

**For discussion
on 22 April 2014**

Legislative Council Panel on Development

19GB – Liantang/Heung Yuen Wai Boundary Control Point and associated works – site formation and infrastructure works

PURPOSE

This paper briefs Members on our revised proposal to increase the approved project estimate (APE) of **19GB** (“the Project”) from \$16,253.2 million by \$8,196.6 million to \$24,449.8 million in money-of-the-day (MOD) prices and provides supplementary information as requested by Members.

BACKGROUND AND PROGRESS OF THE PROJECT

2. In July 2012, the Finance Committee (FC) of the Legislative Council approved the upgrading of part of **13GB** “Liantang/Heung Yuen Wai Boundary Control Point and associated works” to Category A as **19GB** at an estimated cost of \$16,253.2 million in MOD prices, for the site formation and infrastructure works for Liantang/Heung Yuen Wai Boundary Control Point (BCP). By end 2013, we have awarded three works contracts under the Project. The site formation works for the BCP commenced in April 2013 under Contract 5. Two works contracts for the Connecting Road, viz the Fanling Highway Interchange under Contract 3 and the southern section of the Connecting Road between Fanling Highway and Sha Tau Kok Road (Connecting Road (Southern Section)) under Contract 2, commenced in July 2013 and December 2013 respectively. As at mid-April 2014, the construction works are progressing satisfactorily. Tender assessment of Contract 6 for the northern section of the Connecting Road between Sha Tau Kok Road and the BCP (Connecting Road (Northern Section)) is in progress. Tenders for two remaining works contracts, viz the portion of the cross boundary bridges within the Hong Kong Special Administrative Region and the traffic control and surveillance system for the whole Connecting Road are yet to be invited. The status of the works contracts is summarized at **Enclosure 1**.

3. The prices of the returned tenders of the works contracts under the Project are higher than the original estimates. After reviewing the financial position of the Project and the tendering results of the works contracts, we consider it necessary to increase the APE of the Project. We briefed Members of

our proposal to increase the APE at the meeting of the Panel on Development on 7 January 2014 (Last Meeting). At that time, we proposed to increase the APE of the Project by \$8,550.0 million from \$16,253.2 million to \$24,803.2 million in MOD prices to cover the additional costs of the Project and the corresponding increase in the provision for price adjustment and contingencies (Paper No. CB(1)638/13-14(01)). Members in general did not support the proposed increase in APE at the Last Meeting and requested the Government to critically review the project estimate and explore the feasibility to defer the implementation of the Project to avoid the current construction peak.

FOLLOW-UP ACTIONS AFTER THE LAST MEETING

4. The findings of the project estimate review and evaluation of options for postponing the implementation of the Project are summarized in paragraphs 5 to 13 below.

Review of Project Estimate

5. The project estimate comprises the base estimate, project contingency and provision for price adjustment. As the tender prices of the four works contracts under the Project have been ascertained¹ and the estimated cost of the remaining two works contracts (tenders not yet invited) only constitutes a small portion (less than 10%) of the overall project estimate, we consider that there is no room for further trimming of the base estimate and project contingency after thoroughly reviewing the scale and scope of the Project.

6. We have updated the provision for price adjustment of the Project based on the actual expenditure incurred up to 31 March 2014, the latest cash flow pattern and the latest price adjustment factors adopted in March 2014. The corresponding increase in the provision for price adjustment is reduced by \$353.4 million from \$2,983.1 million to \$2,629.7 million.

7. In sum, the proposed increase in APE of \$8,196.6 million in MOD prices is broken down as follows –

¹ Three works contracts are in construction stage and one in tender assessment stage with known tender prices.

Factors	Proposed increased amount (\$ million)	% of the total increase
Increase due to –		
(a) Recent surge in construction prices	3,974.7	48.5%
(b) Poor ground condition for tunnelling works	698.6	8.5%
(c) Tenderers' perception on higher risks associated with construction constraints	387.3	4.7%
(d) Increase in provision for price adjustment	2,629.7	32.1%
(e) Increase in contingencies	506.3	6.2%
(f) Total increase (f = a + b + c + d + e)	8,196.6	100%

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 The latest cash flow of the Project and the detailed assessment of the latest provision for price adjustment are at **Enclosure 2**. A comparison of the cost breakdown of the APE and the latest project estimate in MOD prices is at **Enclosure 3**.
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8. Subject to FC's approval, we will phase the expenditure as follows –

Year	\$ million (in MOD prices)
Up to 31 March 2014	597.7
2014 – 2015	2,344.1
2015 – 2016	4,287.0
2016 – 2017	4,906.3
2017 – 2018	4,758.1
2018 – 2019	3,613.1
2019 – 2020	2,220.4
2020 – 2021	1,723.1
Total	24,449.8

9. The proposed increase in the APE will not give rise to any additional recurrent consequence.

Options of Postponement

10. In the Last Meeting, some Members asked the feasibility to defer the implementation of the Project to avoid the current construction peak so as to reduce the overall project cost.

11. As we pointed out in the discussion paper (ref. no. CB(1)925/13-14(03)) “Challenges to Delivery of the Capital Works Programme” at the meeting of the Panel on Development on 25 February 2014, there will be a persistent high demand for infrastructure works to meet the diverse needs of the society. Infrastructure investment has helped propel Hong Kong’s development as one of the mature economies in the world and raised the quality of life of the general public. According to the latest forecast provided by the Construction Industry Council at the end of October 2013, the overall construction expenditure forecasts over the next few years will range from \$160 billion to \$190 billion each year which is a record high. As such, we consider postponing the construction of worthwhile projects may run the risk of creating a more acute construction peak several years later which may result in even higher project prices due to an increasing imbalance between the supply of plant and labour to meet the demand and at the same time, deferring the realization of the economic and social benefits of the projects.

12. Notwithstanding the above, we conducted a study as per Members’ suggestion. As mentioned in paragraph 2, the works contracts for constructing the Fanling Highway Interchange, Connecting Road (Southern Section) and site formation works of the BCP have commenced. Suspension of the above works contracts will lead to contractual claims and additional payments to the contractors when the works are resumed in future. This will not help to reduce the overall project cost at all. Among the three works contracts not yet awarded, the contract with the highest value is for the construction of the Connecting Road (Northern Section). Tender assessment of this contract is in progress. We have considered the following three postponement options for the Connecting Road (Northern Section) –

Option 1 Cancel the current tender exercise for the Connecting Road (Northern Section), postpone the construction programme of the remaining contracts by three years and commission the BCP in 2021.

