# ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS Transport – Roads 76TI – Bus-bus interchanges on Tuen Mun Road

Members are invited to recommend to Finance Committee to increase the approved project estimate of **76TI** by \$43 million from \$162.3 million to \$205.3 million in money-of-the-day prices.

#### **PROBLEM**

Since the scope of works for **76TI** has to be expanded, additional works have to be carried out and the provision for price adjustment has to be increased, the approved project estimate (APE) of **76TI** is not sufficient to cover the costs of the works under the project.

#### **PROPOSAL**

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to increase the APE of **76TI** by \$43 million from \$162.3 million to \$205.3 million in money-of-the-day (MOD) prices.

#### PROJECT SCOPE AND NATURE

3. In February 2010, the Finance Committee (FC) of the Legislative Council (LegCo) approved the upgrading of **76TI** to Category A at an estimated cost of \$162.3 million in MOD prices. The approved scope of works under **76TI** comprises –

- (a) construction of a bus-bus interchange (BBI) on Tuen Mun Road (TMR) Kowloon-bound near Siu Lam Interchange comprising mainly
  - (i) construction of a road of about 220 metres (m) long and 8.5 m wide parallel to TMR;
  - (ii) construction of a bus drop-off facility and a sheltered passenger holding area with floor area of about 1 040 square metres (m²) and 680 m² respectively;
  - (iii) modification of the signalised junction of Castle Peak Road (CPR) and the slip road from TMR Kowloon-bound and the junction of CPR and an unnamed road;
  - (iv) widening of the unnamed road of about 150 m long to a two-lane carriageway to connect to the bus drop-off area mentioned in (a)(ii) above;
  - (v) realignment and widening of a section of CPR of about 300 m long; and
  - (vi) reprovisioning of the single-lane road between CPR and TMR Kowloon-bound;
- (b) construction of a BBI on TMR Tuen Mun-bound near Tai Lam Kok roundabout comprising mainly –
  - (i) construction of a road of about 280 m long and 8.5 m wide parallel to the TMR with a sheltered passenger holding area of about 560 m<sup>2</sup>;
  - (ii) construction of a U-shaped road of a minimum width of 6 m at Tai Lam Kok roundabout together with a sheltered passenger holding area of about 250 m<sup>2</sup>;
  - (iii) construction of a link bridge of 2.5 m clear width and about 30 m long with two lifts to connect the two sheltered passenger holding areas mentioned in paragraphs (b)(i) and (b)(ii) above; and

- (iv) widening of Brothers' Bridge by about 17 m to form part of the road mentioned in paragraph (b)(i) above;
- (c) associated works including road reconstruction, provision of shelters, drainage, landscaping, traffic aids and street lighting, and slope works; and
- (d) implementation of an environmental monitoring and audit (EM&A) programme for the works mentioned in paragraphs (a) to (c) above.

A plan showing the proposed works is at Enclosure 1.

- 4. The Highways Department (HyD) started the construction works in July 2010 and the progress of works has been satisfactory. As at end September 2012, we have completed majority of the works at the Kowloon-bound BBI, and the remaining minor works are mainly shelter erection, pavement, road junctions and landscaping works. We anticipated that the works at the BBI on TMR (Kowloon-bound) will be substantially completed and opened to the public by December 2012. As regards the works for the other direction, that is the BBI on the Tuen Mun-bound TMR, the progress has also been satisfactory. The remaining works are mainly bridgeworks, lifts installation, shelter erection, and pavement, footpath and landscaping works. We anticipate that the Tuen Mun-bound BBI will be completed and commissioned in the second quarter of 2013.
- 5. The Transport Department (TD) has consulted Tuen Mun District Council (TMDC) on the bus routes serving the BBIs since early 2012 and has reached an agreement with the TMDC in September 2012 that upon commissioning of the first phase (Kowloon-bound) of the BBIs, there will be 12 bus routes observing the BBI.
- 6. In order to provide comfortable and convenient services for the public at the BBIs, the TD has been liaising with the bus companies concerned to study the provision of relevant facilities, including queue railing with seating facilities, vending machines, ventilation facilities, free Wi-Fi, wind panels and bus information displays, etc..

