);**
- (b) **right after completion; and**
- (c) **right after the expiry of the defects liability period.**

### **Response from the Administration**

3.41 **The Director of Architectural Services agrees with the audit recommendations mentioned in paragraph 3.40.**



## **PART 4: MEASUREMENT AND PAYMENT FOR WORKS ORDERS**

4.1 This PART examines the measurement and payment for works orders issued under the term contracts.

### **Measurement and payment procedures**

4.2 ***Schedule of rates.*** Payment to the contractor for works done under a term contract is calculated in accordance with the schedule of rates, which forms an integral part of the contract. Whenever possible, items included in the schedule of rates should be used for the works. The works should be measured in accordance with the instructions detailed in the schedule of rates, and paid for at the rates specified therein and as amended by the contract percentage quoted by the contractor in the tender (Note 24). The contractors may also apply for non-schedule rates for special items.

4.3 ***Cost estimates and interim payments.*** The ArchSD prepares cost estimates of the works orders based on the schedules of rates before issuing them to the contractors. The cost estimates of works orders are used as the basis of committing funds and making interim payments to contractors. In accordance with the terms of the contracts, interim payments may be made during the progress of the works, as follows:

- (a) upon the receipt of contractors' applications for interim payments, the site supervisory staff check the payment percentages claimed for each works order against the actual works progress on site, making amendments where appropriate;
- (b) the staff recommend the applications for approval;
- (c) payments are calculated by applying the payment percentages on the cost estimates of the works orders; and
- (d) interim payments not exceeding 75% of the estimated value of the works executed may be made to the contractors.

4.4 ***Submission of dimension books by contractors.*** The works executed should be measured by the contractor in accordance with the schedule of rates, where appropriate, during the progress of, or as soon as possible after the completion of the works order. A

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**Note 24:** *For tendering purpose, the schedule of rates is grouped into trade sections. The ArchSD predetermines a standard market rate for each item in the trade sections. Tenderers offer a contract percentage (percentage addition or percentage deduction) for each trade section. A percentage addition tendered represents an increase on the scheduled rates, and a percentage deduction represents a decrease.*

further interim payment not exceeding 10% of the estimated value of the works executed may be made upon the contractor's submission of dimension books (Note 25) within the period stipulated in the contract.

4.5 **Batch payment system.** A batch payment system is used for processing the completed works orders. The works orders are batched and sample checked for accuracy of the measurements in the dimension books submitted by the contractor. After checking the samples and agreeing any corrections with the contractor, the percentage error between the claimed total values of the samples and the corrected total values of the samples in a batch is applied to adjust the claimed values of all the works orders in the batch.

4.6 **Final payment.** The ArchSD makes a final offer to the contractor, certifying as correct the final value of the works orders in the batch. Upon acceptance by the contractor, the final payment is made (less any interim payments previously paid).

### **Preparing and revising cost estimates of works orders**

4.7 **Estimates of works orders.** According to the ArchSD's project administration manuals, all estimate sheets should be checked and endorsed by the Property Services Manager or Building Services Engineer prior to authorising funds and issuing works orders. The estimate sheets should be properly filed. They should be reviewed and revised as necessary during the progress of, and on completion of the works orders.

4.8 **Revision of cost estimates.** Project officers have to monitor the overall financial position of the projects under their control and take immediate action to amend the estimated values of the works orders if they would be exceeded.

4.9 Interim payments are made based on the estimated value. If the contractor is to be paid his entitlement, the estimate should be reasonably accurate and should be updated immediately after variations have been authorised. Any revision of the estimate should not be neglected, or left until the works have been completed, or until the dimension books have been submitted.

4.10 **Outsized final claims.** When the final claimed value of a works order deviates significantly from the estimate, the computer system generates an outsized claim report. The outsized claim report highlights deviations by works types and works order values (see Table 9 for details).

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**Note 25:** *The submitted dimension books should be accompanied by supporting vouchers, invoices, receipts or other documents required by the ArchSD.*

**Table 9**  
**Outsized claim report**

<b>Works type</b>	<b>Works order value</b>	<b>Included in report if the claimed value was larger/smaller than the estimated value by</b>
	<b>(\$)</b>	<b>(%)</b>
<b>Design-and-construct works and building works</b>	< \$5,000	100%
	\$5,000 to \$50,000	50%
	> \$50,000	20%
<b>Electrical works</b>	All values	50%

*Source: ArchSD records*

The outsized claims may be caused by inaccurate estimate, inaccurate claims, or input errors. The Senior Property Services Manager/Senior Building Services Engineers have to reassess the accuracy of the estimates because the big difference between the claimed value and the estimated value may be due to poor estimation.

***Audit examination of outsized claim reports***

4.11 Audit examined the daily outsized claim reports for the quarter ended 30 June 2004. During the quarter, 4,268 works orders were batched (see para. 4.5). Of these, the estimates of 214 works orders deviated significantly from the values claimed by the contractors. After a review and valuation by the ArchSD, the status of these 214 works orders (as at end of December 2004) was as follows:

- (a) the ArchSD had revised the estimates of 154 works orders to match with the claimed values;
- (b) the estimates of 10 works orders remained unchanged; and

- (c) the valuation of 50 works orders was still in progress.

4.12 Audit further analysed the 154 works orders (see Table 10 for details). As shown in Table 10:

- (a) the estimates of about 3.6% (i.e. 154 out of 4,268) of the batched works orders deviated significantly from the claimed values and were subsequently revised;
- (b) for the works orders of \$50,000 to \$300,000, and those over \$300,000:
  - (i) the percentages of works orders with estimates deviating significantly from the claimed values were 10% and 5.4% respectively; and
  - (ii) the percentages of works orders of design-and-construct contracts with estimates deviating significantly from the claimed values were 15.7% and 6.8% respectively.

