CHAPTER 5

Civil Engineering and Development Department

Reprovisioning of public piers

Audit Commission
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Report No. 44 of the Director of Audit contains 8 Chapters which are available on our website at http://www.aud.gov.hk/

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REPROVISIONING OF PUBLIC PIERS

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PART 1: INTRODUCTION

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

Background

1.2 Under the port development programme, the Civil Engineering and Development Department (CEDD —Note 1) is responsible for constructing public marine facilities such as piers, breakwaters and seawalls. The CEDD is also responsible for maintaining these facilities by carrying out routine inspections and repairs. The Economic Development and Labour Bureau (EDLB —Note 2) is the policy bureau responsible for port development. In 2004-05, the estimated expenditure on port construction works and maintenance of marine facilities is about $226 million.

Marine landing facilities

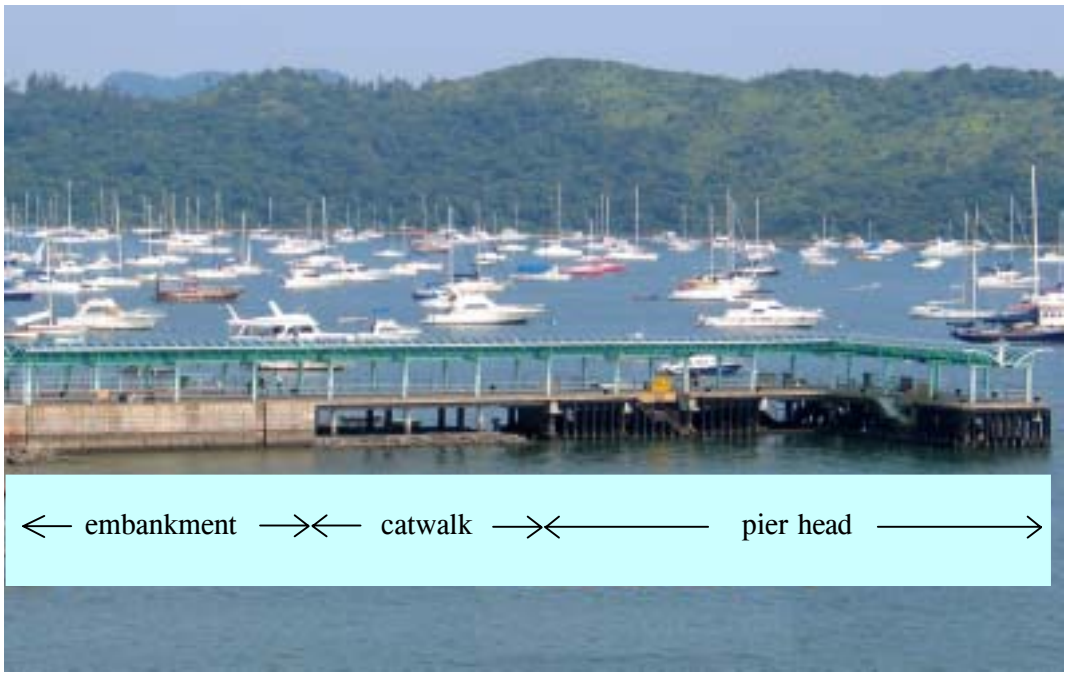
1.3 At present, the CEDD is maintaining 303 landing facilities along the shoreline, including 137 piers and 166 landings. A pier is usually a structure protruding from the shore with one or more berths at the pier head. Depending on the location, the pier head may be positioned further away from the shore and is connected to it by a catwalk and an embankment (see Photograph 1). A landing (also called a landing step) is a landing facility embedded in a seawall (see Photograph 2).

Note 1: *The CEDD was formed on 1 July 2004 by merging the Civil Engineering Department and the Territory Development Department (TDD).*

Note 2: *The EDLB was formerly known as the Economic Services Bureau prior to the implementation of the accountability system for principal officials with effect from 1 July 2002. The policy responsibility for port development was transferred from the then Planning, Environment and Lands Bureau (PELB) to the Economic Services Bureau on 1 April 1999.*

Photograph 1

Example of a pier with a catwalk and an embankment (Pak Sha Wan Public Pier)



Source: Photograph taken by Audit in December 2004

Photograph 2

Example of a landing (Peng Chau)

Source: Photograph taken by Audit in October 2004

Categories of piers

1.4 The piers maintained by the CEDD are classified into the following categories according to their uses:

(a) ***Public piers*** —open for public use for boarding and alighting of passengers, and loading and unloading of goods, but not for berthing. Some licensed ferry and kaito services (Note 3) operate at public piers;

(b) ***Government piers*** —for use by designated government departments; and

(c) ***Ferry piers*** — for use by operators of franchised and licensed ferry services, e.g. the Tsim Sha Tsui Ferry Pier.

Table 1 shows the number of piers in each of the three categories.

Table 1

Number of piers by category

	(No.)	**(%)**
Public piers	62	45%
Government piers	48	35%
Ferry piers	27	20%
	137	**100%**

Source: CEDD records

Note 3: *Kaito services are local ferry services operating in small passenger carrying vessels, serving remote coastal settlements.*

1.5 The size of a pier is determined by the size of the vessels berthing there and the number of berths to be provided. In terms of size, ferry piers are larger, usually with a superstructure to accommodate double-deck ferries and to serve as a passenger concourse. Government piers and public piers are usually smaller.

Deterioration of piers

1.6 According to CEDD's Port Works Design Manual, the design life of a pier is 50 years. Most of the piers are built in the form of a reinforced concrete structure. The steel reinforcement embedded in the concrete is vulnerable to corrosion due to the hot and humid climate in Hong Kong and the penetration of chloride from seawater salts. The rust from corrosion has a volume two to four times more than that of the original steel, causing cracking, spalling and delamination of the concrete cover. Consequently, the reinforced concrete pier structure is prone to rapid deterioration.

Reconstruction programme for deteriorated piers

1.7 In the early 1990s, the CEDD was aware of the widespread deterioration among the reinforced concrete piers. For those piers that had deteriorated beyond economic repair, the CEDD considered that it would be more economical to reconstruct a new pier than to maintain the old one. In 1996, the CEDD started a reconstruction programme to replace the structurally deteriorated piers. As of December 2004, there were 14 piers included in the reconstruction programme. Appendix A is a list of the 14 piers in the reconstruction programme. Figure 1 shows the location of the 14 piers.

Figure 1

Location of the 14 piers included in the CEDD reconstruction programme

Legend: * Construction in progress as of December 2004

Source: *CEDD records*

Audit review

1.8 The Audit Commission (Audit) recently conducted a review to examine the reconstruction of the deteriorated piers (Note 4). The review focused on the following aspects:

(a) durability of reinforced concrete piers (see PART 2);

(b) planning for reconstruction of deteriorated piers (see PART 3);

(c) concerns over reconstruction of Sham Chung Public Pier (see PART 4);

(d) reconstruction of Wu Kai Sha, Peng Chau and Kadoorie public piers (see PART 5); and

(e) design of replacement piers (see PART 6).

The review has found that there is room for improvement in various areas and has made a number of recommendations to address the issues.

General response from the Administration

1.9 The **Director of Civil Engineering and Development** has said that in general he welcomes the audit recommendations.

Acknowledgement

1.10 Audit would like to acknowledge with gratitude the full cooperation of the staff of the CEDD, the EDLB and the Transport Department (TD) during the course of the audit review.

Note 4: *In the Director of Audit's Report No. 19 of October 1992, Audit reported on the reprovisioning of ferry piers in Kwun Tong and recommended that: (a) before committing resources for the building or reprovisioning of a pier, the anticipated demand for ferry services and its effect on the years of future usage of the pier should be critically assessed; (b) the Finance Committee should be fully apprised of the estimated number of years of usage of a pier when funds are sought for its building or reprovisioning; and (c) alternative options should be explored with a view to assessing their cost-effectiveness and to choosing the most cost-effective one for implementation.*

PART 2: DURABILITY OF REINFORCED CONCRETE PIERS

2.1 This PART examines the extent and causes of the deterioration of reinforced concrete piers and the remedial measures taken by the CEDD to tackle the problem.

Consultancy study on deterioration of piers

2.2 In the early 1990s, the CEDD found that there was extensive deterioration in many piers it maintained due mainly to corrosion of the steel reinforcement. In April 1995, the CEDD commissioned a consultancy study "Condition Audit of Reinforced Concrete Piers and Review of Concrete Design for the Marine Environment" (hereinafter referred to as the Pier Condition Study). The key objective was to secure the operational safety and the future durability performance of the piers. The scope of the Pier Condition Study included a detailed study of 93 reinforced concrete piers and a review of the concrete mix design for marine exposure conditions.

2.3 ***Findings of the consultancy study.*** In October 1996, the consultants issued the final report which had the following major findings:

(a) **most of the piers examined were in a poor condition, and were rapidly deteriorating.** The principal cause of deterioration was the corrosion of the steel reinforcement with cracking and spalling of the concrete cover;

(b) corrosion had occurred as a result of ingression of chloride from seawater salts and moisture through the concrete;

(c) **the then repair system had not limited the spread of reinforcement corrosion. Many of the repaired elements were still actively corroding. The piers had to be continually repaired;**

(d) for the majority of cases, it was too late to apply preventive repair treatment which might restrict chloride ingression and hence prevent corrosion. Therefore, repair strategies had to focus on limiting the corrosion rate and the spread of corrosion; and

(e) the existing concrete cover to the reinforcement was clearly not sufficient to resist chloride ingression, and to prevent or limit corrosion activity during the design life of 50 years. A new specification for concrete for use in the more severe local marine environment was urgently required. Additional protective measures would also be necessary to safeguard the integrity of the piers.

Structural repairs required to prolong service lives of deteriorated piers

2.4 The consultants assessed the repair requirements for each of the 93 piers on the basis of age, the nature, extent and severity of the deterioration, and its functional importance. 86 piers were identified to be in need of structural repairs.

2.5 ***Repair strategy.*** The priority of repair was divided into four categories, from urgent to within 1, 2 or 5 years. There were three repair methods to be employed, as follows:

	Repair method	Effect of repair
(a)	Short-term treatment — recasting or concrete-spraying	less than 2 years
(b)	Medium-term treatment — minor patch repair, recasting or concrete-spraying, chloride extraction	2 to 10 years
(c)	Long-term treatment — minor patch repair/recasting/concrete-spraying with surfacing coating, chloride extraction with coating, cathodic protection	more than 10 years

Appendix B is a summary of the 86 piers requiring structural repair, showing different priority groups and repair methods.

2.6 ***Piers requiring urgent repair.*** A total of 13 piers with an average age of 30 were identified as requiring urgent repair. Following the consultants' recommendations, in January 1997, the CEDD awarded a works contract to carry out structural repairs to the 13 piers in the sum of $12.9 million. In February 1998, the works were completed. The works included the removal of deteriorated concrete, replacement of severely corroded steel reinforcement, reinstatement of concrete and the addition of surface coatings. Appendix C shows the particulars of these 13 piers. In addition to these 13 piers, the CEDD also arranged for the necessary repair works for the other piers to improve their structural condition.

2.7 ***Piers recommended for reconstruction.*** A total of 16 piers (see Appendix D) with an average age of 42 were identified for short-term repair. Short-term repair was regarded as a temporary measure for maintaining safety of the piers for a duration of less than two years. The 16 piers were generally aged ones near the end of their design lives. The consultants recommended replacement of these piers and considered that only short-term repair was worthwhile before reconstruction. Some of these piers would be affected by proposed reclamation projects and would be relocated if the projects proceeded.

