

CHAPTER 1

Highways Department

<p>Administration of consultancies under Castle Peak Road Improvement Project</p>
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**Audit Commission
Hong Kong
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This audit review was carried out under a set of guidelines tabled in the Provisional Legislative Council by the Chairman of the Public Accounts Committee on 11 February 1998. The guidelines were agreed between the Public Accounts Committee and the Director of Audit and accepted by the Government of the Hong Kong Special Administrative Region.

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ADMINISTRATION OF CONSULTANCIES UNDER CASTLE PEAK ROAD IMPROVEMENT PROJECT

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PART 1: INTRODUCTION

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

Background

Role of the Highways Department

1.2 One of the functions of the Highways Department (HyD) is to implement highways projects to meet the growth in traffic demand and serve new development areas. This involves the planning, design and supervision of the construction of roads, bridges and noise barriers. In 2007, the HyD incurred \$3.1 billion in implementing road infrastructure projects.

Castle Peak Road improvement works project

1.3 In 1994, the HyD noted that a section of Castle Peak Road (CPR) of 8.3 kilometres (km) between Area 2 (at the junction with Hoi On Road) and Ka Loon Tsuen in Tsuen Wan (hereinafter referred to as the CPR section — see Figure 1 in para. 1.7) required improvement. The reasons were as follows:

- (a) while the CPR section was classified as Rural Road A, the width of a large part of the section was narrower than 7.3 metres (Note 1);
- (b) there were 12 sharp bends along the CPR section, causing severe sight line restrictions to road users;
- (c) the roadside footpaths were either unavailable or too narrow, posing a safety hazard to pedestrians; and
- (d) the road capacity would not be sufficient to cope with future traffic demand following the completion of planned residential developments in Tsuen Wan West and Tuen Mun.

Note 1: *According to the Hong Kong Planning Standards and Guidelines, Rural Road A is a road for the movement of traffic from a smaller centre of population to a major transport network, and its minimum width is 7.3 metres.*

1.4 In October 1994, the HyD appointed a consultant (**Consultant A**) to conduct a feasibility study (**feasibility-study consultancy**) to identify measures for upgrading the road standards and increasing the capacity of the CPR section at a fixed fee of \$7.8 million. In December 1996, Consultant A submitted a report to the HyD recommending the widening of the section from a single two-lane carriageway to a dual two-lane carriageway. The HyD accepted the recommendation for the improvement works (hereinafter referred to as the CPR Project).

1.5 In June 1997, the Finance Committee (FC) of the Legislative Council approved funding of \$57.2 million for the investigation and design of the CPR Project. In the same month, the HyD appointed another consultant (**Consultant B**) to carry out the design and supervision of the works (**design-and-construction consultancy**) at a lump sum of \$19.8 million with provision for inflation adjustments. The design work was scheduled for completion by September 1999.

1.6 In January 2001, in a paper submitted to the Public Works Subcommittee (PWSC) of the FC seeking funding for the CPR Project, the Administration said that the scope included:

- (a) widening and realignment of the CPR section from a single two-lane carriageway to a dual two-lane carriageway with a three-metre wide footpath on both sides, including the construction of elevated highway structures;
- (b) associated works on road reconstruction, road-junction modifications, slope stabilisation, landscape, lighting and drainage;
- (c) reclamation of 2.8 hectares of land;
- (d) construction of two seawalls of 310 metres and 970 metres in length;
- (e) installation of noise barriers;
- (f) construction of a 300-metre two-lane flyover in Ting Kau and eleven covered footbridges; and
- (g) provision of recreational facilities at five beaches in the area to compensate for alienation of beach space.

The PWSC supported the funding application. In March 2001, the FC approved funding of \$3,761 million for the works, which were targeted for completion by June 2005. In September 2001, Consultant B completed the design work.

Award of contracts

1.7 Between August 2001 and December 2005, the HyD awarded four contracts, namely Contracts A, B, C and D, for the construction works (see Table 1 and Figure 1). Under the design-and-construction consultancy agreement, Consultant B was appointed the Engineer of the four contracts.

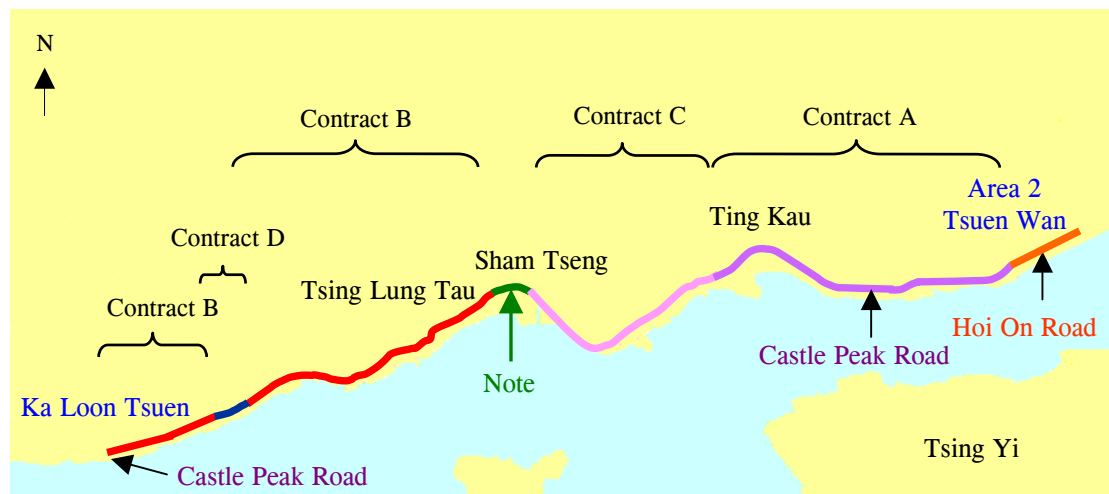
Table 1
Four works contracts

Road improvement works	Original contract sum (\$ million)	Contract commencement date	Substantial completion date
Contract A — A road section between Area 2, Tsuen Wan and Ting Kau	843.0	17.8.2001	17.3.2005
Contract B — A road section between Sham Tseng and Ka Loon Tsuen (excluding the road section under Contract D — see Figure 1)	764.0	23.11.2001	25.5.2006 (Note)
Contract C — A road section between Ting Kau and Sham Tseng	963.0	21.5.2002	31.7.2006
Contract D — A road section at west of Tsing Lung Tau (not covered by Contract B — see Figure 1)	92.8	21.12.2005	30.6.2007

Source: HyD records

Note: According to the HyD, the Contract B works were substantially completed on 25 May 2006. Up to September 2008, the Engineer had not certified the substantial completion of Contract B.

