CHAPTER 4

Architectural Services Department
Administration Wing,
Chief Secretary for Administration's Office

Tamar Development Project

Audit Commission
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TAMAR DEVELOPMENT PROJECT

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TAMAR DEVELOPMENT PROJECT

Executive Summary

1. Tamar Complex is a landmark at Central waterfront. It occupies a site of 4.2 hectares, and comprises the Central Government Complex (CGC) and the Legislative Council (LegCo) Complex (LCC) of the Hong Kong Special Administrative Region. The objectives of the Tamar Development Project were to meet the increase in demand for office space and modern-working-environment requirements of the Government and LegCo. The Project was implemented under a design-and-build arrangement. Before selecting a contractor (Contractor A) and his design for the Project, the Government had launched a two-month exhibition of the project designs proposed by four tenderers and invited members of the public to express views and comments on the four designs.

2. The Architectural Services Department (ArchSD) was responsible for administering the works contract (Contract A) of the Project and supervising the construction works. In June 2006, the Finance Committee (FC) of LegCo approved funding of $5,168.9 million for the design and construction of the Project. In December 2009, the Approved Project Estimate of the Project was approved by the FC to increase to $5,528.7 million. Contract A commenced in February 2008 and was largely completed on schedule in September 2011. The Audit Commission (Audit) has recently conducted a review of the Government's planning and implementation of the Project, with a view to identifying areas for improvement.

Selection of project design and contractor

3. In October 2005, the Financial Secretary set up the Special Selection Board to oversee the tendering of the Tamar Development Project. In September 2006, the ArchSD invited four prequalified applicants to submit tenders for the Project. Subsequently, the tender sums of all four tenders received exceeded the contract sum provided in the Approved Project Estimate. In June 2007, the Board decided to set up the Tender Negotiation Team to conduct negotiation with Contractor A, who had obtained the highest overall tender score, with a view to reducing the tender sum to the contract sum provided in the Approved Project

Estimate. After several rounds of negotiation, in July 2007, Contractor A agreed, after making certain modifications to his tender, including modifying and removing certain works items originally included in the tender document, that the price of his tender be reduced to $4,940.3 million. In January 2008, the ArchSD awarded Contract A to Contractor A at a sum of $4,940.3 million (paras. 2.6 to 2.12).

4. ***Criteria for selecting tenderers for negotiation not stated in tender document.*** It was stated in the tender document that provisions of the Agreement on Government Procurement of the World Trade Organization would apply to the tender. According to the Agreement, a procuring entity shall ensure that, in the course of negotiations, any elimination of participants is carried out in accordance with the criteria set forth in the tender document of a tender exercise, and all modifications to the technical requirements of the tender exercise are transmitted in writing to all remaining participants in the negotiations. However, Audit notes that no criteria for selecting tenderers for negotiations were stated in the tender document, and some works items originally included in the tender document had been modified or removed during tender negotiation with Contractor A, but the other three tenderers were not informed of such modifications or removal (paras. 2.13 to 2.17).

5. ***Price ceiling not stated in tender document.*** Notwithstanding that the Special Selection Board considered it not practical or in the public interest to seek additional funding from the FC, a price ceiling of the contract sum provided in the Approved Project Estimate was not stated in the tender document. It transpired that the tender sums of all four tenders received exceeded the contract sum (paras. 2.19 and 2.20).

Implementation of contract works

6. The contract works were substantially completed on 1 September 2011, almost four months later than the original target completion date. Audit notes that one reason leading to the delay in works completion was the additional time taken in completing Footbridge A, which spans over Harcourt Road and is the main pedestrian passage for Tamar Complex (paras. 3.6 to 3.8).

7. ***Additional time taken in completing Footbridge A.*** The cost of Footbridge A only accounted for 0.7% of that of the Project. However, the ArchSD had taken 18 months from contract commencement to instructing Contractor A to commence works for Footbridge A, and Contractor A had taken another 15 months from receiving the ArchSD's instruction to commencing works for Footbridge A. Extension of time of about four months was granted for the related works. Audit notes that one reason for the additional time taken in completing Footbridge A was the ArchSD's lack of experience in administering works for constructing a footbridge located in busy-traffic areas with many underground utility facilities (paras. 3.8 and 3.10 to 3.13).

8. ***2006 Design Checklist not stated in tender document.*** The Tamar Development Project was the first Government project adopting seismic-resistant measures for building structures. As stated in the tender document, the design and construction of structures should comply with the Mainland's Code for Seismic Design of Buildings issued in 2001. After contract award, based on consultancy advice, the ArchSD considered that the seismic-resistant measures should also comply with the Design Checklist for Buildings Exceeding Limits issued by the related Mainland Authority in September 2006. However, the 2006 Design Checklist was not stated in the tender document. As a result, Contractor A was successful in making a financial claim of $150 million, of which $24 million was related to works acceleration and disruption, additional labour, plant and resources and overtime work (paras. 3.20 to 3.27).

Changes of contract requirements

9. In May 2006, the Property Vetting Committee approved the accommodation requirements of the CGC and the LCC. For the CGC, a total Net Operating Floor Area of 62,340 square metres (m^2) was provided, including a 10% area allowance for meeting the long-term requirements of the Government Secretariat. Regarding the LCC, a total of 16,090 m^2 of Net Operating Floor Area was provided, but without including any area allowance for future expansion. The ArchSD incorporated these area requirements into the tender document (paras. 4.2 and 4.13).

10. ***Additional area requirements made only after award of contract.*** In January 2009, the LegCo Secretariat informed the Administration that additional area was needed for the LCC, mainly to meet space requirements of additional LegCo staff. In April 2010, the ArchSD and Contractor A entered into a supplementary agreement for the construction of an additional Net Operating Floor Area of 1,415 m^2 at the LCC at a cost of $113 million, of which $36 million was related to works acceleration and disruption, and additional design fee. Audit considers that, had the additional LCC area requirement been included in the tender document, the additional cost of $36 million might have been saved or reduced (paras. 4.3, 4.15 and 4.16).

11. ***Long payback periods of some energy-efficiency equipment.*** According to a Joint Circular issued by the Development Bureau and the Environment Bureau in April 2009, the maximum payback period of energy-efficiency measures would normally be capped at nine years. However, Audit examination revealed that the payback periods of six items of energy-efficiency equipment installed at Tamar Complex would exceed nine years, ranging from 25 to 176.5 years (para. 4.32 and Appendix E).

Tamar Complex commissioning

12. ***Defects and outstanding works not yet rectified and completed.*** Audit notes that, as of November 2011 (when the overall handover was near completion), the works of 88,960 items (some 75% of all defects and outstanding works identified) had not been completed. As of August 2013, one year after expiry of the maintenance period of the CGC and the LCC, 495 items of defects and 2,260 items of minor defects had still not been rectified (paras. 5.5 and 5.6).

13. ***Fresh-water-supply system not fully sterilised before use.*** According to Water Supplies Department Circular Letter No. 6/2002, newly installed fresh water mains of a building should be cleaned and sterilised before they are put into operation. However, the fresh-water-supply system of Tamar Complex had not been fully sterilised before the Complex commissioning (paras. 5.15 and 5.23).

Audit recommendations

14. **Audit recommendations are provided in the respective sections of this Audit Report. This Executive Summary only highlights the key recommendations. Audit has *recommended* that, in implementing a related works project in future, the Administration should:**

Selection of project design and contractor

(a) **remind Government Bureaux and Departments of the need to state in the tender document the criteria for selecting tenderers for negotiations as far as practicable (para. 2.23);**

Implementation of contract works

(b) **take measures to minimise any delay in completing an ancillary structure which will entail a knock-on effect on the timely commissioning of the main project component (para. 3.14(a));**

(c) **in administering works for constructing a footbridge in busy-traffic areas with many underground utility facilities, adopt a foundation design that would not require relocation of utility services as far as possible (para. 3.14(b)(i));**

(d) **include in the tender document all standards or guidelines which would affect the works requirements (para. 3.33(a));**

Changes of contract requirements

(e) **in assessing the accommodation requirements of new buildings, provide an appropriate expansion factor for space requirements if there is the likelihood of an increase in space requirements in the near future (para. 4.22);**

(f) **incorporate all works requirements into the tender document as far as possible, and avoid making changes to works requirements after contract award (para. 4.23);**

(g) **take measures to ensure that the payback periods of individual items of energy-efficiency equipment are capped at nine years as far as possible (para. 4.45(a));**

Tamar Complex commissioning

(h) **take measures to ensure that all defects and outstanding works are respectively rectified and completed within the maintenance period or as soon as practicable thereafter (para. 5.13(b)(i)); and**

(i) **take measures to ensure that the fresh-water-supply system is fully disinfected before building commissioning (para. 5.26(a)).**

Response from the Administration

15. The Administration agrees with the audit recommendations.

PART 1: INTRODUCTION

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

Background

1.2 The Tamar site is located in Central near the waterfront. It was originally a basin used for a naval base. Subsequent to the relocation of the naval base to Stonecutters Island, reclamation of the basin took place from 1994 to 1997 to form a site of 5.3 hectares. In April 2002, the Government announced a plan to develop the Tamar site into a prime civic centre comprising the Central Government Complex (CGC) and the Legislative Council (LegCo) Complex (LCC) — the Tamar Development Project. According to information provided to LegCo, the then Central Government Offices (CGO) and the then LegCo Building could not meet the demand for office space and modern-working-environment requirements, and the development of the Tamar site could provide a long-term solution to address these problems. In November 2003, in view of the impact of the Severe Acute Respiratory Syndrome outbreak and the adverse financial situation at that time, the Government decided to defer the Project. In October 2005, subsequent to improvement in the economy, the Government re-activated the Project.

Responsible Government departments

1.3 The Government adopted a design-and-build arrangement for implementing the Tamar Development Project, under which a contractor would be appointed for carrying out both design work and construction works of the Project. In October 2005, the Financial Secretary set up a Special Selection Board (Note 1) to oversee the tendering of a contract for the Project. Furthermore, a Technical

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Note 1: *The Board was chaired by the Chief Secretary for Administration with members comprising two LegCo Members, the Permanent Secretary for Financial Services and the Treasury (Treasury) and the then Permanent Secretary for Housing, Planning and Lands (Planning and Lands) appointed on a personal capacity, and a university professor in architecture.*

Introduction

Committee (Note 2) was appointed under the Special Selection Board to carry out the tender assessment of contractors for the Project. The Government departments responsible for the Project included:

(a) the Architectural Services Department (ArchSD) which was the Employer's Representative in administering the works contract and the Supervising Officer in supervising the construction works;

(b) the Property Vetting Committee (Note 3) which, based on the Accommodation Regulations (Note 4), conducted vetting of and granted approvals for the accommodation requirements of pertinent Government Bureaux and Main Offices (B/Os — Note 5) and LegCo; and

(c) the Administration Wing of the Chief Secretary for Administration's Office (Administration Wing) which provided assistance to the Special Selection Board in selecting and appointing the contractor for the Project, coordinated the accommodation requirements of the pertinent B/Os and LegCo, sought approval of the Property Vetting Committee on accommodation requirements, and coordinated with the ArchSD on incorporating the accommodation requirements into the design of the Project.

Note 2: *The Committee was chaired by the then Permanent Secretary for the Environment, Transport and Works (Works), with members comprising representatives from the Financial Services and the Treasury Bureau, the Administration Wing of the Chief Secretary for Administration's Office, the Architectural Services Department and the Planning Department.*

Note 3: *The Committee was chaired by an Assistant Director of the ArchSD, comprising a member from the Government Property Agency and another member from the Financial Services and the Treasury Bureau.*

Note 4: *Accommodation Regulations promulgate Government accommodation policies and procedures.*

Note 5: *Main Offices include offices of the Chief Executive, the Chief Secretary for Administration and the Financial Secretary.*

Contract award

1.4 A chronology of key events of the tendering and works implementation of the Tamar Development Project is shown in Table 1.

Table 1

Chronology of key events
(2005 to 2013)

Month	Key event
(a) December 2005	The ArchSD invited interested parties to apply for prequalification assessments for undertaking the Project (Note) with a view to identifying contractors with proven design, managerial, financial and technical capabilities.
(b) March 2006	Four applications for prequalification assessments were received.
(c) June 2006	The Finance Committee (FC) of LegCo approved funding of $5,168.9 million for the design and construction of the Project.
(d) September 2006	After prequalification assessments by the Technical Committee and endorsement by the Special Selection Board, the four prequalified applicants (Contractors A, B, C and D) were invited to submit tenders for the Project.
(e) March 2007	The Government launched a two-month exhibition of the project designs proposed by the four tenderers, and invited members of the public to express views and comments on the four designs.
(f) January 2008	After assessing the tenders submitted by Contractors A to D, the Government awarded a design-and-build contract (Contract A) to Contractor A, targeting for completion in May 2011 at an estimated cost of $4,940.3 million.
(g) February 2008	Construction works commenced.

Table 1 (Cont'd)

Month	Key event
(h) December 2009	The FC approved increasing the Approved Project Estimate (APE) of the Project from $5,168.9 million by $359.8 million to $5,528.7 million, mainly for financing the construction of additional areas for the LCC and the installation of additional environmental and energy-conservation measures.
(i) July 2011	Subsequent to the substantial completion of the major parts of the Project in end July 2011, the Executive Council (ExCo) Chamber and its Secretariat, LegCo Chamber and its Secretariat, LegCo Members' Offices, the Chief Executive's Office and relevant B/Os moved into Tamar Complex by phases.
(j) August 2013	Up to August 2013, the account of the Project had not been finalised, and the latest estimated project cost amounted to $5.4 billion.

Source: *ArchSD records*

Note: *According to the ArchSD, this prequalification exercise aimed at inviting five applicants who obtained the highest prequalification scores to submit tenders for the design-and-build contract.*

Remarks: *From 1997 (completion of site reclamation) to 2007, the Tamar site had been put into various short-term uses, such as a fee-paying car park, exhibition pavilions and venues for the Harbour Fest and World Carnival.*

Tamar Complex

1.5 Located at the waterfront in Central, Tamar Complex encompasses the CGC and the LCC which are landmark buildings of the Hong Kong Special Administrative Region. It occupies a site of 4.2 hectares (42,000 square metres (m^2)) and comprises:

(a) the CGC with a Construction Floor Area (CFA) of 133,034 m^2;

(b) the LCC with a CFA of 45,160 m^2; and

(c) open space with an area of 21,020 m^2 (including Tamar Park with an area of 17,522 m^2) which is open for public visits.

Furthermore, two levels of basement floors with a total CFA of 42,942 m^2 are provided, which house a car park for use by authorised persons and plant rooms for Tamar Complex. Tamar Complex is connected by two covered footbridges, one leading to a footpath near the Admiralty MTR Station (Footbridge A) and the other to the Admiralty Walkway System which links to the CITIC Tower on Tim Mei Avenue (Footbridge B). Table 2 shows offices and facilities of the CGC and the LCC, Photograph 1 is a picture of Tamar Complex and Figure 1 displays its layout plan.