Upgrading of maintenance and repair efforts

2.8 The consultants also prepared a maintenance manual incorporating standardised remedial methods and specifications for the reinforced concrete for the piers. The CEDD adopted this maintenance manual for reinforced concrete piers, and issued the Maintenance Manual for Marine Facilities in February 2003.

2.9 Following the Pier Condition Study, the CEDD conducted regular inspections and investigations of the conditions of the piers. It carried out the necessary repair and maintenance works. In addition, the CEDD also implemented supplementary protective measures for corrosion protection, including the application of protective coating on the concrete surface, and the installation of cathodic protection system (Note 5).

Need for a new marine concrete specification

2.10 The consultants considered that the existing concrete cover could not resist chloride ingression and prevent corrosion activity in the marine environment. The then specification for concrete in Hong Kong focused on general construction works with certain provisions for marine environment similar to other prevailing international standards. However, local marine structures were exposed to far more adverse conditions due to the higher temperature and humidity in Hong Kong. A new specification was required to improve the durability of future reinforced concrete structures in the territory.

2.11 After conducting some trials, the consultants proposed a new concrete specification for the marine environment. In July 1998, the CEDD adopted the new specification and applied it to new construction and repair works. The CEDD has also incorporated the new specification for marine concrete in the Port Works Design Manual and Maintenance Manual for Marine Facilities.

Audit observations

Poor durability of reinforced concrete piers

2.12 The results of the Pier Condition Study clearly indicated that most of the reinforced concrete piers constructed using the then specification were in a poor condition. Rapid deterioration was noted not only among the old piers but also in some piers built around 20 years ago. Audit noted that the average age of the 93 piers examined was only 23, as compared with the design life of 50 years.

Note 5: *Cathodic protection prevents corrosion of steel in concrete by applying an external electric current to the embedded steel to counteract the corrosion current. A metallic anode is embedded in the concrete. The electric current is applied to this anode and the embedded steel. This action forces the steel in the concrete to become cathodic, which is protected from corrosion.*

2.13 The Pak Sha Wan Public Pier in Sai Kung, built in 1974, was a notable example of a "relatively young" pier with severe deterioration. It was ranked by the consultants in 1995 as the second most deteriorated pier when it was then only 21 years old. Urgent structural repairs were carried out to ensure its operational safety. However, the pier was considered to have deteriorated beyond economic repair. The Pak Sha Wan Public Pier was subsequently reconstructed in 2001 at a cost of $33.1 million.

Need to closely monitor structural conditions of piers

2.14 The Pier Condition Study revealed that most of the reinforced concrete piers were contaminated with chloride salts. **Repairs were required to restore the structural integrity of the piers. However, the repair could only temporarily slow down the corrosion action and repeated repairs would be required.**

2.15 In their report issued in October 1996, the consultants identified 16 piers for short-term repair, and recommended reconstructing these piers. Audit noted that, as at December 2004, 5 of the 16 piers (see Appendix D for details) were still in use. **Audit considers that the CEDD needs to closely monitor the structural integrity of the reinforced concrete piers, particularly these five piers.**

2.16 After the Pier Condition Study, the CEDD has strengthened its efforts on inspection, maintenance and repair of the piers. The CEDD has also implemented protective measures for corrosion protection of the reinforced concrete piers, including protective coating and cathodic protection system. **The CEDD needs to continue to improve the design of reinforced concrete piers and explore means for prolonging their durability.**

Promulgation of the new marine concrete specification

2.17 In July 1998, the CEDD adopted the new marine concrete specification proposed by the consultants and used it in pier construction and maintenance works. However, the new specification was not promulgated as mandatory for use by other works departments in the design and construction of marine reinforced concrete structures. The CEDD only posted the new specification as "Recommended specification for reinforced concrete in marine environment" on its web site. As other works departments may also be involved in the construction of marine reinforced concrete structures, Audit considers that the findings of the Pier Condition Study and the new marine concrete specification would also be useful to other works departments.

2.18 The CEDD has used the new marine concrete specification for about six years since July 1998 in the construction and maintenance of reinforced concrete piers. **It would be useful for the CEDD to conduct, in due course, a review of the durability of the new piers so as to ascertain the effectiveness of the new specification in resisting chloride ingression.**

Audit recommendations

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

(a) **closely monitor the conditions of reinforced concrete piers, especially the five piers recommended for reconstruction in 1996 which are still in use, so as to ensure that they are safe;**

(b) **continue to improve the design of reinforced concrete piers and explore means for prolonging their durability;**

(c) **in consultation with the Secretary for the Environment, Transport and Works, inform other works departments of the findings of the Pier Condition Study and promulgate the new marine concrete specification with guidelines for use by other works departments; and**

(d) **consider conducting, in due course, a review of the durability of the new piers to ascertain the effectiveness of the new marine concrete specification in resisting chloride ingression.**

Response from the Administration

2.20 The **Director of Civil Engineering and Development** agrees with the audit recommendations mentioned in paragraph 2.19.

2.21 The **Secretary for the Environment, Transport and Works** has said that a Standing Committee on Concrete Technology was established in 1982 to serve as an inter-departmental liaison forum on problems encountered on concrete construction and that any recommendations from the Pier Condition Study could be deliberated by the Standing Committee.

PART 3: PLANNING FOR RECONSTRUCTION OF DETERIORATED PIERS

3.1 This PART examines the formulation of the reconstruction programme by the CEDD and the justifications for reconstructing the deteriorated piers.

Reconstruction programme for replacing deteriorated piers

3.2 In 1996, the Pier Condition Study recommended 16 piers to be reconstructed as the structure of these piers had deteriorated beyond economic repair (see para. 2.7 and Appendix D for details). After further investigations, the CEDD concluded that only 9 of the 16 piers needed to be reconstructed. The other 7 piers would either be reprovisioned under other development/reclamation projects, or would be decommissioned in the future.

3.3 In addition to the 9 piers, the CEDD also identified 5 other piers requiring reconstruction during regular inspections. In 1996, the CEDD rolled out the reconstruction programme for replacing deteriorated piers. As of December 2004, 14 piers had been included in the reconstruction programme (see Appendix A for details). The total approved project estimate of the reconstruction programme was about $359 million. The status (as of December 2004) of the reconstruction programme is as follows:

(a) 7 piers had been reconstructed;

(b) the reconstruction of 5 piers were in progress; and

(c) the reconstruction of the Sham Chung and Lai Chi Chong public piers was deferred, pending further review (see PART 4 for details).

All the piers were public piers except the two government piers, namely the Hei Ling Chau Pier and Tai Lam Chung Pier managed by the Correctional Services Department (CSD) and the Hong Kong Police Force (HKPF) respectively. There were no ferry piers in the reconstruction programme.

3.4 ***Scope of reconstruction works.*** In general, the scope of works for the reconstruction of deteriorated piers included:

(a) the demolition of the existing pier;

(b) the construction of a replacement pier at the same location;

(c) the provision of temporary berthing facilities during construction; and

(d) the addition of facilities, e.g. a roof cover with associated lighting.

Planning and funding for pier reconstruction

3.5 The pier reconstruction projects followed the normal capital works procedures, the major stages of which are as follows:

(a) the need for a project should be established in the first place;

(b) for inclusion in the Public Works Programme (PWP), the client department or policy bureau prepares a Project Definition Statement (Note 6) in which justifications for the project are provided;

(c) the appropriate works department is required to complete a Technical Feasibility Statement (Note 6). On approval of the Technical Feasibility Statement by the Environment, Transport and Works Bureau, the project is included in Category C of the PWP;

(d) the successful inclusion of the project in the Resource Allocation System entitles it to be included in Category B of the PWP. When a project has achieved Category B status, the works department carries out further planning and design; and

(e) when the design and drawings are substantially complete, the works department concerned, with the support of the corresponding policy bureau, seeks funding from the Legislative Council (LegCo) through the submission of the Public Works Subcommittee (PWSC) paper. The project is upgraded to Category A of the PWP upon the Finance Committee's approval. When a project has achieved Category A status, the works department can put the works out to tender.

3.6 A pier project has to be gazetted under the Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127). Any objections received have to be resolved satisfactorily.

Note 6: *Before November 2001, departments were required to prepare a Client Project Brief and a Preliminary Project Feasibility Study instead of the Project Definition Statement and Technical Feasibility Statement. The Project Definition Statement and Technical Feasibility Statement were introduced to replace the Client Project Brief and Preliminary Project Feasibility Study as part of the Government's arrangements for expediting the delivery of the capital works programme.*

3.7 For projects costing not more than $15 million, there is no need to go through the normal capital works procedures. Such projects are processed as Category D items of the PWP (Note 7). For Category D projects, the preparation of a Project Definition Statement and a Technical Feasibility Statement is not normally required. Of the 14 projects included in the reconstruction programme, the works of the Tung Lung Chau and Kadoorie public piers were Category D projects. The other 12 followed the normal capital works procedures.

Justifications for reconstruction of deteriorated piers

3.8 Justifications for the pier reconstruction project are required to be established at the start of the project planning stage. Of the 14 piers, the first 9 were initiated before November 2001 and the justifications for them were set out in the form of a Client Project Brief (except the two Category D projects mentioned in para. 3.7). The other 5 projects were initiated after November 2001 and the justifications were set out in the form of a Project Definition Statement (see para. 3.5(b) and Note 6). The PWSC papers seeking funding approval also contained the relevant justifications.

3.9 The CEDD was the works agent for the pier reconstruction projects. It was responsible for preparing the Preliminary Project Feasibility Study or the Technical Feasibility Statement. As for the preparation of the Client Project Brief or Project Definition Statement, the CEDD also assumed the role of a client department for the 12 public piers. The Client Project Briefs of the two government piers were prepared by the CSD and the HKPF.

3.10 ***Justifications for reconstruction.*** The justifications put up in the relevant documents for the pier reconstruction projects were as follows:

(a) the pier was in a poor condition and was deteriorating with widespread reinforcement corrosion and concrete spalling;

(b) the pier was approaching the end of its serviceable life. It was beyond economic repair to an extent that urgent replacement was necessary. If the pier was not replaced, more frequent and substantial repairs would be required to meet acceptable safety standards. Even with costly repairs, the long-term durability of the structures would still be limited; and

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Note 7: *Category D projects (funded under various block allocations) cover works-related studies and site investigations, and minor works items, each costing not more than $15 million. The Finance Committee approves the funding for each block allocation on an annual, rather than project-specific, basis.*

(c) in the interest of public safety, the pier should be replaced, and the opportunity was taken to upgrade the existing facilities at the pier.

Audit observations

Justifications based mainly on maintenance and safety considerations

3.11 **Audit has examined the project planning documents of the pier reconstruction projects and noted that the justifications for the works were based mainly on maintenance and safety considerations (see para. 3.10).** For the 12 public piers where the CEDD has also taken up the role of client department, the CEDD adopted a strategy of replacing the deteriorated pier on a one-for-one basis. The justifications for reconstruction were not made on the basis of utilisation. (For the two government piers, the client departments, namely the CSD and the HKPF, had provided explicit justifications for their reconstruction.)