Figure 1
Road sections of the four works contracts



Source: HyD records

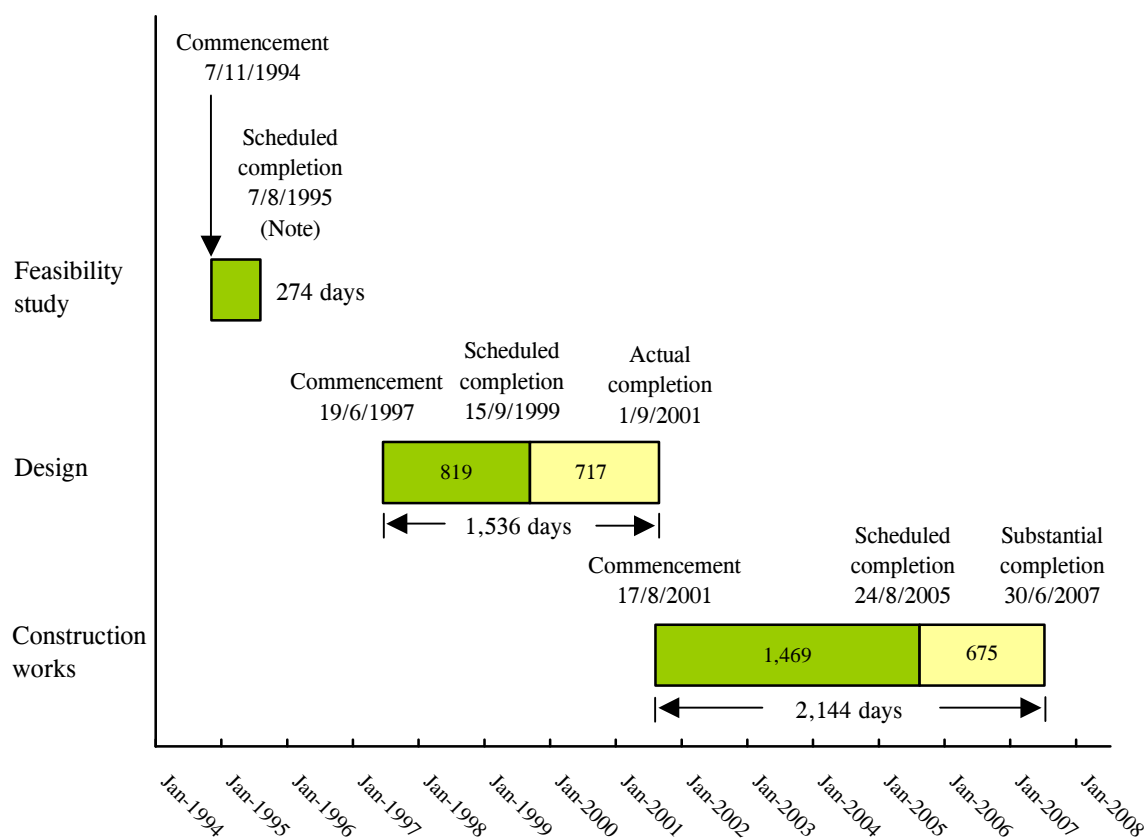
Note: As required under the land grant conditions of a site in Sham Tseng, a developer had carried out road improvement works for a section of CPR in Sham Tseng (the green road section) before 2001. Therefore, road improvement works for this section were not required under the CPR Project.

1.8 Between November 1998 and September 2002, Consultant B submitted various financial claims for additional work under the design-and-construction consultancy. In May 2003, the HyD and Consultant B entered into a **settlement agreement** and the HyD subsequently paid Consultant B a sum of money for settling his claims (see paras. 2.11 and 3.18). In September 2004, the HyD entered into a **supplemental agreement** with Consultant B for the design and supervision of construction works for a 400-metre road section interfacing with another road project (see para. 4.15). The works under the CPR Project were substantially completed between March 2005 and June 2007, and the whole dual two-lane carriageway was open to traffic in phases from March 2005 to July 2007.

Duration of the CPR Project

1.9 The scheduled and actual completion dates of the feasibility study, design and construction works of the CPR Project are shown in Figure 2.

Figure 2
CPR Project milestones



Source: HyD records

Note: The draft feasibility-study report was submitted on 31 July 1995 (i.e. before 7 August 1995). The final report was submitted on 19 December 1996.

Audit review

1.10 The Audit Commission (Audit) has recently conducted a review to examine the HyD's administration of the feasibility-study consultancy and the design-and-construction consultancy under the CPR Project. The review focused on the following areas:

- (a) slope investigation and design (PART 2);
- (b) application for environmental permits (PART 3);
- (c) road works for an interface section (PART 4); and
- (d) alternative designs of works (PART 5).

Audit has found that there are areas where improvements can be made by the HyD in the planning, monitoring and administration of consultancies for road projects. Audit has made a number of recommendations to address the issues.

Acknowledgement

1.11 Audit would like to acknowledge with gratitude the full cooperation of the staff of the HyD, the Civil Engineering and Development Department, the Environmental Protection Department and the Transport Department during the audit.

PART 2: SLOPE INVESTIGATION AND DESIGN

2.1 This PART examines the HyD's administration of the feasibility-study consultancy and the design-and-construction consultancy, in particular the work relating to slope investigation and design, and suggests improvement measures.

Feasibility-study consultancy

2.2 In October 1994, the HyD appointed Consultant A to conduct the feasibility study. As laid down in the consultancy brief, Consultant A should:

- (a) investigate and evaluate feasible alignment options to improve the capacity and level of service of the CPR section; and
- (b) **identify any existing slopes and retaining structures along the CPR section that required upgrading.**

2.3 In July 1995, after reviewing the various options of improvement to the CPR section, Consultant A submitted a draft feasibility-study report (Note 2) to the HyD recommending that the section should be upgraded to a dual two-lane carriageway. **The draft study report indicated that, in association with the road works, four existing slopes along the CPR section would require stabilisation works.**

Geotechnical Engineering Office's views

2.4 In February 1996, regarding the July 1995 draft report, the Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department (CEDD — Note 3) informed the HyD that:

- (a) all the slopes (both man-made and natural) affected by the works along the CPR section should be upgraded;

Note 2: *Consultant A later submitted the final study report in December 1996, the contents of which were similar to those in the July 1995 draft report.*

Note 3: *The CEDD was formed in July 2004 by merging the former Civil Engineering Department and the former Territory Development Department. For simplicity, the Civil Engineering Department is also referred to as the CEDD in this Audit Report.*

- (b) **the draft report did not appear to show all slopes requiring upgrading; and**
- (c) **the HyD should ensure that the required slope works would be covered in the design-and-construction consultancy.**

Design-and-construction consultancy

2.5 In July 1996, the Engineering and Associated Consultants Selection Board (EACSB — Note 4) gave approval for the HyD to invite tenders for the design-and-construction consultancy. In October 1996, in inviting tenders for the consultancy, the HyD included in the tender documents Consultant A's July 1995 draft report (see para. 2.3) and a consultancy brief. The consultancy brief said that:

- (a) potential hazards arising from slope failures and other geotechnical works to properties and commuters travelling along the CPR section should be identified and evaluated. Measures to lower these potential hazards to acceptable levels should be investigated and included in the works design and contract documents;
- (b) all existing slopes and retaining walls within or in the vicinity of the CPR Project should be investigated and upgraded if necessary;
- (c) the scope of the CPR Project included all works necessary for the completion of the works as shown on the drawings of the feasibility-study report. It also included the works for upgrading the road section to a dual two-lane carriageway;
- (d) the consultant should identify and agree with the GEO the existing slopes and retaining walls, within or in the vicinity of the CPR Project, that could influence or be influenced by the Project, and should design works required for these slopes and retaining walls; and
- (e) the extent of the works to be designed was shown schematically on drawings of the feasibility-study report. The general layout and drawings were subject to refinement and modifications to be agreed in the Review and Impact Assessment Phase (see para. 2.6(a) below).

Note 4: *The EACSB is chaired by the Director of Civil Engineering and Development, with members from the Development Bureau and the Financial Services and the Treasury Bureau. The Secretary for Financial Services and the Treasury has delegated his authority to the EACSB for the selection, appointment and remuneration of engineering and associated consultants for government projects.*

2.6 In December 1996, Consultant A submitted the final feasibility-study report to the HyD. In June 1997, the HyD certified the completion of the feasibility-study consultancy. In the same month, after evaluating the tenders submitted by ten consultants, the HyD awarded the design-and-construction consultancy to Consultant B. As laid down in the consultancy agreement, Consultant B should complete his work in accordance with the requirements set out in the consultancy brief (see para. 2.5). The design-and-construction consultancy comprised the following three phases:

- (a) ***Review and Impact Assessment Phase.*** This involved updating all available information, seeking necessary additional information, reviewing, refining and modifying where appropriate the previous work under the feasibility study and carrying out additional design work as necessary. Consultant B should review the findings, conclusions and recommendations of the feasibility study and agree with the GEO the existing slopes that required investigation and upgrading;
- (b) ***Design and Tender Phase.*** This involved completing the detailed design of the works under the CPR Project and inviting tenders for the works contracts in accordance with the planned programme; and
- (c) ***Construction Phase.*** This involved achieving satisfactory implementation of the works under the CPR Project according to the planned programme.

Increase in scope of slope investigation and design

2.7 In June 1997, the GEO completed assessments of the slopes along the CPR section and found that about 100 slopes would require investigation. In November 1998, Consultant B informed the HyD of his intention to claim additional payments on the grounds that the number of slopes requiring investigation and design would not have reasonably been expected during the tender stage. In December 1998, Consultant B identified that 113 slopes might be affected by the road improvement works. In February 1999, the GEO and Consultant B conducted inspections of the slopes. In March 1999, in response to Consultant B's claim, the HyD informed Consultant B that the consultancy fee should have taken into account the need for slope investigation and design, and the claim was not justified. In August 1999, Consultant B informed the HyD that:

- (a) after the tendering for his consultancy, between November 1996 and April 1997, the GEO conducted a study to identify geotechnical features for examination; and
- (b) in July 1999, the GEO published a new requirement for upgrading geotechnical features under road projects. There was no such requirement when Consultant B submitted his tender for the consultancy.

