

TSING YI SECTION OF ROUTE 8

Executive Summary

1. Route 8 connects Sha Tin with North Lantau. In order to alleviate the anticipated traffic congestion at Route 3 between West Kowloon and Tsing Yi, the Government decided in 1998 to construct Tsing Yi Section (connecting Cheung Sha Wan with Tsing Yi) of Route 8. The Tsing Yi Section project was implemented by the Highways Department (HyD) through awarding four works contracts, namely Contracts A, B, C and D. In addition, the HyD awarded Contract E for the installation of a traffic control and surveillance system (TCS System), and Consultant X was appointed for the design and construction supervision of the five contracts.

2. Between December 1998 and November 2008, the Finance Committee of the Legislative Council approved funding of \$12,191.7 million for the design, investigation and construction of Tsing Yi Section. The 7.6-kilometre dual three-lane expressway of Tsing Yi Section was completed and open to traffic in December 2009. As of December 2013, the Government had incurred \$9,926 million for the Tsing Yi Section project.

3. The construction of Tsing Yi Section was to provide an alternative route between Cheung Sha Wan and Tsing Yi, and its timely completion was important for the full commissioning of Route 8. In the event, Tsing Yi Section was completed 16 months later than the original target completion date. The Audit Commission (Audit) has recently conducted a review of the HyD's planning and implementation of Tsing Yi Section, covering Contracts A, C, D and E.

Additional time and cost under Contract A

4. Contract A mainly involved the construction of Ngong Shuen Chau (NSC) Viaduct. In April 2002, the HyD awarded Contract A to Contractor A at a contract sum of \$1,538.7 million. In the event, the contract works were substantially completed in August 2007, nine months later than the original target completion

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date of November 2006, at a final contract sum of \$1,647.7 million, with contract sum increase mainly due to price fluctuation adjustments (paras. 1.10, 2.2 and 2.3).

5. ***Works item omitted from Bills of Quantity (BQ).*** Under Contract A, two tests were required to be carried out on completed piles, namely full-depth coring test on 5% of completed piles and proof drilling test on all completed piles. However, the BQ of Contract A only included the full-depth coring test but not the proof drilling test. Hence, Contractor A was unable to include a tender rate for the latter and eventually made a financial claim for performing the test. In the event, Contractor A was paid a sum of \$32.8 million for settling his claim on the missing BQ item on proof drilling test (paras. 2.4 to 2.6).

6. ***HyD not informed before Contractor A was requested to review the piling design.*** In December 2003, the HyD and Contractor A entered into a Supplementary Agreement for implementing Contractor A's alternative-design works for NSC Viaduct to substitute part of the original works. In April 2004, during the construction stage, Consultant X requested Contractor A to review the founding levels of some piles. In order to avoid delaying the works, while conducting the piling-design review, Contractor A carried out the piling works to deeper founding levels than those certified by an Independent Checking Engineer. Subsequently, Contractor A made a financial claim for carrying out additional works to lower the pile founding levels, and was eventually paid a sum of \$12 million and granted an extension of time (EOT) of 46 days for settling his claim. According to the HyD, Consultant X had not sought its comments before requesting Contractor A to review the pile founding levels (paras. 2.12 to 2.15, 2.17 and 2.19).

7. ***Inadequate consultation before including private land in contract as a temporary works area.*** Under Contract A, a piece of private land on Stonecutters Island (Lot A) was earmarked to be used as a works area by Contractor A. In April 2000, the road scheme for Tsing Yi Section was gazetted which included the proposed declaration of Rights of Temporary Occupation of Lot A as a works area. In August 2003, the owner of Lot A raised objection to the proposed temporary occupation of Lot A as a works area on the grounds that he had not been consulted on the issue since the notice gazetted in April 2000, and that the creation of a works area on his land would seriously interrupt his business operation leading to a substantial financial loss. Subsequently, the HyD made use of three nearby alternative land lots, instead of Lot A, as temporary works areas for Contract A.