**Table 10**  
**Outsized claim reports**  
**(for the quarter ended June 2004)**

	Estimated value of works order			
	< \$50,000	\$50,000 — \$300,000	> \$300,000	Total
<b>(A) Works orders batched</b>				
<b>Types of works orders</b>	<b>(Nos.)</b>	<b>(Nos.)</b>	<b>(Nos.)</b>	<b>(Nos.)</b>
(i) Design-and-construct works	85	89	191	365
(ii) Building works	2,728	384	151	3,263
(iii) Electrical works	529	86	25	640
<b>Total</b>	<b>3,342</b>	<b>559</b>	<b>367</b>	<b>4,268</b>
<b>(B) Works orders with estimates subsequently revised upon valuation</b>				
<b>Types of works orders</b>	<b>(Nos.)</b>	<b>(Nos.)</b>	<b>(Nos.)</b>	<b>(Nos.)</b>
(i) Design-and-construct works	1	14	13	28
(ii) Building works	66	37	6	109
(iii) Electrical works	11	5	1	17
<b>Total</b>	<b>78</b>	<b>56</b>	<b>20</b>	<b>154</b>
<b>(C) The number of works orders with revised estimates as a percentage of the total number of works orders batched ((C) = ((B)÷ (A))× 100%)</b>				
<b>Types of works orders</b>	<b>(%)</b>	<b>(%)</b>	<b>(%)</b>	<b>(%)</b>
(i) Design-and-construct works	1.2	15.7	6.8	7.7
(ii) Building works	2.4	9.6	4.0	3.3
(iii) Electrical works	2.1	5.8	4.0	2.7
<b>Total</b>	<b>2.3</b>	<b>10.0</b>	<b>5.4</b>	<b>3.6</b>

Source: ArchSD records

4.13 Audit randomly selected 20 works orders the estimates of which had deviated significantly from the claimed values for examination. The estimates of these works orders were subsequently revised. Audit found that there were no review and revision of the estimates for most of the 20 works orders before the certification of interim payments. Table 11 is a summary of the audit examination of the 20 works orders.

Table 11

## Audit examination of 20 works orders in outsized claim reports

Works order (20 nos.)	Original estimate	Final estimate (to match claimed value)	Changes to works orders during construction	Revision of estimate at interim payment
	(\$)	(\$)	(Yes/No)	(Yes/No)
1.	100,000	64,040	No	No
2.	415,000	290,800	Yes (Note 1)	No
3.	105,000	63,000	No	No
4.	19,500	8,700	No	No
5.	58,000	35,000	Yes	No
6.	750,000	463,000	No	No
7.	670,000	496,500	No	Yes (Note 2)
8.	50,000	18,000	No	No
9.	75,000	32,000	Yes	Yes (Note 2)
10.	440,000	273,000	Yes	No
11.	60,000	23,000	No	No
12.	148,000	98,500	Yes (Note 1)	No
13.	202,000	159,100	No	No
14.	155,000	50,400	Yes	No
15.	17,000	6,950	No	No
16.	96,000	42,000	Yes	No
17.	190,000	340,000	Yes (Note 1)	No
18.	410,000	528,600	No	No
19.	300,000	400,000	No	Yes (Note 2)
20.	300,000	180,000	Yes	No

Source: ArchSD records

Note 1: Despite the addition of works items, there was no change made to the estimate.

Note 2: The estimate was reviewed and revised at the certification of the interim payment. However, the revised estimate still deviated from the claimed value. This deviation triggered the generation of an outsized claim report.

## **Audit observations**

4.14 Audit considers that the percentages of works orders with estimates deviating significantly from the claimed values were high, particularly for works orders over \$50,000 and for those of the design-and-construct term contracts (see para. 4.12 and Table 10). **The ArchSD should review its control procedures to improve the accuracy of the estimates of the works orders. The ArchSD should consider using professional quantity surveyors to prepare estimates for high-value works orders.**

4.15 The examination of the 20 works orders in the outsized claim reports (see para. 4.13) revealed that, for most of the works orders, the requisite review and revision of the estimate were not carried out before the certification of interim payments, and on completion of the works orders (Note 26). **Audit considers that the ArchSD should ensure that its laid down control procedures are complied with. This would help avoid overpayment or underpayment to contractors, both of which are undesirable.**

## **Audit recommendations**

4.16 **Audit has recommended that the Director of Architectural Services should strengthen the ArchSD's control procedures (particularly for works orders over \$50,000) to ensure that:**

- (a) **the original estimate of a works order is as accurate as circumstances permit; and**
- (b) **the estimates of works orders are critically reviewed and, where appropriate, revised before the certification of interim payments, and on completion of the works orders.**

## **Response from the Administration**

4.17 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 4.16. He has said that:

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**Note 26:** *As mentioned in paragraph 3.36, the Technical Assurance Audit Team undertakes technical assurance audits on the preparation of cost estimates and interim payment certification of works orders.*

- (a) the ArchSD recognises the importance of maintaining accurate estimates. The enhancement of the computer system (see para. 3.35 (a)) will enable electronic preparation and revision of estimates. The staff will be reminded by the system to update and review the estimates before the certification of interim payments, and on completion of the works orders;
- (b) there are practical difficulties in preparing accurate estimates for works in occupied buildings as problems and additional requests might only arise and/or be identified when works are in progress;
- (c) the ArchSD will continue to explore improvement measures to see how works orders estimates can be kept under continuous review during the works; and
- (d) the ArchSD has also put in place internal procedures to revise downwards, if necessary, the maximum interim payment percentage payable to contractors to safeguard the Government's interest.

### **Submission of dimension books by contractors**

4.18 ***Submission of dimension books.*** As mentioned in paragraph 4.4, in order to claim final payments, the contractor has to submit dimension books for checking by the ArchSD. The contractor is required under the contract to submit dimension books within 90 days of completion of the works.

4.19 ***Recovery of interim payments for overdue dimension books.*** Upon confirmation with the contractor, the project staff is required to input the completion date into the computer for generation of the completion certificate. According to the ArchSD's project administration manuals, if dimension books are not submitted within 90 days from the completion date of a works order, a report is generated by the computer for recovering the interim payments paid to the contractor. The project officer is required to ensure that the completion dates of works orders are promptly entered into the computer so that cases of overdue dimension books can be detected as early as possible. The amount recovered will be released when the dimension books have been submitted. According to the contract, the interim payments to be recovered are as follows:

- (a) for interim payments not exceeding \$20,000, the ArchSD would recover the total amount; and



- (b) for interim payments exceeding \$20,000, the ArchSD would recover \$20,000 plus 50 % of the amount paid in excess of \$20,000.