GEO's views

2.8 In November 1999, in response to the HyD's request for comments on Consultant B's claim, the GEO said that:

- (a) Consultant B was well aware that the extent and number of existing slopes were not provided because such information was not available at the time of tendering, and he was expected to make his assessment; and
- (b) the requirements to study and design the slope upgrading works had been clearly stipulated in the consultancy brief, and Consultant B had not put forward any convincing arguments for his claim.

Consultant A's views

2.9 In July 2000, in response to the HyD's enquiry, Consultant A said that:

- (a) given the time scale and budgetary constraints on the site investigation, the feasibility study only covered a **broad-brush appraisal of existing slopes** along the roadside. The main objective of the feasibility study was to identify an appropriate alignment for the CPR section;
- (b) it was appropriate to identify major slopes where any upgrading works could affect the alignment of the road. Identification of minor slopes, upgrading of which would not affect the proposed alignment, was considered outside the scope of the feasibility study; and
- (c) during the course of the feasibility study, Consultant A's work was subject to review by the GEO.

2.10 In August 2000, Consultant B informed the HyD that he was required to investigate 113 slopes (see para. 2.7) and found that detailed design for **57 slopes** would be required. In July 2001, after completing the detailed design, Consultant B claimed additional payments for the design of the slopes on the grounds that the feasibility-study report only identified **4 slopes** for upgrading.

Settlement of dispute

2.11 Between July 2001 and August 2002, the HyD and Consultant B exchanged views on the claim. In September 2002, Consultant B served a notice of arbitration. In October 2002, the Legal Advisory Division (Works) of the Development Bureau (Note 5) appointed an independent consultant to assist the HyD on the issue. In November 2002, the HyD and Consultant B agreed to negotiate a settlement instead of going through the arbitration process. In March 2003, after negotiation and obtaining the Legal Advisory Division's advice, the HyD agreed with Consultant B that he was entitled to an additional payment for investigation and design of some slopes. In May 2003, the HyD entered into a settlement agreement with Consultant B and subsequently paid him a sum of money for settlement of this claim and other claims (see para. 3.18).

Audit observations and recommendations

Need to clearly define the scope of design-and-construction consultancy

2.12 In February 1996, the GEO said that the draft feasibility-study report did not appear to show all slopes requiring upgrading, and that the HyD should ensure that the required slope works would be covered in the design-and-construction consultancy (see para. 2.4). In October 1996, in the consultancy brief included in the tender documents for the design-and-construction consultancy, it was stated that the consultant appointed should identify and agree with the GEO the existing slopes that required investigation and upgrading, and design the improvements required (see para. 2.5(d)). The consultancy brief also mentioned that:

- (a) the scope of the CPR Project included all works necessary for the completion of the works as shown on the drawings of the feasibility-study report (see para. 2.5(c)); and
- (b) the extent of the works to be designed was shown schematically on drawings of the feasibility-study report (see para. 2.5(e)).

Note 5: *In July 2007, the Development Bureau was formed to take over, among others, the works policy portfolio of the former Environment, Transport and Works Bureau. For simplicity, the Environment, Transport and Works Bureau is also referred to as the Development Bureau in this Audit Report.*

2.13 Under the design-and-construction consultancy, Consultant B identified that 57 of the 113 slopes would require detailed design of slope works (see para. 2.10). As a result, Consultant B submitted claims on the grounds that the feasibility-study report had only identified 4 slopes for upgrading (see para. 2.3). In March 2003, after negotiation and obtaining the Legal Advisory Division's advice, the HyD agreed with Consultant B that he was entitled to an additional payment for investigation and design of some slopes. In May 2003, the HyD entered into a settlement agreement with Consultant B and subsequently paid Consultant B a sum of money to settle his claims.

2.14 In July and September 2008, in response to Audit's enquiry, the HyD informed Audit that:

- (a) the scope of works for the CPR project included widening and realignment of the road section, construction of footbridges, reclamation, installation of noise mitigation structures, provision of indirect noise mitigation measures, provision of recreational facilities, reprovision of sitting-out areas, and associated works on road reconstruction, junction modification, slope stabilisation, geotechnical features, landscaping, lighting and drainage. The scope of design-and-construction services for the project, as a whole, was considered adequately defined when the consultancy was invited;
- (b) it was intended at the time of drawing up the design-and-construction consultancy brief that Consultant B would refine and modify the work done under the feasibility study, which formed a broad basis of the consultancy brief; and
- (c) the services related to the existing slopes only formed a small part of the consultancy (the fee on investigating the slopes involved was about 10% of the total consultancy fee).

2.15 There were claims arising from the increase in the scope of slope investigation and design under the design-and-construction consultancy. **To enable tenderers of a design-and-construction consultancy to submit competitive fee proposals and minimise claims after the award of the consultancy, Audit considers that, in administering a road project in future, the HyD needs to clearly define the scope of work in tender documents for the consultancy.**

Need to conduct investigation before awarding design-and-construction consultancy

2.16 According to the **EACSB Handbook** (Note 6), a major project normally involved three types of consultancy studies, namely:

- (a) ***Feasibility-study consultancy.*** The consultancy would examine:
 - (i) a problem or a proposal of a general nature to determine the need for action;
 - (ii) the feasibility of a particular proposal to determine whether and how it could be undertaken; and
 - (iii) alternative proposals to determine which one should be adopted;
- (b) ***Investigation consultancy.*** This consultancy would mainly examine the technical and practical aspects of the project; and
- (c) ***Design-and-construction consultancy.*** This consultancy would include the preparation of detailed designs, drawings, works tender specifications and tender documents, and the administration and technical control of works contracts.

2.17 Furthermore, it was laid down in **Works Branch Technical Circular No. 16/95 of August 1995** on “Selection and Remuneration of Engineering and Associated Consultants” that:

- (a) **in the usual situation where the scope of design-and-construction services for a project could not be adequately defined until an investigation had been carried out, the project should be split into two separate consultancies, one for investigation services and one for design-and-construction services.** Submissions for the design-and-construction consultancy should be invited only after the investigation consultancy had been completed, by which time the scope of design-and-construction services would have been adequately defined to enable consultants to submit competitive lump sum fee proposals; and

Note 6: *The EACSB Handbook provides guidance on matters relating to the selection, appointment and management of consultants.*

- (b) in the unusual situation where the scope of investigation, design and construction services could be adequately defined at the start for the purposes of inviting competitive lump sum fee proposals, a single investigation-design-and-construction consultancy might be awarded.

2.18 **As pointed out by the GEO (see para. 2.4), Consultant A's feasibility study had not identified all the slope works for inclusion in the tender documents for the design-and-construction consultancy. In accordance with Works Branch Technical Circular No. 16/95, the scope of slope works in the design-and-construction consultancy would have been better defined by splitting the consultancy into two separate consultancies, one for investigation and the other for design and construction (see para. 2.17(a)).**

2.19 *Recent improvement measures.* Audit notes that, after the award of the design-and-construction consultancy under the CPR Project in June 1997, there have been measures to improve controls over the award of combined investigation-design-and-construction consultancies, as follows:

- (a) *as laid down in revised EACSB Handbook of May 1999*, subject to the approval of the EACSB, for a project where the scope can be adequately defined at the commencement of the investigation study, the investigation consultancy may be combined with the design-and-construction consultancy for the project; and
- (b) *according to revised Works Branch Technical Circular No. 16/95 of January 2006* (Note 7), if an investigation-design-and-construction consultancy is adopted, the Controlling Officer should be satisfied that the risks of major scope changes following the investigation stage are low, and that it is appropriate to invite bids on the lump sum basis. Such Controlling Officer's satisfaction with the use of the investigation-design-and-construction consultancy arrangement should be clearly indicated in the EACSB submission.