Option 2 Cancel the current tender exercise for the Connecting Road (Northern Section), widen the existing local at-grade roads to cater

for the additional cross-boundary traffic in the initial years of the BCP commissioning and complete the Connecting Road (Northern Section) later on when the widened at-grade roads are saturated.

Option 3 Cancel the current tender exercise for the Connecting Road (Northern Section) and implement the construction of the Connecting Road (Northern Section) in two stages. The Stage 1 works comprise the construction of a single two-lane viaduct to serve the BCP during the initial years of its commissioning. The viaduct under Stage 2 will be completed later on when the viaduct under Stage 1 is saturated.

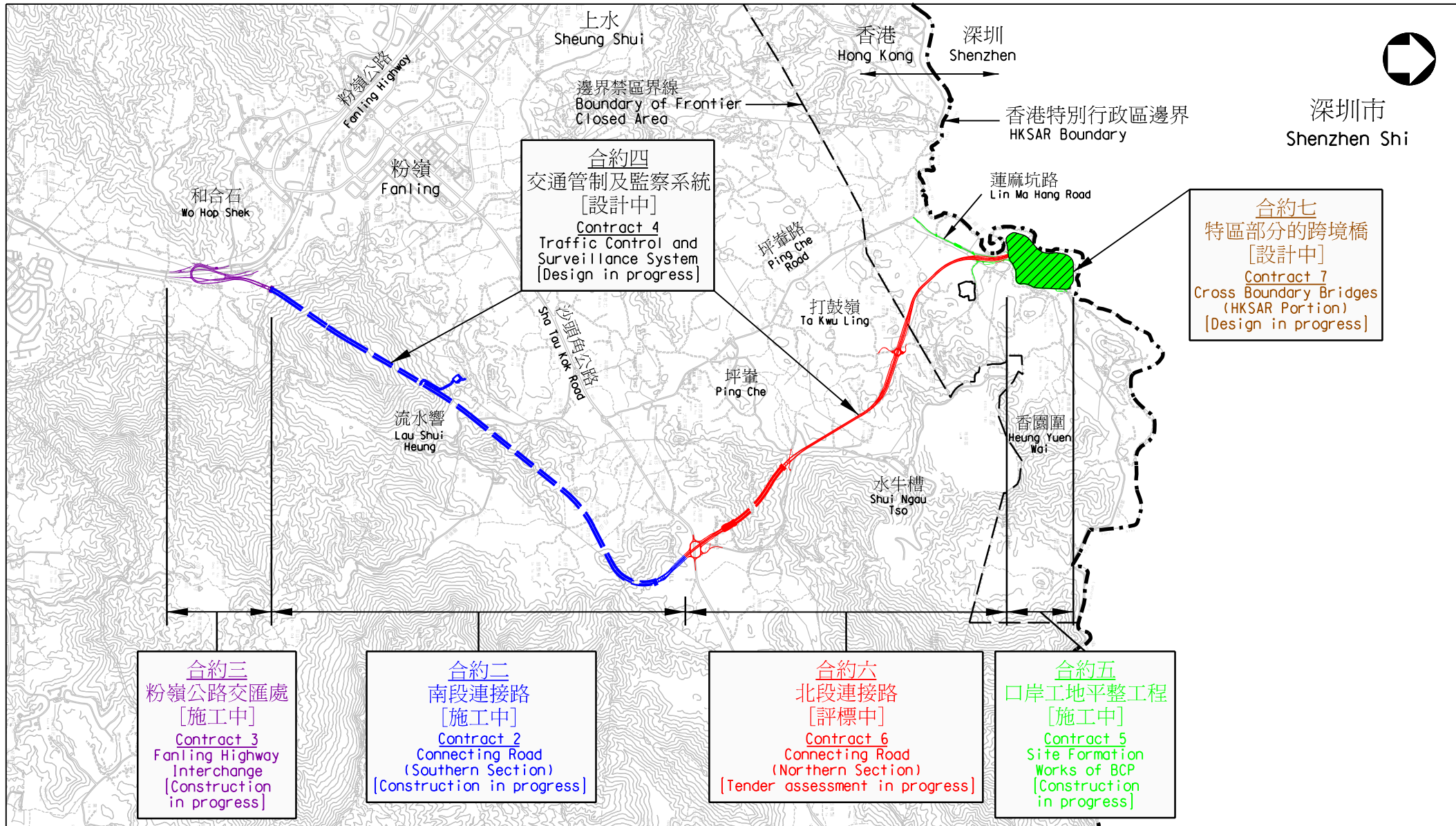
13. We have carefully studied the above three options and our findings are at **Enclosure 4**. In sum, the three options will all give rise to even higher expenditures as compared to the original proposal. The local community will be exposed to much more nuisance/inconvenience arising from the unduly lengthened construction period. Commissioning of the BCP will be delayed by two to three years under the above three options, realization of the economic benefits of the new BCP will be deferred. Also, we cannot alleviate the congestion, nor provide opportunity for improvement at the existing BCPs in a timely manner. Completed works across the boundary will also be laid idle. In view of the above, we consider that all three postponement options are not recommendable. The implementation of the Project according to the current plan is the most preferable option for the overall benefits to Hong Kong.

14. In the Last Meeting, some Members requested the Administration to provide supplementary information related to our proposal to increase the APE of the Project. The supplementary information is at **Enclosure 5**.

WAY FORWARD

15. Members are invited to support our proposal for increasing the APE of the Project by \$8,196.6 million from \$16,253.2 million to \$24,449.8 million in MOD prices. We plan to submit our proposal for consideration by the Public Works Subcommittee in May 2014 and seek FC's approval in June 2014.