3.12 **As the old public piers included in the reconstruction programme were built many years ago, the circumstances giving rise to the need for them might have changed. The mere existence of a pier does not necessarily imply that it should be replaced. It is necessary to critically examine the justifications for reconstructing a deteriorated pier. Audit considers that the CEDD needs to adopt stringent criteria for justifying the reconstruction of the piers as if it is building new ones.** In particular, the CEDD needs to consider:

(a) whether there have been demographic changes in the area resulting in a much smaller population using the pier (see the case studies on the Sham Chung and Lai Chi Chong public piers in PART 4 —paras. 4.1 to 4.29);

(b) whether there are any ferry or kaito services operating at the pier, and the passenger demand for such services (see the case study on the Wu Kai Sha Public Pier in PART 5 —paras. 5.2 to 5.17);

(c) whether there is proven usage of the pier for landing purpose, including the ferry/kaito services and other vessels (see the case study on the Kadoorie Public Pier in PART 5 —paras. 5.32 to 5.46);

(d) whether sea transport is no longer required because of the availability of land transport (see the case study on the Wu Kai Sha Public Pier in PART 5 —paras. 5.2 to 5.17); and

(e) whether there are alternative landing facilities (e.g. landings) in the vicinity of the pier concerned (see the case studies on Peng Chau and Kadoorie public piers in PART 5 —paras. 5.18 to 5.46).

3.13 The case studies in PART 4 and PART 5 show that some of these factors had not been thoroughly examined during the planning of the pier reconstruction projects. As a result, there appeared to be no sufficient justifications for 5 of the 14 projects included in the pier reconstruction programme.

Need to conduct field survey to assess usage

3.14 At the project planning stage, the CEDD had not conducted field surveys to assess the usage of the piers (the first field surveys were conducted in early 2004 — see para. 4.13). Therefore, there was no sufficient information on the usage of the piers when justifications for reconstruction were submitted. **Audit considers that it is necessary to conduct field surveys at the preliminary project planning stage to assess the utilisation of a pier under consideration for reconstruction.**

Audit recommendations

3.15 **Audit has *recommended* that, in future pier reconstruction projects, the Director of Civil Engineering and Development should:**

(a) **besides maintenance and safety considerations, critically examine the need for reconstruction having regard to the actual and forecast utilisation of the pier; and**

(b) **conduct field surveys to assess the utilisation of the pier at the preliminary project planning stage.**

Response from the Administration

3.16 The **Director of Civil Engineering and Development** agrees with the audit recommendations mentioned in paragraph 3.15.

3.17 The **Secretary for Economic Development and Labour** has said that he agrees that the reconstruction of a public pier has to be fully justified, taking into account all factors including the utilisation, the population to be served and the availability of other modes of transport in the vicinity. He has also said that in rare cases where marine access is the only mode of transport, public piers are needed as a necessity for emergency and other purposes. Quantitative factors such as utilisation rate should not be the only criterion.

3.18 The **Secretary for the Environment, Transport and Works** has said that she has no objection to conducting field surveys on utilisation when considering the justifications for reconstructing a deteriorated pier. She has also said that the physical conditions (e.g. safety and cost-effectiveness in repeated maintenance) of the pier, its planned future use and the local residents' views should also be considered.

3.19 The **Commissioner for Transport** has said that, apart from the passenger demand for the ferry services operating from a pier and the utilisation of the pier, the social need for the pier should also be taken into account, especially when the pier is the only access link to the urban area. In this respect, the District Offices will have an important role in assessing the social need for a public pier.

Lack of a managing department for public piers

3.20 It is usually the client department's responsibility to prepare the Client Project Brief or Project Definition Statement, and submit the justifications for the project. For government piers, the department that manages the pier is the client department. The TD is the managing department of ferry piers (other than the Macau Ferry Terminal and the China Ferry Terminal, which are managed by the Marine Department). However, in the case of public piers, there is no designated managing department.

3.21 ***CEDD as both works agent and client department.*** In July 1996, the CEDD sought policy direction on which department should take up the role as the client department for the reconstruction of public piers and for preparing the Client Project Brief. In August 1996, the then PELB advised that, as the CEDD was the maintenance agent and had also been overseeing the Pier Condition Study, the CEDD should be in the best position to justify what reconstruction, strengthening and upgrading works would be necessary, and to prepare the Client Project Brief. Thus, the CEDD became the client department for the 12 reconstruction projects.

Previous discussions on management of public piers

3.22 The management of public piers has long been an unresolved issue among the concerned departments such as the CEDD, the Architectural Services Department, the TD and the Marine Department. This has created problems in the planning, reconstruction and management of public piers, as well as the handling of complaints. While various departments were of the view that a coordinating authority for public piers might achieve more efficient results, for many years a managing department could not be identified. Each department is responsible for the work within its own purview.

3.23 ***1988 Review.*** In July 1988, the then Transport Bureau considered that the absence of a managing department had held up some public pier projects. An early decision was required on which department should assume overall responsibility for the planning and coordination of the management and maintenance of public piers. The Transport Bureau prepared a brief note which said that one of the main functions of the managing department was to forecast the need of pier users and to ascertain the usage by means of surveys. In the brief note, the Marine Department and the TD were named as possible candidates to be the managing department. However, the Marine Department declined the role, and suggested that the existing arrangement was adequate. The TD also declined the role as it had no resources and legal powers to do so. In the circumstances, the Transport Bureau did not pursue the matter further.

3.24 ***Proposed study on management responsibilities of public piers.*** In February 1999, the CEDD considered that the problem on the identification of a management department remained. The unresolved problem had caused much nuisance among government departments and would have a significant impact on the maintenance strategy especially for the very old piers requiring reconstruction. In view of this, in April 1999, the CEDD decided to conduct a review to identify the most suitable bureau and department for managing public piers, and to recommend a management scheme with full justifications and resource requirements to the appropriate authorities. The CEDD planned to commence the study in December 1999. However, in July 2000, the CEDD decided to suspend the proposed study due to staff shortage.

Audit observations

3.25 In the absence of a managing department, the CEDD has taken up the dual role as both the client department and the works agent for reconstructing the public piers. **As the CEDD is the works agent for both maintenance and construction, its primary focus would be on the works aspect of the projects. This could partly explain why the justifications submitted by the CEDD for reconstructing the piers were based mainly on maintenance and safety considerations.**

3.26 On the other hand, the CEDD does not have readily available information on the usage of the piers. It is also not the department responsible for waterborne transport. It would be difficult for the CEDD to establish justifications for reconstruction on the basis of usage. In particular, in cases like the Sham Chung Public Pier (see PART 4) where the usage was low and a decision had to be made on whether to reconstruct the pier, the CEDD might not be the most suitable authority to make the choice. **Audit considers that the dual role now taken up by the CEDD as both the works agent and the client department could undermine the necessary collaboration and checks and balances between the works agent and the client department.**

3.27 The lack of a managing department for public piers had dragged on for some years. Audit noted that the CEDD review on the management of public piers in 1999 was held in abeyance due to staff shortage (see para. 3.24). **Audit considers that it would be useful to conduct this review in due course to improve the overall management of public piers and to identify a managing department.**

3.28 **Until a managing department is identified, Audit considers that, for the reconstruction of public piers, it would be useful to involve the TD and the Marine Department during preliminary project planning to draw on their expertise on waterborne transport and marine regulations.** For the reconstruction of the two government piers (i.e. the Hei Ling Chau Pier and the Tai Lam Chung Pier), the managing departments, namely the CSD and the HKPF, were involved in defining the scope and establishing the justifications for the reconstruction.

Audit recommendations

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

(a) **invite the Commissioner for Transport and the Director of Marine to assist, at the preliminary project planning stage, in establishing justifications for the reconstruction of public piers; and**

(b) **in consultation with the Secretary for Economic Development and Labour, consider conducting a review on the management of public piers with a view to identifying a managing department.**

Response from the Administration

3.30 The **Secretary for Economic Development and Labour** and the **Director of Civil Engineering and Development** agree with the audit recommendations mentioned in paragraph 3.29.

3.31 The **Secretary for the Environment, Transport and Works** has said that the dual role of the CEDD as a works agent to justify the need of a project remains unresolved. She supports the audit recommendation on conducting a review on the management of public piers.

3.32 The **Commissioner for Transport** has said that it will be useful to involve the District Offices in planning the reconstruction of public piers as they have local knowledge on the population and users to be served. They would be in a position to provide comment on the social need for the pier, e.g. whether local villagers used the public pier for access to their marine culture area or are dependent upon marine access for transportation of goods and commodities in their daily life.

PART 4: CONCERNS OVER RECONSTRUCTION OF SHAM CHUNG PUBLIC PIER

4.1 This PART examines the need for reconstructing the Sham Chung Public Pier, and the events leading to the deferment of the reconstruction of both the Sham Chung and Lai Chi Chong public piers.

Reconstruction of five public piers in north east New Territories

4.2 In December 2001, the CEDD obtained policy support from the EDLB for reconstructing five public piers at Sham Chung, Lai Chi Chong, Sha Tau Kok, Wong Shek and Ko Lau Wan. In July 2002, the five PWP projects were upgraded to Category C and, in November 2002, to Category B. In May 2003, the five PWP projects were grouped together as one PWP project.

4.3 The five public piers are all situated in north east New Territories. They were reinforced concrete piers built in the 1960s using prestressing techniques. The CEDD identified severe corrosion and deterioration at these piers during inspections and considered that they were approaching the end of their serviceable lives. Reinstating the piers to an acceptable condition was very difficult and costly. Even with costly repairs, the long-term durability would still be limited. Users would be at risk if the piers were not replaced. The CEDD therefore proposed to reconstruct the piers and enhance their appearance.

Sham Chung and Lai Chi Chong

4.4 Sham Chung and Lai Chi Chong are two rural communities situated in Sai Kung North with no vehicular access. They are about 3 kilometres apart and are connected by a hilly trail. The nearest vehicular road to Sham Chung ends at Yung Shue O. These two places are connected by a narrow paved footpath of about 3.25 kilometres on level ground. For Lai Chi Chong, the nearest vehicular road is about 2.75 kilometres away at Pak Sha O. The major transport facilities for Sham Chung and Lai Chi Chong are the public piers. The map in Figure 2 shows the location of the Sham Chung and Lai Chi Chong public piers. Photograph 3 and Photograph 4 show the two piers.

Figure 2

Location of Sham Chung and Lai Chi Chong public piers

Legend: vehicular road

Source: *CEDD records*

Photograph 3

Sham Chung Public Pier

Source: Photograph taken by Audit in January 2005

Photograph 4

Lai Chi Chong Public Pier

Source: Photograph taken by Audit in January 2005

4.5 The public piers at Sham Chung and Lai Chi Chong are mainly for kaitos and pleasure vessels. There is a licensed kaito service operating from Ma Liu Shui to Tap Mun via Sham Chung and Lai Chi Chong, with two return trips on weekdays and three return trips on weekends and holidays. In March 2004, the TD informed the CEDD that the patronage of the kaito service at the two piers was as follows:

	Number of passengers of the kaito service	
	Weekday	**Weekend and holiday**
Sham Chung Public Pier	3	10
Lai Chi Chong Public Pier	50	100

4.6 ***Population at Sham Chung and Lai Chi Chong.*** Due to demographic changes, Sham Chung and Lai Chi Chong have become sparsely populated with few residents. Table 2 shows the population figures of Sham Chung and Lai Chi Chong according to different sources:

Table 2

Population figures of Sham Chung and Lai Chi Chong

	Planning Department's figures according to the 2001 census	**Home Affairs Department's figures**	
		as at November 2002	**as at March 2004**
	(No.)	**(No.)**	**(No.)**
Sham Chung	40	10	**2**
Lai Chi Chong		50	**3 (Note)**

Source: CEDD records

Note: In addition to the local residents, about 70 to 100 visitors used the campsite at Lai Chi Chong on weekends.