2.20 **Audit considers that the revised EACSB Handbook of May 1999 and revised Works Branch Technical Circular No. 16/95 of January 2006 have introduced good control mechanisms, which would help ensure that, for a project where the scope has not been clearly defined, an investigation is carried out before the award of a design-and-construction consultancy.**

Note 7: *As at June 2008, this circular was in force.*

Audit recommendations

2.21 **Audit has recommended that, in administering a road project and related consultancies in future, the Director of Highways should:**

- (a) **take measures to ensure that the scope of a design-and-construction consultancy is adequately defined (see para. 2.15); and**
- (b) **in the event that the scope of a design-and-construction consultancy cannot be adequately defined after conducting a feasibility study, carry out a separate investigation study in accordance with Works Branch Technical Circular No. 16/95 (see para. 2.18).**

Response from the Administration

2.22 The **Director of Highways** accepts the audit recommendations. He has said that:

- (a) the HyD concurs with the audit view that measures have been taken to ensure that the scope of a design-and-construction consultancy is adequately defined for the future (see para. 2.19); and
- (b) the revisions to EACSB Handbook in May 1999 and Works Branch Technical Circular No. 16/95 in January 2006 have strengthened controls over the handling of combined investigation-design-and-construction consultancies. The HyD will continue to adhere to the requirements in the Circular.

PART 3: APPLICATION FOR ENVIRONMENTAL PERMITS

3.1 This PART examines the HyD's administration of the application for environmental permits for works under the CPR Project and suggests improvement measures.

Environmental Impact Assessment before April 1998

3.2 As laid down in Works Branch Technical Circular No. 14/92 of April 1992 on "Environmental Impact Assessment (EIA) of major development projects", works departments should conduct EIAs for a works project and notify the Environmental Protection Department (EPD) of the environmental impact at an early stage of the project. Furthermore, according to Planning, Environment and Lands Branch General Circular No. 2/92 of January 1992 on "Public access to EIA Reports", after the EPD's acceptance of EIA reports, works departments should place copies at the EPD Headquarters and the District Offices of the Home Affairs Department for public inspection. The works departments concerned should arrange a press release announcing the availability of the EIA reports. Members of the public could give comments on or raise objections to the proposed works. The departments should, in consultation with the EPD, consider appropriate action to address objections raised.

Environmental Impact Assessment after April 1998

Environmental Impact Assessment Ordinance

3.3 In April 1998, the Environmental Impact Assessment Ordinance (EIAO — Cap. 499), enacted in February 1997, came into effect. Under the EIAO, a person carrying out **designated projects** (Note 8) is required to conduct EIAs and apply for environmental permits from the EPD. A designated project is a project that may have an adverse impact on the environment. As defined under the EIAO, designated projects include:

Note 8: *Under the EIAO, there are two types of designated projects, namely Schedule 2 projects and Schedule 3 projects. Schedule 2 projects include road improvement, reclamation and dredging works, and Schedule 3 projects mainly include works related to engineering feasibility studies. As only road, reclamation and dredging works were covered by this audit review, for simplicity, a designated project in this Audit Report refers to a Schedule 2 project.*

- (a) major extensions or improvements to existing expressways, trunk roads, etc.;
- (b) reclamation works (including associated dredging works) involving an area of more than one hectare, which is less than 100 metres from an existing residential area; and
- (c) dredging operations which are less than 500 metres from the nearest boundary of an existing bathing beach.

Procedures for applying for environmental permits

3.4 Under the EIAO:

- (a) a person (the applicant) planning to conduct a designated project should submit a project profile to the EPD in accordance with the technical memorandum (Note 9) of the EIAO;
- (b) after submitting the project profile to the EPD, the applicant should advertise in two local newspapers stating a place where members of the public can have access to the project profile, and that they may give their comments to the EPD;
- (c) the EPD should forward a copy of the project profile to the Advisory Council on the Environment (ACE — Note 10);
- (d) after taking into account the comments of the ACE and the public, the EPD would either:
 - (i) issue to the applicant an EIA study brief with details for an EIA to be carried out; or
 - (ii) give permission for the applicant to directly apply for environmental permits;

Note 9: *The technical memorandum sets out the principles, procedures and guidelines for compiling a project profile, an EIA study brief and an EIA report.*

Note 10: *The ACE advises the Government on measures to combat pollution, and to protect and sustain the environment.*

- (e) after conducting an EIA in accordance with the requirements under the EIA study brief, the applicant should submit an EIA report to the EPD;
- (f) after examining the EIA report, the EPD may advise the applicant to make the report available at specified locations for public inspection and comments during a 30-day period;
- (g) after taking into account any comments from the ACE and the public on the EIA report, the EPD may approve the report and place a copy of it on a register (EIA Register — Note 11) established under the EIAO for public inspection; and
- (h) thereafter, the applicant may apply for environmental permits and the EPD may grant the permits if it is satisfied that the environmental impact of the designated project is unlikely to be adverse, and that there are acceptable mitigation measures for the project.

3.5 In October 1998, after the enactment of the EIAO, Works Bureau Technical Circular No. 18/98 on “Procedures for EIA of development projects and proposals” was issued, setting out procedures for conducting EIAs for government projects. According to the circular:

- (a) in seeking the PWSC’s support for funding of a works project, the Administration should indicate in the paper the action to be taken for a designated project under the EIAO; and
- (b) for a designated project under the EIAO, copies of environmental permits should be included in the tender documents to notify tenderers of the environmental mitigation measures required.

Environmental permits under Castle Peak Road Project

3.6 In December 1996, as required under the feasibility-study consultancy, Consultant A completed an EIA (based on the works identified in the feasibility study) and submitted a report (**December 1996 EIA report**) to the EPD. In April 1997, the EPD accepted the EIA report and placed it at the EPD Headquarters and the District Offices of the Home Affairs Department for public inspection. In April 1998, when the EIAO came into effect, the EPD placed the report on the EIA Register (see para. 3.4(g)).

Note 11: *The EIA Register contains information on project profiles, EIA study briefs and reports, applications for environmental permits and decisions on such applications.*

- 3.7 As required under the design-and-construction consultancy:
- (a) Consultant B should conduct another EIA to review the findings and recommendations of the December 1996 EIA report and submit another report to the HyD by November 1997;
 - (b) the EIA should assess the environmental impacts and identify mitigation measures for the CPR Project; and
 - (c) Consultant B should comply with all ordinances, by-laws, regulations and rules governing the control of any form of pollution for environmental protection and obtain the necessary licences and permits for implementing the Project.

In May 1998, Consultant B submitted an EIA report (**May 1998 EIA report**) to the HyD.

Environmental permits not required for road improvement works

3.8 In July 1998, in response to the HyD's enquiry, the EPD informed the HyD that the CPR Project should be classified as a designated project (see para. 3.3(a)). On the grounds that the CPR section was classified as Rural Road A in accordance with the Transport Planning and Design Manual (Note 12), the HyD considered that it did not fall within the definition of a designated project. In November 1998, the HyD requested the Transport Department (TD) to clarify the classification of the CPR section. In the same month, the TD informed the HyD that the section was classified as Rural Road A at that time, but the appropriateness of the classification in the future would be subject to review.

3.9 In May 1999, in response to Consultant B's enquiry about the application for environmental permits, the EPD informed the HyD that:

- (a) an application for environmental permits for the CPR Project was expected to be made before November 1999 as the tender preparation work would be carried out by the end of 1999; and

Note 12: *The Manual provides information and guidance on the planning and design of transport infrastructures in Hong Kong.*

- (b) if the application for environmental permits would be based on an approved EIA report on the EIA Register (see para. 3.6), the HyD should refer to the December 1996 one as it was the only report placed on the EIA Register. In doing so, the HyD should assess and report to the EPD any subsequent changes. The HyD should explain clearly how the changes would affect the findings and conclusions stated in the EIA report.

3.10 In May 1999, in the light of the EPD's advice, the HyD requested Consultant B to provide additional information required by the EPD. In January 2000, Consultant B submitted a supplementary EIA report (**January 2000 EIA report**) to the EPD providing information on the changes to the December 1996 report.

3.11 According to an implementation schedule compiled by the HyD in October 1999, a paper seeking funding for the CPR Project should be submitted to the PWSC in June 2000. To clarify whether the Project should be classified as a designated project before submitting a paper to the PWSC (see para. 3.5), between February and May 2000, the HyD, the TD and the EPD exchanged views on the issue (see Table 2).