**Development Bureau
Civil Engineering and Development Department
April 2014**



合約三
粉嶺公路交匯處
[施工中]
Contract 3
Fanling Highway
Interchange
[Construction
in progress]

合約二
南段連接路
[施工中]
Contract 2
Connecting Road
(Southern Section)
[Construction in progress]

合約四
交通管制及監察系統
[設計中]
Contract 4
Traffic Control and
Surveillance System
[Design in progress]

合約六
北段連接路
[評標中]
Contract 6
Connecting Road
(Northern Section)
[Tender assessment in progress]

合約五
口岸工地平整工程
[施工中]
Contract 5
Site Formation
Works of BCP
[Construction
in progress]

合約七
特區部分的跨境橋
[設計中]
Contract 7
Cross Boundary Bridges
(HKSAR Portion)
[Design in progress]

圖則名稱 drawing title

工務工程計劃項目第19GB號 — 蓮塘/香園圍口岸與相關工程 — 工地平整及基礎建設工程
- 各工程合約現況

P.W.P. ITEM No. 19GB - LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS
- SITE FORMATION AND INFRASTRUCTURE WORKS
- PRESENT SITUATION OF WORKS CONTRACTS

圖號 drawing no.

BCP-124

比例 scale

1:50 000

辦事處 office

土木工程處 口岸工程部
BOUNDARY CONTROL POINT DIVISION



土木工程拓展署
CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT

**19GB – Liantang/Heung Yuen Wai Boundary Control Point and
associated works – site formation and infrastructure works**

Table 1 – Cash flow and provision for price adjustment in PWSC(2012-13)26

Year	Original project estimate (\$ million, in September 2011 prices) X	Original price adjustment factors (March 2012)# Y	Approved project estimate (\$ million, in MOD prices) Z	Provision for price adjustment (\$ million) A = Z – X
2012-2013	11.0	1.05325	11.6	0.6
2013-2014	525.9	1.11118	584.4	58.5
2014-2015	2,410.0	1.17229	2,825.2	415.2
2015-2016	2,578.0	1.23677	3,188.4	610.4
2016-2017	2,450.0	1.30479	3,196.7	746.7
2017-2018	1,973.0	1.37656	2,716.0	743.0
2018-2019	1,400.0	1.45227	2,033.2	633.2
2019-2020	650.0	1.53214	995.9	345.9
2020-2021	434.2	1.61641	701.8	267.6
Total	12,432.1		16,253.2	3,821.1

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

Year	Latest PE (\$ million, in September 2011 prices) a	Latest PE (\$ million, in September 2013 prices) b ^^	Latest price adjustment factors (March 2014)## c	Latest PE (\$ million, in MOD prices) d	Latest provision for price adjustment (\$ million) e	Net increase in provision for price adjustment (\$ million) f
Up to March 2014	536.4 [^]	597.7 [^]	1.00000	597.7 [^]	e = d – a	f = e – A
2014-2015	1,995.1	2,223.0	1.05450	2,344.1		
2015-2016	3,442.1	3,835.3	1.11777	4,287.0		
2016-2017	3,716.3	4,140.9	1.18484	4,906.3		
2017-2018	3,400.1	3,788.5	1.25593	4,758.1		
2018-2019	2,435.7	2,714.0	1.33128	3,613.1		
2019-2020	1,422.2	1,584.7	1.40117	2,220.4		
2020-2021	1,051.1	1,171.2	1.47123	1,723.1		
Total	17,999.0	20,055.3		24,449.8	6,450.8	2,629.7

Notes:

- # Price adjustment factors adopted in March 2012 were based on the projected movement of prices for public sector building and construction output at that time, which were assumed to increase by 5.5% per annum from 2012 onwards.

Enclosure 2

- ## Price adjustment factors adopted in March 2014 are based on the latest movement of prices for public sector building and construction output, which are assumed to increase by 6.0% per annum from 2014 to 2018 and 5.0% per annum from 2019 to 2021.
- ^ \$536.4 million was the actual expenditure excluding price adjustment up to March 2014; whereas \$597.7 million was the actual expenditure including price adjustment.
- ^^ The latest project estimate (in September 2011 prices) is multiplied by 1.11424 for conversion to September 2013 prices. The figure of 1.11424 represents the changes in price movement for public sector building and construction output between September 2011 and September 2013.

**19GB – Liantang/Heung Yuen Wai Boundary Control Point and
associated works – site formation and infrastructure works**

**Comparison between Approved Project Estimate (APE) and the Latest Project
Estimate**

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)
(a) Site formation and construction of perimeter patrol road with associated fencing and pedestrian subway linking the BCP to Lin Ma Hang Road	217.9	245.6	27.7
(b) Dual two-lane connecting road	9,282.5	14,203.3	4,920.8
(i) about 1 km at-grade road	756.5	832.1	75.6
(ii) about 4.3km viaduct	2,828.2	3,886.6	1,058.4
(iii) about 5.7km tunnel	3,935.1	6,345.9	2,410.8
(iv) at-grade roadworks of four interchanges	100.3	132.6	32.3
(v) administration buildings for tunnel	332.5	430.2	97.7
(vi) ventilation adit and buildings for tunnel	622.5	1,177.5	555.0
(vii) traffic control and surveillance system	226.6	351.2	124.6
(viii) electrical and mechanical (E&M) works	480.8	1,047.2	566.4
(c) Diversion/modifications at existing local roads	110.6	131.1	20.5
(d) Sewage collection, treatment and disposal	208.5	112.8	(95.7)
(e) Re provisioning of affected government facilities	48.6	66.7	18.1
(f) Design and construction of cross boundary bridges (HKSAR portion)	268.0	361.8	93.8
(g) Provision of resite area(s) and ancillary works	98.0	134.3	36.3

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)
(h) Additional energy conservation measures	20.0	22.0	2.0
(i) Environmental mitigation measures and EM&A programme	150.8	187.9	37.1
(j) Consultants' fees ¹ for	77.0	80.3	3.3
(i) contract administration	40.3	42.3	2.0
(ii) management of resident site staff	31.7	33.0	1.3
(iii) independent environmental checker service	5.0	5.0	0.0
(k) Remuneration of resident site staff	792.5	799.0	6.5
(l) On-cost payable to Shenzhen Municipal Government (SZMG)	11.0	1.2	(9.8)
(m) Electrical and Mechanical Services Trading Fund (EMSTF) charges ²	16.7	16.7	0.0
(n) Contingencies	1,130.0	1,636.3	506.3
Sub-total	12,432.1 (in September 2011 prices)	17,999.0 (in September 2011 prices)	5,566.9
(o) Provision for price adjustment	3,821.1	6,450.8	2,629.7
Total	16,253.2 (in MOD prices)	24,449.8 (in MOD prices)	8,196.6

¹ Excluding consultants' fees for the design and construction of the cross boundary bridges (HKSAR portion) (item (f) of paragraph 16 in PWSC(2012-13)26). Please also refer to paragraph 11 of this Enclosure.