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#### **JUSTIFICATION**

- 7. During the construction period, we have listened to the public's views concerning the hygiene facilities in the BBIs on TMR. On the other hand, costs of part of the works were higher than expected in light of actual site conditions. Following a detailed review of the progress and financial position of the project, we consider it necessary to expand the scope of **76TI** and increase the APE of **76TI** by \$43 million in MOD prices to cover the additional costs arising from the following factors
  - (a) expansion of the project scope to provide permanent toilet facilities;
  - (b) additional works to overcome unforeseen difficult ground conditions and to suit the actual site conditions; and
  - (c) increase in provision for price adjustment for works under the project scope as originally approved.

The additional costs arising from the above factors amount to \$50.3 million. We propose to draw down the contingencies under the APE by \$7.3 million to offset part of the increase and increase the APE by \$43 million in MOD prices. Details of the increase in APE are set out in paragraphs 8 to 19 below.

#### Provision of permanent toilet facilities

8. During the discussion on the TMR BBI project at the meeting of the Public Works Subcommittee in January 2010, some Members requested to provide toilet facilities at the BBIs. We therefore proposed to provide three portable toilets at each of the BBIs (one for male, one for female and one for the disabled). At the meeting, we advised that the Administration would assess the need for permanent toilet facilities after taking into consideration the usage of the portable toilets. We would also consider the opinions of the members of the TMDC and the local communities.

- 9. During the construction of the BBIs, we have continued to receive TMDC members' and the public's views on the provision of toilet facilities. TMDC members and the public opined that permanent toilet facilities, with better hygienic conditions and facilities, should be provided at the TMR BBIs as a long-term solution since there were no toilet facilities available for public use or public toilet facilities in the vicinity. The TMDC members also raised the issue at their meeting with LegCo Members on 28 June 2012. We understand that LegCo Members at the meeting concurred with the opinions of TMDC members.
- 10. In view of the strong public demand for permanent public toilet facilities at the TMR BBIs as well as the geographical location of the BBIs and the lack of toilet facilities in the vicinity, we propose to expand the scope of **76TI** for providing permanent toilet facilities at a cost of \$20.2 million in MOD prices. The proposed locations of the permanent toilet facilities are as shown in Enclosure 1.
- 11. If the proposal is approved by the FC, we will commence the design work and proceed with construction work as soon as possible. We expect that works for the permanent toilet facilities will commence in early 2014 for completion in the fourth quarter of 2014 upon completion of pre-construction works such as detailed design. We will continue to provide portable toilets before the commissioning of the permanent toilet facilities.

### Additional works to overcome unforeseen difficult ground conditions and to suit actual site conditions

12. In general, we will assess the geotechnical conditions of the site based on available site investigation information in the vicinity as well as new site investigation information during the design stage of projects. During the construction of the bridge foundations and retaining walls, further detailed site investigations would be conducted to re-confirm the actual geotechnical conditions. During the detailed site investigations at the construction stage of the TMR BBIs, geotechnical conditions were found to vary widely and were worse than expected i.e. the rock levels were lower than expected hence deeper piles for the bridge foundation were required. Moreover, it was necessary to revise the design of the retaining walls to suit the actual ground profile and to overcome the unexpected poor sub-soil conditions, so as to meet current design and safety standards.

13. The total cost of the additional works mentioned above is \$12.7 million, which includes \$5.6 million for earthworks and slopeworks, as well as \$7.1 million for bridge widening works and link bridges.

#### **Increase in provision for price adjustment**

- According to existing Government practice, monthly payments to contractors for most construction contracts are adjusted to cover market fluctuation in labour and material costs, which are known as contract price fluctuation (CPF) payment. When FC's funding approval for **76TI** was sought in February 2010, on the basis of the assumptions on the trend rate of change in the prices of public sector building and construction output in October 2009 and estimated cash flow of the project, a provision of \$6.3 million was allowed for price adjustment in the original APE.
- 15. The actual CPF payments to the contractor in 2010 and 2011 were higher than expected. A larger portion of the remaining payment for works under the original project scope will be made to the contractor between 2012 and 2015. According to the latest assumptions, the trend rate of change in the price of public sector building and construction output for the same period will be on the rise <sup>1</sup>. In light of the above, we estimate the CPF payments for the original scope of works will increase from the originally budgeted \$6.3 million by \$17.4 million to \$23.7 million. Details could be found at Enclosure 2.