Table 2

**Exchange of views among the HyD, the TD and the EPD
(February to May 2000)**

Date	Action taken by	Action
11 February	HyD	Informed the EPD that the TD had confirmed that the CPR section should be classified as Rural Road A
17 and 28 February	HyD	Requested the TD to clarify the road type of the CPR section after the upgrading works
6 April	TD	Informed the HyD that the CPR section would remain to be classified as Rural Road A after the upgrading works
14 April	EPD	Requested the TD and the HyD to reconsider the road classification in view of the widening works
19 April	TD	Informed the EPD that the road classification would not be affected by the widening works
3 May	EPD	<p>Informed the HyD that:</p> <p>(a) the road improvement works were not classified as a designated project; and</p> <p>(b) the HyD should consider whether other works, including reclamation works that would be carried out near residential areas and dredging works that would encroach on existing bathing beaches, would fall within the definition of a designated project</p>

Source: HyD records

Environmental permits required for reclamation and dredging works

3.12 In May 2000, in the light of the EPD's advice (see the EPD's advice of May 2000 in Table 2), the HyD asked Consultant B to prepare project profiles, as required under the EIAO, for application for environmental permits for the reclamation works near existing residential areas, and dredging works that would encroach on existing bathing beaches.

3.13 In January 2001, the Administration submitted a paper to the PWSC seeking funding for the CPR Project (Note 13). In the paper, the Administration said that:

- (a) the road improvement works were not classified as a designated project under the EIAO. However, the reclamation and dredging works under the CPR Project were designated elements under the EIAO, and environmental permits would be required for these works;
- (b) the HyD would not commence the reclamation and dredging works before obtaining the environmental permits;
- (c) as part of the feasibility study for the Project, an EIA report had been prepared and placed on the EIA Register established under the EIAO; and
- (d) the EIA report and subsequent reviews recommended a package of measures comprising the construction of noise barriers and partial enclosures to alleviate the noise impact.

3.14 In February 2001, Consultant B prepared the project profiles as required under the EIAO for application for environmental permits. In March 2001, after satisfactory completion of the relevant processes, the EPD granted permission for the HyD to apply for environmental permits for the reclamation works under Contracts B and C. In April 2001, the EPD issued two environmental permits for works under Contract B and one permit for works under Contract C. For Contract A, no environmental permits were required as no reclamation or dredging works were involved.

Claim for prolongation cost

3.15 Between April 2001 and April 2002, the HyD invited tenders and awarded Contracts A to C (see Table 3).

Note 13: *The funding application was approved by the FC in March 2001 (see para. 1.6).*

Table 3

Tender invitations for Contracts A to C

Contract	Target tender invitation date		Actual tender invitation date	Actual contract award date
	Based on design-and-construction consultancy brief	Based on implementation programme of October 1999		
A	April 1999	July 2000	April 2001	August 2001
B	July 1999	September 2000	July 2001	November 2001
C	April 1999	July 2000	September 2001	April 2002

Source: HyD records

3.16 In March 2000, Consultant B informed the HyD of his intention to claim prolongation cost for the additional time required for design and tendering. One of the reasons for the claim was that there was prolonged time for applying for environmental permits. In September 2001, Consultant B submitted a claim for the prolongation cost.

3.17 In November 2001, the HyD rejected Consultant B's claim on the following grounds:

- (a) it should be Consultant B's duty to complete the EIA report, seek the EPD's approval of the report and obtain environmental permits for implementing the works (see para. 3.7(c)); and
- (b) the necessary action for obtaining environmental permits should have commenced upon the completion of the EIA in May 1998 (see para. 3.7). However, the consultation with the EPD on application for environmental permits only commenced in May 1999 (see para. 3.9).

3.18 In May 2003, after negotiation and obtaining the Legal Advisory Division's advice, the HyD entered into a settlement agreement with Consultant B and subsequently paid him a sum of money for settling all his claims (see para. 2.11), including the above claim.

Audit observations and recommendations

Need to take prompt action on application for environmental permits

3.19 The EIAO came into effect in April 1998. Under the EIAO, a person carrying out a designated project is required to take necessary action and apply for environmental permits (see para. 3.4). In seeking the PWSC's support for funding of a works project, the PWSC should be informed of the action to be taken for a designed project (see para. 3.5(a)).

3.20 In July 1998, the EPD informed the HyD that the CPR Project should be classified as a designated project (see para. 3.8). Between July 1998 and May 2000, the HyD, the TD and the EPD exchanged views on the classification of the road works. In May 2000, the EPD confirmed that the road works were not classified as a designated project, and asked the HyD to consider whether other works, including the reclamation and dredging works, would fall within the definition of a designated project.

3.21 In May 2000, the HyD noted that reclamation and dredging works fell within the definition of designated projects and environmental permits would be required. Subsequently, the HyD asked Consultant B to prepare project profiles for the reclamation and dredging works and apply for environmental permits for these works. In April 2001, the EPD issued environmental permits for the reclamation and dredging works under Contracts B and C.

3.22 Audit noted that 23 months (from July 1998 to May 2000) were spent on clarifying the classification of the road works (see paras. 3.8 to 3.11), and 12 months (from May 2000 to April 2001) on obtaining environmental permits for the reclamation and dredging works (see paras. 3.12 to 3.14). In May 2003, the HyD entered into a settlement agreement with Consultant B and subsequently paid him a sum of money to settle his claims for prolongation cost, including the claim relating to the application for environmental permits. **Audit considers that, in administering a road project in future, the HyD needs to take early action to assess whether the project is a designated project under the EIAO and, if it is, take necessary action to meet the requirements and apply for the environmental permits as soon as possible.**

Need to include all pertinent works in EIAs

3.23 The scope of the CPR Project included road improvement, reclamation and dredging works. Some reclamation and dredging works might be classified as a designated project (see para. 3.3) and environmental permits would be required under the EIAO. Audit noted that:

- (a) with the exception of the December 1996 EIA report which covered the environmental impact of the reclamation and dredging works, the May 1998 EIA report and the January 2000 EIA report mainly covered the road works and did not cover most reclamation and dredging works;
- (b) the environmental impact of the reclamation and dredging works mentioned in the February 2001 project profiles for Contracts B and C was based on that stated in the December 1996 EIA report; and
- (c) as requested by the EPD in May 2000, additional information on the environmental impact of the reclamation works and dredging works (such as the noise impact) was incorporated in the February 2001 project profiles for Contracts B and C.

3.24 In September 2008, the HyD informed Audit that:

- (a) the HyD initially considered that the CPR Project did not fall within the definition of a designated project under the EIAO. As such, no application for environmental permits was made after the completion of the May 1998 EIA report; and
- (b) after the exchange of views among the HyD, the TD and the EPD, it was clarified in May 2000 that the road improvement works were not classified as a designated project. However, the reclamation and dredging works were designated elements under the EIAO and environmental permits would be required. The HyD then asked Consultant B to prepare project profiles for application for environmental permits as required under the EIAO.

3.25 **Audit considers that the HyD needs to take measures to ensure that all works classified as a designated project under the EIAO are included in EIAs conducted for the project.**

Audit recommendations

3.26 **Audit has recommended that, in administering a road project and related consultancies in future, the Director of Highways should:**

- (a) **take early action to assess whether the project is a designated project under the EIAO (see para. 3.22);**
- (b) **if the project is a designated project under the EIAO, take necessary action to meet the requirements and apply for environmental permits as soon as possible (see para. 3.22); and**
- (c) **take measures to ensure that all works classified as a designated project under the EIAO are included in EIAs conducted for the project (see para. 3.25).**

Response from the Administration

3.27 The **Director of Highways** accepts the audit recommendations. He has said that:

- (a) the EIAO was enacted in 1998, which was around the time when the EIA reports of the CPR Project were completed. After ten years since the EIAO has come into effect, project offices have now become familiarised with the requirements and the EPD's interpretations of the EIAO. The project offices are aware of the importance of early actions on clarifying with the EPD whether a project is a designated project under the EIAO, and if it is, applying for environmental permits as soon as possible;
- (b) the HyD considers that applications for environmental permits have been dealt with expeditiously and satisfactorily in recent road projects; and
- (c) the HyD will issue a circular memorandum to remind its project offices in respect of the audit recommendations.