## **Audit observations**

### ***Late submission of dimension books***

4.20 Audit examined the works orders issued under the 17 term contracts as listed in Appendix B. For these contracts, there were 73,657 works orders completed before 1 April 2004. In accordance with the requirement to submit dimension books within 90 days of completion of the works, the contractors should have submitted the dimension books by end of June 2004. The audit examination found that the position as at 4 October 2004 was as follows:

- (a) **for 1,859 (2.5%) works orders with a total cost estimate of \$184 million, the contractors had not yet submitted the dimension books;**
- (b) **for 41,518 (56.4%) works orders with the dimension books submitted, there had been delays in the submission of the dimension books; and**
- (c) for 30,280 (41.1%) works orders, the dimension books had been submitted within the stipulated period.

4.21 Table 12 is a summary of the extent of the late submission of the dimension books mentioned in paragraph 4.20(a) and (b).

Table 12

**Overdue/late submission of dimension books  
(position as at 4 October 2004)**

Overdue/ late submission	Works orders with overdue dimension books (Note 1)		Works orders with late submission of dimension books (Note 2)		Total		
	(a)	(b)	(c)	(d)	(e)= (a)+ (c)	(f)	
(Days)	(Nos.)	(%)	(Nos.)	(%)	(Nos.)	(%)	
<b>100</b>	110	6%	27,588	67%	27,698	64%	
<b>&gt; 100 200</b>	571	31%	8,279	20%	8,850	20%	
<b>&gt; 200 300</b>	322	17%	3,221	8%	3,543	8%	
<b>&gt; 300 400</b>	235	} 856	13%	1,300	3%	1,535	4%
<b>&gt; 400 500</b>	163		9%	603	1%	766	2%
<b>&gt; 500</b>	458		24%	527	1%	985	2%
<b>Total</b>	<b>1,859</b>	<b>100%</b>	<b>41,518</b>	<b>100%</b>	<b>43,377</b>	<b>100%</b>	

Source: ArchSD records

Note 1: For these works orders completed before 1.4.2004, the contractors had not yet submitted the dimension books as at 4.10.2004 (see para. 4.20(a)).

Note 2: For these works orders completed before 1.4.2004, the contractors had submitted the dimension books by 4.10.2004, but there were delays in submission (see para. 4.20(b)).

4.22 Table 12 shows that, as at 4 October 2004, of the 1,859 works orders with overdue dimension books, the submission of the dimension books of 856 (46%) works orders had been overdue for more than 300 days. Table 12 also shows that for dimension books which had been submitted, many were not submitted until a long time after the due date.

4.23 The ArchSD had reminded contractors at various progress meetings to submit their dimension books on time, but usually to no avail. As mentioned in paragraph 4.19, if dimension books are not submitted within 90 days from the completion dates of works orders, the ArchSD could recover the interim payments from the contractors. **However,**

the completion dates of many works orders were input into the computer 180 days or more after the works had been completed (see para. 3.20). Thus, the computer reports prompting recovery action were only generated long after the due date for submission of the dimension books. This resulted in delay in the enforcement of the contractual provision for recovery of interim payments (see para. 4.19).

4.24 **Audit considers that late submission of dimension books is undesirable, as it would affect the ArchSD in performing proper checking on the works done, particularly when there are subsequent alterations to the works.**

4.25 According to the terms of the contracts, if the contractor fails to submit the dimension books within the stipulated period of 90 days without valid reasons, the ArchSD may value the works. The ArchSD's valuation should be final, and 7.5% of the value of the works determined by the ArchSD should be deducted as payment for the Employer's costs for the valuation. **Audit considers the ArchSD should, where appropriate, value the works in the event that the contractor fails to submit the dimension books, particularly for those long overdue cases.**

### **Audit recommendations**

4.26 **Audit has *recommended* that the Director of Architectural Services should:**

- (a) **critically review the reasons for the delay in the submission of dimension books by contractors and take follow-up actions promptly;**
- (b) **ensure that the completion dates of works orders are promptly input into the computer so that cases of overdue dimension books can be detected as early as possible for timely recovery of interim payments, if necessary; and**
- (c) **in the event that the contractors fail to submit the dimension books, consider valuing the works in accordance with the provision of the contracts, particularly for long overdue cases.**

### **Response from the Administration**

4.27 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 4.26. He has said that the enhancement of the computer system (see para. 3.35(a)) will incorporate functions for monitoring the timely input of the

completion dates of works orders into the computer and the processing of tentative offers (see para. 4.31). Through the addition of workstations and handheld device for fieldwork, the system will be more accessible to staff to facilitate the management of works orders.

### **Checking and adjustment of contractors' claimed values**

4.28 ***Batching and sampling.*** As mentioned in paragraph 4.5, dimension books are sample checked for accuracy of measurements. The measurements in the dimension books submitted would be processed and analysed by the ArchSD's computer for production of a bill containing the contractor's claimed values. A works order is batched when its completion date is reported and its dimension books processed. As soon as the number of the works orders reaches the requisite size for forming a batch, a batch list showing the works orders included and the samples selected for checking of the measurements is produced.

4.29 ***Single batch and multiple batch.*** The works orders would be batched in accordance with a set of predetermined criteria which specified the minimum and maximum number of works orders required to form a batch. For design-and-construct term contracts, a batch consisting of only a works order (i.e. single batch) is formed for checking. For maintenance term contracts, a batch consisting of many works orders (i.e. multiple batch) is formed. In accordance with the terms of the contracts, only random samples of not less than 10% by number and by value of the claimed total value are selected by the computer for checking.

4.30 ***Checking of contractor's claimed values.*** For the works orders and the dimension books selected in the samples, the ArchSD carries out the following checks:

- (a) ***Office check.*** This involves checking the correctness of items in the dimension books;
- (b) ***Site check.*** This involves verification on site the items and measurement of works claimed in the contractor's dimension books; and
- (c) ***Technical check.*** This involves checking the accuracy of adjustments made in the office and site checks.

To control the quality of these checks, works orders are randomly sampled by the Senior Quantity Surveyor for a recheck by the Quality Control Unit (Note 27) of the Quantity Surveying Section. The officers responsible for the checking and the time limits are shown in Appendix F.

4.31 ***Tentative offer.*** A tentative offer is the summary of the values of a batch of works orders forwarded (together with dimension books) to the contractor for his agreement. The summary shows the claimed and the checked value of a sample and the corrected or adjusted value of each works order after the adjustment percentage has been applied (see para. 4.5). The contractor is required to signify his agreement with the amounts shown on the batch summary and the corrected dimension books, or to notify the ArchSD in writing of his disagreement within the stipulated period (45 days for maintenance term contracts and 90 days for design-and-construct term contracts counting from the date the batch summary is forwarded).