Table 2

Offices and facilities of the CGC and the LCC

Building	Floor (No.)	Area (m^2 in CFA)	Use
CGC Office Block West Wing	27 floors	123,109	Offices of the Chief Secretary for Administration, the Financial Secretary and 12 Policy Bureaux, and ancillary facilities
CGC Office Block East Wing	23 floors		
CGC Low Block	4 floors	9,925	The Chief Executive's Office, the ExCo Chamber and its Secretariat offices, and ancillary facilities
LCC High Block	11 floors	45,160	LegCo Chamber and its Secretariat offices, offices of the LegCo Members and ancillary facilities
LCC Low Block	5 floors		

Source: ArchSD records

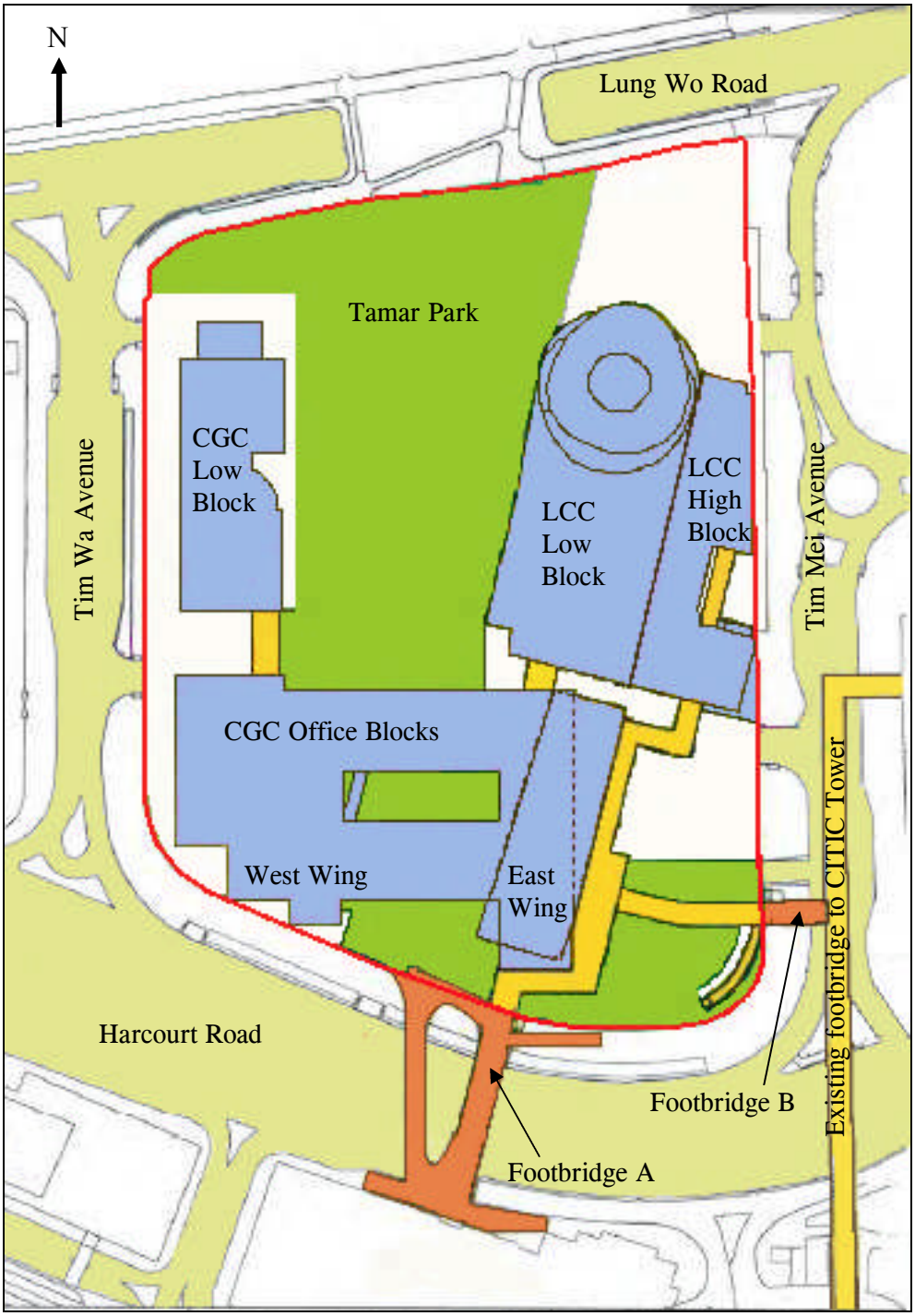
Photograph 1

Tamar Complex

Source: ArchSD records

Figure 1

Layout plan of Tamar Complex



Legend: Tamar Development Project boundary

Source: ArchSD records

Premises formerly occupied by the Government and LegCo

1.6 The ExCo Chamber and Government offices relocated to the CGC had originally occupied premises mainly in the former CGO and Murray Building in Central, and the LegCo Chamber and some of LegCo offices relocated to the LCC had originally occupied the former LegCo Building in Central. As of August 2013, refurbishment and renovation works were in progress at the former CGO and the former LegCo Building, and action was also in progress to convert Murray Building into a hotel for heritage conservation purposes.

Audit review

1.7 The Tamar Development Project, with an APE of $5.5 billion, is one of the major Government capital projects in recent years and is a landmark of Hong Kong. The Project was largely completed on schedule and Tamar Complex houses the important offices and facilities of the Government, including ExCo, LegCo and offices of the Chief Executive, the Chief Secretary for Administration, the Financial Secretary and Policy Bureaux.

1.8 The Audit Commission (Audit) has recently conducted a review of the Government's planning and implementation of the Tamar Development Project, with a view to identifying areas for improvement. The review focuses on the following areas:

(a) selection of project design and contractor (PART 2);

(b) implementation of contract works (PART 3);

(c) changes of contract requirements (PART 4);

(d) Tamar Complex commissioning (PART 5); and

(e) way forward (PART 6).

Audit has identified areas where improvements can be made by the Government in implementing capital works projects in future, and has made recommendations to address the issues.

General response from the Administration and the Legislative Council Secretariat

1.9 The Administration and the LegCo Secretariat agree with the audit recommendations. The Secretary for Development thanks Audit for undertaking this audit review.

Acknowledgement

1.10 Audit would like to acknowledge with gratitude the full cooperation of the staff of the Development Bureau (DEVB), the Financial Services and the Treasury Bureau (FSTB), the Administration Wing, the ArchSD, the Buildings Department (BD), the Government Property Agency and the LegCo Secretariat during the course of the audit review.

PART 2: SELECTION OF PROJECT DESIGN AND CONTRACTOR

2.1 This PART examines the arrangements for selecting the project design and the contractor for the Tamar Development Project.

Contractor selection

2.2 The selection of the contractor for the Tamar Development Project comprised two stages, namely:

(a) Stage One for the prequalification of interested applicants; and

(b) Stage Two for inviting the prequalified applicants to submit tenders for the Project.

Prequalification exercise

2.3 In April 2002, the Administration Wing informed LegCo that, to ensure that the proposed form, scale and massing of the CGC and the LCC would integrate coherently with the landscape design and setting of the waterfront promenade, the Administration proposed to adopt an integrated design-and-build arrangement for all the developments on the Tamar site.

2.4 According to information provided to the then LegCo Panel on Planning, Lands and Works in November 2005, the Administration considered that adopting a design-and-build arrangement, instead of conducting a separate open-design competition for the Project, would have the following advantages:

(a) a proper design competition of the required scale would involve a time span of some 24 months, from the preparation of the design brief to the selection of the winner. This would have obvious programme implications;

(b) the design-and-build approach could also achieve the effect of securing a world-class design through the tender exercise, and ensure quality design submissions by attaching prominent weighting to the design schedule and related requirements; and

(c) each design-and-build tenderer was obliged to ensure the cost-effectiveness of the implementation plan for his design, taking full account of technical advances on construction and functional requirements of the Government and LegCo.

2.5 In December 2005, the ArchSD gazetted invitations to invite eligible applicants to apply for prequalification assessments for undertaking the Project. Among other things, the eligible applicants should be a contractor on the List of Approved Contractors for Public Works, Buildings Category, Confirmed Group-C (Note 6), and had completed at least one building contract of a value of not less than $500 million in the past five years. The prequalification document contained details of the overall design objectives, general user requirements and selection criteria for prequalification. Applicants for prequalification were required to prepare submissions to demonstrate their managerial, financial and technical capabilities, as well as concept designs for the Project, which should illustrate, among other requirements, integration of Tamar Complex with its surrounding areas.

2.6 In March 2006, the ArchSD received four applications for prequalification assessments. After the Technical Committee's examination of the applicants' technical, managerial, financial and design capabilities, and capability to undertake the Project within the prescribed time frame and deliver the prescribed quality, the Special Selection Board approved shortlisting all four applicants for Stage Two of the tender exercise (see para. 2.2(b)). In August 2006, the Administration Wing informed the Special Selection Board that the contract cost was estimated to be over $4,800 million. In September 2006, the ArchSD issued the tender document to the four applicants and invited them to submit tenders for the Project.

Note 6: *The DEVB administers a list of approved contractors for public works. In December 2005, a Group-C contractor was allowed to tender for a contract of a value exceeding $50 million. In June 2009, the value was revised to $75 million.*

Tendering exercise

2.7 The following information was stated in the tender document:

(a) the FC had approved funding of up to $5,168.9 million for the Project. The APE included not just the cost of the design and construction works under the design-and-build contract, but also that of other items such as furniture and equipment, consultant services, provisions for project-price fluctuation and contingencies;

(b) the tenders would be assessed based on a pre-determined marking scheme, as follows:

Factor	Percentage
Quality:	
• Design and aesthetic	27%
• Functional and technical	24%
• Planning, sustainability and environment	9%
	60%
Price	40%
Total	100%

(c) the provisions of the Agreement on Government Procurement of the World Trade Organization (WTO Government Procurement Agreement) would apply to this tender (Note 7); and

(d) the Government reserved the right to negotiate with any tenderer about the terms of his offer.

Note 7: *According to the FSTB, Government contracts for construction services with a value of 5 million Special Drawing Rights or above should comply with the WTO Government Procurement Agreement. The amount was equivalent to $52 million when the invitation to apply for prequalification for the Tamar Development Project was issued in December 2005.*

2.8 At the time of issuing the tender document in September 2006, according to ArchSD records, of the $5,168.9 million of APE, $4,920.3 million (95%) was for meeting the cost of Contract A, leaving $248.6 million (5%) for meeting the costs of items such as furniture and equipment, consultant services, provisions for project-price fluctuation and contingencies.

2.9 In February 2007, the ArchSD received tenders with project designs submitted by Contractors A, B, C and D. All the tender sums exceeded $4,920.3 million. From March to May 2007, the Administration Wing organised a public viewing exercise where members of the public were invited to provide views and comments on the design and aesthetic aspects of the four project designs. After drawing lots, the four designs were designated as Designs A, B, C and D respectively. Based on the public comments collected from exit polls, phone polls and in writing, a consultant engaged by the Administration Wing analysed the public opinions and concluded that Design D was narrowly ahead of Design A, with Design B and Design C lagging behind by a substantial margin. The public views collected were presented to the Special Selection Board for consideration.

2.10 Assessments of the four tenders were conducted by the Special Selection Board based on the marking scheme (see para. 2.7(b)). A tender (Tender A) containing Design A submitted by Contractor A obtained the highest overall tender score. In June 2007, in view of the fact that the price of Tender A exceeded the contract cost provided in the APE, the Special Selection Board, after deliberation, decided to set up a Tender Negotiation Team (Note 8) for conducting tender negotiation with Contractor A, with a view to reducing the tender sum to within the sum provided in the APE. The Board took into account legal advice on this issue and considered it not practical or in the public interest to seek additional funding from the FC or to conduct re-tendering (Note 9).

Note 8: *The Team comprised the Permanent Secretary for Development (Works) and representatives from the ArchSD.*

Note 9: *In October 2013, the ArchSD informed Audit that:*

(a) the options of seeking additional funding from the FC or re-tendering would result in a project delay. If re-tendering was conducted, it would possibly result in a higher tender sum; and

(b) in the year following the tender closing in February 2007, according to the ArchSD Building Works Tender Price Index, the building cost had increased by 36%.

Selection of project design and contractor

2.11 In July 2007, after several rounds of negotiation, Contractor A agreed that the price of Tender A be reduced to $4,940.3 million (Note 10) after making the following modifications in Tender A:

(a) correcting the arithmetic errors in the tender;

(b) reducing the contract contingency sum in the tender;

(c) removing certain works items which were not specified in the tender document but offered by the tenderer (known as better-offer proposal items — Note 11);

(d) modifying and removing certain works items originally included in the tender document (Note 12); and

(e) adjusting the provision of some miscellaneous items (Note 13).

2.12 In view of the fact that adjustments made to Tender A might affect the tender scores and ranking of the four tenders, the Tender Negotiation Team conducted a review of the tender scores of the four tenders received by making similar adjustments (on both quality and price aspects) to the other three tenders. The Team found that the ranking of the four tenders would remain unchanged after making the adjustments. In January 2008, after obtaining approval from the Special Selection Board, the ArchSD awarded Contract A to Contractor A at a sum of $4,940.3 million, which was scheduled for completion in May 2011.

Note 10: *At that time, following a review of the project budget, the ArchSD identified a saving of $20 million, comprising savings in the consultancy fees of $2.7 million and project contingency of $17.3 million. The contract sum provided in the APE therefore increased from $4,920.3 million to $4,940.3 million.*

Note 11: *For example, Net Operating Floor Area of 3,756 m^2 at the CGC and some loading/unloading space exceeding the tender requirements were removed from Tender A.*

Note 12: *For example, the provision of 18 site supervisory staff was removed from Tender A. According to the ArchSD, additional ArchSD in-house supervising staff were provided to enhance the works supervision.*

Note 13: *For example, sums provided for audio-visual and library equipment, and radio communication and electronic equipment were reduced.*

Areas for improvement

Criteria for selecting tenderers for negotiation not stated in tender document

2.13 In May 1997, Hong Kong acceded to the WTO Government Procurement Agreement. The objective of the Agreement is to provide for open and fair competition among domestic and foreign service providers through procedures designed to ensure that all tenderers are treated by procuring entities covered by the Agreement on equal footing. Among other things, the WTO Government Procurement Agreement requires that:

(a) a procuring entity may conduct negotiations when such intent has been indicated in the tender document, or when it appears from evaluation that no one tender is obviously the most advantageous in terms of the specific evaluation criteria set forth in the tender notices or documentation;

(b) negotiations shall primarily be used to identify the strengths and weaknesses in tenders; and

(c) a procuring entity shall not, in the course of negotiations, discriminate between different suppliers. In particular, a procuring entity shall ensure that:

(i) any elimination of participants is carried out in accordance with the criteria set forth in the tender notices and documentation;

(ii) all modifications to the criteria and to the technical requirements are transmitted in writing to all remaining participants in the negotiations;

(iii) all remaining participants are afforded an opportunity to submit new or amended submissions on the basis of the revised requirements; and

(iv) when negotiations are concluded, all participants remaining in the negotiations shall be permitted to submit final tenders in accordance with a common deadline.

2.14 In a press release on 29 September 2006 relating to the invitation of the four prequalified applicants to submit tenders for Contract A, the Government stated that:

(a) as mandated under the WTO Government Procurement Agreement, the tender process had to be conducted in a fair and non-discriminatory manner; and

(b) relevant parties should avoid comments, reports or moves that might prejudice or be perceived as prejudicing the fairness or integrity of the tender process throughout the tender exercise.