PART 4: ROAD WORKS FOR AN INTERFACE SECTION

4.1 This PART examines the HyD's administration of consultancy work for a road section under the CPR Project interfacing with the proposed Route 10 project.

Route 10 Project

4.2 In 1997, the HyD planned to construct a highway, namely Route 10, connecting Northeast Lantau and Yuen Long South via So Kwun Wat and Tsing Lung Tau (hereinafter referred to as **the Route 10 Project**) in 2002 for completion in 2007. According to the HyD, Route 10 would:

- (a) provide an alternative external road link for Lantau and the Hong Kong International Airport; and
- (b) meet forecast traffic demand generated by:
 - (i) population and employment growth in the north-western part of the New Territories; and
 - (ii) cross-boundary activities.

4.3 For planning and design purposes, Route 10 was divided into two sections, namely **the southern section** stretching from North Lantau to So Kwun Wat and **the northern section** stretching from So Kwun Wat to Yuen Long Highway. The scope of works of the southern section would include the construction of a dual 3-lane bridge of 1.7 km (Tsing Lung Bridge) spanning across Ma Wan Channel from Kwai Shek to Tsing Lung Tau.

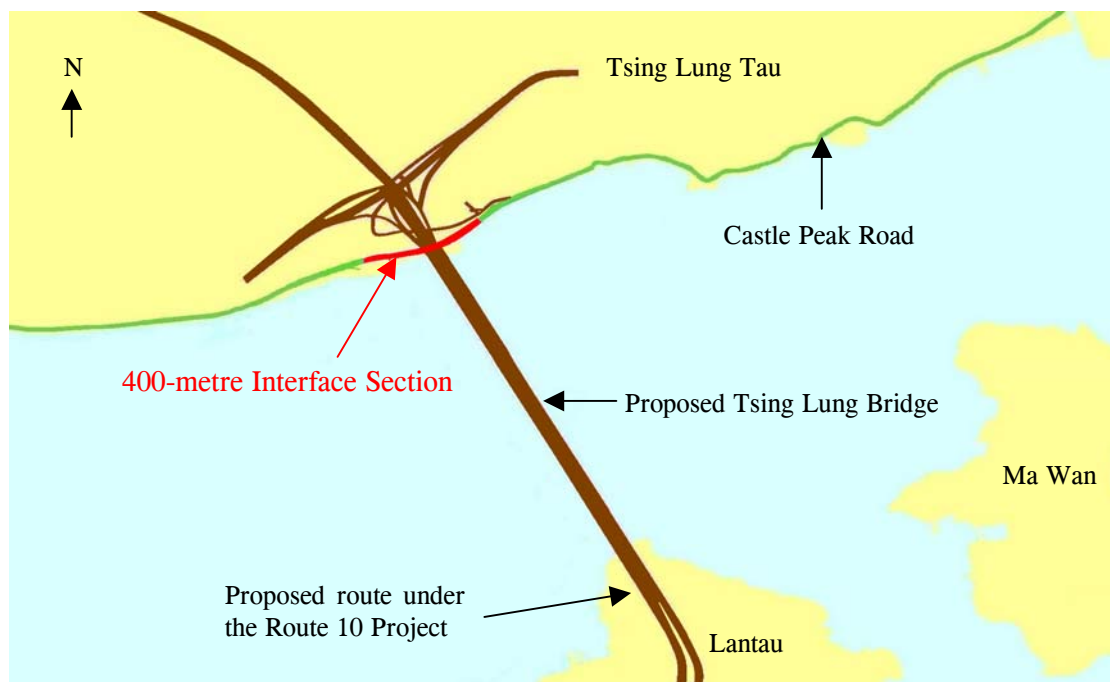
Interface between proposed Route 10 and Castle Peak Road

4.4 In March 1998, the HyD appointed a consultant (**Consultant C**) to carry out an investigation and preliminary design study of the Route 10 Project. In December 1998, Consultant C submitted a report on "Interfaces with other projects and advance works (southern section)" to the HyD, which said that:

- (a) there would be an overlap construction period between the Route 10 Project (planned to commence in January 2002 for completion in 2007) and the CPR Project (planned to commence in March 2000 for completion in December 2003);
- (b) there would be interface problems between one of the piers (columns for supporting a bridge) of the proposed Tsing Lung Bridge under the Route 10 Project and a 400-metre road section (near Tsing Lung Tau) under the CPR Project (hereinafter referred to as **the Interface Section** — see Figure 3); and
- (c) if the Interface Section was entrusted to the project team of the Route 10 Project, it was necessary to ensure that the entrusted works would be completed before December 2003 to meet the works programme of the CPR Project.

Figure 3

The Interface Section



Source: HyD records

Decision on entrusting Interface Section works

4.5 The Major Works Project Management (MWPM) Office (Note 14) of the HyD comprised project teams which were responsible for administering major works projects. The CPR Project and the Route 10 Project were administered by two separate project teams in the MWPM Office, namely **the CPR Project Team and the Route 10 Project Team**.

4.6 In January 1999, in response to Consultant C's proposal of entrusting the Interface Section works to the Route 10 Project Team (see para. 4.4 (c)), the CPR Project Team said that it had no objection to the proposal on the condition that works for the Interface Section would be completed by December 2003 to tie in with the completion of the works under the CPR Project. Between March and October 1999, the two project teams exchanged views on the proposed entrustment arrangement. In October 1999, the Route 10 Project Team informed the CPR Project Team that the Route 10 Project Team would be responsible for the design and construction works for the Interface Section and the works would be completed not later than October 2004.

4.7 In late 1999, as required under the design-and-construction consultancy, Consultant B submitted a preliminary design of the Interface Section to the HyD, proposing the construction of an elevated road (see paras. 4.8 and 4.12).

Funding approval for southern section of Route 10 Project

4.8 In November 1999, the Administration submitted a paper to the PWSC seeking funding for the detailed design of the **southern section** of the Route 10 Project. In December 1999, the FC approved funding for the design work. In March 2000, the HyD appointed a consultant (**Consultant D**) to carry out the detailed design of the southern section of the Route 10 Project, including the Interface Section.

Objections to constructing southern section of Route 10

4.9 In July 2000, the works under the southern section of Route 10 was gazetted under the Roads (Works, Use and Compensation) Ordinance (Cap. 370). During the 60-day consultation period, the Administration received 577 objections. Most of the objections were related to the environmental impact of the proposed roads and the traffic impact on Tuen Mun Road. In the light of the objections, the HyD revised the alignment of the southern section of Route 10.

Note 14: *The MWPM Office was headed by a Project Manager, who managed project teams each of which was headed by a Chief Engineer.*

Award of Contract B under the CPR Project

4.10 In November 2001, the HyD awarded Contract B to Contractor B for carrying out the works between Sham Tseng and Ka Loon Tsuen under the CPR Project, excluding the works for the Interface Section. The works under Contract B were scheduled for completion in November 2004.

Revised alignment to southern section of Route 10

4.11 In June 2002, the revised alignment to the southern section of Route 10 was gazetted. During the 60-day consultation period, the Administration received 1,580 objections. The HyD subsequently took action to address the objections.

Consultant D's design of Interface Section

4.12 In December 2002, Consultant D completed the design of the Interface Section, proposing an at-grade road on reclamation (different from Consultant B's design of an elevated road). According to the HyD, the change in design was to cater for the works under the Route 10 Project.

Works of Interface Section under Castle Peak Road Project

4.13 In February 2003, the CPR Project Team and the Route 10 Project Team agreed that the works for the Interface Section should be de-linked from the Route 10 Project and undertaken under the CPR Project. In May 2003, approval was obtained for extending the time (from May to November 2003) under Roads (Works, Use and Compensation) Ordinance for submission of the Route 10 Project to the Chief Executive in Council. In May and August 2003, the CPR Project Team sought Consultant B's views on the resources required to redesign and supervise the Interface Section works. In November 2003, the Administration gazetted the decision not to execute the works of the southern section of Route 10 described in the gazette notice of June 2002 (see para. 4.11).