4.32 ***Final offer and final payment.*** A final offer is the final value of the works orders after adjustments have been made as a result of checks by the ArchSD or objection from the contractor to the tentative offer. Upon the return of the batch summary signed by the contractor, the ArchSD certifies the amount as the final value of the works orders in the batch. It then prepares the certificate for final payment less any interim payments made. If the contractor fails to sign and return the batch summary and the corrected dimension books, and fails to serve the notice of disagreement within the stipulated time (see para. 4.31), the ArchSD may, in accordance with the contract, certify as correct the amounts shown on the batch summary and pass such certificate for payment, where upon the contractor should have no further claim in respect of the works orders in the batch.

## **Audit observations**

### ***Long time taken in checking contractor's claimed value and agreeing on tentative offer***

4.33 Audit examined the 288 batches of works orders finalised in August 2004. For 233 (81%) batches, the ArchSD took more than 100 days to check the contractors' claimed values and to agree on the tentative offers. For 70 (24%) batches, the ArchSD took more than 300 days to complete the process. Audit selected 14 of the 70 batches of works orders for further analysis. A summary of the analysis is shown in Table 13.

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**Note 27:** *The Quality Control Unit is headed by a Principal Survey Officer. He is assisted by two Senior Survey Officers. The Unit is responsible for quality checking of the dimension books.*

Table 13

## Checking of contractor's claimed value and agreeing on tentative offer

Batch	Sampled works orders	Duration to check the claimed value (Note 1)	Duration to agree on the tentative offer (Note 2)
	(Nos.)	(Days)	(Days)
	(a)	(b)	(c)
<b>(A) Multiple batch</b>			
Batch A	7	1,091	843
Batch B	5	378	16
Batch C	7	445	170
Batch D	4	438	22
Batch E	4	487	18
Batch F	5	92	692
<b>(B) Single batch</b>			
Batch G	1	521	843
Batch H	1	504	18
Batch I	1	1,450	154
Batch J	1	780	14
Batch K	1	538	43
Batch L	1	558	26
Batch M	1	491	26
Batch N	1	576	13

Source: ArchSD records

Note 1: This was the duration to complete the checking of the sampled works order(s) and adjusting the dimension books, where necessary, after each stage of checking. The checking included the office check, the site check, the technical check, and the recheck by the Quality Control Unit.

Note 2: This was the duration from the completion of checking of the sampled works order(s) of the batch to the agreement of the tentative offer with the contractor.

4.34 According to the ArchSD computer manuals, the time required from the production of a batch list to the generation of a tentative offer ranges from 30 to 96 days. As shown in column (b) of Table 13, for most of the batches, the ArchSD took a long time to complete the checking of the contractors' claimed values. **Audit considers that the**

**ArchSD should take action to ensure that the checking and adjustment of dimension books are promptly completed.**

4.35 As shown in column (c) of Table 13, for some of the batches, the ArchSD also took a long time in reaching agreements with the contractors on the tentative offers. Audit noted that in three batches (Batch A, Batch F and Batch G), the contractors only notified the ArchSD of their disagreements over the adjusted values long after the stipulated period of time (see para. 4.31). Thereafter, the ArchSD also took a long time in revising the tentative offers. **Audit considers that the ArchSD should strictly enforce the condition of contract that the contractors should notify the ArchSD of any disagreements over the tentative offers within the stipulated period of time. The ArchSD should also respond to the contractors' disagreements promptly.**

***Previous term contracts not yet finalised***

4.36 There were also a number of previous term contracts (other than those listed in Appendix B), which had elapsed for a long time (from two to more than nine years) but the contracts had not yet been finalised (see Appendix G for a list of these contracts). The delay was mainly due to the late submission of the outstanding dimension books, and/or the lack of agreement on the contractors' claimed values of some works orders (some contractors had actually defaulted).

**Audit recommendations**

4.37 **Audit has recommended that the Director of Architectural Services should:**

- (a) **ensure that the checking and adjustment of dimension books are promptly completed;**
- (b) **strictly enforce the condition of contract to ensure that contractors notify the ArchSD of any disagreements over the tentative offers within the stipulated period of time;**
- (c) **deal with contractors' disagreements promptly;**
- (d) **take prompt actions to finalise the previous term contracts (mentioned in para. 4.36) which have elapsed for a long time; and**

- (e) **consider setting performance targets for the actions mentioned in the audit recommendations in sub-paragraphs (a) and (c) above.**

### **Response from the Administration**

4.38 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 4.37. He has said that:

- (a) the ArchSD will give priority to finalising the previous term contracts which have elapsed;
- (b) one of the reasons for the late finalisation of the accounts is the increase in workload over the years without a corresponding increase in staff. The ArchSD is exploring new modes of service delivery on a continuous basis;
- (c) the ArchSD has used more lump sum contracts for works with clearly defined scope and works programme in the past two years. This has eliminated the need for comprehensive remeasurement of the works done;
- (d) the ArchSD is progressively outsourcing accounts checking work to quantity surveying consultants. For maintenance term contracts, the ArchSD has already outsourced approximately 20% of the workload. Another two consultancy agreements are being prepared for further outsourcing; and
- (e) The ArchSD has set performance targets in 2005 for dimension book checking. The targets are that 80% of the dimension books should have the checking completed within the following time frame:
  - (i) 7 working days for works orders costing \$10,000 or less; and
  - (ii) 14 working days for works orders costing more than \$10,000.



## **PART 5: A CASE STUDY ON MAINTENANCE OF GOVERNMENT BUILDINGS**

5.1 This PART examines the planning and implementation of maintenance works for government buildings by reference to a case study on the maintenance of the Star Ferry Carpark Building. The audit focused on the maintenance works of the building since 2001.

### **Star Ferry Carpark Building**

5.2 The Star Ferry Carpark Building (hereinafter referred to as the building) was built in 1958. It consists of the ground floor, the first floor and the roof floor. There are 370 car parking spaces and 35 motorcycle parking spaces. The Property Services Branch of the ArchSD is responsible for the general maintenance of the building. Apart from general maintenance, the building is also subject to planned maintenance, and is normally redecorated on a 4-year cycle basis, subject to the availability of funds. The building is licensed to a carpark operator for daily operations under a tenancy agreement (Note 28). From 2001 to early 2004, seven works orders costing \$5.9 million were issued for the maintenance of the building (see paras. 5.3 to 5.8 for details).