² Since the establishment on 1 August 1996 under the Trading Fund Ordinance, the EMSTF charges government departments for design and technical consultancy services provided by the Electrical and Mechanical Services Department. The services rendered for this project include checking consultants' submissions on all E&M installations and providing technical advice to Government on all E&M works and their impact on the project.

2. As regards **items 1(b)(i) and 1(b)(iv) (at-grade road and at-grade roadworks of four interchanges of dual two-lane connecting road)**, the increase of \$107.9 million is mainly due to a higher risk premium associated with construction constraints.

3. As regards **item 1(b)(ii) (viaduct of dual two-lane connecting road)**, the increase of \$1,058.4 million is mainly due to recent surge in construction prices and a higher risk premium associated with construction constraints.

4. As regards **items 1(b)(iii), 1(b)(v) and 1(b)(vi) (tunnel, administration buildings, ventilation adit and buildings for tunnel of dual two-lane connecting road)**, the increase of \$3,063.5 million is mainly due to recent surge in construction prices, poor ground conditions for tunnelling works and a higher risk premium associated with construction constraints.

5. As regards **item 1(b)(vii) (traffic control and surveillance system of dual two-lane connecting road)**, the increase of \$124.6 million is mainly due to recent surge in construction prices.

6. As regards **item 1(b)(viii) (E&M works of dual two-lane connecting road)**, the increase of \$566.4 million is mainly due to recent surge in construction prices and a higher risk premium associated with construction constraints.

7. As regards **items 1(a), 1(c), 1(d), 1(e) and 1(g) (site formation, perimeter patrol road, subway, diversion/modifications at existing local roads, sewage collection, treatment and disposal, reprovisioning of affected government facilities and provision of resite area(s) and ancillary works)**, the net increase of \$6.9 million is mainly due to a higher risk premium associated with construction constraints.

8. As regards **item 1(f) (cross boundary bridges (HKSAR portion))**, the increase of \$93.8 million is mainly due to recent surge in construction prices.

9. As regards **item 1(h) (additional energy conservation measures)**, the increase of \$2.0 million is mainly due to recent surge in construction prices.

10. As regards **item 1(i) (environmental mitigation measures and EM&A programme)**, the increase of \$37.1 million is mainly due to a higher risk premium associated with construction constraints.

11. As regards **item 1(j)(i), 1(j)(ii), 1(k) and 1(l) (consultants' fees for contract administration and management of resident site staff, remuneration of resident site staff, and on-cost payable to SZMG)**, we agreed with SZMG in June 2013 that each side will construct the portion of the cross boundary bridges within its own territory. As such, there is no entrustment of the construction of the cross boundary bridges (HKSAR portion) to SZMG. The on-cost payable to SZMG is reduced by \$9.8 million. The consultants' fees and remuneration of resident site staff are correspondingly increased by \$9.8 million.

12. As regards **item 1(n) (contingencies)**, the increase of \$506.3 million is due to the increased estimate of the works items mentioned in paragraphs 2 to 10 above, to cater for possible additional costs due to remeasurement, variations of works and possible claims in the construction and finalization stages of the Project.

13. As regards **item 1(o) (provision for price adjustment)**, the increase of \$2,629.7 million is due to the increased estimate of the works items mentioned in paragraphs 2 to 10 and contingencies in paragraph 12 above, the latest cashflow and the increase of the latest price adjustment factors.

**19GB – Liantang/Heung Yuen Wai
Boundary Control Point and associated works –
site formation and infrastructure works**

**Study on Feasibility of Postponing the Implementation of
the Boundary Control Point Project**

INTRODUCTION

At the meeting of the Panel on Development on 7 January 2014, some Members requested the Government to explore the feasibility to defer the implementation of the Project to avoid the current construction peak so as to reduce the overall project cost. The findings are outlined below.

OPTIONS OF POSTPONEMENT

2. The works contracts for constructing the Fanling Highway Interchange, Connecting Road (Southern Section) and site formation works of BCP have commenced. Suspension of the above works contracts will lead to contractual claims and additional payments to the contractors when the works are resumed in future. This will not help to reduce the overall project cost at all. Among the three works contracts not yet awarded, the contract with the highest value is for the construction of the Connecting Road (Northern Section). Tender assessment of this contract is in progress. We have considered the following three postponement options -

Option 1

3. Option 1 is to cancel the current tender exercise for the Connecting Road (Northern Section), postpone the construction programme of the remaining contracts by three years and commission the BCP in 2021. Please refer to the plan at **Annex 1** for details.

4. According to our assessment, as the overall construction expenditure forecasts over the next few years will still maintain at a high level, the construction prices will unlikely fall. Postponing the construction of Connecting Road (Northern Section) by three years will lead to rise in the estimated cost for the uncompleted works by about \$1,200 million due to inflation. Also, postponing the commissioning of the BCP by three years will result in the loss of quantifiable economic benefits amounting to about \$2,700 million. The upkeep of the completed works such as Lung Shan Tunnel and Fanling Highway Interchange will be required, the total cost of which for three

years is estimated to be about \$300 million. This option will result in a total quantifiable loss of about \$4,200 million.

Option 2

5. Option 2 is to cancel the current tender exercise for the Connecting Road (Northern Section), postpone the construction of Connecting Road (Northern Section), and widen the existing local at-grade roads to cater for the additional cross-boundary traffic in the initial years of the BCP commissioning. The Connecting Road (Northern Section) will be completed later on when these at-grade roads are saturated. Please refer to the plan at **Annex 2** for details.