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In the event, Contractor A was paid a sum of \$23.8 million and granted EOTs of 66 days for settling his claims for additional costs and time arising from changes in the works area (paras. 2.22 to 2.24).

8. ***Financial implications not provided for informed decision.*** In May 2002, a Traffic Management Liaison Group (TML Group) including representatives from the Transport Department (TD) and the Hong Kong Police Force (HKPF) was set up to review temporary traffic arrangements proposed by Contractor A. In August 2003, Contractor A informed the TML Group that a three-time launching scheme would be introduced for the erection works of three bridges. In December 2003, the representatives of the TD and the HKPF of the TML Group raised objection to the three-time launching scheme on the grounds of the prolonged traffic impact on West Kowloon Highway. Subsequently, after obtaining agreement of the TML Group, a two-time launching scheme was adopted. After completing the erection works for Bridge I, on the grounds that the works had no adverse traffic impact and only a few minor complaints had been received, the TML Group agreed in November 2004 that the works could be reverted back to the three-time launching scheme. In the event, Contractor A was paid a sum of \$17 million and granted an EOT of 26 days for settling his claim for additional costs and time arising from the change of the three-time launching scheme to the two-time launching scheme. Audit notes that the TML Group had not been informed of the financial implications of possible contract claims arising from the change (see paras. 2.30 to 2.42).

Additional cost under Contract D

9. Contract D involved the construction of Nam Wan Tunnel and West Tsing Yi Viaduct. In April 2003, the HyD awarded Contract D to Contractor D at a contract sum of \$1,479.3 million. In the event, the contract works were substantially completed in November 2007, five and a half months later than the original target completion date of May 2007, at a final contract sum of \$1,699.4 million, with contract sum increase partly due to price fluctuation adjustments (paras. 1.10, 3.2 and 3.3).

10. ***Additional cost arising from different tunnel lengths for different lining thickness between BQ and Ground Investigation (GI) Drawings.*** Under Contract D, Contractor D was responsible for constructing concrete linings covering the inside surface of the twin tunnels and the cross passages of Nam Wan Tunnel. The thickness of the linings was to be determined by referring to Q-values (under

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the Norwegian Geotechnical Institute System) measured in-situ on the excavated rock face. In the tender BQ, the estimated tunnel lengths for lining thickness of 400 millimetres (mm), 500 mm and 600 mm were stated at 787 metres (m) each. On the other hand, GI Drawings with estimated Q-values for different tunnel sections (provided to tenderers for reference upon request) reflected that the estimated tunnel lengths for lining thickness of 400 mm, 500 mm and 600 mm were “1,855 m”, “130 m” and “320 m” respectively, differing significantly from the “787 m” stated in the tender BQ. In his tender submitted, Contractor D specified a BQ rate of \$95,151/m for 400 mm tunnel linings but nil rates for both 500 mm and 600 mm tunnel linings, resulting in an estimated cost of \$75 million for the tunnel lining works (paras. 3.5 to 3.8).

11. According to in-situ Q-values obtained after tunnel excavation, linings with thickness of 400 mm, 500 mm and 600 mm should have been constructed for tunnel lengths of “2,069 m”, “145 m” and “147 m” respectively. However, during works implementation, Consultant X instructed Contractor D to construct linings with thickness of 400 mm, 500 mm and 600 mm for tunnel lengths of “1,157 m”, “1,036 m” and “168 m” respectively, resulting in a cost of \$110 million. In the event, Contractor D was paid an additional sum of \$43 million for settling his claim that site instructions given to him to construct linings with thickness of 400 mm for less tunnel lengths and 500 mm and 600 mm for more tunnel lengths were at variance with contract requirements. As a result, the final cost of the concrete lining works amounted to \$153 million, which was 104% higher than the original contract estimate of \$75 million. Audit notes that the HyD had not identified the significant differences in tunnel lengths for different lining thickness between those stated in the BQ and those derived from the GI Drawings (see para. 10 above) during its checking of the BQ included in the tender document (paras. 3.10, 3.11, 3.14, 3.15 and 3.18).