#### **Review of financial position**

16. We consider it is necessary to increase the APE of **76TI** by \$43 million from \$162.3 million to \$205.3 million in MOD prices to cover the additional costs of the project. The proposed increase of \$43 million is broken down as follows –

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<sup>&</sup>lt;sup>1</sup> The original funding application was approved by FC in February 2010. The trend rate of change in the price of public sector building and construction output adopted for the original funding application are 2% per annum between 2010 and 2013, and 3% per annum from 2014 to 2016. The latest forecast in October 2012 assumed that the trend rate of change in the price of public sector building and construction output will increase by 7% per annum in 2012, and 6% per annum between 2013 and 2016.

	Factors		Proposed increased amount/savings in MOD prices (\$ million)	% of the total increased amount/ savings
	Increase due to –			
(a)	cost of providing permanent toilet facilities		20.2	40.2
	(i) building and electrical and mechanical works		15.1	
	(ii) consultants' fees		1.7	
	1. design	1.0		
	2. construction supervision	0.6		
	and contract management			
	3. management of resident site staff (RSS)	0.1		
	(iii) remuneration of RSS		0.9	
	(iv) provision for price adjustment		2.5	
(b)	cost of additional works to overcome unforeseen difficult ground conditions and to suit actual site conditions		12.7	25.2
(c)	increase in provision for price adjustment for project scope as originally approved		17.4	34.6
(d)	Total increase		50.3	100.0
	(d) = (a) + (b) + (c)			
	Partly offset by –		,:	
(e)	drawdown from contingencies		(7.3)	100.0
(f)	Proposed increase $(f) = (d) - (e)$		43.0	100.0

17. A detailed breakdown of the estimates for additional consultants' fees and resident site staff costs by man-months is at Enclosure 3. A comparison of the cost breakdowns of the APE and the revised project estimate in MOD prices is at Enclosure 4.

#### FINANCIAL IMPLICATIONS

18. Subject to FC's approval, we will phase the expenditure as follows –

Year	\$ million (in MOD prices)
Up to 31.3.2012	97.3
2012 - 2013	49.1
2013 – 2014	26.3
2014 - 2015	28.5
2015 – 2016	4.1
	205.3

19. The additional annual recurrent expenditure arising from the provision of the permanent toilet facilities is about \$0.9 million. The remaining part of the increase in APE proposal will not give rise to additional annual recurrent expenditure.

#### **PUBLIC CONSULTATION**

- 20. The HyD has maintained continued communication with and report works progress to the TMDC and has arranged for TMDC to inspect the progress of works on site. We consulted the Working Group on Tuen Mun External Traffic under the Traffic and Transport Committee of the TMDC on provision of the permanent toilet facilities on 17 October 2012. Members of the Committee unanimously supported the proposed provision of permanent toilet facilities. We will continue to liaise with TMDC and the local community.
- 21. We consulted LegCo Panel on Transport on the proposal to increase the APE on 16 November 2012. Members are generally supportive of the proposal.

#### **ENVIRONMENTAL IMPLICATIONS**

- 22. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). During construction of remaining works and works of the proposed permanent toilet facilities, we will continue to control noise, dust and site run-off nuisance through the implementation of appropriate mitigation measures to avoid the occurrence of adverse environmental impacts on the public.
- 23. We will require the contractor to reuse inert construction waste (e.g. excavated rock and soil materials) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of construction waste at public fill reception facilities. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.
- We estimate that the works for the permanent toilet facilities will generate about 24 tonnes of construction waste in total. Of these, we will reuse about 11 tonnes (46%) of inert construction waste on site and deliver about 8 tonnes (33%) to public fill reception facilities for subsequent reuse<sup>2</sup>. We will dispose of the remaining 5 tonnes (21%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be about \$840 for the permanent toilet facilities (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne<sup>3</sup> at landfills).