2.15 According to the WTO Government Procurement Agreement, in the course of negotiations, any elimination of participants should be conducted in accordance with the criteria set forth in the tender document (see para. 2.13(c)(i)) and all modifications to the technical requirements should be transmitted in writing to all remaining participants in the negotiation (see para. 2.13(c)(ii)). Audit however found in this case that some works items originally included in the tender document had been modified or removed during tender negotiation with Contractor A (see para. 2.11(d)), but the other three tenderers were not informed of such modifications or removal. In response to Audit enquiries in September and October 2013, the Administration Wing and the FSTB informed Audit the following:

Administration Wing

(a) the whole process of tender evaluation and selection of the contractor had been conducted under the steer of a high-level Special Selection Board, which was conscious of the need to comply with the WTO Government Procurement Agreement requirements and all relevant tendering rules and regulations. The Board, taking into account all relevant factors including the consideration that the negotiation with Contractor A did not affect the ranking of the tenders (see para. 2.12), was satisfied that the tendering process and the tender negotiation had been conducted in compliance with established procedures;

(b) negotiation with Contractor A was conducted in accordance with Stores and Procurement Regulations (SPRs — Note 14) 385(d)(ii) and (e) (see Appendix A);

FSTB

(c) according to SPR 385(e), negotiations under SPR 385(d)(ii)-(iv) should normally be conducted only with the single conforming tenderer or with the conforming tenderer whose tender had been found to be clearly the most advantageous to the Government in relation to the evaluation criteria (see Appendix A);

(d) in this case, the Special Selection Board found the offer of Contractor A (with the highest overall tender score) to be clearly the most advantageous to the Government and decided to negotiate with Contractor A only. This was in line with SPR 385(e); and

(e) the requirements in paragraph 2.13(c) (in particular insets (c)(iii) and (iv)) should not apply in the present case where only one tenderer was selected for negotiation and the revised technical requirements stated in the tender document did not affect the final outcome of the selection process.

2.16 Regarding the reference by the Administration Wing and the FSTB in paragraph 2.15 to SPR 385(d) and (e) (see Appendix A), Audit would like to point out that, since SPR 385(d) and (e) were not stated in the tender document, they might not be binding conditions of this tendering exercise. In this connection, as stated in the tender document, the provisions of the WTO Government Procurement Agreement would apply to this tendering exercise (see para. 2.7(c)).

Note 14: *Under the Public Finance Ordinance (Cap. 2), the Government procurement process is governed by the SPRs.*

2.17 According to the WTO Government Procurement Agreement, in the course of negotiations, a procuring entity shall ensure that any elimination of participants is carried out in accordance with the criteria set forth in the tender notices and documentation (see para. 2.13(c)(i)). Audit however notes that no criteria for selecting tenderers for negotiations were stated in the tender document. In order to enhance transparency and remove any ambiguity in the tendering process, in Audit's view, the FSTB needs to remind Government Bureaux and Departments (B/Ds) of the need to state in the tender document the criteria for selecting tenderers for negotiation as far as practicable.

Price ceiling not stated in tender document

2.18 When seeking funding of $5,168.9 million from the FC in June 2006, because the design of the Project was not known at that time, the ArchSD made a cost estimate of the Project with reference to the unit-construction cost of Grade-A private office buildings.

2.19 It was stated in the tender document that the APE of $5,168.9 million included not just the cost of Contract A, but also other items such as furniture and equipment, consultant services, provisions for project-price fluctuation and contingencies. At the time of issuing the tender document in September 2006, the ArchSD had estimated that only $4,920.3 million of the APE of $5,168.9 million was provided for meeting the cost of Contract A (contract fund — see para. 2.8). However, this contract fund was not stated in the tender document as the price ceiling. During deliberation in August 2006, the Special Selection Board concluded that setting a tender-price ceiling might constrain the design creativity of the tenderers, and induce the tenderers to submit tender proposals with prices close to the price ceiling, hence reducing their incentive to submit designs with lower costs.

2.20 As it transpired, the tender sums of all four tenders received exceeded $4,920.3 million. Upon noting that the tender sums of all the four tenders received exceeded the contract fund available, the Special Selection Board considered it not practical or in the public interest to seek additional funding from the FC or to conduct re-tendering (see para. 2.10). After conducting negotiation with Contractor A and making modifications to Tender A and revising the contract sum under the APE (see para. 2.11), the ArchSD awarded Contract A to Contractor A at an adjusted price of $4,940.3 million.

2.21 In September and October 2013, the Administration Wing, the ArchSD and the FSTB informed Audit that:

Administration Wing

(a) it was the conscious decision of the Special Selection Board at its meeting in August 2006, after evaluation of all the pros and cons, that a tender-price ceiling needed not be imposed as a mandatory requirement for the Tamar Development Project and only the APE should be set out in the tender document;

(b) by setting out in the tender document the project scope and APE, this would suffice to convey to the tenderers the message about keeping the project cost within the budget;

(c) professionals should be able to work out the order of cost for the estimated value of the contract upon knowing that the APE was meant to also cover components other than the contract under bidding;

ArchSD

(d) including a price ceiling in a tender exercise was not a norm. The Special Selection Board had discussed the inclusion of a price ceiling and decided not to include it in the tender document;

FSTB

(e) according to SPR 345(d), Government departments should not normally disclose the estimated contract value to the tenderers as it might become a main guiding factor in the preparation of their tender proposals, which might be reduced or expanded unnecessarily, thus undermining the principles of competition and value for money. Setting a tender-price ceiling might preclude innovative designs, which should not be set as a norm;

(f) there were other means of imposing budgetary control in a tender exercise, such as capping the quality of the finishing in the tender requirements or revising the price and non-price weightings in the tender marking schemes to reflect the importance attached to the quality aspects where appropriate;

(g) there were various options that a procuring department might explore when the returned tender sums of a tender exercise exceeded the APE, including:

(i) conducting price negotiation with the most advantageous tenderer (selected in accordance with the tenderer evaluation criteria);

(ii) cancellation of the tender exercise;

(iii) conducting re-tendering after re-packaging the works, reducing the scope of works, and incorporating cost-reduction measures; and

(iv) conducting re-tendering the same scope of works at a later date when there was stronger market competition if the overall project programme allowed; and

(h) the decision of not seeking APE increase should not be considered as a "practice". As stipulated in Financial Circular No. 3/2012 "Capital Works Programme", Directors of Bureaux and Directors of works departments must ensure that works expenditure stayed strictly within the APE and in strict accordance with the scope of the project as approved by the FC or under delegated authority. The Controlling Officer of a project should seek to increase the APE once he was aware that the project estimate was expected to exceed the APE. In the case of the Tamar Development Project, the Special Selection Board's decision of not seeking additional funding from the FC or conducting re-tendering was made having regard to the prevailing circumstances at the time.

2.22 In Audit's view, if it is the Government's intention not to seek additional funding from the FC for a project, the APE will unavoidably form a resource constraint on the project, and a tender-price ceiling should be included in the tender document. This arrangement will prevent tender sums from exceeding the contract fund available, and obviate the need to conduct tender negotiations with one or more tenderers for the purpose of reducing the tender sums to within the fund available, and make tender modifications (see paras. 2.13 to 2.17).

Audit recommendation

2.23 **Audit has *recommended* that the Secretary for Financial Services and the Treasury should remind B/Ds that they should state in the tender document the criteria for selecting tenderers for negotiations as far as practicable.**

Response from the Administration

2.24 The Secretary for Financial Services and the Treasury has said that:

(a) SPR 385(e) states that wherever possible, the criteria for selection of tenderers for negotiations shall be stated in the invitation to tender. Where such criteria have not been set forth in the invitation to tender, the selection of tenderers for negotiations must be based on objective and reasonable criteria; and

(b) in the recent exercise for streamlining procurement procedures (as promulgated vide Financial Circular No. 4/2013 "Streamlining Procurement Procedures" of 27 June 2013), the role of Controlling Officers to observe and uphold a culture of compliance with the requirements set out in the SPRs, regularly remind all staff concerned about their need to always comply with the SPRs and closely monitor their compliance is highlighted in the revised SPR 125 for B/Ds to observe.

PART 3: IMPLEMENTATION OF CONTRACT WORKS

3.1 This PART examines the implementation of works under Contract A, focusing on:

(a) construction of Footbridge A (paras. 3.7 to 3.15); and

(b) implementation of seismic-resistant building works (paras. 3.16 to 3.36).

Project cost increase

3.2 In December 2009, the Administration proposed and the FC approved increasing the APE from $5,168.9 million by $359.8 million to $5,528.7 million. Table 3 shows the justifications for the additional funding.

Table 3

Justifications for additional funding

Justification	Amount ($ million)
(a) Building works and building services for the enhanced communal facilities and Secretariat office of LegCo	113.0
(b) Additional environmental and energy-conservation measures	70.9
(c) Additional contingencies and additional provisions for contract-price fluctuation adjustments (Note 1)	52.3
(d) Additional furniture and equipment	47.1
(e) Artworks	32.4
(f) Other works variations (Note 2)	44.1
Total	359.8

Source: Audit analysis of ArchSD records

Note 1: Contract A adopted a contract-price fluctuation adjustment system, under which payments to the contractor would be adjusted according to the "Index Numbers of the Costs of Labour and Materials used in Public Sector Construction Projects" published by the Census and Statistics Department.

Note 2: These included enhanced electronic equipment and glass partitions for LegCo, enhanced barrier-free access provisions, provision of a cafe and additional consultancy fees.

3.3 As of March 2013, the total expenditure of the Tamar Development Project was $5,358.2 million, comprising $5,249.3 million for Contract A and $108.9 million for consultancy fees, and furniture and equipment. The additional contract cost of $309 million ($5,249.3 million less $4,940.3 million — see para. 2.12) was attributable to:

Particular	Amount ($ million)
(a) Supplementary Agreement No. 1 (SA1) — entered into in April 2010	195.5
(b) Supplementary Agreement No. 2 (SA2) — entered into in July 2010	25.0
(c) Supplementary Agreement No. 3 (SA3) — entered into in July 2011	150.0
(d) Variation orders	103.5
	474.0
Less: cost savings identified in contingencies and provisional items provided in Contract A (see para. 3.5)	(165.0)
Total contract cost increase	309.0

3.4 The major additional works giving rise to the additional contract cost included:

(a) SA1 with a cost of $195.5 million, mainly including works for constructing additional areas for the LCC ($113 million) and works for additional environmental and energy-efficiency measures ($70.9 million) — see PART 4;

(b) SA2 with a cost of $25 million, mainly including works for installing security facilities for major offices at the CGC. According to the Administration, in order to meet the confidentiality and security requirements, it was necessary to procure the security facilities after contract award; and

(c) SA3 with a cost of $150 million, mainly including works for providing additional steel reinforcement quantities and associated costs on seismic-resistant building works (see paras. 3.16 to 3.36).

3.5 Under Contract A, a total of 81 variation orders at a total estimated cost of $103.5 million had been issued, which mainly comprised works for changing the office layout and additional building services requirements. Of the financial provision of $228.8 million originally budgeted for contingencies and provisional items (works items not yet finalised at the time of contract award) in Contract A, $165 million had been used to partly meet the cost of additional works (see para. 3.3).

Additional time for contract completion

3.6 Contract A comprised works for seven Works Sections (Sections I to VII), which commenced on 11 February 2008 and were originally scheduled for completion on 11 May 2011 (a total of 1,186 days or 39 months). In the event, owing to various reasons, Extensions of Time (EOTs) ranging from 5.5 to 112.5 days had been granted to different Works Sections, and the contract works for the whole Project were substantially completed on 1 September 2011, which was 112.5 days (3 months and 20.5 days — see Appendix B) later than the original scheduled completion date.

Construction of Footbridge A

3.7 Under Works Section V of Contract A, Footbridge A of 66 metres long at an estimated cost of $39.8 million was required to be constructed over Harcourt Road. According to Contract A, the time of commencing the construction of Footbridge A was to be advised by the ArchSD. In the event, the ArchSD instructed Contractor A to commence the construction works on 17 August 2009, which was scheduled for completion on 11 May 2011. As it transpired, Footbridge A was completed on 1 September 2011, 3 months and 20.5 days later than the original scheduled completion date.

Areas for improvement

Knock-on effects of additional time in completing Footbridge A

3.8 Footbridge A is the main pedestrian passage for Tamar Complex and any delay in its completion would affect the time of commissioning Tamar Complex. In this connection, the ArchSD granted EOTs of 112.5 days (3 months and 20.5 days) for works under Footbridge A, including an EOT of 107 days owing to obstruction to works caused by the presence of underground cables, and an EOT of 5.5 days attributable to inclement weather and clearance of bombs discovered. According to the ArchSD, because a material delivery route had to be maintained for the footbridge construction, the delay in completing Footbridge A had knock-on effects on the completion of the CGC and the LCC (Works Sections I to IV). Accordingly, the ArchSD had to grant an additional EOT of 74 days (2 months and 13 days) for each of Works Sections I to IV. As a result, the substantial completion of the CGC and the LCC was deferred from 17 May 2011 (Note 15) to 30 July 2011.

3.9 According to Contract A:

(a) Contractor A should submit design and construction method of foundation works to the ArchSD for approval before commencement of related works;

(b) there were many utility facilities beneath the footpaths and pavement along both sides of Harcourt Road and adjacent to Admiralty Centre. Careful planning should be taken if works were proposed in these areas in order to avoid damage to the utilities and minimise any diversion works; and

(c) if diversion was unavoidable, Contractor A should liaise with utility companies and minimise any diversion work, and the diversion cost should be borne by Contractor A.

Note 15: *An EOT of 5.5 days was granted for the works for the CGC and LCC (Sections I to IV) due to the hoisting of Tropical Cyclone Warning Signal No. 8 and Black Rainstorm Warning, and clearance of bombs discovered, extending the original target completion date from 11 to 17 May 2011.*

3.10 According to the ArchSD, the works of the CGC and the LCC had not been delayed due to any default of Contractor A who did not have liability to pay any liquidated damages. In Audit's view, although Footbridge A only formed a small part of the whole project (0.7% in terms of cost), the additional time of 2 months and 13 days in commissioning the CGC and the LCC resulting from the long time taken in completing Footbridge A is undesirable. Therefore, in implementing a similar project in future, the ArchSD needs to take measures to minimise any delay in completing an ancillary structure which will entail a knock-on effect on the timely commissioning of the main project component.

18 months taken before instructing Contractor A to commence works

3.11 A chronology of key events of implementing works relating to Footbridge A is shown in Appendix C. Audit notes that soon after the commencement of Contract A, Contractor A took action to seek the Transport Department's approval for related temporary traffic management schemes. However, the ArchSD had taken 18 months from February 2008 to August 2009 before instructing Contractor A to commence works for Footbridge A. During the period, the ArchSD commenced public consultations in June 2008 (four months after commencement of Contract A) with the related District Council and later sought approval from the Chief Executive-in-Council regarding eight objections received. In the event, the Chief Executive-in-Council granted approval for the construction of Footbridge A in June 2009. The ArchSD needs to take earlier action on public consultations and resolving public objections in a similar situation in future.