12. ***Risk of unreasonably high BQ rate.*** Contractor D’s BQ rate of \$95,151/m for tunnel lining of 400 mm was three times higher than the pre-tender cost estimate of \$22,000/m. However, the HyD and Consultant X had not requested Contractor D to provide reasons for submitting this unreasonably high BQ rate. Furthermore, the HyD had not assessed the financial implications of possible related contract claims and included them in the Tender Assessment Report for submission to the Central Tender Board (para. 3.20).

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Provision of traffic control and surveillance system under Contract E

13. The TCS System is installed at Tsing Yi Section and Sha Tin Section of Route 8 for traffic management by the TD. The TCS System includes closed-circuit television cameras, automatic vehicle detection devices, lane control signals and variable message signs. In October 2004, the HyD awarded Contract E to Contractor E at a lump-sum-fixed price of \$255 million. In the event, Contract E was substantially completed in January 2010, 17 months later than the original target completion date of August 2008, at a final contract sum of \$309.2 million (paras. 4.2 and 4.7).

14. *Long time taken to provide site access to Contractor E.* Tsing Yi Section and Sha Tin Section of Route 8 were implemented under seven civil works contracts, which included constructing facilities related to the installation of the TCS System. The related civil works were to be completed (according to milestone dates specified in the seven works contracts) before providing the completed facilities and site access to Contractor E for carrying out the TCS System installation work. On the other hand, site access dates corresponding to the completion of the seven work contracts were specified in Contract E for Contractor E to gain access to the sites for commencing the system installation work. Owing to longer time taken in completing the related civil works vis-à-vis the original scheduled time under some works contracts, site access to most of the sites were only provided to Contractor E by phases a long time after the site access dates specified in Contract E. In the event, Contractor E was paid a sum of \$52.2 million for settling his claim for additional costs arising from contract modifications and delays in providing site access to him for carrying out the TCS System installation work. Audit notes that the longer time taken in completing civil works under some works contracts had knock-on effects on the subsequent system installation work and had resulted in substantial financial claims (paras. 4.8, 4.9, 4.12 to 4.14, and 4.22).

Audit recommendations

15. **Audit recommendations are provided in the respective sections of this Audit Report. This Executive Summary only highlights the key recommendations. Audit has recommended that the Director of Highways should:**

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- (a) **take measures to ensure that HyD staff and consultants provide separate BQ items for works of different nature in the tender documents of a contract (para. 2.10(a));**

- (b) **in implementing a lump-sum fixed-price contract involving a contractor's design, establish proper control procedures to require the HyD consultant to seek the HyD's comments before instructing the contractor to carry out works which may subsequently constitute works variations involving additional cost which exceeds \$300,000 (para. 2.20);**

- (c) **in implementing a works project in future involving the use of private land as a temporary works area, take measures to ensure that pertinent land-lot owners have been consulted and their concerns have been properly dealt with before including such land in a works contract (para. 2.28);**

- (d) **in implementing a works project in future involving a change in the works procedures on the grounds of traffic considerations, provide the TML Group with the related financial implications of possible contract claims for making informed decisions (para. 2.44);**

- (e) **take measures to ensure that HyD staff and consultants strengthen checking of BQ items to safeguard their completeness and accuracy, and pay particular attention to any unreasonable BQ rates (para. 3.22(a) and (b)); and**

- (f) **in implementing a works project with independent system installations in future, take measures to strengthen the HyD's monitoring of the civil works completion, taking into account the knock-on effects and potential financial claims resulting from any significant delay in providing site access to a system contractor (para. 4.23(b)).**

Response from the Administration

16. The Administration agrees with the audit recommendations.