

Report No. 49 of the Director of Audit — Chapter 4

CONSTRUCTION OF TAI PO WATER TREATMENT WORKS

Summary

1. Between 1994 and 1996, the Finance Committee (FC) of the Legislative Council approved funding for implementing the Tai Po Water Treatment Works Project. To implement the project, in October 1994 and November 1995, the Water Supplies Department (WSD) employed a consultant (the Consultant) under two consultancies for carrying out: (a) an investigation study; and (b) the design and supervision of construction works. In January 1998, the WSD awarded a contract (the Contract) to a contractor (the Contractor) for the construction of the water treatment works and a treated water pumping station in Tai Po. The WSD also appointed the Consultant as the Engineer of the Contract. The Audit Commission (Audit) has recently conducted a review of the WSD's administration of the Contract.

Changes to works layout

2. In June 1995, the WSD consulted the Tai Po Rural Committee and the Tai Po District Council on the project. In July 1995, the villagers of She Shan Village objected to the proposed works site on Fung Shui grounds. In January 1996, the WSD instructed the Consultant to change the works layout and adjust the site boundary. In July 1996, the villagers agreed with the revised works layout plan. Owing to the need to address the villagers' objection, the completion date of the design was extended from October 1996 by eight months to June 1997. After negotiations, the WSD paid the Consultant an additional fee for the additional work.

3. *Need to carry out public consultations at an early stage.* As laid down in the investigation study consultancy agreement, the land requirements and site boundary of the water treatment works should be finalised by January 1995. However, the WSD only conducted consultations with the Tai Po Rural Committee and the Tai Po District Council in June 1995. It then took twelve months to resolve the objection raised by the villagers and the revised works layout was agreed by them in July 1996. *Audit has recommended that the Director of Water Supplies should: (a) conduct consultations with the parties affected at an early stage; and (b) make concerted efforts to address objections as soon as possible.*

4. ***Need to allow adequate time for consultations.*** On 12 July 1995, the Public Works Subcommittee (PWSC) of the FC considered a funding application for the project. However, the WSD only consulted the Tai Po Rural Committee and the Tai Po District Council in June 1995, less than one month before the PWSC meeting. In the event, the Administration did not inform the PWSC of the villagers' objection received on 11 July 1995. *Audit has recommended that the Director of Water Supplies should allow adequate time for public consultations before seeking the PWSC's endorsement of funding, so that information about objections to the project can be included in the submission.*

Increase in rock excavation quantities

5. Based on the results of the site investigation conducted between December 1995 and July 1996, provisional quantities of rock excavation of 23,547 cubic metres (m³) were included in the Bills of Quantities (BQ) of the Contract. However, the actual rock excavation quantities were 81,729 m³, which were 347% of the original provision. The Contractor submitted claims for extensions of time (EOTs) and prolongation costs for the additional rock excavation. In April 2004, the Engineer made an assessment, over which the Contractor raised a dispute. After mediation, the WSD paid the Contractor an additional sum to settle the dispute.

6. ***Need to provide better estimation of rock excavation quantities in BQ.*** The site investigation was completed in July 1996. At that time, the revised works layout plan had just been finalised (after seeking the villagers' agreement on 15 July 1996), and the designs for some structures were at an early stage. Although the site investigation was partially adjusted in the first half of 1996 to suit the revised works layout, additional site investigations could have provided more information for facilitating the estimation of rock excavation quantities in the BQ. *Audit has recommended that the Director of Water Supplies should: (a) conduct additional site investigations before tendering of a works contract if there are significant layout changes; and (b) take measures to ensure that BQ quantities in the works contract are estimated as accurately as possible.*

7. ***Need to inform the WSD of significant variation works.*** Between March and July 1999, the Engineer instructed the Contractor to remove a layer of rock involving 2,894 m³ of excavation quantities. This resulted in the granting of an EOT and the payment of a prolongation cost to the Contractor. However, the WSD had not been informed of the variations and the cost implications before the Contractor was instructed to carry out the works. *Audit has recommended that the Director of Water Supplies should require the Engineer of a contract to promptly inform the WSD of significant variation works (and their implications on the cost and works programme) before carrying out the works.*

Changes to the electricity distribution system

8. ***Need to provide better estimation of power requirements.*** Under the Contract, the Contractor should design, supply, install and commission an electricity distribution system for the Tai Po Water Treatment Works. In April 1999, the WSD decided that the electricity distribution system should be redesigned. As it transpired, the overall electrical loading of the load centres was 28% higher than the pre-contract estimate. For the administration building and the secondary rapid gravity filter building, the power requirements were 340% and 227% of the pre-contract estimates respectively. One of the reasons for the increased power requirements was the acceptance of the alternative arrangement proposed by the Contractor during the tender stage. *Audit has recommended that the Director of Water Supplies should: (a) take measures to ensure that electrical power requirements are estimated as accurately as possible; and (b) before accepting a contractor's proposed alternatives, thoroughly assess the implications.*

9. ***Need to promptly respond to Contractor's submissions.*** As laid down in the Contract, the Contractor's first submissions of designs, drawings and documents and re-submissions involving a substantial amount of redesign should reach the Engineer's office in time to allow at least 28 working days for the Engineer's review. However, Audit examination revealed that, of the 39,688 submissions put up by the Contractor, only 20,223 (51%) were responded to within 28 working days of receipt of the submissions. *Audit has recommended that the Director of Water Supplies should take measures to ensure that the contractor's submissions are responded to within the time specified in the contract.*

10. ***Need to specify response time for Requests for Information (RFIs).*** The Contract did not contain provisions specifying the Engineer's response time for the Contractor's RFIs. The Engineer and the Contractor had different views on the RFI response time. *Audit has recommended that the Director of Water Supplies should: (a) specify in the contract the number of days within which the Engineer should respond to the contractor's RFIs; and (b) take measures to ensure that the contractor's RFIs are promptly responded to.*

Management of contract variations

11. ***Need to issue Variation Orders (VOs) before execution of variation works.*** The Contract stipulated that no variation should be made by the Contractor without an order in writing by the Engineer. However, Audit examination revealed that, of the 491 VOs issued, 93 VOs (19%) were issued after the completion of the whole works in January 2005. *Audit has recommended that the Director of Water Supplies should take measures to ensure that VOs are issued before the execution of variation works.*

12. *Need to closely monitor programme implications.* As laid down in the WSD Project Administration Manual, before the issue of a VO, the Engineer should assess its programme implications and possible disruption/prolongation costs. Audit examination revealed that some VOs had caused delays to the works programme and resulted in prolongation/disruption costs, notwithstanding that the Engineer had indicated that these VOs would not have programme implications. *Audit has recommended that the Director of Water Supplies should closely monitor the implications of VOs on the works programme.*

Response from the Administration

13. The Administration has accepted the audit recommendations.

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