6. According to our assessment, there are many road junctions along the existing at-grade roads (including a section of Sha Tau Kok Road and Ping Che Road) and the width of the roads is not sufficient. The remaining capacity of the road junctions and the carriageway cannot cater for the additional cross-boundary traffic flow after commissioning of the new BCP, and widening of the carriageway and improvement to the junctions along the roads are required. Based on our preliminary estimate, the above road improvement works will involve resumption and clearance of about 100 private lots and associated structures, removal of about 600 trees including two Old and Valuable Trees¹. During construction, temporary traffic diversion will be implemented along the roads, which will affect the local accesses along Ping Che Road and Sha Tau Kok Road. After commissioning of the BCP, the heavy cross-boundary traffic will severely affect the living environment of the residents along the roads. In this regard, it is highly unlikely that this option would gain the support of the local community.

7. As the road improvement works require design, traffic and environmental impact assessments, public consultation, gazettal of road works, resumption and clearance of private land, tendering, etc, the works can only be completed in 2021 the earliest. Therefore, the commissioning of the new BCP will be postponed by three years to 2021.

8. We estimate that the cost of the road improvement works is about \$1,000 million. It is anticipated that the widened roads will be saturated in 2027. As such, the Connecting Road (Northern Section) is required to be completed by 2027 (i.e. commissioning of the Connecting Road will be postponed by nine years).

¹ The two Old and Valuable Trees are LCSD N/2 and LCSD N/4 in the Register of Old and Valuable Trees kept by the Leisure and Cultural Services Department.

9. According to our assessment, postponing the commissioning of the BCP and the Connecting Road (Northern Section) by three years and nine years respectively will lead to increase of cost for the Connecting Road (Northern Section) by \$4,000 million and loss of quantifiable economic benefits amounting to about \$2,700 million. The upkeep of the completed works such as Lung Shan Tunnel and Fanling Highway Interchange will be required, with an estimated cost of about \$300 million for three years. This option will result in a total loss of about \$7,000 million.

Option 3

10. Option 3 is to cancel the current tender exercise for the Connecting Road (Northern Section), and then construct the Connecting Road (Northern Section) in two stages. The Stage 1 works comprise the construction of a single two-lane viaduct to serve the BCP during the initial years of its commissioning. The viaduct under Stage 2 will be completed later on when the viaduct under Stage 1 is saturated in 2027. Please refer to the plan at **Annex 3** for details.

11. As the viaduct in the Connecting Road (Northern Section) is changed to a single two-lane carriageway, it has only one traffic lane for each direction. The operation of the BCP will be severely hampered if there are emergency incidents on the viaduct. The single carriageway cannot serve as a high speed trunk road as originally intended to reduce transportation costs and time for travellers and goods on roads. Also, the viaduct built in Stage 1 will be saturated in 2027, and the viaduct under Stage 2 will be required to be completed by then. There will be construction activities from 2017 to 2020 and then from 2025 to 2027 under this option, which will cause prolonged impacts on the nearby residents and the environment. In this regard, it is highly unlikely that this option would gain the support of the local community.

12. As the works require re-design of the viaduct, public consultation, gazettal of amendments to the authorized road scheme, re-tendering, etc, the works can only be completed in 2020 the earliest. Therefore, the commissioning of the new BCP will be postponed by two years to 2020.

13. According to our assessment, postponing the commissioning of the BCP by two years will give rise to loss of quantifiable economic benefits amounting to about \$1,800 million. Lung Shan Tunnel and Fanling Highway Interchange, which will be completed in 2018, cannot be commissioned timely.

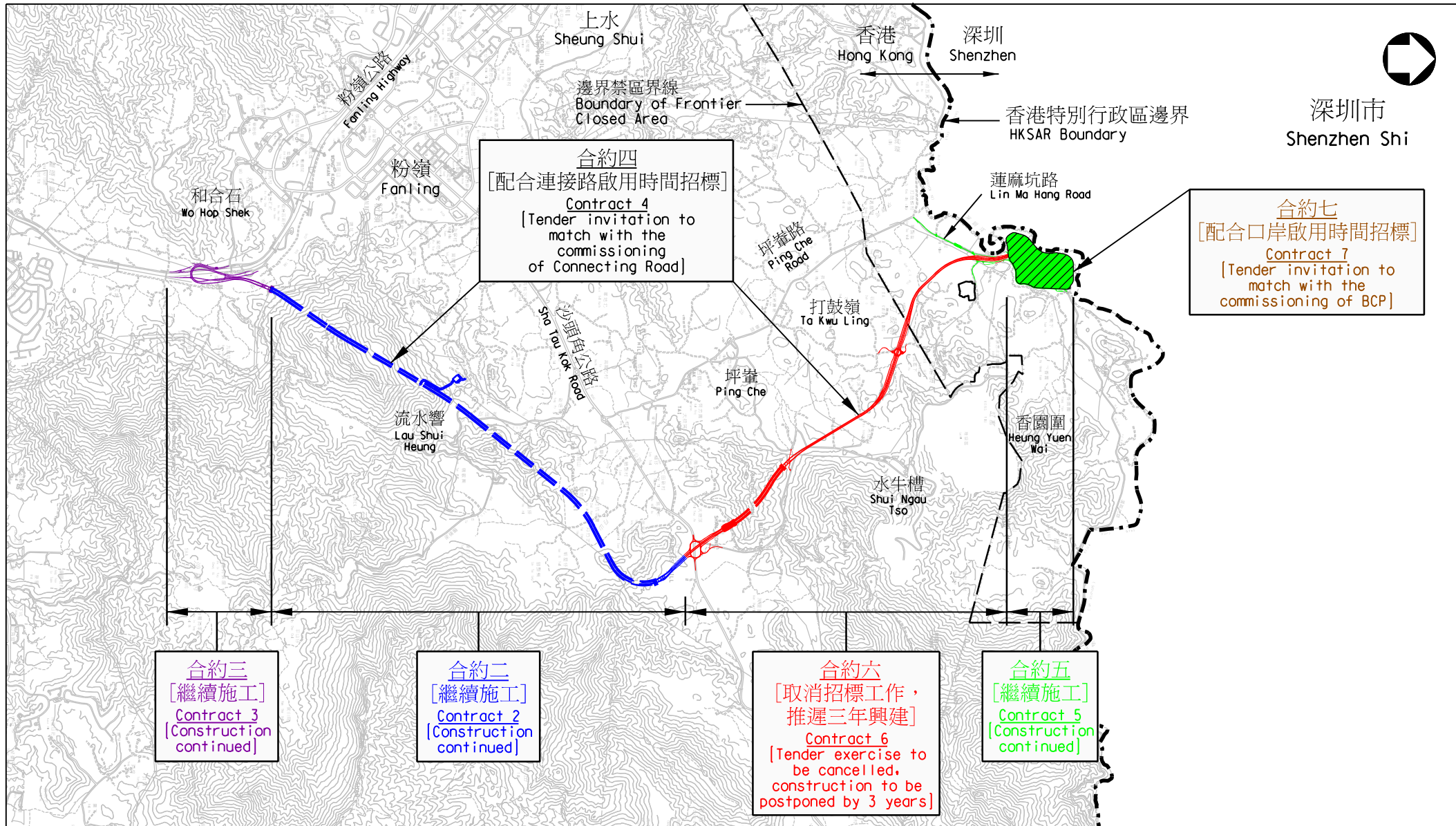
The estimated cost for the upkeep of these facilities is about \$200 million.