15 months taken to commence the approved foundation works

3.12 As shown in Appendix C, Contractor A had taken 15 months from August 2009 (ArchSD's instruction for commencing works) to November 2010 before commencing the approved foundation works for Footbridge A. As early as September 2009, a utility company informed Contractor A that relocation of underground cables would not be feasible. In December 2009, the utility company further requested Contractor A to change the foundation design to avoid relocation of underground cables. In August 2010, after revising the foundation design twice, Contractor A finally identified a design which would avoid relocation of the underground cables.

3.13 In September 2013, the ArchSD informed Audit that, although it did not have ample experience and expertise in carrying construction works on public roads, it had spent significant efforts to resolve the utility-diversion and other site-constraint problems. In Audit's view, the ArchSD needs to draw lesson from this case which involved constructing a footbridge in busy-traffic areas having many underground utility facilities. For example, the ArchSD should consider seeking the advice and assistance of other relevant works departments (e.g. the Highways Department and the Civil Engineering and Development Department) when encountering similar problems in future.

Audit recommendations

3.14 **Audit has *recommended* that, in implementing a works project in future, the Director of Architectural Services should:**

(a) **take measures to minimise any delay in completing an ancillary structure which will entail a knock-on effect on the timely commissioning of the main project component, such as by conducting related public consultations and resolving public objections in a timely manner; and**

(b) **in administering works for constructing a footbridge in busy-traffic areas with many underground utility facilities:**

(i) **adopt a foundation design which will not require relocation of utility facilities as far as possible; and**

(ii) **consider seeking the advice and assistance of other relevant works departments.**

Response from the Administration

3.15 The Director of Architectural Services agrees with the audit recommendations. He has said that the ArchSD will, in implementing a works project in future:

(a) critically review the works programmes of individual ancillary structures to ensure that their completion will tie in with the overall project programme; and

(b) for works to be carried out on public roads in busy-traffic areas having many underground utility facilities, seek the assistance of the relevant B/Ds, including exploring the feasibility of entrusting that part of works to them for implementation.

Implementation of seismic-resistant building works

3.16 As of August 2013, the Buildings Ordinance (Cap. 123) did not stipulate any seismic-resistant requirement for building structures in Hong Kong.

3.17 In 2002, the BD commissioned a consultancy study on the seismic hazard and risk to buildings in Hong Kong. The draft final report of the study of June 2005 (Note 16) recommended that seismic design standards should be provided for the design of future buildings in Hong Kong, and that the capability of special existing buildings (that were required to remain operational for post-earthquake recovery purposes) to resist extreme earthquakes should be assessed.

3.18 In August 2006, on the grounds that the buildings of the Tamar Development Project were essential to remain operational for post-earthquake recovery purposes and it would be very difficult to retrofit the buildings with seismic-resistant requirements after commissioning of Tamar Complex, the Administration Wing and the ArchSD proposed that seismic-resistant requirements

Note 16: *The final report was issued in December 2007, which recommended the development of seismic-design standards for adoption in Hong Kong (see para. 3.29).*

should be incorporated into the building structures of the Tamar Development Project. According to the ArchSD, in the absence of seismic-resistant building standards in Hong Kong, implementation of seismic-resistant requirements should take into account the following factors:

(a) Seismic Intensity (Note 17) is the most important factor in implementing seismic-resistant requirements which should be based on the local seismic activities. The Mainland's Code for Seismic Design of Buildings issued in 2001 — PRC 2001 Code (Note 18) should be adopted as it included local seismic design information and requirements for Hong Kong;

(b) based on PRC 2001 Code and the Seismic Zonation Map of China published by the related Mainland authority, Hong Kong falls within the zone where seismic-resistant measures capable of resisting an earthquake of Seismic Intensity 7 (Note 19) should be incorporated into building structures; and

(c) implementation of seismic-resistant measures will improve the robustness and ductility of the building structures and enhance structural safety under extreme conditions, such as fire and explosions.

3.19 The then Environment, Transport and Works Bureau (ETWB) considered that all building structures of the Tamar Development Project should be designed for seismic-resistant purposes. The then Housing, Planning and Lands Bureau also advised that adopting PRC 2001 Code would likely render the building structures complying with the seismic requirements of the future code of practice to be developed for Hong Kong.

Note 17: *Seismic Intensity is an index for gauging the intensity of earthquake at a certain location based on the extent of ground motion during an earthquake.*

Note 18: *In the Mainland, compliance with PRC 2001 Code was mandatory for all building structures up to 29 July 2008. On 30 July 2008, PRC 2001 Code was replaced by an updated version (PRC 2008 Code) which provided improvement and updates on the Code.*

Note 19: *According to Mainland's national standards, seismic intensities are classified into 12 grades and Seismic Intensity 7 is of moderate magnitude.*

Building structures exceeding limits

3.20 PRC 2001 Code provided standards on seismic-resistant design measures for different structural forms of buildings. For structural forms of buildings falling outside those specified in the Code, they are referred to as "structures exceeding limits". Under the Mainland practice, for a building with a structural form exceeding limits, it should be presented to an official specialist panel for review and direction on the implementation of appropriate seismic-resistant measures, and the building design submission to the specialist panel should comply with the latest Design Checklist for Buildings Exceeding Limits (first promulgated by the related Mainland authority in 1997). On 5 September 2006, a revised Design Checklist was issued (2006 Design Checklist), which was however not incorporated into PRC 2001 Code.

3.21 On 29 September 2006, the Government invited tenders for the Tamar Development Project. As stated in the tender document:

> (a) the design and construction of structural elements should comply with the requirements of the seismic design standard of PRC 2001 Code; and
>
> (b) if some building structures were not covered by PRC 2001 Code, the contractor should follow other internationally recognised codes or alternative approaches as approved by the ArchSD.

3.22 In January 2008, Contractor A was awarded the contract. In May 2008, the ArchSD employed a consultant (Seismic Consultant) to review the seismic-resistant measures submitted by Contractor A. In September 2008, the Seismic Consultant advised that:

(a) all four building blocks of the CGC and the LCC should be "structures exceeding limits", i.e. they were structures falling outside the specifications of PRC 2001 Code; and

(b) the design requirements specified in the 2006 Design Checklist (see para. 3.20) should be adopted.

3.23 In August 2010, Contractor A informed the ArchSD that at the time of tender submission, he considered that all four building blocks of the CGC and the LCC were structures within the design limits of PRC 2001 Code, and that he had made financial provisions in his tender on such a basis. In view of the ArchSD's requirement that all the four building blocks should be regarded as "structures exceeding limits" for seismic-building works purposes, Contractor A claimed that he needed to incur additional expenditure on steel reinforcement, concrete and formwork, and the additional requirements had also caused a delay and disruption to the works progress. In November 2010, Contractor A submitted a claim for the additional expenditure relating to implementation of additional seismic-resistant measures.

3.24 In December 2010, after seeking advice of the Legal Advisory Division of the DEVB, the ArchSD sought approval from the FSTB for conducting negotiation with Contractor A to settle his claim for costs arising from implementation of additional seismic-resistant measures at a ceiling cost of $150 million. According to the ArchSD:

> (a) the 2006 Design Checklist which involved clarification on additional requirement had not been specified in the tender document; and
>
> (b) Contractor A was entitled to an additional payment if extra expenses had been incurred due to ambiguity or discrepancy not anticipated at the time of tender.

3.25 In July 2011, after approval by the FSTB, Contractor A and the ArchSD entered into a supplementary agreement (SA3 — see para. 3.4(c)), under which a sum of $150 million (Note 20) was payable to Contractor A for settling his claim on the issue.

Note 20: *According to the ArchSD, the sum included $24 million of additional costs relating to works acceleration and disruption, additional labour, plant and resources and overtime work for the purpose of meeting the original project commissioning time of May 2011.*

Areas for improvement

2006 Design Checklist not stated in tender document

3.26 The Tamar Development Project was the first Government project which adopted seismic-resistant measures for building structures, and the Government had no previous experience on adopting such measures in Hong Kong. Audit notes that the 2006 Design Checklist (see para. 3.20) was issued on 5 September 2006, 24 days before the tender invitation date of 29 September 2006. According to the ArchSD, pertinent buildings on the Mainland had been required to comply with the 2006 Design Checklist since its promulgation in September 2006. However, the 2006 Design Checklist was not included in the tender document issued on 29 September 2006. In the event, Contractor A was successful in making a financial claim on the grounds that compliance with the 2006 Design Checklist involved additional design requirements which had not been anticipated in the tender process (see para. 3.24(b)).

3.27 In September 2013, the ArchSD informed Audit that, under the design-and-build contract arrangement, even if the 2006 Design Checklist was included in the tender document, contractual claim might still arise due to different interpretation or clarification on the design requirements. In Audit's view, in administering a similar works contract in future, it is desirable for the ArchSD to include in the tender document all standards or guidelines which would affect the works requirements. In the event that new standards or guidelines are published between the time of inviting tenders and the tender closing time, the ArchSD needs to issue a tender addendum for the purpose.

Problem of "structures exceeding limits" under the design-and-build contract

3.28 According to the ArchSD's Seismic Consultant, all the four building blocks of the CGC and the LCC were structures exceeding limits (see para. 3.22(a)). However, Contractor A claimed that at the time of the tender submission, he considered that all four building blocks were structures within the design limits of PRC 2001 Code, and he successfully made a financial claim on the grounds of the contract ambiguity. Under the design-and-build contract arrangement, the building design of Contract A was not known at the time of

preparing the tender document. Therefore, the ArchSD was unable to determine whether any of the building structures in Contract A should be classified as structures exceeding limits for the purpose of implementing additional seismic-resistant measures. For similar cases in future, while the 2006 Design Checklist provides guidance on the design of structures exceeding limits, a design-and-build contractor may still make contractual claims over differences in views on whether a building structure should be a structure exceeding limits. This is because the contractor may claim that, according to his interpretation, some building structures are not structures exceeding limits, but the ArchSD may have a different interpretation (see para. 3.27). Therefore, the ArchSD needs to take into account this factor in considering the adoption of a design-and-build contract for buildings adopting seismic-resistant designs in the future.

Local seismic-resistant building design standards not yet developed

3.29 In December 2007, the BD completed a consultancy study on seismic effects (see Note 16 to para. 3.17) with an objective of assessing earthquake risks in Hong Kong and the effects of earthquakes on local buildings. The study recommended the development of seismic-design standards for adoption in Hong Kong.

3.30 In June 2012, the DEVB informed the LegCo Panel on Development that:

(a) since the specific ground motions, building designs, construction standards and practices of different localities were different, it would not be appropriate for Hong Kong to simply follow the seismic-resistant design requirements of other countries or territories;

(b) a tailor-made code, taking into account the relevant international standards and Hong Kong's geology, topography and construction practices, should be formulated if statutory seismic-resistant building design standards were to be introduced locally;

(c) the Government would make reference to standards adopted by the Mainland, the United States of America and other cities in devising Hong Kong's seismic-resistant design requirements. In line with international practices, consideration would be given to imposing more stringent requirements for special buildings having a post-earthquake recovery role, including government buildings; and

(d) the Government aimed to consult stakeholders, including the building professional institutions, building contractor associations, developers' association, local academics of relevant fields and LegCo, on the issue.

3.31 As of August 2013, local seismic-resistant building design standards had not been developed in Hong Kong. In September 2013, the BD informed Audit that:

(a) prior to the availability of the local seismic-resistant building design standards, building projects might make reference to the Mainland or any other international standards for enhancing the seismic-resistant capability of buildings, such as the adoption of the Mainland standards in the Tamar Development Project (see para. 3.21);

(b) the contract claim in paragraphs 3.23 to 3.25 was the result of contractual disputes rather than the lack of local seismic-resistant building design standards. Such local standards, when available, might not help avoid such contractual disputes;

(c) the introduction of new seismic-resistant design standards for buildings in Hong Kong would not only affect the building professionals but also the interest of members of the public. Therefore, such action needed the support of the stakeholders and the general public at large. In this connection, the BD had recently conducted a consultation with the stakeholders of the building industry and members of the general public; and

(d) the BD planned to commission a consultancy to formulate a tailor-made code of practice on seismic-resistant building design standards for Hong Kong by taking into account relevant international standards, local construction practices and geological conditions of Hong Kong. Amendment of the building law would be required if the new design standards were introduced as mandatory requirements. The whole process took time and the BD would comply with the necessary consultation and legislative procedures.

3.32 In Audit's view, the development of such standards will help enhance the safety standards of buildings and provide local standards for inclusion in pertinent works contracts. Therefore, in developing the local seismic-resistant building design standards, the BD needs to consult the ArchSD on its experience in the design and implementation of the seismic-resistant building works of the Tamar Development Project.

Audit recommendations

3.33 **Audit has *recommended* that, in implementing a building project involving the adoption of seismic-resistant designs in future, the Director of Architectural Services should:**

(a) **include in the tender document all standards or guidelines which would affect the works requirements;**

(b) **in the event that the standards or guidelines in (a) above are published between the time of inviting tenders and the tender closing time, issue a tender addendum for the purpose; and**

(c) **in considering the adoption of a design-and-build contract for the project, take into account potential disputes and contractual claims arising from differences in interpretation over structures exceeding limits.**

3.34 **Audit has also *recommended* that the Director of Buildings should, in developing the local seismic-resistant building design standards, consult the Director of Architectural Services on the experience in the design and implementation of the seismic-resistant building works of the Tamar Development Project.**

Response from the Administration

3.35 The Director of Architectural Services agrees with the audit recommendations in paragraph 3.33. He has said that the ArchSD will closely keep in view the latest development in local seismic-resistant building design standards when deciding the procurement method and tender specifications for future building projects.

3.36 The Director of Buildings agrees with the audit recommendation in paragraph 3.34.

PART 4: CHANGES OF CONTRACT REQUIREMENTS

4.1 This PART examines the changes of contract requirements after contract award of the Project, focusing on:

(a) change of accommodation requirements (paras. 4.2 to 4.29); and

(b) additional environmental and energy-efficiency measures (paras. 4.30 to 4.48).

Change of accommodation requirements

Space requirements in 2006

4.2 In May 2006, the Property Vetting Committee approved the accommodation requirements of the CGC and the LCC. According to the funding paper submitted to the FC in May 2006:

CGC

(a) the estimated Net Operating Floor Area (NOFA — Note 21) requirement of the CGC was 56,670 m^2 (3% larger than that of the replacement offices, mainly in the former CGO and Murray Building, of 54,860 m^2). Taking account of a 10% increase of NOFA for meeting the long-term requirements of the Government Secretariat, the total NOFA provided for was 62,340 m^2 (see Appendix D);

(b) about 3,270 staff would be accommodated at the CGC. As the various central offices and policy bureaux had over 8,000 staff, over 5,000 staff would remain working in offices outside the CGC;

Note 21: *NOFA is the floor area actually allocated to users. It does not include areas of toilets, bathrooms, lift lobbies, stair halls, public corridors and mechanical plant rooms.*

LCC

(c) the LegCo Building, the nearby commercial buildings (namely Citibank Tower and Prince's Building) and CGO West Wing with a total NOFA of 9,410 m^2 were accommodating the 60 LegCo Members and around 330 LegCo staff;

(d) the new LCC would provide an NOFA of 16,090 m^2, which would be 6,680 m^2 (71%) larger than that of the replacement offices (see Table 4). The area would accommodate 60 LegCo Members and around 360 LegCo staff (including a forecast of 26 additional staff); and

(e) the LegCo Chamber would be designed to accommodate 120 LegCo Members since it was technically not easily expandable at a later stage. Additional foundation works of LCC buildings would be carried out to allow for future building expansion with an additional 9,200 m^2 of NOFA for accommodating 60 additional LegCo Members. The planned expansion was to be implemented under four phases, with each phase accommodating 15 Members.