### **Maintenance works for the carpark building**

5.3 ***Works order issued in July 2001.*** In July 2001, following complaints over spalling concrete defects and defective waterproofing of the roof floor, the ArchSD issued Works Order (WO)(1), with a cost estimate of \$10,000, under a maintenance term contract (Note 29) to repair the spalling concrete. In October 2001, the Transport Department raised concern over the dilapidated condition of the building. Subsequent to an inspection, the ArchSD noted that the overall spalling concrete problem was serious. The ArchSD considered that the deterioration was due to ageing and the corrosive environment at the waterfront. In November 2001, the ArchSD initiated a planned maintenance project (Note 30) to increase the scope of the works for the building. The cost estimate of WO(1)

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**Note 28:** *According to the ArchSD, under the tenancy agreement, the ArchSD's obligations to carry out any repair or remedy works to the building should not arise unless the ArchSD received written notifications of any defect or need for repair from the carpark operator.*

**Note 29:** *The maintenance works for the building, both general and planned maintenance, were implemented under a maintenance term contract during the period from 1 April 2001 to 31 March 2004.*

**Note 30:** *Upon Audit's enquiry, the ArchSD said that, unlike other planned maintenance, WO(1) issued in 2001 was an ad hoc one. The comprehensive inspection, which was required for the advanced planning of the maintenance works, was therefore not applicable. The ArchSD also said that the last planned maintenance carried out for the building was in 1995.*

was revised from \$10,000 to \$1,850,000 (the latest cost estimate being \$1,700,000). The amended works order covered the repainting of the whole building, both interior and exterior, and some other structural replacement works. The majority of the works were completed in June 2002 (Note 31).

5.4 ***Works order issued in October 2002.*** In October 2002, the ArchSD was informed that 37 car parking spaces on the first floor of the building were closed as water had been dripping and paint peeling-off from the ceiling, causing damage to the vehicles. In October 2002, as an interim measure to prepare for the reopening of the car parking spaces, the ArchSD issued WO(2), with a cost estimate of \$78,000, to remove the loosened paint coating and to apply a new coating on the ceiling. The works were completed in October 2002 as scheduled.

5.5 ***Works order issued in November 2002.*** In November 2002, the ArchSD issued WO(3), with a cost estimate of \$680,000, to replace the aged luminaries in the building to improve lighting and enhance safety to the users. The works order covered primarily the installation of lighting with conduits, trunking and wiring. The works were completed in May 2003.

5.6 ***Works order issued in January 2003.*** In late 2002, the ArchSD engaged a consultant to study the leakage problem. The consultant considered that the leakage problem was possibly caused by the wearing-out of the roof surfacing material, thus exposing the waterproofing material underneath. The waterproofing material was damaged, and became ineffective because it was not designed to resist direct ultra-violet light and prolonged physical wearing by vehicular traffic. In January 2003, the ArchSD engaged a specialist contractor, under a lump-sum works order (WO(4)), with a cost estimate of \$1,628,680, to replace the roof surfacing material with a proper waterproofing system for the whole roof. The works were carried out in conjunction with the lighting improvement works of WO(3). While the majority of the works were completed by late March 2003, the works were actually completed in mid-January 2004 due to the need to rectify defects. Photograph 4 shows the damaged roof surfacing material of the building.

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**Note 31:** *When the maintenance works were being carried out, the ArchSD also arranged for the contractor of a previous roofing contract to rectify the leakage problem of the roof-waterproofing layer. The roofing contract was under a 7-year warranty period until May 2002.*

**Photograph 4**

**Damaged roof surfacing material of the building**



Source: ArchSD records

5.7 **Works orders issued in late 2003 and early 2004.** In October 2003, the ArchSD was informed that spalling concrete with exposed steel bars were found at the ceiling of the first floor of the building. In November 2003, upon site visit, the ArchSD noted that there were also defective ceiling plasters in addition to spalling concrete, both resulting from the wiring works carried out to improve the lighting (see para. 5.5). To repair the spalling concrete and defective ceiling plasters, the ArchSD issued the following three works orders:

- (a) **WO(5) issued in November 2003.** The cost estimate was \$84,000 but was subsequently increased to \$1,820,000. This works order initially covered minor touch-up works. In the end, it covered extensive spalling concrete repair works and repainting works at the ground floor and the first floor;
- (b) **WO(6) issued in December 2003.** The cost estimate was \$5,000; and
- (c) **WO(7) issued in January 2004.** The cost estimate was \$98,000.

Photograph 5 shows the spalling concrete with exposed steel bars at the ceiling. The works carried out under the three works orders were completed in February 2004.

**Photograph 5**

**Spalling concrete with exposed steel bars at the ceiling**



*Source: ArchSD records*

5.8 Table 14 is a summary of the works orders issued for the building since 2001.

**Table 14**  
**Works orders issued for Star Ferry Carpark Building**

Works order	Job description	Works order issue date	Original cost estimate	Latest cost estimate	Amount paid upon finalisation	Completion date
			(\$)	(\$)	(\$)	
WO(1)	Repair works for spalling concrete, repainting of the whole building, and some structure replacement works	12.7.2001	10,000	1,700,000	— (Note)	30.6.2002
WO(2)	Temporary repair works to deal with water seepage on the first floor	10.10.2002	78,000	124,000	125,011	30.10.2002
WO(3)	Replacement of lighting to improve the lighting levels	14.11.2002	680,000	600,000	— (Note)	29.5.2003
WO(4)	Replacement of the roof surfacing material with a proper waterproofing system for the whole roof	3.1.2003	1,628,680	1,628,680	1,628,680	16.1.2004
WO(5)	Repair works for spalling concrete and defective ceiling plasters	20.11.2003	84,000	1,820,268	— (Note)	29.2.2004
WO(6)	Taking down, re-fixing and installing lighting fitting for building works	2.12.2003	5,000	4,300	4,235	16.2.2004
WO(7)	Repair works for spalling concrete of soffit, wall and column on the roof floor	17.1.2004	98,000	98,000	91,832	11.2.2004
		<b>Total</b>	<b>2,583,680</b>	<b>5,975,248</b>		

Source: ArchSD records

Note: The works order had not yet been finalised as of February 2005.