14. If only one viaduct is to be constructed now, it is estimated that the project cost can be reduced by about \$1,000 million. However, the remaining viaduct will then be constructed alongside an existing viaduct in future. Given the more difficult construction condition adjacent to an existing viaduct and the forecast increase in construction prices, the estimated cost of the remaining viaduct may reach \$2,000 million when it is completed in 2027 (i.e. increased by \$1,000 million).


15. This option will result in a total loss of about \$3,000 million.

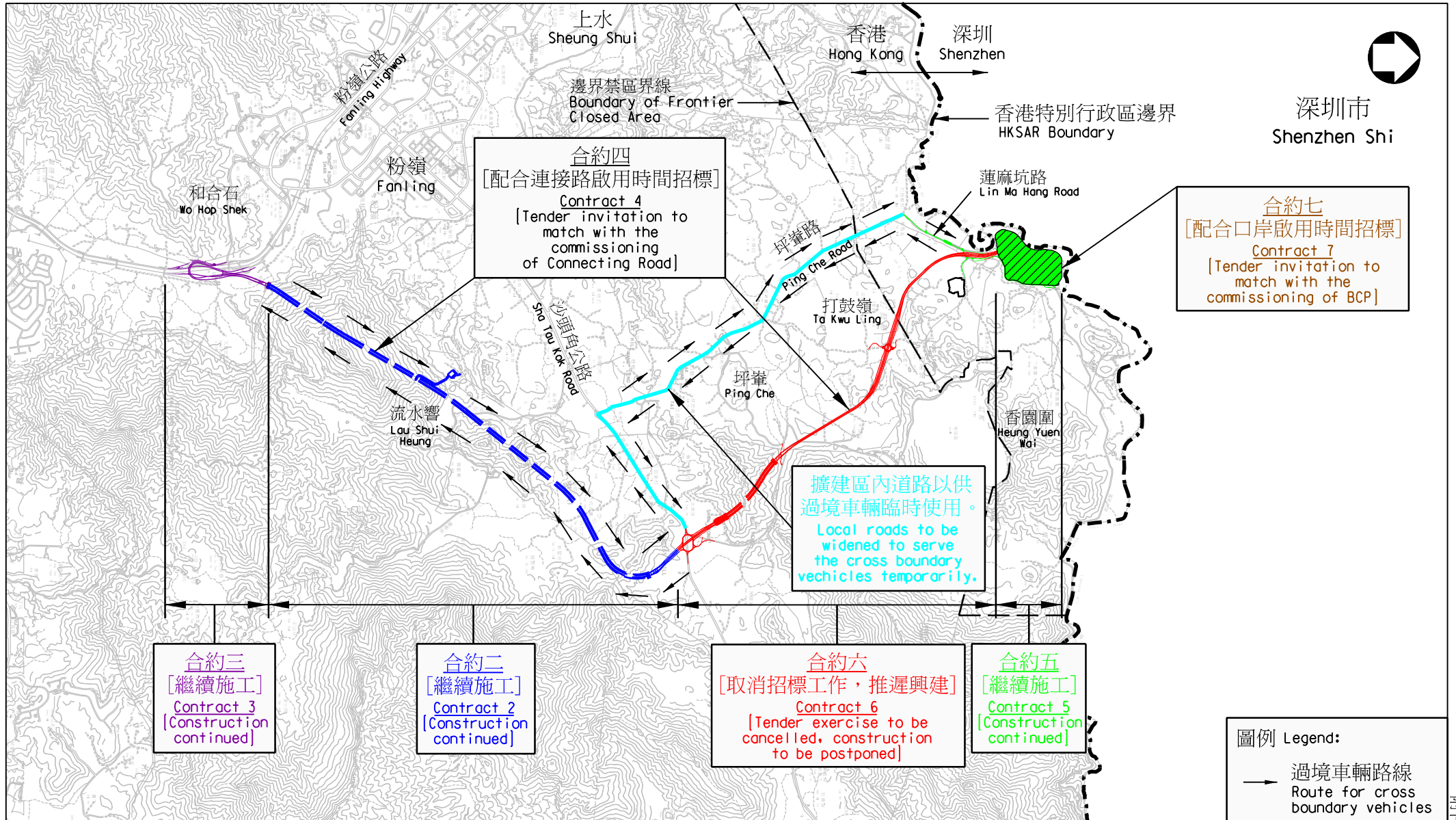
CONCLUSION

16. All three options will result in higher expenditures as compared to the original proposal. The local community will be exposed to much more nuisance/inconvenience arising from the unduly lengthened construction period. It is doubtful that these options will be supported by the local community. Commissioning of the BCP will be delayed by two to three years, the realization of the economic benefits of the new BCP will be deferred. Also, we cannot alleviate the congestion nor provide opportunity for improvement at the existing BCPs in a timely manner. Completed works across the boundary will also be laid idle. In view of the above, we consider that all three postponement options are not recommendable. Implementation of the Project according to the current plan is the most preferable option for the overall benefits to Hong Kong.