4.7 ***Scope of the reconstruction works.*** According to the original design, the reconstruction works of the public piers at Sham Chung and Lai Chi Chong would be carried out on a like-for-like basis. The replacement piers would be of the same size as the existing piers with two berths. The CEDD also took the opportunity to upgrade the facilities by adding to each pier an aesthetically designed roof cover over the pier head and the catwalk. The estimated costs for reconstructing the Sham Chung and Lai Chi Chong public piers were $26.1 million and $29.6 million respectively.

Media concerns over reconstruction of Sham Chung Public Pier

4.8 In November 2003, some newspapers reported that the CEDD was planning the reconstruction of the Sham Chung Public Pier at an estimated cost of $26 million. The news articles questioned the rationale for the reconstruction works and the substantial cost involved, having regard to the fact that there were few residents at Sham Chung. There were also comments on the adverse environmental impact of the reconstruction works.

4.9 In February 2004, another newspaper raised similar concerns over the need for reconstructing the Sham Chung Public Pier. The journalist also sent a letter to the Financial Secretary and the Director of Audit. In March 2004, the Office of the Financial Secretary replied that:

(a) the Government would take into account the usage by the indigenous residents and visitors and the need for emergency operations before making a decision on the future of deteriorated piers;

(b) **funds would be sought from the Finance Committee only when a demonstrated need could be established for individual piers;** and

(c) the Government was still reviewing the need for reconstructing the Sham Chung Public Pier.

4.10 Following the newspaper comments, the CEDD received a number of complaints from the public on the reconstruction of the Sham Chung Public Pier. In January and February 2004, three environmental groups lodged formal objections when the project was gazetted under the Foreshore and Sea-bed (Reclamations) Ordinance.

4.11 In March 2004, the District Officer (Tai Po) of the Home Affairs Department wrote to the CEDD and expressed concerns over the newspaper comments, particularly concerning the following points:

(a) ***Number of people benefited.*** **According to the village representative of Sham Chung, there were only two to three residents. An average of 20-30 people visited the area each month. The low figures led to queries as to whether the amount of money to be spent was justified;**

(b) ***Need.*** The residents at Sham Chung were around or over 60 years old and had retired. They had no great need for daily travelling to and from Sham Chung. However, there remained the need for emergency, particularly when a resident needed urgent medical care; and

(c) ***Future development.*** There was no major development intended for the area.

4.12 The District Officer (Tai Po) suggested that the CEDD should reconsider the capital investment of the pier compared to its need, usage and lifespan, and should consider constructing a small pier at a lower cost.

Utilisation of the piers

4.13 From January to April 2004, the CEDD conducted field surveys to assess the utilisation of the five public piers planned for reconstruction. The field surveys covered six weekdays, seven weekends and public holidays. The utilisation rates were recorded in terms of the number of vessels calling at the pier, and the numbers of passengers boarding and alighting. Appendix E shows the results of the CEDD field surveys.

4.14 The field surveys indicated that the utilisation rates of the Sham Chung and Lai Chi Chong public piers were low. In July and August 2004, the CEDD conducted more field surveys. They showed that the utilisation rates were still low, with that of the Sham Chung Public Pier showing a further decrease, although that of the Lai Chi Chong Public Pier showed a slight increase.

Deferment of the reconstruction works

4.15 In March 2004, the EDLB, the CEDD and various government departments held a meeting to discuss the reconstruction of the five public piers. The meeting noted that:

(a) in 2001, the EDLB gave its policy support for the reconstruction of the piers for safety reasons. Reprovision would be made on a like-for-like basis;

(b) continued maintenance of the piers as a short-term solution was not an option if safety of users could not be guaranteed. The piers, if fully justified by reasonable need for regular usage, should be reconstructed, otherwise they should be closed;

(c) there seemed to be a strong case for reconstructing the piers at Sha Tau Kok, Wong Shek and Ko Lau Wan. For the piers at Sham Chung and Lai Chi Chong, further information on their usage was required;

(d) **many objections were raised by the media or environmental groups on the pier reconstruction project at Sham Chung. It was highly likely that similar objections would be raised on the pier reconstruction project at Lai Chi Chong; and**

(e) the EDLB was worried that the objections to the Sham Chung pier reconstruction project would delay the implementation programme of other piers. As such, the reconstruction of the public piers at Sha Tau Kok, Wong Shek and Ko Lau Wan should be put forward in April 2004, while those at Sham Chung and Lai Chi Chong should be dealt with later.

4.16 In late March 2004, the EDLB decided to split the project for reconstructing the five public piers into two, and to seek funding approval separately. One project dealt with the Sha Tau Kok, Wong Shek and Ko Lau Wan public piers. Another project dealt with the Sham Chung and Lai Chi Chong public piers. In June 2004, the EDLB sought funding support from the PWSC for reconstructing the Sha Tau Kok, Wong Shek and Ko Lau Wan public piers. **The PWSC was informed that the reconstruction of the Sham Chung and Lai Chi Chong public piers would be deferred because time was required to resolve the objections received. At the same time, the Government was reviewing the need for reconstructing these two piers in the light of the recent usage.**

4.17 In June 2004, the Finance Committee approved the funding for reconstructing the Sha Tau Kok, Wong Shek and Ko Lau Wan public piers at an estimated cost of $109 million. The reconstruction of Sham Chung and Lai Chi Chong public piers remained as a Category B project.

Revision of the design of reconstruction works

4.18 With the deferral of the reconstruction of the Sham Chung and Lai Chi Chong public piers, from June to September 2004, the CEDD and the EDLB held more discussions on the way forward. The EDLB considered that:

(a) the reconstruction of these piers had to be fully justified on the basis of reasonable need for regular usage. **Neither the usage figures nor the population to be served could establish a strong case for reconstruction**;

(b) it might be arguable that it was necessary to provide convenient marine access for indigenous residents and visitors, and for emergency operations. Nevertheless, it was necessary to collect relevant information as much as possible to support the construction of new piers. The scale would then be considered after a demonstrated need had been established; and

(c) **there was a need to adopt a bare minimum approach and to explore all feasible options including re-considering the location, scale and the overall design of the piers. It was necessary to explore the most cost-effective option to cater for the genuine need.**

4.19 ***Reduction in the scope of works.*** After reviewing the user requirement and design of the piers in the light of the actual utilisation, the CEDD said that:

(a) consultations with the Lands Department and the Planning Department confirmed that there would be no potential development in the vicinity of the piers. It could be envisaged that the utilisation rate would remain steady;

(b) the Tourism Commission confirmed that there were no tourism development plans for Sham Chung and Lai Chi Chong. The reconstruction works should not be associated with tourism enhancement or other projects; and

(c) the demolition of the piers without reprovisioning would likely arouse strong objection from the Tai Po District Council, local villagers, visitors to the area, and would cause adverse impact to tourism at the above scenic areas.

4.20 ***Submission of revised design.*** In September 2004, the CEDD completed the review of the design of the Sham Chung and Lai Chi Chong public piers, and submitted a revised design to the EDLB for consideration. In its submission, the CEDD said that:

(a) based on the results of the usage surveys, a single berth (instead of two berths in the original design) would be provided for each pier. This would be sufficient to meet the current usage;

(b) the size of the pier head would be substantially reduced. The catwalk was designed as a composite steel/concrete structure to maximise the span length and minimise the number of piles needed; and

(c) the original roof cover would be dispensed with. Only a small shelter would be provided for the Lai Chi Chong Public Pier, and no shelter would be provided for the Sham Chung Public Pier.

4.21 ***Revised reconstruction programme.*** In September 2004, the CEDD submitted a revised programme for reconstructing the Sham Chung and Lai Chi Chong public piers for the EDLB's endorsement. According to the proposed timetable, funds for the reconstruction works would be sought from the Finance Committee in December 2005. The construction works were planned to start in May 2006 for completion in May 2008.

Audit observations

Justifications for the reconstruction not well established

4.22 The justifications for reconstructing the Sham Chung and Lai Chi Chong public piers were based mainly on maintenance and safety considerations. At the project initiation stage, the CEDD did not critically assess the need for the continued provision of the public piers on the basis of actual and forecast utilisation.

4.23 Due to demographic changes, there are only very few residents at Sham Chung and Lai Chi Chong. In November 2003 and February 2004, members of the public questioned the cost-effectiveness of the project. **For future pier reconstruction projects, Audit considers that, besides maintenance and safety considerations, the CEDD should critically assess the need for reconstruction on the basis of utilisation, taking into account the population to be served.**

Significant cost reduction in revised design

4.24 Audit noted that the revised design of the replacement piers would result in a significant reduction in the construction cost. According to the CEDD's cost estimates, the revised design would reduce the total cost by $23 million (or 41%) for both piers. Table 3 shows the reduction in the estimated construction cost.

Table 3

Reduction in estimated construction cost

	Construction cost		
	Original design	**Revised design**	**Reduction in cost**
	(A)	**(B)**	**(C) = (A) - (B)**
	($ million)	**($ million)**	**($ million)**
Sham Chung Public Pier	26.1	15.0	11.1 (42.5%)
Lai Chi Chong Public Pier	29.6	17.7	11.9 (40.2%)
Total	**55.7**	**32.7**	**23.0 (41.3%)**

Source: CEDD records

4.25 **The revision in design of the replacement piers and the reduction in construction cost indicated that the replacement of piers on a like-for-like basis might not be appropriate. There is room for economy in the design of replacement piers.** Please see PART 6 for a detailed analysis of the design of replacement piers.

The way forward for Sham Chung and Lai Chi Chong public piers

4.26 The EDLB has yet to make a decision on the way forward for reconstructing the Sham Chung and Lai Chi Chong public piers. **The EDLB and the CEDD should conduct thorough consultation and take into account public comments before making a final decision. When seeking funding approval, the CEDD needs to provide full justifications for reconstructing the piers, including the population to be served, the expected utilisation of the piers, and the views of the public.**

Audit recommendations

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

(a) **critically assess the need for reconstructing a deteriorated public pier, taking into account:**

(i) **the audit recommendations in paragraph 3.15; and**

(ii) **the population to be served; and**

(b) **provide, in the papers seeking funding approval, full justifications for reconstructing the Sham Chung and Lai Chi Chong public piers, showing explicitly the population to be served, the utilisation of the piers, and the views of the public, so that the Finance Committee can make an informed decision.**

Response from the Administration

4.28 The **Secretary for Economic Development and Labour** and the **Director of Civil Engineering and Development** agree with the audit recommendations mentioned in paragraph 4.27.

4.29 The **Secretary for Economic Development and Labour** has also said that he had precisely these considerations in mind when he held back the reconstruction of the Sham Chung and Lai Chi Chong public piers in early 2004, since field data did not conclusively support the imminent need for reconstruction.