#### HERITAGE IMPLICATIONS

25. The proposed increase in the APE does not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interests and Government historic sites identified by the Antiquities and Monuments Office.

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<sup>&</sup>lt;sup>2</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90 per m³), nor the cost to provide new landfills (which is likely to be more expensive), when the existing ones are filled.

#### LAND ACQUISITION

26. The proposed increase in the APE does not require any land acquisition.

#### **ENERGY CONSERVATION MEASURES**

- 27. The proposed permanent toilet facilities will adopt various forms of energy efficient features, including
  - (a) T5 energy efficient fluorescent tubes with electronic ballast and lighting control by occupancy sensors;
  - (b) compact fluorescent lamps with electronic ballast and lighting control by daylight sensors; and
  - (c) light-emitting diode type exit signs.
- 28. The total estimated additional cost of the energy conservation measures is around \$6,000, which has been included in the cost estimate of the project. The energy efficient features will achieve 3.2% energy savings in the annual energy consumption of the toilet facilities with a payback period of about 3.4 years.

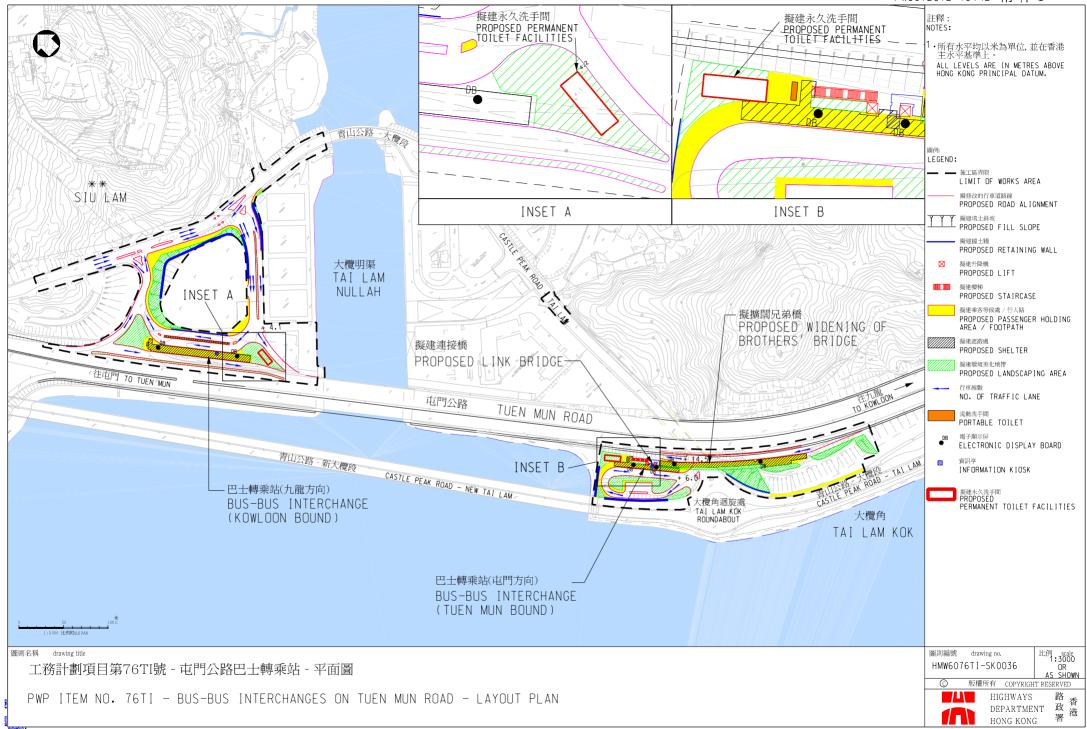
#### BACKGROUND INFORMATION

- 29. In February 2010, we upgraded **76TI** to Category A at an estimated cost of \$162.3 million for the construction of BBIs on TMR. The construction works commenced in July 2010. The works at the BBI on TMR Kowloon-bound is expected to be substantially completed by end 2012 while the works on TMR Tuen Mun-bound and the remaining works are expected to be completed and commissioned in the second quarter of 2013.
- 30. The proposed increase in the APE will not involve any tree removal and planting proposal.