深圳市
Shenzhen Shi

圖則名稱 drawing title 工務工程計劃項目第19GB號 — 蓮塘/香園圍口岸與相關工程 — 工地平整及基礎建設工程 - 延後方案一 P.W.P. ITEM No. 19GB - LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS - SITE FORMATION AND INFRASTRUCTURE WORKS - POSTPONEMENT OPTION 1	圖號 drawing no.	比例 scale
	BCP-125	1:50 000
	辦事處 office 土木工程處 口岸工程組 BOUNDARY CONTROL POINT DIVISION	
 土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT		



合約四
 [配合連接路啟用時間招標]
Contract 4
 [Tender invitation to match with the commissioning of Connecting Road]

合約七
 [配合口岸啟用時間招標]
Contract 7
 [Tender invitation to match with the commissioning of BCP]

擴建區內道路以供過境車輛臨時使用。
 Local roads to be widened to serve the cross boundary vehicles temporarily.


合約三
 [繼續施工]
Contract 3
 [Construction continued]

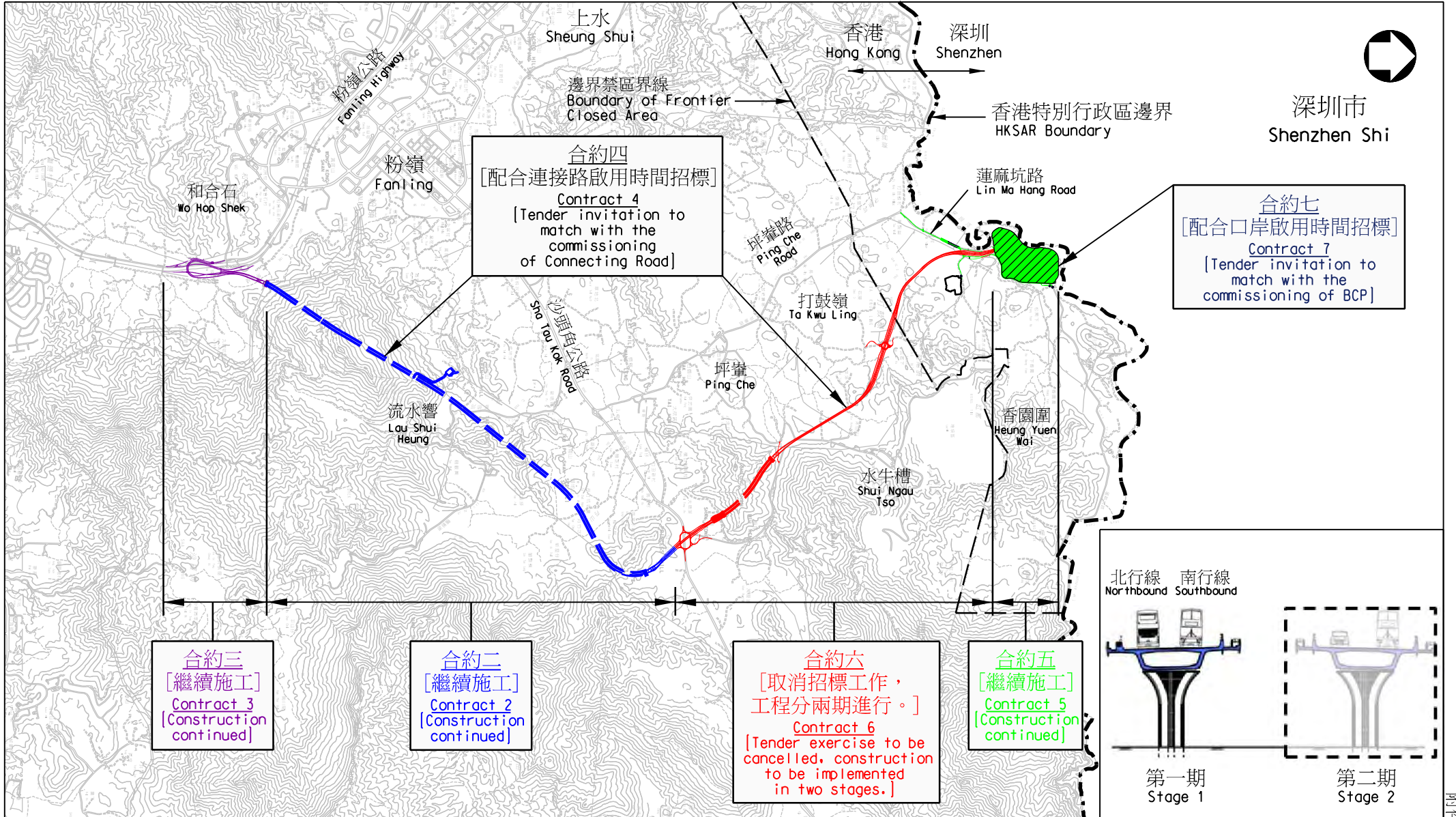
合約二
 [繼續施工]
Contract 2
 [Construction continued]

合約六
 [取消招標工作，推遲興建]
Contract 6
 [Tender exercise to be cancelled, construction to be postponed]


合約五
 [繼續施工]
Contract 5
 [Construction continued]

圖例 Legend:
 → 過境車輛路線
 Route for cross boundary vehicles

圖則名稱 drawing title 工務工程計劃項目第19GB號 — 蓮塘/香園圍口岸與相關工程 — 工地平整及基礎建設工程 — 延後方案二 P.W.P. ITEM No. 19GB - LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS - SITE FORMATION AND INFRASTRUCTURE WORKS - POSTPONEMENT OPTION 2	圖號 drawing no.	比例 scale
	BCP-126	1:50 000
	辦事處 office 土木工程處 口岸工程部 BOUNDARY CONTROL POINT DIVISION	
 土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT		



圖則名稱 drawing title
 工務工程計劃項目第19GB號 — 蓮塘/香園圍口岸與相關工程 — 工地平整及基礎建設工程
 - 延後方案三
 P.W.P. ITEM No. 19GB - LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS
 - SITE FORMATION AND INFRASTRUCTURE WORKS
 - POSTPONEMENT OPTION 3

圖號 drawing no. BCP-127	比例 scale 1:50 000
辦事處 office 土木工程處 口岸工程部 BOUNDARY CONTROL POINT DIVISION	
 土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	

**Legislative Council Panel on Development
Meeting on 7 January 2014
Supplementary Information Requested by Members**

Introduction

Supplementary information requested by Members at the meeting of Panel on Development on 7 January 2014 is provided in the ensuing paragraphs.