PART 5: RECONSTRUCTION OF WU KAI SHA, PENG CHAU AND KADOORIE PUBLIC PIERS

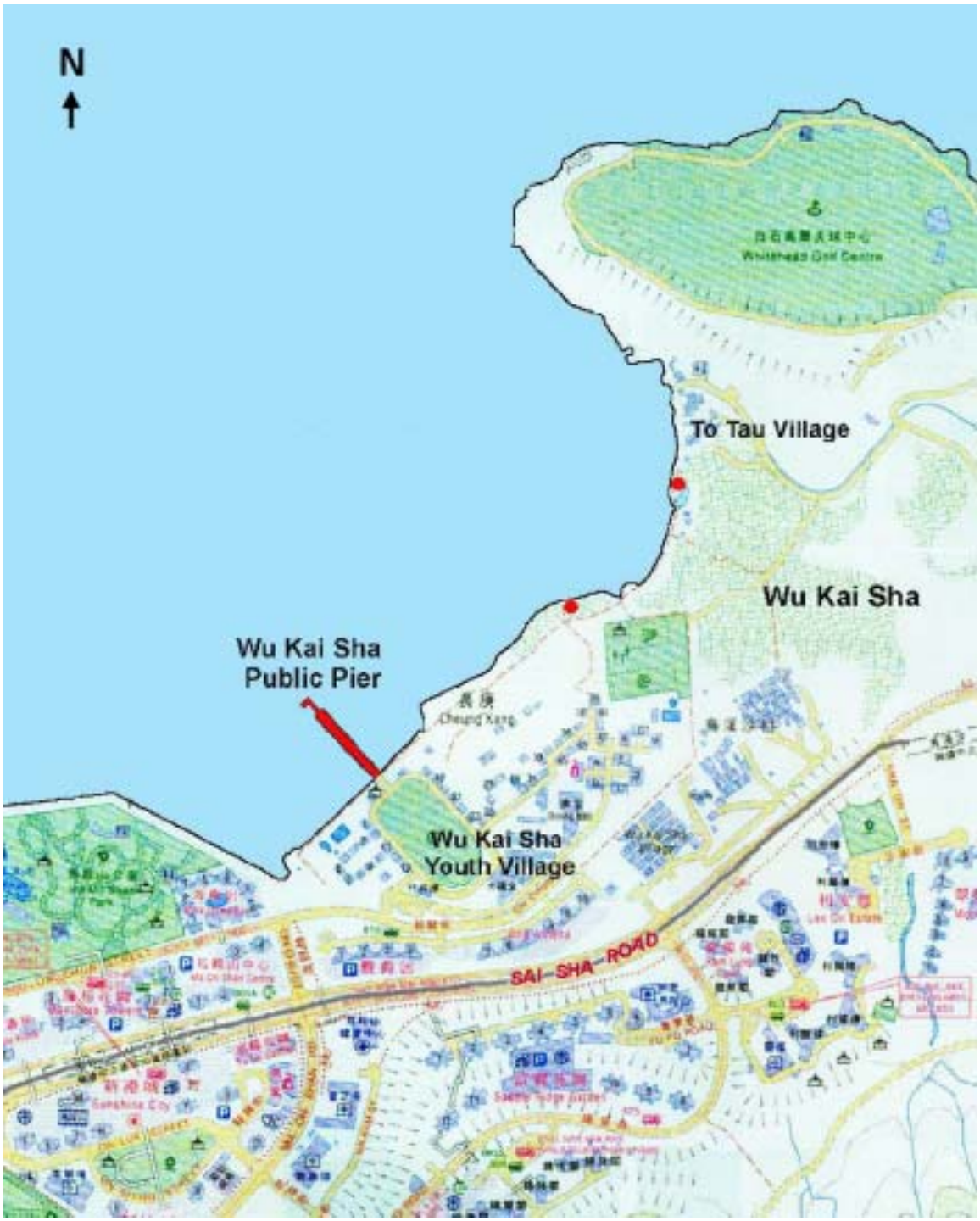
5.1 This PART examines the justifications for reconstructing the Wu Kai Sha, Peng Chau and Kadoorie public piers.

Reconstruction of the Wu Kai Sha Public Pier

5.2 Wu Kai Sha was once an isolated community in Ma On Shan, with fishing villages and a youth camp. Prior to the 1980s, there was no road access. The only transport available was a kaito service operating from the Wu Kai Sha Public Pier to Ma Liu Shui. In the 1980s, with the development of the Ma On Shan new town, roads were built. The Sai Sha Road was opened to traffic by stages, connecting Ma On Shan to Sha Tin and Sai Kung. As land transport was available, the kaito service ceased operation in 1983. The map in Figure 3 shows the location of the Wu Kai Sha Public Pier.

Figure 3

Location of Wu Kai Sha Public Pier



Legend: Pier

Jetty

Source: *CEDD records*

Justifications for reconstruction

5.3 The Wu Kai Sha Public Pier was built in 1954. It was identified by the Pier Condition Study as one of the piers recommended for reconstruction (see para. 2.7). In August 1998, the CEDD initiated the reconstruction of the Wu Kai Sha Public Pier, and prepared the Client Project Brief which was endorsed by the then PELB. It was mentioned in the Client Project Brief that the Wu Kai Sha Public Pier had deteriorated to such an extent that reconstruction was necessary.

5.4 In September 2000, the reconstruction project was upgraded to Category B. In February 2001, in a scope review of the project, the CEDD considered that the usage of the pier was not frequent, and that local villagers would no longer use it because land transport was well developed. There were also no kaito services operating at the pier. The CEDD could only identify two user departments:

(a) the Department of Health (D of H), for visits by the Chee Wan Floating Clinic (Note 8); and

(b) the Customs and Excise Department (C&ED), for landing of its patrol launches.

5.5 In view of the limited number of users, the CEDD considered that demolition of the pier might be more justified than reconstructing the pier. In February 2001, the CEDD asked the D of H and the C&ED about their frequency of usage of the pier. The CEDD also asked the two departments how it would affect their operations if the pier was demolished.

5.6 ***Operation of the floating clinic.*** In April 2001, the D of H replied that, with the improvement of the traffic network and the provision of the nearby Ma On Shan Health Clinic since 1996, the number of consultations made at the floating clinic had dropped significantly. In view of the low utilisation, the D of H was reviewing the long-term provision of the service at the Wu Kai Sha Public Pier.

5.7 ***Proposed use of the pier as a C&ED marine base.*** In February 2001, the C&ED responded that it would not occupy the pier. However, if there were accommodation and relevant facilities such as water and electricity supply at the pier after reconstruction, the C&ED would use the pier as its marine base.

Note 8: *The Chee Wan Floating Clinic is operated by the Community Physician of the Department of Health to serve remote areas and outlying islands, including Wu Kai Sha. There are scheduled calls at the Wu Kai Sha Public Pier on Tuesdays and Saturdays, for a duration of 30 and 45 minutes respectively.*

5.8 In June 2001, the CEDD responded that it would consider in the detailed design stage whether it was justified to provide the requested facilities. In the event, the CEDD did not include the facilities for the supply of water and electricity in the design of the replacement pier. The reconstruction works proceeded on the basis of a public pier, not as a marine base for the C&ED with the requested facilities.

Funding approval

5.9 In April 2002, the Finance Committee approved the funding for reconstructing the Wu Kai Sha Public Pier at an estimated cost of $15.1 million. In the PWSC paper submitted for funding approval, it was mentioned that the Wu Kai Sha Public Pier was mainly used by local fishermen and government vessels. The pier would be constructed with a pier head of 75 square metres with one berth and a replacement catwalk. The opportunity was also taken to upgrade the existing facilities by providing a roof cover for shelter and shade.

5.10 The reconstruction works commenced in November 2002 and were expected to be completed by early 2005. Photograph 5 shows the Wu Kai Sha Public Pier under reconstruction.

Photograph 5

Wu Kai Sha Public Pier

Source: Photograph taken by Audit in December 2004

Audit observations

Availability of land transport obviates the need for reconstruction

5.11 The old Wu Kai Sha Public Pier served many years as the essential sea transport for the area when road transport was not available. With the development of the road transport, the kaito service ceased in 1983 and the utilisation of the pier had been low. **However, at the project initiation stage in 1998, the CEDD did not conduct field surveys to assess the utilisation of the pier. The justifications for reconstruction were based mainly on maintenance and safety considerations.**

Low utilisation realised at detailed design stage

5.12 During the detailed design in February 2001, the CEDD realised that the utilisation of the pier was low. It sought the views of the D of H and the C&ED to help justify the reconstruction works. However, both departments did not consider the use of the pier essential to their services.

5.13 The C&ED proposed to use the replacement pier as its marine base. However, the CEDD did not provide the facilities requested by the C&ED. **As such, the C&ED would not use the reconstructed pier as a marine base. Audit considers that the CEDD has not resolved the issue of low utilisation of the pier.**

Need for reconstructing the pier not well established

5.14 In the PWSC submission, the CEDD said that the Wu Kai Sha Public Pier was used by fishermen and government departments but did not mention the low utilisation of the pier. Audit conducted several field inspections (from October to December 2004) of the pier and observed that:

(a) very few vessels called at the pier;

(b) there was no vehicular access to the pier, and pedestrian access was inconvenient;

(c) on two occasions, the Chee Wan Floating Clinic berthed at the pier. Only three patients attended the floating clinic; and

(d) there were no fishing villages in the area.

5.15 **Audit has reservations about the need to reconstruct the Wu Kai Sha Public Pier. The CEDD had not established a demonstrated need for the reconstruction. In future pier reconstruction projects, the CEDD should critically assess the need for reconstruction having regard to the utilisation of the pier and the availability of land transport.**

Audit recommendation

5.16 **Audit has *recommended* that the Director of Civil Engineering and Development should critically assess the need for reconstructing a deteriorated pier, taking into account the audit recommendations in paragraph 3.15 and the availability of land transport that may obviate the need for a pier.**

Response from the Administration

5.17 The **Director of Civil Engineering and Development** agrees with the audit recommendation mentioned in paragraph 5.16.

Reconstruction of the Peng Chau Public Pier

Peng Chau development project

5.18 Peng Chau is a small island with an area of about 1 square kilometre and a population of about 7,000. From 1981 to 2003, the then TDD (see Note 1 in para. 1.2) carried out the Peng Chau development project which involved 14 works contracts at a cost of $480 million. The project scope included the construction of seawalls, reclamation works, and housing projects.

5.19 ***Landing facilities at Peng Chau.*** The development project also provided additional landing facilities for Peng Chau. At present, there are three piers at Peng Chau:

(a) the Peng Chau Ferry Pier;

(b) the Peng Chau Public Pier; and

(c) the Tai Lei Island Public Pier.

In addition, there are 9 landings at the west coast of Peng Chau, 7 of which were built under the TDD's development project. Please see Figure 4 for a map of Peng Chau showing the location of the piers and landings.

Figure 4

Location of piers and landings at Peng Chau

Legend:

Peng Chau Public Pier	Route A: Ferry service to and from Central (see Note 9)
Peng Chau Ferry Pier	Route B: Ferry service to and from Hei Ling Chau
Tai Lei Island Public Pier	Route C: Kaito service to and from Discovery Bay
Landing	

Source: CEDD records

Ferry services at Peng Chau

5.20 There are three licensed ferry services operating at Peng Chau:

(a) ***Route A:*** a licensed ferry service to and from Central at the Peng Chau Ferry Pier (Note 9);

(b) ***Route B:*** a licensed ferry service to and from Hei Ling Chau at Landing No. 1; and

(c) ***Route C:*** a licensed kaito ferry service to and from Discovery Bay at the Peng Chau Public Pier.

Justifications for reconstruction

5.21 The old Peng Chau Public Pier was built in 1955. It was identified by the Pier Condition Study as one of the piers recommended for reconstruction (see para. 2.7). In August 1998, the CEDD sought policy support from the then PELB. The justifications for reconstruction were mainly that the pier had deteriorated beyond economic repair. To ensure safety in operation, it would be more economical to reconstruct the pier than to continue the expensive maintenance works.

5.22 During the planning and design stage, the CEDD consulted relevant government departments, including the TD about the operation of ferry services at the public pier, and the TDD about possible interfacing works with the ongoing Peng Chau development project. The TDD informed the CEDD about the additional landings to be provided under the development project.

