

Report No. 43 of the Director of Audit — Chapter 10

ROAD IMPROVEMENT WORKS

Summary

1. Hong Kong's roads are among the most heavily used in the world. The Government has to continue reviewing and developing the road network to support future development needs. This involves improving the existing road network, such as widening and/or realigning the roads (hereinafter referred to as road improvement works), in addition to building new roads. From January 2001 to December 2003, the Highways Department (HyD) completed eight major road improvement contracts with a total value of \$2,750 million.

Management of road improvement contracts

2. *Completion of road improvement contracts.* Road improvement works usually require temporary closure of traffic lanes. Therefore, any prolonged completion of road improvement works is undesirable. Substantial contract variations are also undesirable as such variations would invariably have both cost and time implications. For seven out of the eight HyD's road improvement contracts the Audit Commission (Audit) selected for review, the contract periods were extended (excluding extension due to inclement weather). Five of them had their contract periods extended for more than six months. The HyD also paid and/or assessed prolongation costs in six contracts. The major factors affecting the progress of the works included variations of works, existence of uncharted underground utilities, unforeseen ground conditions and other factors such as restrictions on temporary traffic arrangements. *Audit has recommended that the Director of Highways should make continued efforts in the project planning, contract preparation and management of road improvement works to minimise the need for issuing substantial contracts variation orders and, as a consequence, granting of extension of time during the construction stage.*

Widening of Tolo Highway

3. The original completion date of the contract awarded for widening Tolo Highway (i.e. Contract A) was 2 December 2001. The works of Contract A were certified as substantially completed on 22 August 2003, and the contract period was extended to the same date. The HyD paid an estimated sum of \$84.3 million of prolongation cost to Contractor A. The main causes of granting extension of time (EOT) included difficulties encountered during the piling works of a vehicular bridge, and increases in road reconstruction works.

4. ***Difficulties encountered during piling works.*** In Contract A, major works for constructing the bored piles of a vehicular bridge involved breaking out obstructions during pile installation, and drilling the bored piles into the bed rock to form a rock socket. During construction, there were significant increases in the quantities of the obstructions and the rock sockets, more than those allowed for in Contract A. The increases had caused an overall delay to the contract. The HyD had to grant EOT and pay prolongation cost to Contractor A. *Audit has recommended that the Director of Highways should strengthen the site investigation measures in order to obtain, as far as possible, comprehensive and accurate information on the ground conditions before tendering.*

5. ***Increases in road reconstruction works.*** In July 2000, Contractor A was instructed to carry out full lane reconstruction works instead of local reinstatement over drainage trenches and noise barriers foundation to reduce future maintenance problem. During construction, it was found that the existing road levels at some locations were below the designed road levels. The differences were most likely due to the settlement of the existing carriageway after the as-built drawings had been prepared. In order to match the road levels, Contractor A was instructed to carry out new pavement construction works. As a result, there were increases in the quantity of new pavement construction works which affected the progress of the works. *Audit has recommended that the Director of Highways should critically review the control procedures of the HyD to ensure that major design requirements are identified before tendering, and strengthen the site survey measures to verify, as far as possible, the levels of the existing road as indicated on the as-built drawings, before using the data on these drawings for the design of the widened road.*

Improvement to Tuen Mun Road

6. The original completion date of the contract awarded for improving Tuen Mun Road (i.e. Contract B) was 15 August 2000. The works of Contract B were certified as substantially completed on 31 May 2001, and the contract period was extended to the same date. The HyD paid \$32.1 million of prolongation and disruption costs to Contractor B. A substantial portion of the EOT granted was related to additional slope stabilisation works and additional reinforced earth walls works.

7. ***Additional slope stabilisation and reinforced earth walls works.*** The works of Contract B required a large amount of geotechnical works, such as excavation works and slope stabilisation works. After the commencement of the excavation works, significant discrepancies between the anticipated and the actual ground conditions (on the type of granite and the depth of rockhead level) were noted. The discrepancies led subsequently to the issue of a number of variation orders for additional slope stabilisation works and additional reinforced earth wall works. In the event, the HyD had to grant EOT and pay prolongation and disruption costs to Contractor B for the completion of the works. *Audit has recommended that the Director of Highways should, similar to the recommendation in paragraph 4, strengthen the site investigation measures to obtain, as far as possible, comprehensive and accurate information on the ground conditions before tendering.*

Entrusted water mains works

8. The original completion date of the contract awarded for constructing road improvement works at the junction of Pok Fu Lam Road and Sassoon Road (i.e. Contract C) was 13 April 2001. The works of Contract C were certified as substantially completed on 9 April 2002, and the contract period was extended to the same date. For the EOT granted, it was assessed that Contractor C would be entitled to a prolongation cost of \$16.3 million. A portion of the EOT granted was related to the removal of asbestos cement water mains required for the entrusted water mains works of the Water Supplies Department (WSD).

9. ***Removal of asbestos cement water mains.*** At the time of tendering in August 1998, the water mains to be replaced were shown in the tender drawings based on the record plans provided by the WSD. The drawings did not indicate that the water mains were made of asbestos cement. During construction, it was found that some water mains in the site were made of asbestos cement, which were vulnerable to breakage when exposed. The construction works could not be proceeded until the asbestos cement water mains had been removed. In order to ensure an uninterrupted water supply to the Queen Mary Hospital, a substantial temporary diversion of the water main network was required before the removal of the asbestos cement water mains. The progress of the works was thus affected. In the event, the HyD had to grant EOT and pay prolongation cost to Contractor C. *Audit has recommended that the Director of Highways should strengthen consultation with the relevant departments to ascertain, before tendering, if specific requirements are needed for constructing the entrusted works.*

Additional utility works

10. The original completion date of the contract awarded for improving Victoria Road (i.e. Contract D) was 9 June 2001. The works of Contract D were certified as substantially completed on 30 October 2002. Of the EOT granted, a substantial portion was related to utility works for the Cyberport development. It was assessed that Contractor D would be entitled to a prolongation cost of \$8.5 million. As at 31 July 2004, further EOT to be granted was under assessment.

11. ***Utility works for the Cyberport development.*** Since the commencement of Contract D, various unforeseen conditions such as adverse ground conditions and unknown underground utilities had affected the progress of the works. In October 2001, the HyD drew up acceleration measures to bring forward the completion of the works to early July 2002. As the acceleration measures were about to be implemented, according to the HyD, in mid-November 2001, new requirements were introduced to squeeze in the fixed telecommunication network service works for the commissioning of the Cyberport. As priority had to be given to the fixed telecommunication network service works, the progress of the accelerated works was seriously affected. In the event, the works of Contract D were completed in October 2002. *Audit has recommended that the Director of*

Highways should carry out adequate investigations to ascertain the underground utilities before tendering, and take proactive action to liaise with utility companies and government departments/bureaux to ascertain, as far as possible, their particular requirements before tendering.

Response from the Administration

12. The Administration has accepted the audit recommendations.

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