4.14 In March 2004, after considering the need to redesign the Interface Section works and various implementation options, and seeking the views of the Financial Services and the Treasury Bureau, the HyD sought the EACSB's approval for entering into a supplemental agreement with Consultant B for the design and supervision of construction works. In the submission, the HyD said that:

- (a) due to subsequent development, the Route 10 programme had been put under review;
- (b) it was therefore necessary to implement the works for the Interface Section independent of the Route 10 Project; and
- (c) a review of the detailed design of the Interface Section was required so that it could be implemented independently.

4.15 In March 2004, the EACSB gave approval for the HyD to negotiate with Consultant B on taking up the design and supervision work for the Interface Section. The CPR Project Team then negotiated with Consultant B on the issue and prepared the supplemental agreement and supplemental brief for appointing Consultant B to undertake the additional services. After various revisions, Consultant B produced a finalised detailed design of the Interface Section with an at-grade road with reduced reclamation (different from Consultant D's design — para. 4.12). In September 2004, the HyD entered into a supplemental agreement with Consultant B for the design and supervision of construction works for the Interface Section. In February 2005, the layout of the relevant section of the CPR was re-gazetted, which was approved in May 2005. After completing the design and the tender documents for the Interface Section, in August 2005, the tender for the works was gazetted. In December 2005, the HyD awarded Contract D to Contractor D for carrying out the works for the Interface Section. In June 2007, the works were substantially completed.

Audit observations and recommendation

4.16 In March 2001, the FC approved funding of \$3,761 million for the CPR Project, which was targeted for completion by June 2005 (see para. 1.6). In February 2003, the CPR Project Team and the Route 10 Project Team agreed that the Interface Section works should be delinked from the Route 10 Project and undertaken under the CPR Project. In November 2003, the Administration gazetted the decision not to execute the works of the southern section of Route 10 (see para. 4.13). In March 2004, the CPR Project Team obtained the EACSB's approval for negotiating with Consultant B for him to carry out the design and supervision work for the Interface Section. In December 2005, the HyD awarded Contract D for the Interface Section works, and the works were substantially completed in June 2007 (see para. 4.15). The dual two-lane carriageway at the Interface Section was open to traffic in July 2007, two years after the target completion date stated in the paper submitted to the FC in March 2001.

- 4.17 In September 2008, in response to Audit's enquiry, the HyD said that:
- (a) the delay in completing the Interface Section was due to late commencement of the construction works as a result of the re-programming of the Route 10 Project and the necessary revision to the design of the Interface Section; and
 - (b) the design of the Interface Section was integrated with, and inseparable from, reclamation works relating to the construction of Tsing Lung Bridge under the Route 10 Project. The delay in the implementation of the Route 10 Project and the completion of the Interface Section works was outside the control of the HyD. The CPR Project Team had taken reasonable endeavours to implement the works for the Interface Section as soon as practicable.

Audit recommendation

- 4.18 **Audit has recommended that, in administering a road project and related consultancies in future, the Director of Highways should ensure that concerted efforts are made to complete the project by the scheduled completion dates stated in the submissions to the FC as far as practicable.**

Response from the Administration

- 4.19 The **Director of Highways** accepts the audit recommendation. He has said that:
- (a) the gazetted CPR Project plan at the time of submission to the FC in March 2001 was based on the premise that the CPR section would rest on a yet-to-be authorised major reclamation at Tsing Lung Tau for accommodating the main pier of Tsing Lung Bridge under the Route 10 Project. If the Route 10 Project were to be shelved, the road design for the Interface Section had to be reviewed and the revised plan re-gazetted. To avoid abortive work, detailed design work for the Interface Section, as delinked from the Route 10 design, could not proceed until the shelving of the Route 10 Project;
 - (b) in mid-2003, the Development Bureau conducted a review of the transport infrastructure in the Northwest New Territories and the North Lantau, including the need for and the timing of Route 10 in the context of the overall transport network in the area. The Administration could only consider whether and when to proceed with the Route 10 Project after the review;
 - (c) between February 2003 (when the works under the CPR Project were agreed internally to be delinked from the Route 10 Project) and November 2003 (when the southern section works of the Route 10 Project was gazetted not to be

executed), the CPR Project Team had constantly reviewed and considered the milestone dates set out earlier and the target completion date as mentioned in the FC paper of March 2001; and

- (d) the arrangement of entrusting the CPR works to the Route 10 Project Team was an internal matter. It did not affect the programme of the Interface Section. If the design of the Interface Section were to be implemented by the CPR Project Team instead of the Route 10 Project Team, it would still be impracticable to proceed with the related works of the Interface Section until the shelving of the Route 10 Project.

4.20 The **Secretary for Transport and Housing** has said that:

- (a) the HyD made a reasonable decision in 1999 to implement the Interface Section works as part of the southern section of Route 10, as the section was an integrated and inseparable part of the proposed Tsing Lung Bridge. According to the HyD's assessment in March 2002, before the gazettal of the revised alignment of the southern section in June 2002, the Interface Section works under the Route 10 programme could still meet the target completion date of mid-2005; and
- (b) the procurement of services for design review could not start prior to the gazettal of the decision of not executing the Route 10 Project in November 2003, as this would impart a pre-mature message that the project would experience major changes or was dropped from the drawing board. This would in turn pre-empt the way forward of Route 10. If Route 10 were to proceed, it would not be necessary to change the design of the Interface Section. The design review would become abortive work. The internal agreement in February 2003 on carrying out the works independently could only facilitate advance preparation work but not the actual procurement of design review services.

PART 5: ALTERNATIVE DESIGNS OF WORKS

5.1 This PART examines the HyD's administration of alternative designs of works during the course of the CPR Project and suggests improvement measures.

Consultant B's designs of works

5.2 Under the design-and-construction consultancy, Consultant B was responsible for completing the detailed designs of works under the CPR Project, which would be included in the tender documents for Contracts A to D. Between September 2001 and October 2005, Consultant B completed the detailed designs of works, including those for roads, retaining walls, slopes, viaducts, footbridges, noise mitigation measures, drainage outfalls and water mains.

Tender invitations

2001 guidelines on inviting tenderers to submit alternative designs

5.3 As laid down in Works Bureau Technical Circular No. 2/2001 of February 2001 (before tendering for Contract A in April 2001) on "Designs and Alternative Designs by Tenderers" (Note 15):

- (a) **where there was potential for better value for money, departments might invite tenderers to submit tenders incorporating their own alternative designs for a certain part of works notwithstanding the fact that a design for that part of works had been provided by the Engineer;**
- (b) an alternative design should be assessed against the Engineer's design, taking into consideration factors including the cost of completing the works and savings, and the feasibility and merits of the alternative design;

Note 15: *As stated in Works Bureau Technical Circular No. 12/99 of March 1999, departments should not invite tenderers to submit alternative designs for any part of the works covered by the Engineer's design. This circular was superseded by Works Bureau Technical Circular No. 2/2001.*

- (c) the alternative design should be certified by an independent checking engineer (Note 16) who would confirm that the design complied with the contract requirements; and
- (d) the Engineer might recommend acceptance of an alternative design, provided that the design was cost-effective and in accordance with the contract requirements.

Tender invitations for Contracts A, B and C

5.4 Between April and September 2001, the HyD invited tenders for Contracts A, B, and C. Regarding tendering for Contracts A and B, in May and July 2001, Consultant B informed the HyD that:

- (a) he had evaluated the need for inviting tenderers to submit alternative designs according to Works Bureau Technical Circular No. 2/2001 (see para. 5.3); and
- (b) after considering the possible alternative designs for viaducts and noise mitigation structures, he had found that such alternative designs would have insignificant potential for better value for money. He therefore recommended that the HyD needed not invite tenderers to submit alternative designs.

5.5 For Contract C, before inviting tenders in September 2001, Consultant B recommended that the HyD needed not invite tenderers to submit alternative designs. In the light of Consultant B's recommendations, the HyD did not invite tenderers to submit alternative designs for Contracts A, B and C.