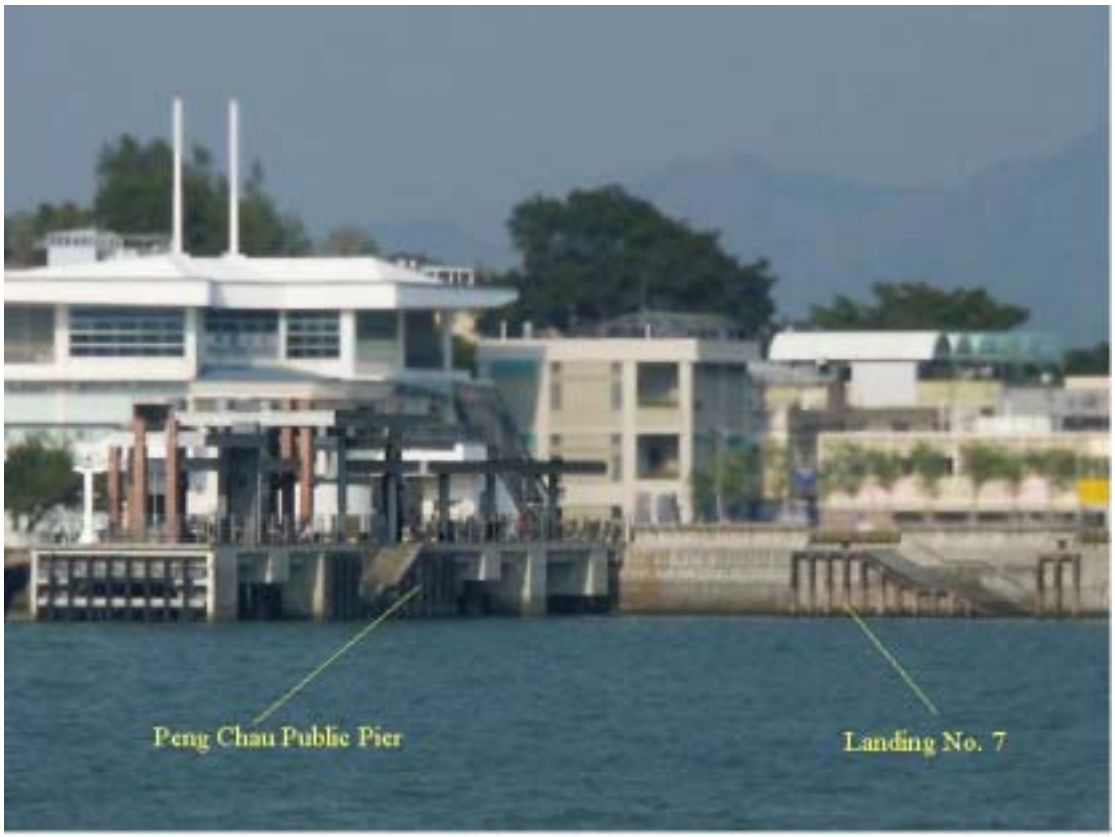
5.23 ***Funding approval.*** In April 2002, in seeking funding, the CEDD informed the PWSC that the berthing facilities at the Peng Chau Public Pier were mainly for the two licensed ferry services (i.e. Route B and Route C mentioned in para. 5.20). During construction, the provision of temporary berthing facilities was not necessary as the ferry services could be diverted to two nearby landings (i.e. Landing No. 7 and Landing No. 8) newly completed under the TDD's development project. The two landings were 20 metres and 120 metres respectively away from the public pier (see the map at Figure 4).

Note 9: *There is also an auxiliary inter-island ferry service (to and from Cheung Chau via Mui Wo and Chi Ma Wan) operating at the Peng Chau Ferry Pier.*

5.24 In April 2002, the Finance Committee approved the funding for reconstructing the Peng Chau Public Pier at an estimated cost of $30.2 million. The reconstruction works for the Peng Chau Public Pier started in May 2002 and were completed in January 2004 at the cost of $22.1 million. Compared with the old pier, the number of berths was increased from two to three and the pier area was increased by 56% to 390 square metres. Photograph 6 shows the Peng Chau Public Pier and Landing No. 7.

Photograph 6

Peng Chau Public Pier and Landing No. 7



Source: Photograph taken by Audit in November 2004

Audit observations

Ample landing facilities in Peng Chau

5.25 Peng Chau is a small island with many landing facilities, i.e. three piers and nine landings covering the entire length of its west shoreline. Landing No. 1 and Landing No. 2 had been available for public use for many years. The TDD development project added seven more landings to Peng Chau. In fact, a landing can be used for the berthing of vessels as a public pier.

Inaccurate information in the PWSC paper

5.26 According to the TD's records, ferry service Route B has been operating at Landing No. 1 for many years, i.e. before and after the reconstruction of the public pier. Landing No. 1 is in fact closer to the ferry pier and more convenient to passengers coming from Central (by Route A ferries) to make an onward trip to Hei Ling Chau. Only Route C ferries operated at the public pier before the reconstruction works. The TD informed the CEDD that only Route C ferries would operate at the new public pier.

5.27 However, in its submission to the PWSC, the CEDD said that the public pier was mainly used for two ferry services, both Route B and Route C. In January 2005, upon Audit's enquiry, the CEDD said that:

(a) the information in the PWSC paper was not entirely accurate; and

(b) it had promulgated a new checklist for PWSC submission to ensure that the information submitted to the PWSC was correct and complete.

Availability of landings not taken into account

5.28 The maintenance considerations and the need to accommodate the two ferry services were the justifications for reconstructing the Peng Chau Public Pier. Unlike other pier reconstruction projects, there was no need for the CEDD to provide temporary berthing facilities during construction as four landings near the pier were available for use. The Peng Chau Public Pier was closed during the 20-month construction period. It had also been closed for 17 months before the reconstruction works due to the TDD's works. During these closure periods, Route C ferries were diverted to operate at Landing No. 2 and Landing No. 7 until the new pier was completed in January 2004.

5.29 The fact that Route B ferries have been operating at Landing No. 1 and that Route C ferries had operated for 37 months at Landing No. 2 and Landing No. 7 demonstrate that the landings are suitable for operation of ferry services. At present, Peng Chau has nine landings on its west shoreline. **Together they provide sufficient landing facilities for the ferry services of Route B and Route C, and other vessels calling at Peng Chau. In view of this, Audit has reservations about the need for reconstructing the Peng Chau Public Pier. Audit considers that the CEDD should, in future pier reconstruction projects, critically assess the need for reconstruction, taking into account other landing facilities in the area.**

Audit recommendation

5.30 **Audit has *recommended* that the Director of Civil Engineering and Development should, besides maintenance and safety considerations, critically assess the need for reconstructing a deteriorated pier, taking into account other landing facilities in the area.**

Response from the Administration

5.31 The **Director of Civil Engineering and Development** agrees with the audit recommendation mentioned in paragraph 5.30.

Reconstruction of the Kadoorie Public Pier

Location of the Kadoorie Public Pier

5.32 The Kadoorie Public Pier is located at 19 Milestone Castle Peak Road, Tuen Mun (see Figure 5). It is situated between the Castle Peak Beach and Kadoorie Beach and is close to Sam Shing Estate. The area is well served by road transport. The pier is mainly used for kaito services.

Figure 5

Location of Kadoorie Public Pier and landings in Tuen Mun

Legend: Pier Landing

Source: *CEDD records*

Justifications for reconstruction

5.33 The old Kadoorie Public Pier was built in the 1940s. It was identified by the Pier Condition Study as one of the deteriorated piers recommended for reconstruction (see para. 2.7). The CEDD subsequently included the Kadoorie Public Pier in the reconstruction programme. In October 1999, in the proposal for reconstruction, it was stated that the Kadoorie Public Pier was in a deteriorating condition and should be replaced to ensure public safety. Since the estimated cost was less than $15 million, the works proceeded as a Category D project (see para. 3.7).

5.34 In January 2001, in seeking policy and funding support from the policy bureau to reconstruct the pier, the CEDD said that the Kadoorie Public Pier was mainly used for the kaito service between Castle Peak Bay and Ma Wan Chung of Tung Chung. The opportunity was also taken to upgrade the existing facilities by providing a roof cover and widening the footpath.

5.35 ***Funding approval.*** In February 2001, the then Works Bureau approved the reconstruction works at an estimated cost of $11.9 million. The works included constructing a new pier head of 70 square metres and a new catwalk. In December 2002, the construction of the new pier was completed at the cost of $7.5 million. Photograph 7 shows the Kadoorie Public Pier.

Photograph 7

Kadoorie Public Pier

Source: Photograph taken by Audit in November 2004

Audit observations

Discontinuation of the kaito service

5.36 According to the TD records, the kaito service between Castle Peak Bay and Ma Wan Chung (see para. 5.34) had been in operation for over 30 years. The operator was required to provide kaito service according to the timetable and calling points stipulated in the licence. There were eight sailings on weekdays and Saturdays, and ten sailings on Sundays and public holidays.

5.37 ***Recent land transport development.*** With the opening of a new expressway in 1997, road transport was extended to North Lantau, covering the new airport and the Tung Chung new town. In mid-1998, the Mass Transit Railway Tung Chung Line also started operation. These two developments adversely affected the demand for the kaito service between Castle Peak Bay and Ma Wan Chung.

5.38 In August 1999, the operator wrote to the TD expressing his difficulties in operating the kaito service which was running at a deficit. In view of the drop in the number of passengers, the operator applied to the TD for adding a calling point at the landing near Marina Garden, Tuen Mun (see Figure 5 in para. 5.32). The TD considered that the Kadoorie Public Pier was far away from the Tuen Mun town centre while the landing at Marina Garden was closer and more convenient to passengers. In June 2001, the TD approved the operator's application.

5.39 In November 2004, from the kaito operator's web site, Audit noted that the timetable for the kaito service showed that the only calling point at Tuen Mun was the landing at Marina Garden. **The Kadoorie Public Pier was not listed as a calling point.**

5.40 In the same month, Audit conducted field inspections at the Kadoorie Public Pier, the landing at Marina Garden and the Ma Wan Chung Public Pier. Audit observed that the kaito service was not in operation at all the three locations. Local residents at Ma Wan Chung informed Audit staff that the kaito service to Castle Peak Bay had ceased for months. **There was no more kaito service operating at the Kadoorie Public Pier.**

Availability of alternative landing facilities

5.41 There are a number of landing facilities in Tuen Mun (see Figure 5 in para. 5.32). At Area 44, there are two landings, including the one near Marina Garden (see para. 5.38). The Kadoorie Public Pier is situated at Castle Peak Bay at a roadside location not convenient to kaito passengers. Sam Shing Estate in Area 27, about half a kilometre from the Kadoorie Public Pier, is more convenient. There are two landings for public use at the seawall near Sam Shing Estate. One of the landings had been used for the kaito service between Tuen Mun and Tai O for about 20 years until January 2003, when the

service was terminated. Therefore, this landing is a readily available facility near the Kadoorie Public Pier.

Lack of critical examination of the need for reconstruction

5.42 The justifications submitted by the CEDD for reconstructing the Kadoorie Public Pier were mainly based on maintenance considerations and its use for the kaito service. Audit noted that the CEDD did consult the TD about the licensed kaito service operating at the pier. However, the CEDD had not obtained details of the patronage of the kaito service for analysis and had not conducted field surveys to ascertain the actual utilisation.