31.	We estimate that the works associated with the proposed increase in
the APE will	create about 34 jobs (29 for labourers and another 5 for professional/
technical staf	f) providing a total employment of 460 man-months.

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Transport and Housing Bureau December 2012



#### 76TI – Bus-bus interchanges on Tuen Mun Road

Table 1 – Cash flow and provisions for price adjustment in PWSC(2009-10)81

Year Original project estimate (\$million, in September 2009 prices)		Original price adjustment factors (October 2009) #	Approved project estimate (\$million, in MOD prices)	Provision for price adjustment (\$million)
	X	Y	Z	A=Z-X
2010 - 2011	50.7	1.02000	51.7	1.0
2011 - 2012	61.3	1.04040	63.8	2.5
2012 - 2013	42.0	1.06121	44.6	2.6
2013 - 2014	2.0	1.08243	2.2	0.2
Total	156.0		162.3	6.3

Table 2 – Latest cash flow and provision for price adjustment due to latest project estimate (PE) and latest adjustment factors (original scope)

Year	Latest PE (\$million, in September 2009 prices)	Latest PE (\$million, in September 2012 prices)	Latest price adjustment factors (September 2012) ##	Latest PE (\$million, in MOD prices)	Latest provision for price adjustment (\$million)	Net increase in provision for price adjustment (\$million)
	a	b	c	d	e	f
Up to March 2012	87.5	97.3^	1.00000	97.3		
2012 – 2013	42.3	48.8^^	1.00000	48.8	e = d - a	f = e - A
2013 – 2014	19.5	22.5^^	1.06250	23.9		
2014 – 2015	10.0	11.5^^	1.12625	13.0		
Total	159.3	180.1		183.0	23.7	17.4

Table 3 – Latest cash flow and provision for price adjustment due to latest PE and latest adjustment factors (permanent toilet facilities)

Year	Latest PE (\$million, in September 2012 prices) ^^	Latest price adjustment factors (September 2012) ##	Latest PE (\$million, in MOD prices) <sup>@</sup>	Latest provision for price adjustment (\$million)
	h	i	j	k
2012 - 2013	0.3	1.00000	0.3	
2013 - 2014	2.3	1.06250	2.4	k-i h
2014 - 2015	13.8	1.12625	15.5	$\mathbf{k} = \mathbf{j} - \mathbf{h}$
2015 - 2016	3.4	1.19383	4.1	
Total	19.8		22.3	2.5

Table 4 – Latest cash flow and provision for price adjustment due to latest PE and latest adjustment factors (expanded scope)

	Original Scope	Expanded Scope					
Year	Latest PE (\$million, in September 2009 prices)	September adjustment in MOD 2012 prices factors prices a		Latest provision for price adjustment (\$million)	Net increase in provision for price adjustment (\$million)		
	1	m	n	0	р	q	
Up to March 2012	87.5	97.3^	1.00000	97.3			
2012 – 2013	42.3	49.1^^	1.00000	49.1			
2013 – 2014	19.5	24.8^^	1.06250	26.3	$\mathbf{p} = \mathbf{e} + \mathbf{k}$	$\mathbf{q} = \mathbf{p} - \mathbf{A}$	
2014 - 2015	10.0	25.3^^	1.12625	28.5			
2015 – 2016	-	3.4^^ 1.19383 4.1					
Total	159.3	199.9		205.3	26.2	19.9	

#### Notes

- # Price adjustment factors adopted in October 2009 were based on the projected movement of prices for public sector building and construction output at that time, which were assumed to be increased by 2% per annum from 2009 to 2013 and 3% per annum from 2014 to 2016.
- ## Price adjustment factors adopted in October 2012 were based on the latest movement of prices for public sector building and construction output, which are assumed to increase by 7% per annum in 2012 and 6% per annum from 2013 to 2016.
- ^ \$97.3 million was the actual expenditure up to March 2012.
- ^^ The latest project estimate for the original scope (in September 2009 prices) was multiplied by 1.15313 for conversion to September 2012 prices. The figure of 1.15313 represented the changes in price movement for public sector building and construction output between September 2009 and September 2012.
- @ As shown in paragraph 5 of Enclosure 4, a sum of \$2.1 million out of \$5.5 million is retained for meeting unexpected expenditures required for completing the works for the permanent toilet facilities.