2004 guidelines on inviting contractors to submit alternative designs

5.6 In August 2004, Environment, Transport and Works Bureau (ETWB) Technical Circular (Works) No. 25/2004 on "Contractor's Designs and Alternative Designs" (Note 17) was issued, superseding Works Bureau Technical Circular No. 2/2001. The Circular incorporated the guidelines of Works Bureau Technical Circular No. 2/2001 (see para. 5.3), and introduced new ones on inviting contractors to submit alternative designs after the contract award. ETWB Technical Circular (Works) No. 25/2004 said that:

Note 16: *An independent checking engineer is employed by a tenderer whose qualifications, skills and experience are deemed satisfactory by the Government.*

Note 17: *As at June 2008, this circular was in force.*

- (a) before introducing this circular, there were no provisions for the acceptance of alternative designs proposed by a contractor after awarding a contract even if they were beneficial to the Government. If the alternative designs were to be adopted, the parties concerned could only achieve it by entering into a supplementary agreement. The extra administrative efforts involved might discourage the advancement of value engineering;
- (b) to promote value engineering, this circular introduced contract provisions to allow a contractor to submit, and the Government to accept, alternative designs after awarding a contract. **The savings in cost, if any, should be shared equally between the Government and the contractor;**
- (c) departments should ensure that an accepted alternative design was cost-effective and in accordance with the Engineer's requirements, and had no additional cost implications; and
- (d) departments should note that the Government would only get 50% of the cost saving arising from accepting contractors' proposed alternative designs after awarding contracts. To achieve best value for money, it was always preferred that all alternative designs were duly considered during the design and tender stage. **Departments should invite tenderers to propose alternative designs as far as practicable.**

Tender invitation for Contract D

5.7 Before inviting tenders for Contract D in August 2005, Consultant B recommended that the HyD needed not invite tenderers to submit alternative designs. In the light of Consultant B's recommendation, the HyD did not invite tenderers to submit alternative designs for Contract D. In December 2005, the HyD awarded Contract D to Contractor D.

Contractors' alternative designs after awarding Contracts A to D

5.8 During the course of the CPR Project between July 2002 and September 2006, Contractors A to D submitted cost-saving alternative designs for some of the works under Contracts A to D. These alternative designs mainly related to works for retaining walls, slopes, viaducts, footbridges and noise mitigation measures. After assessing the cost, programme and other implications, Consultant B recommended, and the HyD accepted, the adoption of some of the contractors' alternative designs.

5.9 For Contracts A, B and C, as they were awarded before the issue of ETWB Technical Circular (Works) No. 25/2004, there were no contract provisions for the HyD to accept alternative designs during the course of the contracts. Therefore, the HyD signed three supplementary agreements with Contractor A, one with Contractor B and three with Contractor C regarding the acceptance of alternative designs the contractors proposed. For Contract D awarded in December 2005, the contract included provisions for the HyD to accept alternative designs during the course of the contract and that the cost savings would be shared equally between the Government and Contractor D. **As a result of accepting the alternative designs proposed by Contractors A to D during the course of the CPR Project, the HyD obtained a cost saving of \$53 million (see Table 4).**

Table 4

Cost saving by adopting alternative designs for Contracts A to D

	(\$ million)
(a) Works value based on original designs	855
(b) Works value based on alternative designs	752
(c) Design and certification cost of alternative designs	50 (Note)
(d) Cost saving ((a) – (b) – (c))	53

Source: HyD records and Audit analysis

Note: The design and certification cost of alternative designs of \$50 million comprised design cost of \$36 million and certification cost of \$14 million.

Works replaced under alternative designs

5.10 The original contract sums of Contracts A to D totalled \$2,663 million. As a result of accepting the alternative designs, works included in the contracts with a value of \$855 million (32% of \$2,663 million) were replaced by works with a value of \$752 million under the alternative designs (see Table 4 in para. 5.9). For example, the HyD accepted alternative designs of Contractors A to D, which involved constructing various types of retaining walls to replace the original designs based mainly on bored-pile retaining walls. As a result of adopting such alternative designs, the number of bored piles under Contracts A to D was reduced from 1,437 to 595 (59% reduction).

Audit observations and recommendations

Merits of inviting tenderers to propose alternative designs

5.11 Works Bureau Technical Circular No. 2/2001 (and subsequently ETWB Technical Circular (Works) No. 25/2004) provided an option for works departments to invite tenderers to propose alternative designs in their tender submissions (see para. 5.3). During the tender exercises for Contracts A to D between April 2001 and August 2005, the HyD did not invite tenderers to submit alternative designs. As it transpired, the HyD accepted the four contractors' proposed alternative designs during the construction works. Under the four contracts, the original estimated value of works replaced by those under the alternative designs amounted to \$855 million, representing 32% of the original estimated value of works (see para. 5.10). The HyD obtained a cost saving of \$53 million from adopting the alternative designs (see para. 5.9).

5.12 In July and September 2008, in response to Audit's enquiry, the HyD informed Audit that:

- (a) for Contracts A to D, Consultant B's recommendations on not inviting tenderers to submit alternative designs were made after considering the relevant factors (such as technical and financial risks);
- (b) in the tendering for the contracts under the CPR Project, the HyD had critically considered the option of inviting tenderers to submit alternative designs;
- (c) the design and certification cost of \$50 million was an inseparable part of the cost of works of the alternative designs;

- (d) of the works value of \$752 million based on the alternative designs, \$358 million (48%) of works were related to the design and construction of reinforced-earth retaining walls. The design was a proprietary design at the time of tendering; and
- (e) the cost savings resulting from the alternative designs represented 6% of the original works value (Note 18).

5.13 **Audit notes that the arrangement to invite tenderers to submit alternative designs during the tender stage has the following benefits:**

- (a) **the arrangement would enhance competitive tendering as all tenderers with cost-effective works designs could submit their designs for consideration during a tender exercise; and**
- (b) **under ETWB Technical Circular (Works) No. 25/2004, the cost saving resulting from adopting a contractor's alternative designs would be shared equally between the Government and the contractor.** If alternative designs are submitted and accepted during the tender stage, the cost will be reflected in the tender price and it will not be necessary to share the cost saving with the contractor.

Audit considers that, in administering road projects in future, the HyD needs to invite tenderers to submit alternative designs as far as practicable.

Need to provide justifications for not inviting tenderers to propose alternative designs

5.14 Before tendering for each of Contracts A to D, Consultant B recommended that the HyD needed not invite tenderers to submit alternative designs. Audit noted that ETWB Technical Circular (Works) No. 25/2004 did not specifically require the provision of justifications for not inviting alternative designs at the tender stage. **In Audit's view, to ensure that the option of inviting alternative designs is properly evaluated at the tender stage, the Development Bureau needs to consider requiring works departments to document the justifications for not pursuing the option.**

Note 18: *The computation is as follows:*

$$\frac{\$53 \text{ million}}{\$855 \text{ million}} \times 100\% = 6\% \text{ (see Table 4 in para. 5.9)}$$

Audit recommendations

5.15 **Audit has recommended that, in administering a works contract in future, the Director of Highways should critically consider the option of inviting tenderers to submit alternative designs during tendering, where there is potential for better value for money, in accordance with ETWB Technical Circular (Works) No. 25/2004 (see para. 5.13).**

5.16 **Audit has recommended that the Secretary for Development should:**

- (a) **remind works departments of the need to critically consider the option of inviting tenderers of works contracts to submit alternative designs during tendering, where there is potential for better value for money, in accordance with ETWB Technical Circular (Works) No. 25/2004 (see para. 5.13); and**
- (b) **consider incorporating into ETWB Technical Circular (Works) No. 25/2004 the requirement for a works department to document the justifications for not inviting tenderers to submit alternative designs (see para. 5.14).**

Response from the Administration

5.17 The **Director of Highways** accepts the audit recommendation in paragraph 5.15. He has said that the HyD will issue a circular memorandum to remind its works offices of the requirements of ETWB Technical Circular (Works) No. 25/2004.

5.18 The **Secretary for Development** agrees with the audit recommendations in paragraph 5.16.

Acronyms and abbreviations

ACE	Advisory Council on the Environment
Audit	Audit Commission
CEDD	Civil Engineering and Development Department
CPR	Castle Peak Road
EACSB	Engineering and Associated Consultants Selection Board
EIA	Environmental Impact Assessment
EIAO	Environmental Impact Assessment Ordinance
EPD	Environmental Protection Department
ETWB	Environment, Transport and Works Bureau
FC	Finance Committee
GEO	Geotechnical Engineering Office
HyD	Highways Department
km	kilometres
MWPM Office	Major Works Project Management Office
PWSC	Public Works Subcommittee
TD	Transport Department