5.43 Demand for the kaito service has been hard hit by the availability of land transport to North Lantau since 1997. The dwindling demand for the kaito service could have been predicted and confirmed when the operator requested in August 1999 to add a calling point (see para. 5.38). The field inspections conducted by Audit indicated that the kaito service had ceased operation (see para. 5.40). The field inspections also indicated that the utilisation of the Kadoorie Public Pier was low.

5.44 On the other hand, the two landings at Sam Shing Estate are suitable and readily available landing facilities for kaito operation at a location more convenient than the Kadoorie Public Pier. **Audit has reservations about the need for reconstructing the Kadoorie Public Pier, having regard to the low demand for and the eventual cessation of the kaito service, and the availability of alternative landing facilities nearby. The CEDD should critically assess the need for reconstructing a deteriorated pier, taking into account the operating status and patronage of any ferry or kaito services and the availability of alternative landing facilities nearby.**

Audit recommendations

5.45 **Audit has *recommended* that the Director of Civil Engineering and Development should critically assess the need for reconstructing a deteriorated pier, taking into account:**

(a) **the operating status and patronage of ferry or kaito services using the pier, and the availability of alternative landing facilities nearby; and**

(b) **the audit recommendations in paragraph 3.15.**

Response from the Administration

5.46 The **Director of Civil Engineering and Development** agrees with the audit recommendations mentioned in paragraph 5.45.

PART 6: DESIGN OF REPLACEMENT PIERS

6.1 This PART examines the design of replacement piers to ascertain whether there is room for improvement in future pier reconstruction projects.

New approach to pier design

6.2 In the past, public piers were designed primarily for meeting operational needs. The comfort of users and the appearance of the piers were not given much emphasis. Therefore, the piers usually had a plain appearance. In recent years, apart from meeting functional and safety requirements, the CEDD began to put emphasis on the aesthetics aspects and facilities in pier design to ensure that the appearance is in harmony with the environment. It gives particular emphasis to architectural and landscaping design to enhance pier appearance.

6.3 Under this new approach, the CEDD took the opportunity to introduce improvements and additional facilities to the replacement piers. The replacement piers were designed with increase in size and the number of berths, and as a general provision, a roof cover with associated lighting.

Increase in size and number of berths

6.4 In each of the 12 reconstruction projects (the 14 reconstruction projects mentioned in para. 3.3 excluding Sham Chung and Lai Chi Chong public piers), the replacement pier provided was larger than the old one. In six replacement piers, additional berths were provided. Appendix F shows a comparison between the replacement pier and the old one for the 12 piers.

Addition of roofs and lighting facilities

6.5 Under the reconstruction programme, of the 12 replacement piers, 10 were provided with a roof and associated lighting. Appendix G shows the details of the additional facilities.

6.6 Of the 10 replacement piers with a roof provided, the roofs of 8 cover not only the pier head, but also the catwalk. In the cases of the Pak Sha Wan and Kadoorie public piers, the roofs cover all the way to the catwalk and the embankment (see Photograph 1 in para. 1.3 and Photograph 7 in para. 5.35). The cost of the roof and lighting for a pier ranged from $0.8 million to $5.3 million, with an average of about $2.3 million.

Audit observations

Improvements provided to replacement piers

6.7 In line with the new approach to pier design, the CEDD considered that the facilities of the replacement pier should be no less than those of the original pier. As such, the starting point for the design was a new pier similar in size to the old one with the same number of berths. If users requested an increase in size, the design would be suitably amended. In the event, all the replacement piers were larger in size than the old ones. In six cases, additional berths were provided. A roof and lighting were also provided as a general provision.

6.8 Audit considers that this planning approach might not be appropriate in reconstructing public piers. The main problem is that most public piers were built many years ago. The utilisation of the pier might have changed over time. It is more appropriate to design the replacement pier as if building a new one. The latter approach, based on utilisation, might be more appropriate in achieving an optimal design with due regard to economy.

Increase in size not based on utilisation

6.9 The utilisation of a pier is a key parameter in the design of the replacement pier. However, Audit noted that in designing the replacement piers, the CEDD had not conducted any field surveys to assess the actual utilisation. It was not until January 2004, after the concerns had been raised by the media (see para. 4.8), that the CEDD carried out field surveys at the public piers at Sham Chung, Lai Chi Chong, Sha Tau Kok, Wong Shek and Ko Lau Wan.

6.10 In the cases of the Sha Tau Kok and Wong Shek public piers, the actual utilisation figures were obtained to support the addition of more berths. However, Audit noted that the CEDD had not made any capacity assessment. There was no quantitative analysis to show that the berthing capacity of the old piers at Wong Shek and Sha Tau Kok (both with two berths) would be exceeded by the actual or forecast usage.

6.11 In assessing the berthing capacity, it is important to note that a public pier is open for use by the public and ferry or kaito operators on a sharing basis. The piers are not for berthing or mooring. Usually, it only takes a few minutes for a vessel to berth at a public pier for boarding and alighting of passengers. Therefore, one single berth in a public pier is able to accommodate, on a sharing basis, a number of vessels for landing purpose.

6.12 **In the design of future replacement piers, it is necessary for the CEDD to determine the size and number of berths on the basis of utilisation. The CEDD should also lay down guidelines for assessing the utilisation and the berthing capacity of the replacement piers.**

6.13 When utilisation is low, it may not be appropriate to expand the size and the number of berths of the pier. It may only be necessary to provide a smaller replacement pier with fewer number of berths. The Pak Sha Wan Public Pier (see paras. 6.14 to 6.16) is a case in point where the size and the number of berths of the replacement pier may have exceeded the need based on utilisation.

Excess capacity of Pak Sha Wan Public Pier

6.14 The old Pak Sha Wan Public Pier was a large one with 5 berths. The replacement pier was also provided with 5 berths. Its size was increased from 620 to 717 square metres. The reconstruction works were completed in 2001. During the design stage, the CEDD did not assess the actual utilisation and the berthing capacity required, although it consulted the TD about the kaito services operating at the pier.

6.15 According to the CEDD's records of 1999, the Pak Sha Wan Public Pier was very popular in the Sai Kung District. It served 11 kaito services, and pleasure and other vessels. Audit noted that the 11 kaito services operating at the pier were in fact the number of kaito licences issued by the TD. The routes of the kaito services overlapped each other. There was no service schedule. The kaito services were provided on demand or by appointment, due probably to the low patronage.

6.16 As at December 2004, there were ten valid kaito licences. During the period from 1999 to 2004, four operators relocated their kaito operations to the Sai Kung Public Pier. **In November and December 2004, Audit conducted site inspections at the Pak Sha Wan Public Pier, and found that the actual utilisation of the pier was low. It is questionable whether the Pak Sha Wan Public Pier requires five berths. A smaller pier with 2 or 3 berths would suffice.**

Cost of a roof and lighting

6.17 Additional capital costs were incurred in providing the roof and lighting to the replacement piers. Additional recurrent costs had to be incurred for the operation and maintenance of the roof and lighting. **A roof cover is a desirable facility for the comfort of users, but is not essential, particularly for piers with low utilisation. However, roofs were provided to 10 replacement piers (see Appendix G). The roofs covered not only the pier heads, but also the catwalks for 8 piers, and even the embankments (for the**

Pak Sha Wan and Kadoorie public piers). There is a need for the CEDD to adopt an economic design in the provision of roofs.

6.18 ***Comments on roof design.*** In early 2004, when the roof designs of the replacement piers at Sham Chung, Lai Chi Chong and Wong Shek were circulated, the Agriculture, Fisheries and Conservation Department commented that the CEDD had assumed that the roofs were necessary for all the piers and that the design should be "creative" with a view to becoming a local attraction for tourists. As these piers were located at countryside areas surrounded by natural scenery, it was important to maintain the visual amenities of the areas. While a creative design was encouraged, it should be non-intrusive. However, some designs had a significant visual impact and should be simplified to blend in with the natural environment.

6.19 In April 2004, the Country Parks Committee (Note 10) said that, although members had no objection to providing roofs, they had reservation about the roof designs. They stressed that the roofs should be designed with simple structures and minimum visual impact. They worried that piers with spectacular design in the countryside would ruin the natural landmark. In particular, roofs with too conspicuous design features would draw visitors' attention away from the scenic natural features.

Room for economy in the design of replacement piers

6.20 **The cost of constructing a replacement pier depends on its size, the number of berths, and the facilities provided. Judging from the above findings, Audit considers that there is room for economy in the design of replacement piers. In addition, the scaling down of the design of the replacement piers at Sham Chung and Lai Chi Chong (see paras. 4.20 to 4.26) also demonstrated that there is room for economy.**

Audit recommendations

6.21 **Audit has *recommended* that the Director of Civil Engineering and Development, in the design of replacement piers, should:**

(a) **achieve an optimal design commensurate with the utilisation of the pier; and**

(b) **adopt an economic design when it is decided that a roof is to be provided.**

Note 10: *The Country Parks Committee advises the Director of Agriculture, Fisheries and Conservation on the planning, development and management of country parks.*

Response from the Administration

6.22 The **Director of Civil Engineering and Development** agrees with the audit recommendations mentioned in paragraph 6.21.

Structural forms of piers

6.23 According to the Port Works Design Manual of the CEDD, piers can be built in two structural forms: the open structure and the solid structure. In selecting the appropriate structural form, it is necessary to evaluate the relative merits with regard to site conditions, cost, future maintenance, environmental impact and associated mitigation measures (see paras. 6.24 to 6.28 below).

Open structure

6.24 Piers constructed in the form of an open structure usually include a reinforced concrete deck supported on steel tubular or reinforced concrete piles (an example is in Photograph 4, para. 4.4). They are generally called reinforced concrete piers. Most of the piers built are in the form of a reinforced concrete structure (see para. 1.6). The advantages of reinforced concrete piers are that they do not cause wave reflection and water circulation problems. In addition, the dredging of soft marine mud is not required during construction.

6.25 The structural arrangement of a reinforced concrete pier is more complex. More design effort is required to determine the structural layout. As piling works are involved, reinforced concrete piers are usually more expensive than solid piers. Furthermore, frequent and costly maintenance is necessary due to the corrosion of the embedded steel reinforcement.

Solid structure

6.26 Piers constructed in the form of a solid structure are usually made of precast concrete blocks. A typical solid pier is shown in Photograph 8. Solid piers are usually less expensive than reinforced piers in both construction and maintenance. Solid piers do not contain steel reinforcement, thus, there are no similar corrosion problems. Regular inspections can be carried out less frequently.

Photograph 8

An example of a solid pier
(Chek Keng Public Pier)

Source: Photograph taken by Audit in October 2004

6.27 There are several disadvantages associated with solid piers. Firstly, in areas with strong waves, incident waves and waves reflected from the solid piers may make berthing difficult. Secondly, solid structures do not allow the passage of currents. If there are strong currents, local eddies induced by the solid structures also make berthing more difficult.

6.28 Dredging works are usually required for constructing the foundation of solid piers if there is soft marine mud. The suspended sediment generated during dredging may affect the water quality. Therefore, mitigating measures, such as the use of a silt curtain, are often necessary.

Audit observations

Concerns over corrosion of reinforced concrete piers

6.29 **The corrosion of the embedded steel reinforcement is the main cause of the deterioration of reinforced concrete piers. On the other hand, solid piers do not have such corrosion problems since no steel reinforcement is used.**

6.30 In September 1996, the CEDD held a senior management meeting to discuss the findings of the Pier Condition Study (see PART 2 for details). Concerns over the rapid deterioration of reinforced concrete piers were raised. It was mentioned that the future design of piers could consider limiting or omitting the use of steel reinforcement, and that the use of solid piers could be considered.