Table 4

Projected accommodation in LCC
(May 2006)

Office/facility	NOFA in former LegCo buildings (m^2)	Projected NOFA in LCC (m^2)
LegCo Members' offices and facilities	2,820	4,160
Staff offices	3,050	3,640
Meeting facilities (including the Chamber)	820	3,650
Ancillary facilities	2,720	4,640
Total	9,410	16,090

Source: Records of Administration Wing and LegCo

Additional LegCo space requirement in 2009

4.3 In January 2009, the LegCo Secretariat informed the Administration Wing that an additional NOFA of 1,260 m^2 was needed to be provided in the LCC to meet additional areas for a constitutional library, LegCo archives, a sign language interpreter studio and additional LegCo staff.

4.4 In February 2009, the LegCo Secretariat informed the Administration Wing that one of the following four options would help address the additional LegCo space requirements:

- ***Option A.*** Carrying out the expansion works at the LCC after a decision to increase the number of LegCo Members;
- ***Option B.*** Carrying out the expansion works at the LCC under the existing design-and-build contract, with expansion works to be completed at the same time of the original works;
- ***Option C.*** Carrying out the expansion works at the LCC under the existing design-and-build contract, with expansion works to be completed as soon as practicable; and
- ***Option D.*** Carrying out the expansion works at the LCC under a new contract commencing after the handover of the new LCC in May 2011.

4.5 In March 2009, the Administration Wing informed the LegCo Secretariat that:

(a) the Schedule of Accommodation for the LCC had been agreed with the LegCo Commission (Note 22) before tendering of Contract A in September 2006;

(b) pending a decision on the future constitutional development, there were neither justifications nor funding to support a revision of the scope of the Project; and

(c) changing the scope of the Project in the midst of the works would require the issuance of variation orders, the cost of which would escalate in a late construction stage, and give rise to possible claims by the contractor for any possible delay that might result. It might also cause serious disruption to the entire construction programme.

4.6 In the same month, the LegCo Commission requested the Administration to give further consideration to its request for additional space for the LCC under the current design-and-build contract (i.e. Options B or C in para. 4.4).

4.7 In April 2009, the ArchSD approached Contractor A and asked him to provide an estimate of the costs of providing an additional floor on LCC High Block and some areas on LCC Low Block within the existing works programme on the basis that the works would not affect the original completion date of the whole Project (i.e. Option B). Contractor A estimated that the design and construction of the additional works would cost about $113 million. In May 2009, the Administration informed the LegCo Commission that it agreed with the implementation of Option B.

4.8 In July 2009, Contractor A submitted an application to the Town Planning Board for implementing full expansion of LCC (see para. 4.2(e)). The full expansion would include the addition of five floors above LCC High Block, and constructing 11 building floors on the Podium of LCC High Block. In September 2009, the Board approved the application.

Note 22: *The LegCo Commission is chaired by the President of LegCo and consists of up to 13 LegCo Members including the Chairman.*

Changes of contract requirements

4.9 In October 2009, the Administration informed the Panel on Development of a proposed additional funding application for additional space for the LCC and some other expenditure items. In December 2009, the Administration sought funding approval of $359.8 million (including $113 million for providing additional floor areas for the LCC) from the FC. According to the papers submitted to the Panel on Development and the FC, the total additional NOFA in the LCC was 1,415 m^2 (see Table 5).

Table 5

Additional area for LCC
(October 2009)

Facility	NOFA (m^2)
Communal facility	
(a) expansion of the existing LegCo library with a constitutional library	220
(b) establishment of additional LegCo archives	140
(c) a studio for use by sign language interpreters for proceedings of LegCo	50
(d) an extra photographers' room	53
Secretariat office	
(e) additional office space to cater for staff increase (Note)	952
Total	1,415

Source: Records of Administration Wing and LegCo

Note: The LegCo Secretariat estimated that, upon commissioning of the LCC, 134 additional staff would be required to cope with provision of new services, compared with the original estimate of 26 additional staff in 2006 (see para. 4.2(d)).

4.10 In December 2009, the FC approved the additional funding application. In April 2010, the ArchSD and Contractor A entered into a supplementary agreement (SA1) for executing the additional works (see para. 3.4(a)).

4.11 In June 2010, LegCo passed a motion to increase the number of LegCo Members from 60 to 70 from October 2012 (Note 23). In November 2010, the LegCo Commission decided that the offices of the 10 new LegCo Members should be provided in the LCC and some LegCo Secretarial staff would be relocated to offices outside the LCC. In the same month, the ArchSD issued a variation order for changing the office layout to provide additional offices for LegCo Members. The final cost of the variation order was $15.4 million. According to the ArchSD, the sum included $9 million of additional costs relating to works acceleration and disruption, additional site safety measures, extra plant and material, and overtime work.

Areas for improvement

No expansion factor for LCC

4.12 In February 2000, the LegCo Commission requested the Government to identify a possible site in a centrally located area for the construction of a purpose-built building to meet the long-term accommodation requirements of LegCo. The LegCo Commission estimated that the number of LegCo Members would increase to 120 around 2030 to 2040, based on the population-wide representation ratio of 80,000 to 100,000 citizens per LegCo Member. The LegCo Commission also proposed that the new accommodation should be in the form of a complex comprising a number of buildings to be developed by phases.

Note 23: *In August 2010, the Standing Committee of the National People's Congress approved the method of forming LegCo from October 2012.*

4.13 In September 2006, after agreeing with the LegCo Commission on the area requirements of the LCC, the ArchSD incorporated into the tender document such area requirements (see para. 4.5(a)). As shown in Appendix D, for the CGC, a 10% expansion factor had been built into the area requirement. However, this expansion factor was not provided for the area requirement of the LCC (see Table 4 in para. 4.2). In Audit's view, this expansion factor should have been incorporated into the area requirement of the LCC.

4.14 Audit considers that, in assessing the accommodation requirements of new buildings in future, pertinent B/Ds need to provide an appropriate expansion factor for space requirements if there is the likelihood of an increase in space requirements in the near future.

Additional area requirements made only after contract award

4.15 In April 2010 (Contract A was awarded in January 2008), at the request of the LegCo Commission, the ArchSD and Contractor A entered into SA1, under which, among other things, additional NOFA of 1,415 m^2 for the LCC would be constructed. The total cost of constructing this additional NOFA was $113 million, which included $36 million of costs relating to works acceleration and disruption, and additional design fee. This was because the additional works had to be incorporated into the construction schedule while maintaining the original project completion date.

4.16 According to ETWB Technical Circular (Works) No. 30/2003 on Control of Client-initiated Changes for Capital Works Projects, changes in user requirements can be disruptive to the overall programme of projects, and often result in abortive work and additional costs. As stated in the Circular, in order to expedite the delivery of projects, concerted effort should be made to contain the need for changes to user requirements to those that are absolutely essential and necessary. In Audit's view, had the additional NOFA requirement of 1,415 m^2 in the LCC (see para. 4.15) been included in the original tender document, the additional $36 million of acceleration and disruption costs and additional design fee might have been saved or reduced. Therefore, in administering a works project in future, project proponents need to take measures to ensure that all works requirements are incorporated into the tender document as far as possible, and avoid making changes to works requirements after contract award.

Future expansion of LCC by phases

4.17 According to the planned office accommodation in 2006, the LegCo Secretariat would have about 360 staff upon the commissioning of the LCC (see para. 4.2(d)). As of March 2013, the LegCo Secretariat had 523 staff, of whom 431 were accommodated at the LCC, and the remaining 92 at Murray Road Multi-storey Carpark Building (occupying an area of 2,300 m^2).

4.18 As stated in paragraph 4.2(e), the foundation works of the LCC were designed to support construction of an additional area of 9,200 m^2 in future, and the Town Planning Board has given approval for the expansion works (see para. 4.8). Of the future expansion area of 9,200 m^2, 1,415 m^2 (see para. 4.9) have been used for building an additional floor on LCC High Block and additional floor areas on the LCC Low Block and 181 m^2 for building a new extension of the CITIC Tower footbridge leading to the LCC (Note 24). The area of expansion for the LCC that remains is 7,604 m^2 (9,200 m^2 less 1,415 m^2 less 181 m^2).

4.19 In May 2006, the Administration informed the FC that the expansion of LCC was planned to be implemented under four phases (see para. 4.2(e)). In Audit's view, in implementing works for LCC expansion in future, the remaining area of expansion of 7,604 m^2 should preferably be provided in one phase of works. This arrangement would minimise disruption to LegCo Members and Secretariat staff and achieve cost saving. Any surplus office space in the earlier years after works completion could be gainfully deployed for other uses (e.g. to be allocated on a short-term basis to appropriate B/Ds).

Allocation of surplus CGC floor area

4.20 The Administration Wing allocated floor areas of the CGC to B/Os based on the Schedule of Accommodation approved by the Property Vetting Committee. Audit examination revealed that the as-built floor area of the CGC was 63,240 m^2, which was 900 m^2 larger than the planned area (see Table 6). However, Audit notes

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Note 24: *In June 2013, the FC approved funding of $74.3 million for the extension of the CITIC Tower footbridge leading to the LCC. According to the ArchSD, the new footbridge extension would take up portion of the LegCo future expansion area of about 181 m^2.*

that the Administration Wing has fully allocated the as-built floor areas to various B/Os.

Table 6

Planned and as-built floor area of CGC and LCC

Office	Planned NOFA stated in FC paper (a) (m^2)	As-built NOFA (b) (m^2)	Difference (c) = (b) − (a) (m^2)
CGC	62,340	63,240	900
LCC	17,505	17,528	23
Total	79,845	80,768	923

Source: ArchSD records

4.21 In September 2013, the Administration Wing informed Audit that the surplus areas of 900 m^2 in the CGC were scattered among different floors and had been allocated to various B/Os. In Audit's view, the Administration Wing needs to take into account these surplus areas when allocating additional office space to the pertinent B/Os in future.

Audit recommendations

4.22 **Audit has *recommended* that the Secretary for Financial Services and the Treasury should remind pertinent B/Ds of the need to, in assessing the accommodation requirements of new buildings, provide an appropriate expansion factor for space requirements if there is the likelihood of an increase in space requirements in the near future.**

4.23 **Audit has also *recommended* that the Secretary for Development should remind project proponents of the need to, in administering a works project in future, incorporate all works requirements into the tender document as far as possible, and avoid making changes to works requirements after contract award.**

4.24 **Audit has also *recommended* that, in implementing works for LCC expansion in future, the Director of Administration and the Secretary General of the Legislative Council Secretariat should:**

(a) **consider providing the remaining area of expansion in one phase of works; and**

(b) **allocate any surplus area on a short-term basis to appropriate B/Ds.**

4.25 **Audit has also *recommended* that the Director of Administration should take into account the surplus areas allocated to pertinent B/Os in the CGC when allocating additional office space to them in future.**

Response from the Administration and the Legislative Council Secretariat

4.26 The Secretary for Financial Services and the Treasury agrees with the audit recommendation in paragraph 4.22. He has said that:

(a) in assessing the Schedules of Accommodation proposed by B/Ds, the Government Property Agency and Property Vetting Committee always check with the B/Ds concerned whether the latter have included their expansion needs in their accommodation proposals;

(b) individual B/Ds have different space requirements, particularly for departmental specialist accommodation. Requests for expansion of space requirements are therefore considered on a case-by-case basis; and

(c) the Government Property Agency and Property Vetting Committee will support a request for an additional space requirement if it is fully justified.

4.27 The Secretary for Development agrees with the audit recommendation in paragraph 4.23. He has said that the DEVB will re-circulate ETWB Technical Circular (Works) No. 30/2003 (see para. 4.16) to relevant B/Ds to remind them of the related requirements.

4.28 The Director of Administration agrees with the audit recommendations in paragraphs 4.24 and 4.25. She has said that:

(a) the Administration Wing will work closely with the LegCo Secretariat and duly take into account all relevant considerations when pursuing any plan for LCC expansion to meet the accommodation requirements of LegCo in future;

(b) when the Administration Wing invited B/Os to bid for unallocated expansion area at Tamar to meet their evolving operational requirements in November 2010, the as-built NOFA details were not available as the CGC was under construction; and

(c) the Administration Wing will duly take into account the surplus areas already allocated to pertinent B/Os in the CGC when allocating additional office space to them in future.

4.29 The Secretary General of the Legislative Council Secretariat agrees with the audit recommendations in paragraph 4.24.

Additional environmental and energy-efficiency measures

4.30 According to ETWB Technical Circular (Works) No. 16/2005 on "Adoption of Energy Efficient Features and Renewable Energy Technologies in Government Projects and Installations" issued in November 2005 (ETWB 2005 Circular):

(a) energy-efficient features (e.g. environmental building and lighting design) should be incorporated into the building design as far as practicable; and

(b) renewable-energy technologies (e.g. solar water heating and photovoltaic technologies) should be incorporated so far as reasonably practicable into a works project wherever the project satisfies the prescribed criteria (Note 25).

4.31 In January 2008, in a press release announcing the award of Contract A, the Government indicated that Tamar Complex would be one of the Government's "greenest" complexes when completed.

4.32 In April 2009, the DEVB and the Environment Bureau (ENB) issued a joint circular on "Green Government Buildings" (Joint Circular). According to the Joint Circular:

(a) the maximum payback period (Note 26) of energy-efficiency measures would normally be capped at nine years, unless full justifications are provided by the relevant B/Ds;

Note 25: *For example, the criteria include adopting solar water heating for premises installed with centralised hot water supply systems and installing photovoltaic panels for works projects involving open space greater than 1,000 m^2.*

Note 26: *The payback period of an energy-efficiency measure is determined by dividing the cost of the capital investment by the estimated annual energy saving generated. It represents the estimated time (in years) required to recover the capital investment through energy saving.*

(b) renewable-energy technologies should be incorporated in all new government buildings as far as reasonably practicable; and

(c) the total additional costs involved in renewable-energy technologies, waste reduction and management, water management and indoor air quality would be capped at 2% of the total project cost, unless full justifications are provided by the relevant B/Ds.

4.33 Under Contract A, 21 items of energy-efficiency equipment at a total capital cost of $24.7 million (Original Installations — see Table 7) were provided. In April 2010, after seeking the FC's funding approval (see para. 3.2), the ArchSD and Contractor A entered into SA1, under which $70.9 million was provided for additional environmental and energy-efficiency measures (see para. 3.4(a)). In addition, the ArchSD also incurred $13.3 million (funded by the project vote of the Tamar Development Project) for procurement of such measures. Therefore, the total cost of the additional measures (Additional Installations) was $84.2 million. The Additional Installations comprised 5 items of energy-efficiency equipment, 4 items of equipment using renewable-energy technologies and 2 items of environmental-conservation equipment. The ArchSD has made estimates of the annual energy saving of the energy-efficiency equipment and the equipment using renewable-energy technologies. Based on the capital cost and estimated annual energy saving of each item of the energy-efficiency equipment, Audit has made estimates of the payback periods of the 21 items of Original Installations and the 5 items of Additional Installations (see Table 7 and Appendix E).