## **Audit observations**

### ***Planning of maintenance works***

5.9 **In view of the frequent, extensive and repetitive maintenance works carried out from 2001 to early 2004 (as discussed in paras. 5.3 to 5.8), Audit considers that there is scope for improvement in planning the maintenance works for the building.**

### ***Control over additional works***

5.10 As mentioned in paragraph 5.7, for WO(5) issued in November 2003, the original cost estimate was \$84,000, which only covered minor touch-up works. The works order was completed in February 2004.

5.11 In March 2004, the Property Services Officer responsible for the works order informed the Property Services Manager that, based on the records of the “hidden” works (Note 32) measured, the cost estimate of the works order had to be revised from \$84,000 to \$1,700,000 (Note 33). The Property Services Officer sought the Property Services Manager’s endorsement of the revised cost estimate. From the breakdown of the revised estimate, Audit noted that the cost of the spalling concrete repair works was \$1,133,000. As for the repainting works at the ground floor and the first floor, which had not been included in the original estimate, the cost estimate was \$575,000. In June 2004, the Chief Property Services Manager gave retrospective approval for the works. In November 2004, the ArchSD accepted the works records submitted by the contractor.

5.12 **Audit considers that, for additional works that are not covered in the original cost estimate of a works order, they should be endorsed by a Property Services Manager of an appropriate rank prior to the commencement of the works. This is particularly important if substantial hidden works are involved, or if the revised cost estimate is much higher than the original cost estimate.**

## **Audit recommendations**

5.13 **Audit has *recommended* that the Director of Architectural Services should:**

- (a) **improve the planning of maintenance works, particularly those which are extensive, to avoid frequent and/or repetitive works which may incur additional costs and cause inconvenience to the public;**

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**Note 32:** *Hidden works are works which will be concealed or put out of view and cannot be measured after completion.*

**Note 33:** *According to the ArchSD, unlike other maintenance works (e.g. painting), the extent of concrete repair works could not be accurately estimated until completion of hacking off of the spalling concrete by the contractor and on-site checking by the ArchSD staff.*

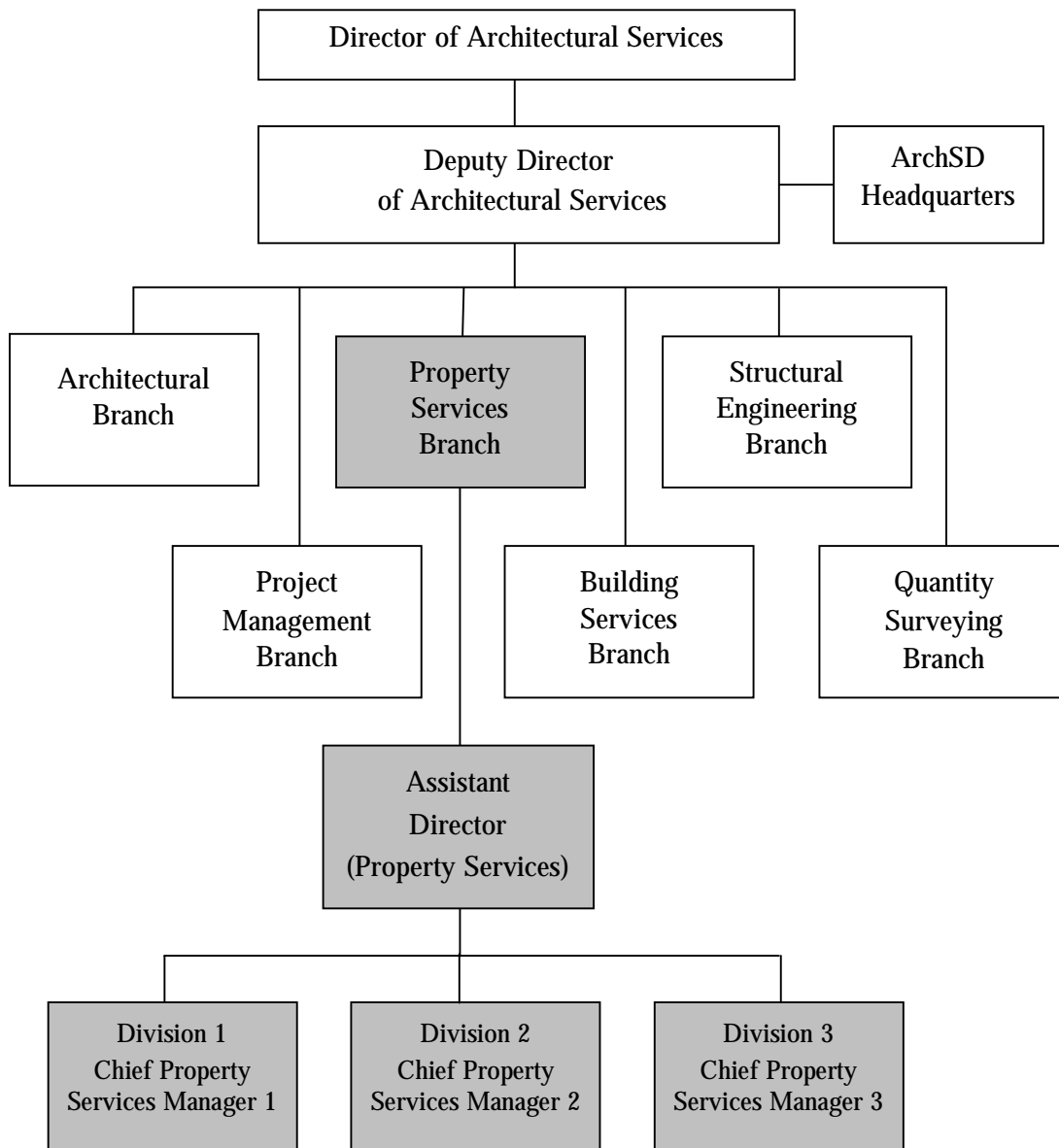
- (b) **for additional works to be carried out under a works order, take action to ensure that the scope and cost of the works are endorsed by a Property Services Manager of an appropriate rank prior to the commencement of the works; and**
- (c) **to avoid leakage problems similar to those of the Star Ferry Carpark Building, issue a technical information paper to give guidance on the design of the waterproofing system for the floor of roof car parks.**