Scope for wider adoption of the solid pier design

6.31 Despite the advantages of the solid pier design over the reinforced concrete pier design, of the 12 replacement piers, only 1 (the Tai Lam Chung Pier) was built in the form of a solid pier. All the other 11 piers were built in the form of a reinforced concrete pier. **In view of the lower overall costs (both construction and maintenance) and longer durability of the solid pier design, the CEDD should consider the wider use of the solid pier design.**

Audit recommendation

6.32 **Audit has *recommended* that the Director of Civil Engineering and Development should consider the wider use of the solid structure in future pier reconstruction projects.**

Response from the Administration

6.33 The **Director of Civil Engineering and Development** agrees with the audit recommendation mentioned in paragraph 6.32.

6.34 The **Commissioner for Transport** has said that kaito and other small vessels are more prone to wind and water currents. Safety is a critical factor in pier design. The Marine Department should give advice on the marine safety aspects.

Appendix A
(paras. 1.7 and 3.3 refer)

List of piers in the CEDD reconstruction programme

Item (Note 1)	Name of pier	Year of construction	Year of reconstruction	Approved project estimate ($ million)
Reconstruction completed				
1.	Pak Sha Wan Public Pier	1974	2001	35.2
2.	Tung Lung Chau Public Pier	1961	2002	12.9
3.	Kadoorie Public Pier	1946	2002	11.9
4.	Hei Ling Chau Pier	1957	2003	18.4
5.	Tai Lam Chung Pier	1953	2003	52.3
6.	Kat O Chau Public Pier	1959	2004	28.1
7.	Peng Chau Public Pier	1955	2004	30.2
Reconstruction in progress (Note 2)				
8.	Cheung Chau Public Pier	1953	Early 2005	46.2
9.	Wu Kai Sha Public Pier	1954	Early 2005	15.1
10.	Sha Tau Kok Public Pier	1945	End 2006	61.4
11.	Wong Shek Public Pier	1967	End 2006	26.5
12.	Ko Lau Wan Public Pier	1967	End 2006	21.1
		Total approved project estimate		**359.3**
Reconstruction under planning (Note 3)				
13.	Sham Chung Public Pier	1962	—	—
14.	Lai Chi Chong Public Pier	1962	—	—

Source: *CEDD records*

Note 1: *Items 1 to 5 were funded as individual PWP projects. Items 6 to 9 were funded under one PWP project. Items 10 to 12 were also funded under one PWP project.*

Note 2: *The time for completion of reconstruction is based on the latest estimate.*

Note 3: *There were also a few other piers under consideration for reconstruction. They have not yet been formally included in the PWP.*

Appendix B
(para. 2.5 refers)

Priority of repair of piers

Priority of repair	Repair method			Total (No.)
	Short-term treatment (No.)	Medium-term treatment (No.)	Long-term treatment (No.)	
Urgent	4	9	0	13 (Note 1)
Within 1 year	4	10	22	36
Within 2 years	1	9	2	12
Within 5 years	7	12	6	25
Total	**16** (Note 2)	**40**	**30**	**86**

Source: *CEDD Pier Condition Study of October 1996*

Note 1: *See Appendix C for details.*

Note 2: *See Appendix D for details.*

Appendix C
(para. 2.6 refers)

Urgent structural repairs (completed in February 1998) of 13 reinforced concrete piers

	Name of pier	Category	Age in 1995	Nature of repair (Note)
1.	Queen's Pier	Public	41	Short-term
2.	Pak Sha Wan Public Pier	Public	21	Short-term
3.	Tung Lung Chau Public Pier	Public	34	Short-term
4.	Yau Ma Tei Government Dockyard Pier	Government	40	Short-term
5.	Kennedy Town Old Cattle Pier	Public	21	Medium-term
6.	Tap Mun Public Pier	Public	37	Medium-term
7.	Sha Lo Wan Public Pier	Public	22	Medium-term
8.	Chi Ma Wan Pier	Government	27	Medium-term
9.	Tung Ping Chau Public Pier	Public	32	Medium-term
10.	Tsing Yi Yau Kom Tau Minor Ferry Pier	Public	27	Medium-term
11.	Ap Chau Public Pier	Public	26	Medium-term
12.	Tai Po Railway Pier	Public	33	Medium-term
13.	Kai Tak Airport Pier	Government	33	Medium-term
	Average age		**30**	

Source: CEDD Pier Condition Study of October 1996

Note: See paragraph 2.5.

Appendix D
(paras. 2.7, 2.15 and 3.2 refer)

Piers recommended in October 1996 for short-term repairs and reconstruction

	Name of pier	Category	Age in 1995	Status as at December 2004	
1.	Queen's Pier (Note 1)	Public	41	In use	
2.	Green Island Light House Pier	Government	38	In use	
3.	Green Island Gun Powder Depot Pier	Government	50	In use	
4.	Kennedy Town Poultry Pier	Public	47	In use	
5.	Tai Tam Public Pier	Public	50	In use	
6.	Cheung Chau Public Pier	Public	43	Reconstruction in progress	(Note 2)
7.	Wu Kai Sha Public Pier	Public	42	Reconstruction in progress	
8.	Pak Sha Wan Public Pier (Note 1)	Public	21	Reconstructed	
9.	Tung Lung Chau Public Pier (Note 1)	Public	34	Reconstructed	
10.	Kat O Chau Public Pier	Public	37	Reconstructed	
11.	Peng Chau Public Pier	Public	41	Reconstructed	
12.	Hei Ling Chau Pier	Government	39	Reconstructed	
13.	Kadoorie Public Pier	Public	50	Reconstructed	
14.	Tai Lam Chung Pier	Government	43	Reconstructed	
15.	Yau Ma Tei Government Dockyard Pier (Note 1)	Government	40	Decommissioned	
16.	Yau Ma Tei Yuen Chau Godown	Government	50	Decommissioned	
	Average age		**42**		

Source: *CEDD Pier Condition Study of October 1996*

Note 1: *Urgent repairs were carried out (see Appendix C).*

Note 2: *These 9 piers were included in the CEDD reconstruction programme (see Appendix A).*

Appendix E
(para. 4.13 refers)

CEDD's field surveys on utilisation of five public piers
(January to April 2004)

Date	Number of vessels *(Number of passengers)*				
	Sham Chung	**Lai Chi Chong**	**Sha Tau Kok**	**Wong Shek**	**Ko Lau Wan**
	(No.)	**(No.)**	**(No.)**	**(No.)**	**(No.)**
Weekend and public holiday					
25/1/2004	4 *(9)*	6 *(23)*	N/A	64 *(738)*	14 *(314)*
1/2/2004	5 *(70)*	10 *(75)*	N/A	59 *(881)*	11 *(150)*
21/3/2004	15 *(109)*	8 *(51)*	34 *(286)*	41 *(881)*	23 *(297)*
28/3/2004	19 *(99)*	5 *(78)*	21 *(232)*	33 *(690)*	N/A
5/4/2004	7 *(73)*	5 *(130)*	26 *(267)*	129 *(1,324)*	21 *(253)*
10/4/2004	9 *(191)*	5 *(350)*	18 *(172)*	85 *(2,309)*	25 *(664)*
11/4/2004	9 *(157)*	9 *(370)*	14 *(224)*	88 *(1,474)*	30 *(558)*
Weekday					
23/3/2004	6 *(9)*	2 *(4)*	24 *(113)*	36 *(170)*	11 *(42)*
24/3/2004	1 *(10)*	1 *(1)*	28 *(103)*	69 *(253)*	15 *(51)*
25/3/2004	8 *(64)*	4 *(10)*	28 *(116)*	52 *(148)*	11 *(25)*
26/3/2004	*2 (11)*	1 *(6)*	14 *(77)*	74 *(204)*	9 *(21)*
27/3/2004	*6 (7)*	6 *(140)*	25 *(122)*	64 *(232)*	17 *(27)*
29/3/2004	6 *(25)*	4 *(14)*	25 *(107)*	57 *(222)*	14 *(42)*
Average:					
Weekend and holiday	**10** ***(101)***	**7** ***(154)***	**23** ***(236)***	**71** ***(1,185)***	**21** ***(373)***
Weekday	**5** ***(21)***	**3** ***(29)***	**24** ***(106)***	**59** ***(205)***	**13** ***(35)***
Overall	**7** ***(64)***	**5** ***(96)***	**23** ***(165)***	**65** ***(733)***	**17** ***(204)***

Source: CEDD records

Appendix F
(para. 6.4 refers)

Comparison between the old pier and the replacement pier

Name of pier	Size of pier (Note 1)				Number of berths		
	Old	New	Increase		Old	New	Increase
	(A)	(B)	(C) = (B) - (A)		(D)	(E)	(F) = (E) - (D)
	(m^2)	(m^2)	(m^2)	(%)	(No.)	(No.)	(No.)
1. Pak Sha Wan Public Pier	620	717	**97**	**16%**	5	5	**0**
2. Tung Lung Chau Public Pier	92	167	**75**	**82%**	1	1	**0**
3. Kadoorie Public Pier	129	194	**65**	**50%**	1	1	**0**
4. Hei Ling Chau Pier	203	213	**10**	**5%**	1	1	**0**
5. Tai Lam Chung Pier (Note 2)	351	1,349	**998**	**284%**	2	6	**4**
6. Kat O Chau Public Pier	162	426	**264**	**163%**	1	2	**1**
7. Peng Chau Public Pier	250	390	**140**	**56%**	2	3	**1**
8. Cheung Chau Public Pier	352	571	**219**	**62%**	3	4	**1**
9. Wu Kai Sha Public Pier	156	162	**6**	**4%**	1	1	**0**
10. Sha Tau Kok Public Pier	1,243	1,735	**492**	**40%**	2	4	**2**
11. Wong Shek Public Pier	361	614	**253**	**70%**	2	3	**1**
12. Ko Lau Wan Public Pier	404	514	**110**	**27%**	2	2	**0**

Source: CEDD records

Note 1: The size of a pier includes the area of the pier head and that of the catwalk, if any.

Note 2: The expansion of the Tai Lam Chung Pier was supported by requirements from the HKPF.

Appendix G
(paras. 6.5 and 6.17 refer)

Provision of roof and lighting

Name of pier	Area covered by the roof			Capital cost of roof and lighting ($ million)
	Pier head	Catwalk	Embankment	
1. Pak Sha Wan Public Pier	√	√	√	0.8
2. Kadoorie Public Pier	√	√	√	2.5
3. Hei Ling Chau Pier	√	√		0.8
4. Kat O Chau Public Pier	√	√		3.3
5. Peng Chau Public Pier	√			2.4
6. Cheung Chau Public Pier	√			1.5
7. Wu Kai Sha Public Pier	√	√		1.2
8. Sha Tau Kok Public Pier	√	√		5.3
9. Wong Shek Public Pier	√	√		3.4
10. Ko Lau Wan Public Pier	√	√		1.8
			Total	**23.0**

Source: CEDD records

Appendix H

Acronyms and abbreviations

Audit	Audit Commission
CEDD	Civil Engineering and Development Department
C&ED	Customs and Excise Department
CSD	Correctional Services Department
D of H	Department of Health
EDLB	Economic Development and Labour Bureau
LegCo	Legislative Council
PELB	Planning, Environment and Lands Bureau
HKPF	Hong Kong Police Force
PWP	Public Works Programme
PWSC	Public Works Subcommittee
TD	Transport Department
TDD	Territory Development Department