Table 7

Environmental and energy-efficiency equipment

Equipment	Capital cost (a) ($'000)	Estimated annual energy saving (b) ($'000)	Average payback period (c) = (a) ÷ (b) (years)
1. Original Installations			
21 items of energy-efficiency equipment	24,695 → 93,295	11,668 → 13,246	2.1 → **7.0**
2. Additional Installations			
(a) 5 items of energy-efficiency equipment	68,600	1,578	43.5
(b) 4 items of equipment using renewable-energy technologies	12,100 → 84,200	29	N/A (Note 1)
(c) 2 items of environmental-conservation equipment	3,500	N/A (Note 2)	N/A (Note 2)

Source: *Audit analysis of ArchSD records*

Note 1: *According to the ArchSD, payback-period analyses are not applicable to these items.*

Note 2: *According to the ArchSD, estimated annual energy savings and payback periods are not applicable to these items.*

4.34 When seeking additional funding for the Additional Installations in December 2009, the ArchSD informed the FC that:

(a) the ArchSD had critically reviewed the feasibility of incorporating more new environmental features in the Tamar Development Project so that it remained the paragon of a green government building at the time of its commissioning. In considering further environmental features for the Project, it might be necessary to look beyond cost-benefits and consider the intangible long-term benefits that would be brought to the environment;

(b) the additional energy-efficiency features would achieve an additional 3.6% energy savings in the annual energy consumption and had a payback period of about 44 years (see item 2(a) of Table 7 in para. 4.33). Together with the energy-conservation measures already incorporated into the Tamar Development Project, the energy-efficiency features would achieve 26% energy savings in the annual energy consumption when compared to a normal office and had a payback period of about eight years;

(c) some of the new environmental technologies were only used commercially in a limited scale. Together with various cost-implication factors (e.g. adjustment of works programme and impacts on construction sequences), these technologies were higher in cost and might have very long payback periods; and

(d) adopting the new energy-conservation measures would demonstrate the Government's willingness to promote and try out new technologies for protecting the environment.

Areas for improvement

Long payback periods of some items of energy-efficiency equipment

4.35 As shown in items (B)(1) to (4) of Appendix E, the payback periods of 4 of the 5 items of additional energy-efficiency equipment exceeded the normal maximum payback period of nine years. In particular, the payback periods of the following items were long:

(a) 87.3 years for using Light-Emitting Diode (LED) lighting costing $30.8 million;

(b) 40.6 years for installing occupancy sensors for lighting costing $26 million; and

(c) 176.5 years for installing dimming control for footbridge lighting costing $300,000.

4.36 In September 2013, the ArchSD informed Audit that, although some items of energy-efficiency equipment had a payback period exceeding the normal maximum of nine years as stipulated in the Joint Circular (see para. 4.32(a)), the overall payback period of all items of the energy-efficiency equipment under the Original and Additional Installations was seven years (see Table 7 in para. 4.33), and it had obtained the agreement of the DEVB and the ENB on this issue.

4.37 In Audit's view, with a view to achieving value for money, the ArchSD needs to take measures to ensure that the payback periods of individual items of energy-efficiency equipment to be procured in future should be capped at nine years as far as possible.

Inadequate promotion of energy-conservation equipment installed at Tamar Complex

4.38 As shown in items (B)(6) to (9) of Appendix E, the ArchSD incurred a capital cost of $12.1 million for installing 4 items of equipment using renewable-energy technologies, which would achieve an annual energy saving of $28,600 (0.2% of capital cost). For example:

(a) a capital cost of $7.7 million was incurred for installing a solar hot water system which would achieve an annual energy saving of $18,900 (0.2% of capital cost — Note 27);

Note 27: *In 2009, the ENB informed the Administration Wing that the annual energy saving of a typical solar hot water system should be about 10% of the related capital cost.*

(b) a capital cost of $2.4 million was incurred for installing thin-film photovoltaic panels which would achieve an annual energy saving of $5,100 (0.2% of capital cost); and

(c) a capital cost of $1.2 million was incurred for installing photovoltaic external lighting for open space which would achieve an annual energy saving of $1,900 (0.2% of capital cost).

4.39 Audit notes that:

(a) the ETWB 2005 Circular stipulates that renewable-energy technologies should be incorporated so far as reasonably practicable into a works project wherever the project satisfies the prescribed criteria (see para. 4.30(b)); and

(b) the Joint Circular stipulates that renewable-energy technologies should be incorporated in all new government buildings as far as reasonably practicable, and imposes a cost ceiling on environmental measures adopting renewable-energy technologies (see para. 4.32(b) and (c)).

4.40 In September 2013, the ENB informed Audit that:

(a) it was conducting a review of ETWB 2005 Circular (see para. 4.30) and the Joint Circular (see para. 4.32) to identify room for further enhancing the environmental and energy efficiency performance of government buildings. The review was targeted for completion by end 2013; and

(b) during the review, the ENB would explore the feasibility of developing more detailed guidelines on the adoption of renewable-energy technologies.

4.41 Audit also notes that one of the objectives of adopting new energy-conservation measures in the Tamar Development Project was to demonstrate the Government's willingness to promote and try out new technologies

for protecting the environment (see para. 4.34(d)). Audit however notes that the ArchSD has not conducted promotion of the use of energy-conservation equipment installed at Tamar Complex. The ArchSD needs to conduct promotion of such equipment.

Higher-than-estimated electricity consumption

4.42 In 2009, the ArchSD made estimates of the electricity consumption of the CGC and the LCC. Audit notes that, after implementation of various environmental and energy-efficiency measures (see para. 4.33), the actual electricity consumption of the CGC and the LCC in 2012-13 was 4% and 53% respectively higher than the estimated one (see Table 8).

Table 8

Estimated and actual electricity consumption

Complex	Estimated annual consumption (a) (kilowatt-hour — kWh)	Actual consumption in 2012-13 (b) (kWh)	Variance (c) = (b) − (a) (kWh)
CGC	29,977,240	31,322,173	+1,344,933 (+4%)
LCC	7,520,865	11,538,423	+4,017,558 (+53%)
Overall	37,498,105	42,860,596	+5,362,491 (+14%)

Source: ArchSD records

Changes of contract requirements

4.43 In September and October 2013, the ArchSD and the LegCo Secretariat informed Audit that:

ArchSD

(a) the increase in electricity consumption could be attributed to a number of factors, including the actual building operating hours and utilisation rates of facilities. For the LCC, the actual operating hours of some facilities had far exceeded the anticipated building operation schedule compiled during the design stage;

(b) the ArchSD had been closely monitoring the electricity consumption since building occupation and providing advice to the building users on the implementation of various energy-saving measures;

(c) there was improvement in the actual electricity consumption for the one-year period ending August 2013, where the CGC recorded electricity consumption of 28,980,854 kWh, which was 3% lower than the estimated level, and the LCC recorded electricity consumption of 10,693,657 kWh, which was 42% higher than the estimated level;

LegCo Secretariat

(d) the LCC was a multi-purpose building which included venues for holding meetings of LegCo and its committees, offices of LegCo Members and the Secretariat staff, facilities for the press as well as education and visitor facilities for the public. Unlike general office buildings where the electricity consumption was comparatively stable, the electricity consumption in the LCC was very much affected by the number and duration of meetings and activities held;

(e) the LCC's electricity consumption estimate made in 2009 was based on the number and duration of meetings and activities held in the former LegCo Building at that time. However, since moving to the new LCC, there had been a substantial increase in the number and duration of meetings as well as system rectification and testing works after office hours and weekends, which were not foreseen when drawing up the electricity consumption estimate in 2009. With hindsight, the electricity consumption of the LCC was underestimated in 2009; and

(f) the LegCo Secretariat had taken various measures to reduce electricity consumption. In the period from January to August 2013, electricity consumption of the LCC had decreased by 15% as compared to that in the same period in 2012.

4.44 In Audit's view, the ArchSD, in collaboration with the Administration Wing and LegCo Secretariat, needs to take appropriate measures with a view to reducing electricity consumption of Tamar Complex.

Audit recommendations

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

(a) **in administering a works project in future, take measures to ensure that the payback periods of individual items of energy-efficiency equipment are capped at nine years as far as possible;**

(b) **conduct promotion of the environmental and energy-efficiency equipment at Tamar Complex; and**

(c) **in collaboration with the Director of Administration and the Secretary General of the Legislative Council Secretariat, take appropriate measures with a view to reducing electricity consumption of Tamar Complex.**

Response from the Administration and the Legislative Council Secretariat

4.46 The Director of Architectural Services agrees with the audit recommendations. He has said that the ArchSD will:

(a) comply with the guidelines and circulars issued by the DEVB and the ENB on the payback period of the energy-efficient installations;

(b) promote the use of environmental and energy-efficiency equipment installed at Tamar Complex; and

(c) work closely with the Administration Wing and the LegCo Secretariat with a view to further reducing electricity consumption of Tamar Complex.

4.47 The Director of Administration agrees with the audit recommendation in paragraph 4.45(c). She has said that:

(a) in recognition of the need for energy conservation, the Administration Wing has closely monitored the level of electricity consumption and has implemented various energy-saving initiatives in the CGC; and

(b) the Administration Wing will further collaborate with the ArchSD to take appropriate measures with a view to reducing electricity consumption of Tamar Complex.

4.48 The Secretary General of the Legislative Council Secretariat agrees with the audit recommendation in paragraph 4.45(c). He has said that the LegCo Secretariat will continue to explore and implement additional measures to reduce electricity consumption of the LCC.

PART 5: TAMAR COMPLEX COMMISSIONING

5.1 This PART examines the commissioning of Tamar Complex, focusing on:

(a) rectification of defects and completion of outstanding works (paras. 5.2 to 5.14); and

(b) sterilisation of fresh-water-supply system (paras. 5.15 to 5.28).

Defects and outstanding works

5.2 Under Contract A:

(a) the maintenance period was 12 months from the date of substantial completion of the contract works;

(b) Contractor A should carry out any outstanding work as soon as practicable and in any event before the expiry of the maintenance period;

(c) all maintenance work should be carried out by Contractor A during the maintenance period or within 14 days after its expiry. The ArchSD might also require Contractor A to carry out maintenance work including any work of repair or rectification, or make good any defect or other fault identified within the maintenance period, and Contractor A should carry out such work within the maintenance period or as soon as practicable thereafter;

(d) all such outstanding and defect rectification works should be carried out by Contractor A at his own expense;

(e) if Contractor A failed to carry out any outstanding work and/or defect rectification work, the Government should be entitled, after giving a reasonable notice in writing to Contractor A, to have such work carried out by its own workers or by other contractors, and the Government should be entitled to recover from Contractor A the expenditure incurred in connection therewith; and

(f) upon the expiry of the maintenance period and when all outstanding work and all work of repair, rectification and making good any defect and other fault identified in the maintenance period have been completed, the ArchSD should issue a maintenance certificate to Contractor A.

5.3 The maintenance periods of the seven Works Sections had expired during May 2012 to September 2012 (see Table 9).

Table 9

Maintenance period expiry dates

Works Section	Particular	Substantial completion date	Maintenance period expiry date
VI	Footbridge B	17 May 2011	17 May 2012
I	Office Blocks of CGC	30 July 2011	30 July 2012
II	Low Block of CGC	30 July 2011	30 July 2012
III	High Block of LCC	30 July 2011	30 July 2012
IV	Low Block of LCC	30 July 2011	30 July 2012
V	Footbridge A	1 September 2011	1 September 2012
VII	Open Space and remaining works	1 September 2011	1 September 2012

Source: ArchSD records

Building handing over

5.4 Footbridges A and B, and open space were handed over to the ArchSD after substantial completion of works. For premises in the CGC and the LCC, they were handed over to the building users in the presence of ArchSD staff (and Administration Wing staff for the CGC) by phases from end of July to mid-December 2011.

Position as of November 2011

5.5 According to the ArchSD, it had conducted site inspections with building users around two weeks before actual handover of the completed premises. Based on the inspections, the site staff of ArchSD and the building users compiled lists of defects and outstanding works for follow-up actions by Contractor A. As of November 2011, when the overall building handover was near completion, a total of 118,324 items of defects and outstanding works had been identified, of which the works of 88,960 items (75.2%) had not been completed. According to the ArchSD, most of the outstanding works items had been completed before the actual handover of the related premises, although the ArchSD did not maintain such statistics.

Position in 2013

5.6 As of April 2013 (almost two years after substantial completion of works of the CGC and the LCC), further to the 118,324 items of defects and outstanding works identified (see para. 5.5), the ArchSD and users of Tamar Complex had identified additional 45,327 items of defects (totally 163,651 items), and 5,893 (3.6%) of the 163,651 items of defects and outstanding works (Note 28) had not been rectified. As of August 2013 (2 years after substantial completion of works of the CGC and the LCC), 2,755 items of defects had not been rectified, comprising 495 items which would be rectified by Contractor A and 2,260 items which would not be rectified by the Contractor. According to the ArchSD, regarding the 2,260 items of defects:

(a) they were minor in nature, such as scratch marks on building fixtures and finishes, and minor touching-up works required for installations located inside the false-ceiling space;

(b) after discussion with the users, it was agreed that the related rectification works would not be carried out so as to minimise disturbance to users; and

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Note 28: *Examples of defects included water leakage or seepage, defective or damaged electrical switches, defective or damaged walls and unsatisfactory workmanship on insulation of air-conditioning ductwork and pipeworks. According to the ArchSD, of the 163,651 items, 77,763 items were minor defects.*

(c) the ArchSD would conduct valuation of the omitted works in (b) above for the purpose of making appropriate deduction from the final contract payment to Contractor A.

5.7 Under Contract A, Contractor A was responsible for rectifying all defects identified during the maintenance period. Upon satisfactory rectification of all defects and completion of outstanding works, the ArchSD would issue a maintenance certificate to Contractor A. The following are examples of defects yet to be rectified as of August 2013:

- Water leakage and seepage problems after heavy rain.
- The solar hot water system for the CGC Office Blocks intended for use by the canteen operator was found defective. Up to August 2013, the system had not been handed over to the Administration Wing.
- Unstable Closed Circuit Television image problem and unsynchronised time recording of cameras.
- Some as-built drawings of building works and some operation and maintenance manuals were outstanding.

Areas for improvement

Defects and outstanding works not yet rectified and completed

5.8 In July 2012, before the expiry of the maintenance period for the CGC and the LCC, the ArchSD provided Contractor A with the final defect lists on outstanding works and defects. In September 2012, Contractor A undertook that he would complete the outstanding works and rectify the defects by end of November 2012. In Audit's view, it is unsatisfactory that 3.6% of the defects and outstanding works had not been rectified and completed as of April 2013 (see para. 5.6). Audit notes that the carrying out of defect rectification works and outstanding works after commissioning of the CGC and the LCC have caused disruption and nuisance to the building users. According to the ArchSD, it has received many complaints from the

building users over disruption caused by works being carried out during office hours, such as irritating smell resulting from painting works and unwanted fire alarm triggered by the works.

5.9 As of August 2013, rectification works for 2,755 items of defects (see para. 5.6) had not been completed and hence the ArchSD had not issued the maintenance certificate to Contractor A.