### **Response from the Administration**

5.14 The **Director of Architectural Services** agrees with the audit recommendations mentioned in paragraph 5.13. He has said that:

- (a) the Star Ferry Carpark Building is a 40-year old building. Spalling concrete and roof repairs have to be carried out from time to time because of the corrosive marine environment and intensive usage;
- (b) the ArchSD staff would communicate more proactively with the carpark management on maintenance matters;
- (c) the staff will be reminded to take more proactive action in conducting maintenance inspection for leased premises, even though there may be terms in the tenancy agreement requiring the tenant to report in writing to the Government regarding building defects;
- (d) the two works orders (WO(1) and WO(5)) for repairing the spalling concrete should have been certified complete once the initial intended scope of repair works was completed. When it was later found necessary to expand the scope of the works significantly, new works orders should have been issued;
- (e) the enhancement of the computer system (see para. 3.35(a)) will provide management function to ensure that additional works under a works order are endorsed by an officer of an appropriate rank, prior to the commencement of the works; and
- (f) the ArchSD will prepare a technical information paper to provide guidance on the design and installation of waterproofing system for roof car parks.

**Organisation structure of Architectural Services Department**



*Source: ArchSD records*



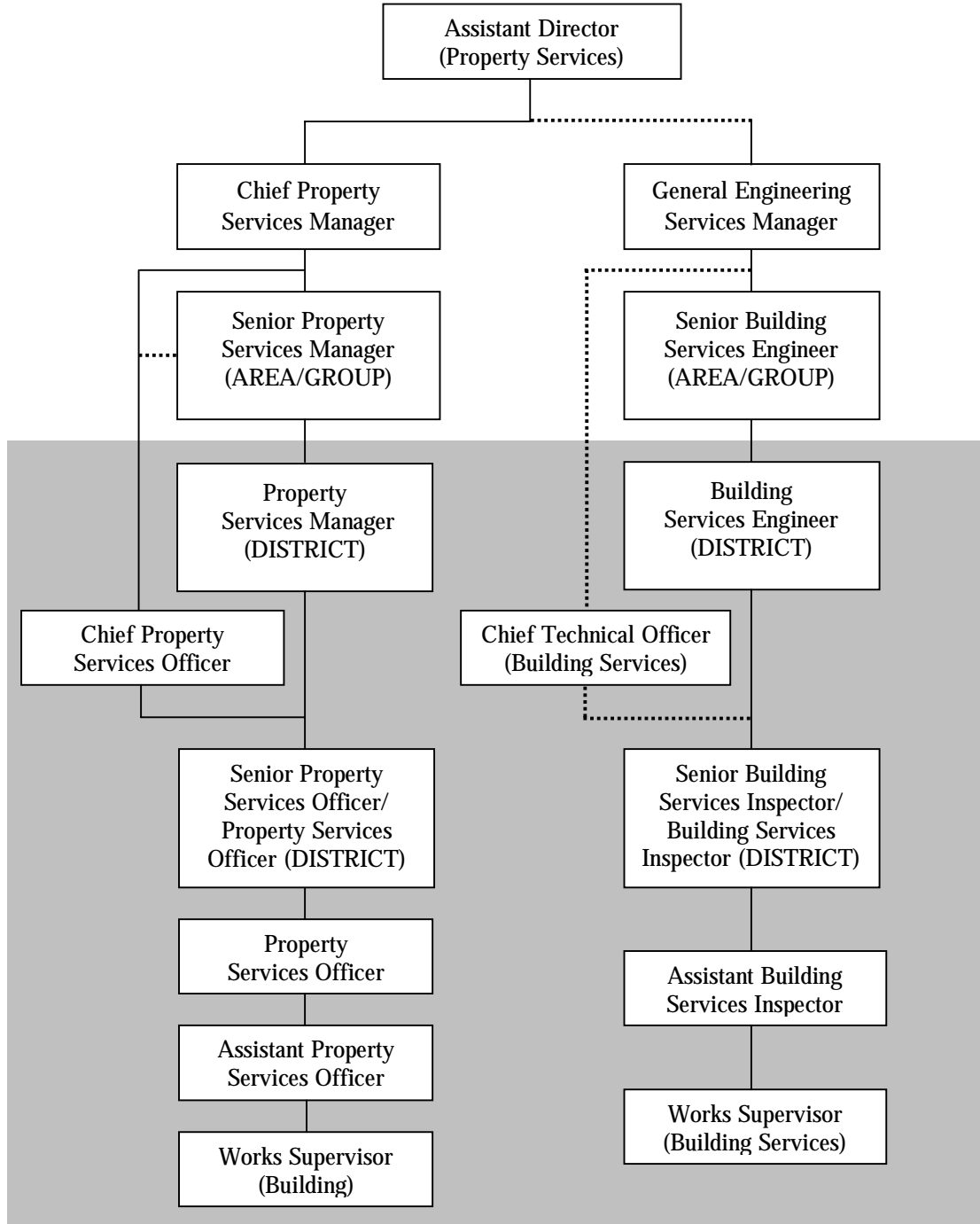
**Appendix B**  
(paras. 3.3, 3.4,  
3.21, 4.20 and  
4.36 refer)

**Audit examination of term contracts**

<b>Term contract</b>	<b>Contract period</b>	<b>Duration (months)</b>
<b>Maintenance term contract (10 nos.)</b>		
Contract A	1.4.01 – 31.3.04	36
Contract B	1.4.01 – 31.3.04	36
Contract C	1.4.01 – 31.3.04	36
Contract D	1.4.01 – 31.3.04	36
Contract E	1.4.01 – 31.3.04	36
Contract F	1.4.01 – 31.3.04	36
Contract G	1.6.01 – 31.3.04	34
Contract H	1.6.01 – 31.3.04	34
Contract I	1.7.02 – 30.9.05	39
Contract J	1.7.02 – 30.9.05	39
<b>Design and construction of minor works term contract (4 nos.)</b>		
Contract K	1.11.02 – 31.10.04	24
Contract L	1.11.02 – 31.10.04	24
Contract M	1.11.02 – 31.10.05	36
Contract N	1.11.02 – 31.10.05	36
<b>Design and construction of fitting-out works term contract (3 nos.)</b>		
Contract O	1.6.01 – 31.5.03	24
Contract P	1.6.02 – 31.5.04	24
Contract Q	1.6.02 – 31.5.05	36