Contractors of the awarded works contracts and their parent companies

2. The contractors of the awarded works contracts and their parent companies are as follows –

Contract Number	Contract Title	Name of Contractor
CV/2012/08	Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 2	Dragages Hong Kong Limited (Parent Company: Bouygues SA)
CV/2012/09	Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 3	Chun Wo Construction and Engineering Company Limited (Parent Company: Chun Wo Development Holdings Limited)
CV/2013/03	Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 5	Sang Hing Civil – Richwell Machinery JV (Parent Company: Sang Hing Civil Contractors Company Limited and Richwell Machinery Engineering Limited)

Name of the consultants overseeing the site investigation works for Lung Shan Tunnel

3. AECOM Asia Company Limited is the consultants overseeing the site investigation works for Lung Shan Tunnel.

Assessment on whether the Government can put a claim on the consultants for failing to take into consideration the poor ground conditions to the design and cost estimate of the tunnelling works in a timely manner

4. According to the Civil Engineering and Development Department (CEDD) Geotechnical Engineering Office Technical Guidance Note No. 24, site investigation should be as comprehensive as possible to provide adequate information for the detailed design of tunnel works. The amount and extent of site investigation depends on the depth, location and geographical environment of the tunnel. The guidance note makes reference to the US Army Corps of Engineers Manual¹, which stipulates that tunnel construction in rural area requires an amount of the site investigation works at 0.5% of the estimated tunnelling cost while tunnel construction in dense urban area requires an amount of the site investigation works at 2 to 4% of the estimated tunnelling cost.

5. Due to access problems and adverse weather conditions, CEDD's site investigation contractor could not complete all the site investigation works by mid-2012. Nevertheless, when we made funding application for the Project in 2012, the design consultants of CEDD had made reference to the site investigation results available by then, and substantially completed the detailed design of Lung Shan Tunnel. At that time, the amount of the completed site investigation works was about 1.5% of the estimated tunnelling cost, which was considered adequate according to the above guidance.

6. In view of the above, we opined that the consultants have performed their duties in a professional manner. The site investigation completed at a later stage (including the horizontal boreholes for verifying the design) revealed that the ground conditions at some tunnel sections were poorer than we envisaged, which was unforeseeable. The higher construction cost for the concerned tunnel sections is arisen from the actual ground condition and is not related to when the site investigation results are available.

A detailed analysis of the breakdown to explain what had led to the increase of 48.5% in construction prices and the increase of 32.1% in the provision for price adjustment

Surge in Construction Prices

7. There has been a surge in construction prices since early 2012, particularly in heavy civil engineering works and electrical and mechanical works included in the four main works contracts of the Project. The cost of the Project is

¹ USACE(1997). *Engineer Manual 1110-2-2901 Engineering and Design – Tunnels and Shafts in Rock*. US Army Corps of Engineers.

particularly susceptible to this surge in construction prices.

8. The construction prices of civil engineering works include direct costs of labour, plant and materials and other indirect costs such as overheads, profit and risk of the contractors. According to the statistics released by the Census and Statistics Department, the wages of the skilled workers in the trades of heavy civil engineering works have increased by 18% to 46% within 12 months from August 2012 to August 2013. The hiring rates for crawler cranes and bored piling plant have increased by about 30% and 40% respectively. There is also certain increase in the indirect costs incurred by the contractors in daily operation, including rent, staff salary, etc.

9. Apart from that, the installation of precast bridge segments requires prestressing operation which can only be carried out by specialist sub-contractors. Tunnel construction requires specialist sub-contractors to handle the sophisticated tunnel boring machine and carry out drill-and-blast tunnelling activities. The supply of these specialist sub-contractors is tight in the current market.

10. As a result, we estimate that the total increase in construction prices of heavy civil engineering works of the Project is about \$3,321.2 million.

11. There has also been a surge in construction prices of electrical and mechanical works. We have made reference to the Building Services Tender Price Index compiled by the Architectural Services Department, which is a reference for the general trend of tender prices for building services. The index in the second quarter of 2013 is 230, which is 54% higher than the index in first quarter of 2012 of 149. Moreover, the electrical and mechanical works will only be carried out at a later stage of the Project (i.e. year of 2017/18), and the tenderers may have placed additional risk premiums in the returned tenders for the potential surge in future. This trend was reflected in the returned tendered prices for the electrical and mechanical works in the Project, which are more than double of our original estimate. The total increase in construction prices of electrical and mechanical works is about \$653.5 million.

Increase in Provision for Price Adjustment

12. As outlined in paragraph 6 of this Panel paper, the increase in the provision for price adjustment is reduced by \$353.4 million from \$2,983.1 million to \$2,629.7 million. The contributing factors to account for the increase are as follows –

- (a) As the base estimate of construction prices has increased, the amount of the provision for price adjustment has to be increased accordingly. The increase in provision for price adjustment due to this factor is about \$1,711 million.
- (b) The cash flow of the Project is different from the original estimate based on the actual tender schedule, construction sequence and site progress. This accounts for an increase of about \$606 million in the provision for price adjustment.
- (c) The price adjustment factors adopted in March 2014 are different from those adopted in the funding application in 2012 for the Project, which accounts for an increase of about \$313 million in the provision for price adjustment.

Assessment on whether the aforementioned factors could have been taken into account when preparing the previous cost estimate

13. The aforementioned factors cannot be foreseen when we made application for funding in 2012 for the Project because at that time –

- (a) We had made reference to the tendered prices of similar infrastructure projects, and taken into account the prevailing market condition and the information up to early 2012 to prepare the project estimate. Subsequently, there has been a surge in construction prices since early 2012, and the surge is higher than what we originally expected. This leads to an increase in the base estimate of construction prices, and in turn, the provision for price adjustment, which was unforeseeable.
- (b) All contracts had yet to be tendered. We took into account the anticipated construction sequence and the estimated cash flow of the Project to estimate the provision for price adjustment. The need for re-tendering has changed the planned tender schedule of the works contracts. The actual construction sequence adopted by contractors and the site progress at present are also different from what we forecast previously. As a result, the cash flow of the Project is different from the original estimate, which was also not foreseeable.
- (c) We had already used the most updated price adjustment factors to determine the provision for price adjustment in accordance with the normal practice in other funding applications. The changes in price adjustment factors are due to the latest changes in economic conditions and outlook, which were also unforeseeable.