5.10 In September 2013, the ArchSD informed Audit that:

(a) the long time taken to rectify the outstanding defects was due to additional time required for arranging access to work, particularly in the LCC; and

(b) some works could only be carried out during non-office hours on weekdays, during weekends or long holidays. These included, for example, noisy works and works which would generate volatile organic compounds (such as painting and wall paper repairs), works at LegCo Members' Offices, Conference Hall and communal conference rooms in the LCC and the CGC.

5.11 In Audit's view, the ArchSD needs to strengthen its supervision of Contractor A's work on rectifying defects, such as asking him to deploy more labour resources to complete the defect rectification works as early as possible, and make arrangements to avoid unnecessary disruption and nuisance to the building users when carrying out the works. In the event that Contractor A could not complete the remaining defect rectification works in a timely manner, the ArchSD needs to consider carrying out the works by another contractor and recovering the related expenditure from Contractor A in accordance with Contract A (see para. 5.2(e)). In implementing a works project in future, the ArchSD also needs to take measures to ensure that all defects and outstanding works are rectified and completed respectively within the maintenance period or as soon as practicable thereafter.

Need to enhance monitoring of implementation of some works items

5.12 Audit notes that there is scope for improvement in monitoring contract quality of work. Cases 1 and 2 are examples.

Case 1

Defective drainage works

1. On 20 April 2012, a rainwater pipe burst occurred on the second floor of the CGC East Wing, causing water seepage at the ceiling of the Public Entrance lobby and Press Entrance lobby on the ground floor, and flooding to the lift lobbies of the first and second floors as well as the cafe at Tamar Park.

2. On 20 May 2012, another rainwater pipe burst took place on the first floor of CGC East Wing, with rainwater flowing down the staircase.

3. The ArchSD's investigation revealed that in both cases, the related rainwater pipes had not been adequately supported. As a result, when the pipes encountered high water flows during heavy rainfall, serious pipe movements led to pipe burst. According to the ArchSD, the pipe installations had been carried out in accordance with the suppliers' recommendations. They were subsequently reinforced with more firmly-fixed installations.

Audit comments

4. In implementing a works project in future, the ArchSD needs to strengthen its monitoring of a contractor's quality of work, such as those relating to the installation of rainwater pipes.

Source: ArchSD records

Case 2

Defective soft landscape works

1. According to the ArchSD, during a typhoon in July 2012 (Tropical Cyclone Warning Signal No. 10 was hoisted on 24 July 2012), 102 (25%) of the 410 trees planted in Tamar Complex were damaged (57 trees fell, 44 trees leaned and the branches of 1 tree broke).

2. As revealed by the joint inspections by the ArchSD and Contractor A conducted after the typhoon, the major cause of the tree damage was that the rectification work of some defects identified during the planting stage had not been satisfactorily completed. Examples included:

(a) wrapping materials had not been completely removed before tree planting. A fallen tree was found having wrapping materials (for protecting the tree root during transportation) not yet completely removed before tree planting. Similar irregularities were first identified by the ArchSD in September 2011 during the tree planting works and it had reminded Contractor A to take necessary rectification actions; and

(b) the quality of some plants was not satisfactory. The ArchSD had identified about 20 trees having cracks or bark peeling during the planting stage, and issued in September 2011 a letter to Contractor A asking for rectification actions.

Audit comments

3. In implementing a works project in future, the ArchSD needs to strengthen its monitoring of a contractor's quality of work, such as those relating to landscape works.

Source: ArchSD records

Audit recommendations

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

(a) **regarding the outstanding defect rectification works at Tamar Complex:**

(i) **strengthen the ArchSD's supervision of Contractor A's work with a view to ensuring that all defects are rectified as early as possible;**

(ii) **make arrangements to avoid unnecessary disruption and nuisance caused to building users when carrying out the works; and**

(iii) **if Contractor A could not complete the works in a timely manner, consider carrying out the works by another contractor and recovering the related expenditure from Contractor A; and**

(b) **in implementing a works project in future:**

(i) **take measures to ensure that all defects and outstanding works are respectively rectified and completed within the maintenance period or as soon as practicable thereafter; and**

(ii) **strengthen the ArchSD's monitoring of a contractor's quality of work, in particular that relating to installation of rainwater pipes and landscape works.**

Response from the Administration

5.14 The Director of Architectural Services agrees with the audit recommendations. He has said that the ArchSD:

(a) will continue to closely monitor Contractor A's performance and closely coordinate with the Contractor, building management and users with a view to expediting the completion of the remaining defect rectification works. The ArchSD will take measures to minimise the disruption caused while carrying out the works. Contractor A will complete the remaining defects as soon as possible; and

(b) is mindful of Contractor A's quality of work and appreciates the need to complete all defects and outstanding works as soon as practicable. Based on the experience gained from the Tamar Development Project, the ArchSD has conducted experience-sharing sessions with staff for continuous development.

Sterilisation of fresh-water-supply system

5.15 According to Water Supplies Department (WSD) Circular Letter No. 6/2002 issued in August 2002 on Cleaning and Sterilisation of Fresh Water Mains of Inside Service issued to all licensed plumbers and Authorised Persons, newly installed fresh water mains of inside service should be cleaned and sterilised to the satisfaction of the Water Authority (Note 29) before they are put into operation. According to the WSD, the inside service of a building includes water pipes, water tanks and water-pumping systems (see para. 5.20(a)).

5.16 In May 2010, Contractor A commenced the installation works for the fresh-water-supply system of Tamar Complex. In July 2011, the CGC and the LCC were substantially completed, and users began to move into the buildings by phases. Fresh-water supply was provided to Tamar Complex at the same time.

Note 29: *According to the Waterworks Ordinance (Cap. 102), the Director of Water Supplies is the Water Authority.*

5.17 In December 2011, a senior government official working at the CGC contracted Legionnaires' Disease (Note 30). The Department of Health (DH)'s investigations identified Legionella bacteria (exceeding the action level adopted by the DH — Note 31) in the officer's private washroom (with shower facilities) and 16 other locations in the CGC, and two locations in the LCC.

5.18 According to the ArchSD's investigation report of January 2012, possible factors leading to the proliferation of Legionella bacteria in Tamar Complex included:

(a) low utilisation of some fresh-water-supply facilities, such as private washrooms of senior government officials;

(b) the existence of some unused water pipes (reserved for future connections) leading to pipe dead ends and accumulation of stagnant water inside the fresh-water-supply system; and

(c) hot water supply in the system (according to the DH, the optimum temperature for proliferation of Legionella bacteria is around 25°C to 40°C).

5.19 Subsequently, the ArchSD implemented the following measures:

(a) carrying out sterilisation of the whole fresh-water-supply system of Tamar Complex at a cost of $2.1 million;

(b) instructing Contractor A to dismantle all the water pipes reserved for future water connections; and

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Note 30: *Legionnaires' Disease is an acute pneumonic illness caused by human inhalation of airborne droplets contaminated with Legionella bacteria, which are commonly found in natural fresh water sources (e.g. rivers and ponds) and man-made water systems (e.g. hot and cold water supply systems).*

Note 31: *According to the DH, when the concentration of Legionella bacteria of a water source exceeds 100 colony forming units per litre of water, risk assessment and appropriate remedial actions are required to be carried out on the water source.*

(c) issuing a set of housekeeping guidelines in June 2012 making reference to the recommendations of the Prevention of Legionnaires' Disease Committee (Note 32) for proper use of the fresh-water-supply system for controlling Legionnaires' Disease at Tamar Complex.

5.20 In January 2012, the WSD informed the LegCo Panel on Development that:

(a) before connecting the newly installed inside service of a building (including water pipes, water tanks and water-pumping systems) to the public-water-supply network, a licensed plumber should clean and sterilise the inside service thoroughly so as to avoid contamination caused to the public water supply;

(b) one of the possible causes of the presence of Legionella bacteria in water samples taken from Tamar Complex was the phased occupation schedule of the new buildings, resulting in some of the water mains not being put into active use after the provision of water supply to the Complex;

(c) a test of Legionella bacteria in water samples was not required under the World Health Organization (Note 33) guidelines and there was no scientific basis in support of a direct correlation between Legionnaires' Disease and a specific level of concentration of Legionella bacteria in water samples; and

(d) the WSD would review the existing guidelines in consultation with the relevant trade associations to examine the need for necessary amplification, and would enhance public education on related subjects.

Note 32: *In 1985, the Government established the Committee to advise the Government on the minimisation of the risk of Legionnaires' Disease and on the promotion of good practices to building owners and associated practitioners for preventing the outbreak of Legionnaires' Disease. The Committee's recommendations issued in April 2012 on proper use of a fresh-water-supply system included:*

(a) infrequently-used water outlets should be fully flushed for a minimum of one minute at least once a week; and

(b) redundant pipework that might lead to stagnant water should be removed.

Note 33: *World Health Organization is the directing and coordinating authority for health in the United Nations.*

5.21 In August 2012, WSD Circular Letter No. 2/2012 on Cleaning and Disinfection of Fresh Water Inside Service was issued to all licensed plumbers and Authorised Persons. According to the Circular Letter:

(a) under Regulation 7 of Waterworks Regulations (Cap. 102A), a consumer or his agent shall be responsible for keeping an inside service clean; and

(b) to this end, the consumer or his agent shall clean and disinfect a newly installed fresh-water inside service before it is provided with water supply from the WSD.

5.22 In late 2012, the CGC and the LCC joined the WSD's Quality Water Recognition Scheme with a view to ensuring satisfactory quality of fresh-water supply to Tamar Complex.

Areas for improvement

Fresh-water-supply system not fully sterilised before use

5.23 In September 2013, the ArchSD informed Audit that:

(a) to ensure satisfactory water quality before commissioning of Tamar Complex:

(i) sterilisation of the newly installed fresh-water mains between water meters of Tamar Complex and public-water mains maintained by the WSD had been carried out by a licensed plumber in 2011 according to WSD Circular Letter No. 6/2002 (see para. 5.15);

(ii) of the 23 fresh-water tanks in Tamar Complex, cleaning and sterilisation of 8 potable water tanks had been carried out as an enhancement measure; and

(iii) laboratory testing had been conducted on water samples collected from 19 randomly selected points (Note 34); and

(b) since the issue of WSD Circular Letter No. 2/2012 in August 2012 (see para. 5.21), the ArchSD had adopted the practice of conducting disinfection of other parts of a newly installed fresh-water inside service.

5.24 In Audit's view, in order to reduce risks of water contamination by bacteria, the ArchSD needs to conduct disinfection of all water mains and components of the fresh-water-supply system of new Government buildings in accordance with WSD Circular Letter No. 2/2012 in future.

Low utilisation of some fresh-water-supply facilities

5.25 At the CGC, 35 private washrooms with showers facilities are provided for use by senior government officials. According to the ArchSD's investigation in January 2012 (based on information provided by the users), of these 35 private washrooms, 14 (40%) were infrequently used. In Audit's view, in order to reduce risks of water contamination by bacteria, the ArchSD, in collaboration with the Administration Wing, needs to devise strategies to address this issue.

Audit recommendations

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

(a) **in implementing a building project in future, take measures to ensure that the fresh-water-supply system is fully disinfected before building commissioning; and**

Note 34: *According to the ArchSD, as a voluntary quality assurance measure, water samples were taken from 7 of the total 23 fresh-water tanks and 12 of the total 1,396 fresh-water taps, and the test results were found satisfactory.*

(b) **in collaboration with the Director of Administration, devise strategies to address the risks of water contamination by bacteria due to low utilisation of some fresh-water-supply facilities at Tamar Complex.**

Response from the Administration

5.27 The Director of Architectural Services agrees with the audit recommendations. He has said that:

(a) the requirement for full disinfection of the fresh-water-supply system as stipulated in WSD Circular Letter No. 2/2012 has been incorporated in the ArchSD's recent projects; and

(b) the ArchSD will work closely with the Administration Wing and the LegCo Secretariat to ensure that the measures included in the housekeeping guidelines issued in June 2012 (see para. 5.19(c)) are effectively implemented.

5.28 The Director of Administration agrees with the audit recommendation in paragraph 5.26(b). She has said that the Administration Wing has provided B/Os in the CGC with the housekeeping guidelines on the prevention of Legionnaires' Disease, and the Administration Wing will continue to make arrangements for regular cleaning of the fresh-water-supply facilities at the CGC.

PART 6: WAY FORWARD

6.1 This PART outlines the major audit observations and examines the way forward.

Tamar Development Project

6.2 Tamar Complex comprises important premises of the Administration and the Legislature of the Hong Kong Special Administrative Region, and it forms a landmark at the Central waterfront. At a cost of $5.4 billion, works of the Tamar Development Project under the design-and-build arrangement commenced in February 2008 and were substantially completed in September 2011. Before selecting Contractor A and his design for the Project, the Government had launched a two-month exhibition of the project designs proposed by four tenderers and invited members of the public to express views and comments on the four designs.

6.3 This Project was largely completed on schedule. On the expenditure side, with supplementary funding of $359.8 million approved by the FC in December 2009 to cover additional scope of works, the total expenditure of the Project was within the revised APE of $5,528.7 million.

Major audit observations

6.4 In PART 2, Audit has found that the prices of all four tenders received exceeded the contract sum provided in the APE. For the purpose of reducing the tender sum to within the contract sum provided in the APE, the Tender Negotiation Team conducted tender negotiations with only Contractor A but not with the other three tenderers. However, no criteria for selecting tenderers for negotiation was stated in the tender document. Furthermore, although the Government considered it not practicable to seek additional funding from the FC, a price ceiling was not stated in the tender document.

6.5 In PART 3, Audit has revealed that a long time had been taken in constructing Footbridge A which led to a delay of 2 months and 13 days in commissioning Tamar Complex. Moreover, partly owing to an omission to include the 2006 Design Checklist in the tender document relating to the implementation of seismic-resistant measures, the ArchSD and Contractor A entered into SA3, under which an additional payment of $150 million was made to Contractor A, including $24 million for additional costs on works acceleration and disruption, additional labour, plant and resources, and overtime work.

6.6 In PART 4, Audit has found that, after the award of Contract A and at the request of the LegCo Commission, the ArchSD and Contractor A entered into SA1 for the construction of additional areas at the LCC involving an additional NOFA of 1,415 m^2. The cost of this additional requirement amounted to $113 million, of which $36 million related to acceleration and disruption costs and additional design fee. Audit has also reported that the payback periods of some energy-efficiency equipment were longer than the normal nine-year payback period, and that the energy savings arising from the installation of some equipment using renewable-energy technologies were very low vis-à-vis the related capital investment.

6.7 In PART 5, Audit has also reported that some outstanding works and defects had not been completed and rectified within the one-year maintenance period. The fresh-water-supply system had also not been fully sterilised before commissioning of Tamar Complex.

Post-completion review

6.8 According to ETWB Technical Circular (Works) No. 26/2003 on "Post-completion Review of Major Works Contracts under Public Works Programme", the purposes of conducting a post-completion review are to:

(a) measure the success of a project in achieving its planned objectives on time, within budget and at the specified quality;

(b) bring up the lessons learned, both good and bad, for the benefit of future projects; and

(c) provide an opportunity to review the overall effectiveness of the procurement strategy and procedures so as to identify any necessary improvement areas.