Source: ArchSD records

**Management structure of the Property Services Branch**



Legend: Direct relationship ———  
 Lateral relationship - - - - -  
 Project team [shaded area]

Source: ArchSD records

**Appendix D**  
(paras. 3.13 and  
3.21 refer)

**Works orders outstanding  
(position as at 4 October 2004)**

<b>Term contract</b>	<b>Works orders</b>		<b>Total</b>
	<b>With cost estimate &lt; \$50,000</b>	<b>With cost estimate \$50,000</b>	
	<b>(a)</b>	<b>(b)</b>	<b>(c) = (a) + (b)</b>
	<b>(Nos.)</b>	<b>(Nos.)</b>	<b>(Nos.)</b>
<b>Maintenance term contract (10 nos.)</b>			
Contract A	192	70	262
Contract B	134	88	222
Contract C	58	48	106
Contract D	70	24	94
Contract E	327	176	503
Contract F	160	82	242
Contract G	117	60	177
Contract H	64	48	112
Contract I	854	407	1,261
Contract J	595	251	846
<b>Subtotal</b>	<b>2,571</b>	<b>1,254</b>	<b>3,825</b>
<b>Design-and-construct term contract (7 nos.)</b>			
Contract K	4	131	135
Contract L	13	65	78
Contract M	16	142	158
Contract N	2	69	71
Contract O	1	14	15
Contract P	0	13	13
Contract Q	1	21	22
<b>Subtotal</b>	<b>37</b>	<b>455</b>	<b>492</b>
<b>Total</b>	<b>2,608</b>	<b>1,709</b>	<b>4,317</b>

Source: ArchSD records

**Appendix E**  
(paras. 3.17 and  
3.25 refer)

**Analysis of extensions of time granted to contractors**

Works order (20 nos.)	Inclement weather	Additional works	Coordination with other contractors	Awaiting supplier's warranty certificate	Pending client's arrangement	Others	Total EOT granted
	(Days)	(Days)	(Days)	(Days)	(Days)	(Days)	(Days)
1.	—	81	—	—	379 (Note 1)	—	460
2.	—	—	—	—	492	—	492
3.	—	—	—	—	538 (Note 2)	—	538
4.	—	—	—	—	—	350 (Note 3)	350
5.	—	—	—	—	488	—	488
6.	—	644	—	131	126	—	901
7.	91	184	—	—	90	334 (Note 4)	699
8.	46	210	—	—	107	8	371
9.	—	—	—	—	306	—	306
10.	—	—	—	—	791	—	791
11.	98	62	76	—	433	—	669
12.	33	—	—	—	211	—	244
13.	—	—	—	774	19	—	793
14.	—	—	—	—	456	—	456
15.	—	—	—	—	298	—	298
16.	—	365	—	—	—	—	365
17.	10	—	—	—	209	12	231
18.	—	221	—	—	89	—	310
19.	—	—	—	—	338	59	397
20.	—	—	92	—	267	90	449

Source: ArchSD records

Note 1: The EOT granted was due to the need to await client's access arrangement, and delay in supplying materials by the Government Logistics Department.

Note 2: Some of the EOTs granted were due to inclement weather.

Note 3: The EOT granted was due to the need to await connection of water meters by the Water Supplies Department.

Note 4: The EOT granted was due to the need for works to be executed phase by phase.

**Checking of contractor's claimed values**

Type of works	Claimed value of works order	Staff responsible for checking/ (Time allowed for checking)			
		Office check	Site check	Technical check	Quality Control Unit check
Building works	\$10,000	Supervisory staff	Supervisory staff	Quantity surveying staff	Quality control unit staff (building works)
		(7 days)		(7 days)	(7 days)
	> \$10,000	Supervisory staff	Quantity surveying staff	Quantity surveying staff	Quality control unit staff (building works)
		(14 days)	(14 days)		(14 days)
Electrical works	All values	Supervisory staff and technical grade staff (building services)	Supervisory staff and technical grade staff (building services)	Supervisory staff and technical grade staff (building services)	Quality control unit staff (building services)
		(14 days)			(14 days)

Source: ArchSD records

**Previous term contracts not yet finalised  
(as at 30.11.2004)**

<b>Term contract</b>	<b>Contract period</b>	<b>Contract period elapsed</b>
<b>Maintenance term contract</b>		
Contract 1 (Note 1)	1.4.1992 – 31.3.1995	9 years 8 months
Contract 2 (Note 1)	1.4.1992 – 31.3.1995	9 years 8 months
Contract 3	1.4.1995 – 31.3.1998	6 years 8 months
Contract 4 (Note 1)	1.4.1995 – 31.3.1998	6 years 8 months
Contract 5 (Note 2)	9.12.1997 – 31.3.1998	6 years 8 months
Contract 6 (Notes 1 and 2)	9.12.1997 – 31.3.1998	6 years 8 months
Contract 7	1.4.1998 – 31.3.2001	3 years 8 months
Contract 8 (Note 1)	1.4.1998 – 31.3.2001	3 years 8 months
Contract 9 (Note 1)	1.4.1998 – 31.3.2000	4 years 8 months
Contract 10	1.7.1999 – 30.6.2002	2 years 5 months
Contract 11	1.6.2000 – 31.5.2001	3 years 6 months
<b>Design-and-construct term contract</b>		
Contract 12	1.4.1996 – 31.3.1999	5 years 8 months
Contract 13	1.6.1999 – 31.5.2001	3 years 6 months
Contract 14	1.6.1999 – 31.5.2002	2 years 6 months
Contract 15	1.11.1999 – 31.10.2002	2 years 1 month
Contract 16	1.11.1999 – 31.10.2002	2 years 1 month
Contract 17	1.11.1999 – 31.10.2002	2 years 1 month

*Source: ArchSD records*

*Note 1: The contractors of these contracts had already defaulted. It was the same contractor for Contract 2, Contract 4, Contract 6 and Contract 9.*

*Note 2: Instead of being a contract, Contract 5 and Contract 6 represented the entrustment of the remaining works of a defaulted contract to other contractors.*

**Acronyms and abbreviations**

ArchSD	Architectural Services Department
ASG	Accommodation Strategy Group
Audit	Audit Commission
CWRF	Capital Works Reserve Fund
EOT	Extension of time
MBWC	Minor Building Works Committee
PWSC	Public Works Subcommittee
WO	Works Order