#### 76TI – Bus-bus interchanges on Tuen Mun Road

# Breakdown of the estimates for consultants' fees and resident site staff costs for the works for the permanent toilet facilities (in September 2012 prices)

(a)	Consultants' fees (Note 2)		Estimated Man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
	- design	Professional	-	-	-	0.5
		Technical	-	-	-	0.5
	- construction supervision and contract management	Professional	-	-	-	0.2
	contract management	Technical	-	-	-	0.4
					Sub-total	1.6
(b )	Resident site staff (RSS) costs (Note 3)	Professional	3	38	2.0	0.4
		Technical	14	14	2.0	0.6
					Sub-total	1.0
	Comprising –  (i) Consultants' fees for management of RSS					0.1
	(ii) Remuneration of RSS					0.9
					Total	2.6

<sup>\*</sup> MPS = Master Pay Scale

#### Notes

- 1. A multiplier of 2.0 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = \$65,695 per month and MPS salary point 14 = \$22,405 per month.).
- 2. The consultants' fees for design, construction supervision and contract management are estimated based on the existing consultancy agreement. The design and construction stages for the permanent toilet facilities will only commence after Finance Committee has given funding approval for increasing the approved project estimate of **76TI**.
- 3. The actual man-months and actual costs will only be known after completion of the construction works.

76TI – Bus-bus interchanges on Tuen Mun Road

## Comparison between approved project estimate and the latest project estimate

		Appro Proje Estim	(A) proved roject stimate million)		B) atest roject cimate nillion)	(B) - (A) Difference (\$million)
(a)	Permanent toilet facilities  (i) building works and electrical and mechanical (E&M) works  (ii) consultants' fees  (iii) remuneration of resident site staff (RSS)  (iv) provision for price fluctuation	- - -	-	15.1 1.7 0.9 2.5	20.2	20.2
(b)	Roads and drains		27.6		27.6	0
(c)	Earthworks and slopeworks		30.1		35.7	5.6
(d)	Bridge widening works		34.2		37.9	3.7
(e)	Passenger holding areas		19.2		19.2	0
(f)	Link bridges with two lifts		14.5		17.9	3.4
(g)	Landscaping		3.5		3.5	0
(h)	Consultants' fees  (i) construction supervision and contract administration  (ii) management of RSS  (iii) environmental monitoring and audit programme	0.4 0.1 0.6	1.1	0.4 0.1 0.6	1.1	0
(i))	Remuneration of RSS		13.0		13.0	0
(j)	Contingencies		12.8		5.5	(7.3)
	Sub-total		156.0	_	181.6	25.6
(k)	Provision for price adjustment under project scope as originally approved		6.3	-	23.7	17.4
	Total		162.3	_	205.3	43.0

As regards Items (a) (permanent toilet facilities), a sum of \$20.2 million including (i) \$15.1 million for the building works and associated E&M works for the permanent toilet facilities; (ii) \$1.7 million for consultants' fees; (iii) \$0.9 million is required for site supervision; and (iv) \$2.5 million for provision for price adjustment is required.

- 2. As regards Items (c) (earthworks and slopeworks), the total increase of \$5.6 million is due to changes in the design of the retaining walls to suit the actual ground profile and overcome the unexpectedly poor sub-soil conditions.
- 3. As regards Items (d) (bridge widening works) and (f) (link bridges with two lifts), the total increase of \$7.1 million (including (d) \$3.7 million and (f) \$3.4 million) is due to unexpectedly difficult ground conditions that required deeper piles for the bridge foundation.
- 4. As regards Item (j) (contingencies), a sum of \$5.5 million is retained for meeting unexpected expenditures required for completing the remaining works (including a sum of \$2.1 million for the proposed permanent toilet facilities).
- 5. As regards Item (k) (provisions for price adjustment), an increase of \$17.4 million is due to unexpected increase in actual and projected payments for contract price fluctuation.