6.9 With a view to assessing the effectiveness of the Tamar Development Project in achieving its planned objectives, and of the procurement strategies and procedures, in Audit's view, the ArchSD needs to, in collaboration with the Administration Wing and LegCo Secretariat, conduct a post-completion review of the Project, taking into account the audit observations in this Audit Report.

Audit recommendation

6.10 **Audit has *recommended* that the Director of Architectural Services should, in collaboration with the Director of Administration and the Secretary General of Legislative Council Secretariat, conduct a post-completion review of the Tamar Development Project, taking into account the audit observations in this Audit Report.**

Response from the Administration and the Legislative Council Secretariat

6.11 The Director of Architectural Services agrees with the audit recommendation. He has said that all the audit observations in this Audit Report will be taken into account in conducting the post-completion review of the Tamar Development Project.

6.12 The Director of Administration agrees with the audit recommendation. She has said that the Administration Wing will provide full support to the ArchSD in conducting the post-completion review of the Tamar Development Project.

6.13 The Secretary General of the Legislative Council Secretariat agrees with the audit recommendation.

Appendix A
(paras. 2.15(b) and (c)
and 2.16 refer)

Stores and Procurement Regulations 385 (d) and (e)

SPR 385(d)

The Permanent Secretary for Financial Services and the Treasury (Treasury) has authorised Controlling Officers or their designated directorate officers not having been involved in the concerned tender exercises to approve negotiations for tenders of their own departments in any of the following circumstances:

(i) when a single tender has been invited with the prior approval of the Permanent Secretary for Financial Services and the Treasury (Treasury); or

(ii) when only one tender or very few tenders have been received in response to an open tender invitation and the procuring department considers the tenders received may not be sufficiently competitive, whether in terms of price or other key quality attributes; or

(iii) when the tender price to be recommended is too high (or too low in the case of a revenue tender) in comparison with the price of similar procurement in the past or in relation to other market information; or

(iv) when the tender to be recommended contains counter-proposals to the tender terms which are disadvantageous to the Government but are not sufficiently substantial or do not cause substantial deviation from the essential requirements contained in the invitation to tender to render the recommended tender non-conforming.

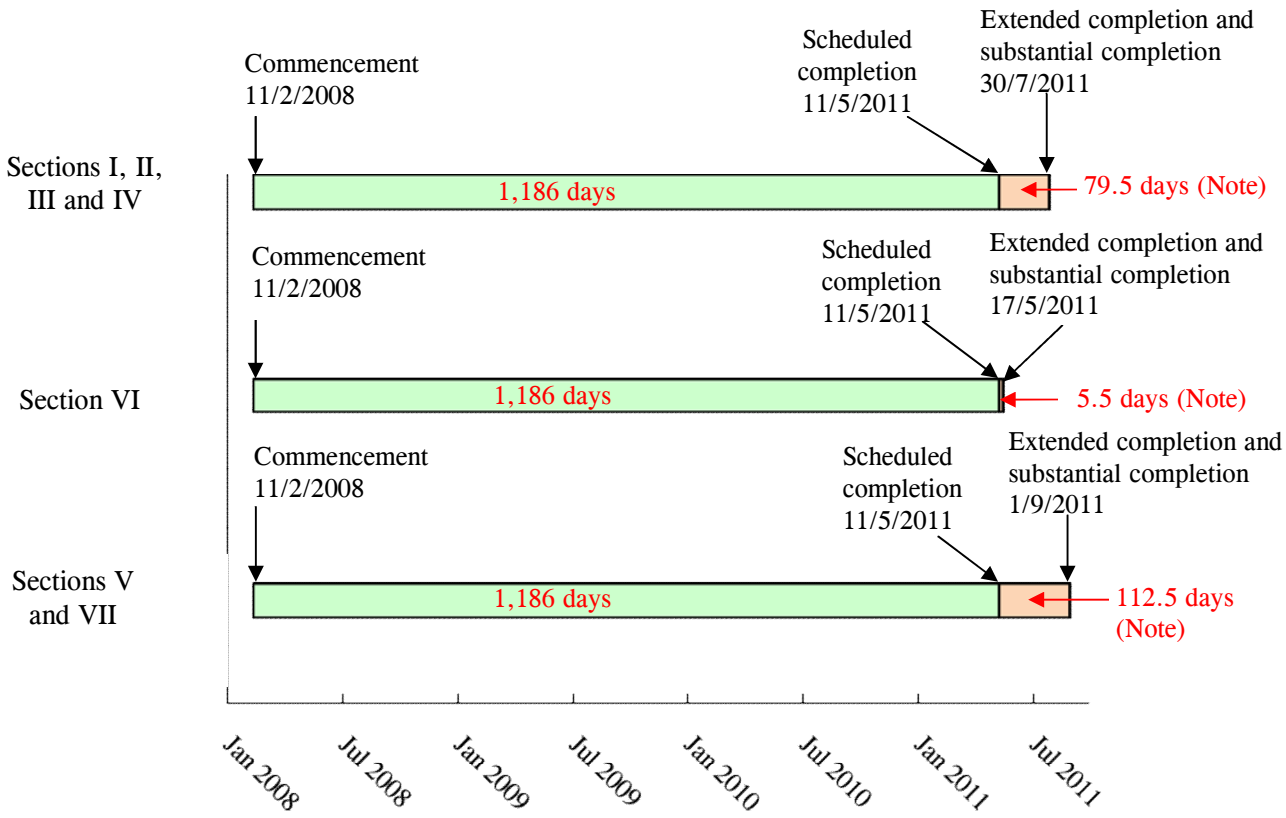
SPR 385(e)

Negotiations under items (d)(ii)-(iv) above shall normally be conducted only with the single conforming tenderer or with the conforming tenderer whose tender has been found to be clearly the most advantageous to the Government in relation to the evaluation criteria. Where no one tender is clearly more advantageous or where the most advantageous tender cannot be determined until the counter-proposals have been resolved or withdrawn, it may be necessary to hold negotiations also with the tenderers who have presented the second or the third lowest (highest for revenue contracts) conforming tenders. Wherever possible, the criteria for selection of tenderers for negotiations shall be stated in the invitation to tender. Where such criteria have not been set forth in the invitation to tender, the selection of tenderers for negotiations must be based on objective and reasonable criteria.

Source: FSTB records

Appendix B
(para. 3.6 refers)

Additional time taken in completing Contract A



Legend: Scheduled contract period

EOTs granted

Source: *Audit analysis of ArchSD records*

Note: *All EOTs granted included an EOT of 5.5 days for inclement weather and clearance of bombs discovered.*

Remarks:
Section I: *Office Blocks of CGC*
Section II: *Low Block of CGC*
Section III: *High Block of LCC*
Section IV: *Low Block of LCC*
Section V: *Elevated Walkway over Harcourt Road (Footbridge A)*
Section VI: *Elevated Walkway linking to CITIC Tower (Footbridge B)*
Section VII: *Open Space and remaining works*

Appendix C
(paras. 3.11 and 3.12 refer)

Chronology of key events of constructing Footbridge A (February 2008 to September 2011)

Month	Key event
(a) February 2008	Contract A commenced and Contractor A submitted to the Transport Department proposed temporary traffic management schemes for the construction of Footbridge A.
(b) April 2008	The Hong Kong Police Force granted approval-in-principle on the proposed temporary traffic management schemes submitted by Contractor A.
(c) June 2008	The ArchSD consulted the Central and Western District Council on the proposed temporary traffic management schemes. The District Council had no adverse comments on the schemes.
(d) July 2008	The Transport Department granted approval-in-principle on the proposed temporary traffic management schemes.
(e) August to October 2008	The ArchSD circulated to the relevant B/Ds a proposed gazette plan for the construction of Footbridge A under the Road (Works, Use and Compensation) Ordinance (Cap. 370).
(f) November 2008	The Transport and Housing Bureau gazetted the proposed construction of Footbridge A for a two-month public consultation (Note 1).
(g) January 2009	At the end of the public consultation period, eight objections were received. The ArchSD and the Administration Wing formed a steering group with a view to resolving the objections.
(h) March to May 2009	The ArchSD took action to resolve the objections and prepared documents for submission to the Chief Executive-in-Council.
(i) June 2009	After considering the objections received, the Chief Executive-in-Council authorised the construction of Footbridge A without any modification.
(j) August 2009	The Transport and Housing Bureau gazetted the decision of the Chief Executive-in-Council on the construction of Footbridge A. The ArchSD instructed Contractor A to complete the footbridge works by the scheduled completion date of May 2011.
(k) September 2009	Contractor A commenced site preparatory works for underground-cable diversion and held a meeting with utility companies: • A utility company expressed that there was no room for relocating a cable duct (Cable duct A). • Contractor A requested the utility company to carry out a detailed survey.

Month	Key event
(l) November 2009	Contractor A and the utility company conducted a joint inspection. Another cable duct (Cable duct B) obstructing the construction of the footbridge foundation was found.
(m) December 2009	• The utility company informed Contractor A that relocation of Cable duct A was not feasible and requested that the footbridge foundation design should be revised to avoid relocation of Cable duct A. • Contractor A requested the utility company to relocate Cable duct B.
(n) February 2010	Assuming that Cable duct B would be relocated, Contractor A proposed to install 56 mini-piles as the footbridge foundation **(Design Option 1)**. Foundation works commenced based on Design Option 1.
(o) March 2010	The utility company informed Contractor A that relocation of Cable duct B was not feasible due to technical reasons, and requested Contractor A to change the footbridge foundation design.
(p) April 2010	Contractor A revised the footbridge foundation design for installing 58 mini-piles **(Design Option 2)** and commenced works accordingly.
(q) June 2010	During construction, ground settlement occurred and the ArchSD asked Contractor A to review the construction method for the mini-pile foundation.
(r) August 2010	The works progress was slow due to cable obstruction. Contractor A gave up Design Option 2 and decided to construct 3 bored piles and 5 mini-piles as the footbridge foundation which would prevent damaging the utility cables **(Design Option 3)**.
(s) November 2010	Upon the ArchSD's approval on Design Option 3, Contractor A commenced the foundation works.
(t) January 2011	Contractor A completed the foundation works.
(u) September 2011	Footbridge A was completed (Note 2).

Source: ArchSD records

Note 1: Under the Roads (Works, Use and Compensation) Ordinance, the Secretary for Transport and Housing shall submit within nine months after the end of the public consultation period all the objections received to the Chief Executive-in-Council for consideration.

Note 2: In July 2012, the ArchSD granted an EOT of 107 days for Footbridge A works.

Appendix D
(paras. 4.2(a) and 4.13 refer)

Projected accommodation in Central Government Complex (May 2006)

Office/Facility	NOFA in former CGO and related buildings (m^2)	Projected NOFA in CGC (m^2)
Chief Executive's Office	1,160	1,580
ExCo Chamber and its Secretariat	880	1,150
Offices of the Chief Secretary for Administration and the Financial Secretary, including Administration Wing and other offices	6,880	6,770
Offices of bureaux	42,890	38,660
Common and ancillary facilities	3,050	8,510
Sub-total	54,860	56,670
Allowance for expansion (10%)	—	5,670
Total	54,860	62,340

Source: Records of Administration Wing

Appendix E
(paras. 4.33, 4.35 and 4.38 refer)

Environmental and energy-efficiency measures

(A) Original Installations (January 2008)

Energy-efficiency equipment	Capital cost (a) ($'000)	Estimated annual energy saving (b) ($'000)	Payback period (c) = (a)÷(b) (year)
(1) Environmental building design	2,700	579	4.7
(2) Environmental air-conditioning and ventilation design			
(a) Re-use of condensate water for fresh air pre-cooling	500	17	29.4
(b) Free cooling design	1,500	60	25.0
(c) Energy recovery system	4,360	597	7.3
(d) Automatic condenser tube cleaning system	800	180	4.4
(e) Heat recovery chiller	500	113	4.4
(f) Energy-efficiency seawater cooled chiller plant	3,924	2,067	1.9
(g) Demand control of fresh air supply	500	338	1.5
(h) Variable speed drive for air-conditioning equipment	2,290	1,840	1.2
(i) Flexible zone control	290	308	0.9
(j) Demand control for carpark ventilation system	500	576	0.9
(k) Intelligent energy optimisation control	1,132	1,589	0.7
(l) Occupancy sensor control	306	504	0.6
(m) High-efficiency motor	518	1,352	0.4

Energy-efficiency equipment	**Capital cost** **(a)** **($'000)**	**Estimated annual energy saving** **(b)** **($'000)**	**Payback period** **(c) = (a)÷(b)** **(year)**
(3) Environmental lift and escalator design			
(a) Automatic on/off switch of lighting and ventilation fan for lift cars	50	7	7.1
(b) Service-on-demand escalator	661	184	3.6
(c) Use of lift regenerative power	0	23	0
(4) Environmental lighting design			
(a) Occupancy sensor and computerised lighting control	3,972	609	6.5
(b) LED exit signs	192	71	2.7
(c) LED lamp as indication light for control panel	0	42	0
(d) Lower lighting power density design	0	612	0
Overall	24,695	11,668	2.1

(B) Additional Installations (April 2010)

Item	Capital cost (a) ($'000)	Estimated annual energy saving (b) ($'000)	Payback period (c) = (a)÷(b) (year)
Energy-efficiency equipment			
(1) Dimming control for footbridge lighting	300	1.7	176.5
(2) LED lighting	30,800	352.8	87.3
(3) Occupancy sensor for lighting	26,000	640.7	40.6
(4) Task lighting design for CGC	11,000	420.1	26.2
(5) Temperature-controlled mechanical ventilation	500	162.8	3.1
Subtotal	68,600	1,578.1	43.5
Equipment using renewable-energy technologies			
(6) Solar hot water system	7,700	18.9	N/A (Note 1)
(7) Thin-film photovoltaic panels	2,400	5.1	
(8) Photovoltaic external lighting for open space	1,200	1.9	
(9) Light pipe	800	2.7	
Subtotal	12,100	28.6	
Environmental-conservation equipment			
(10) Additional infrastructure for power supply to electric vehicles	2,000	N/A (Note 2)	N/A (Note 2)
(11) Recycling bins	1,500		
Subtotal	3,500		
Total	84,200		

Source: *Audit analysis of ArchSD records*

Note 1: *According to the ArchSD, payback-period analyses are not applicable to these items.*

Note 2: *According to the ArchSD, estimated annual energy savings and payback periods are not applicable to these items.*

Acronyms and abbreviations

APE	Approved Project Estimate
ArchSD	Architectural Services Department
Audit	Audit Commission
BD	Buildings Department
B/Ds	Government Bureaux and Departments
B/Os	Government Bureaux and Main Offices
CFA	Construction Floor Area
CGC	Central Government Complex
CGO	Central Government Offices
DEVB	Development Bureau
DH	Department of Health
ENB	Environment Bureau
EOT	Extension of Time
ETWB	Environment, Transport and Works Bureau
ExCo	Executive Council
FC	Finance Committee
FSTB	Financial Services and the Treasury Bureau
kWh	Kilowatt-hour
LCC	Legislative Council Complex
LED	Light-Emitting Diode
LegCo	Legislative Council
m^2	Square metres
NOFA	Net Operating Floor Area
SA	Supplementary Agreement
SPRs	Stores and Procurement Regulations
WSD	Water Supplies Department
WTO	World Trade Organization