

ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND

HEAD 705 – CIVIL ENGINEERING

Support – Boundary facilities (other than road works)

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

Members are invited to approve an increase in the approved project estimate of **19GB** by \$8,719.9 million from \$16,253.2 million to \$24,973.1 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) for **19GB** is not adequate to enable the works to be completed.

PROPOSAL

2. The Director of Civil Engineering and Development, with the support of the Secretary for Development, proposes to increase the APE of **19GB** by \$8,719.9 million from \$16,253.2 million to \$24,973.1 million in money-of-the-day (MOD) prices (as detailed in the paper PWSC(2014-15)33 at Enclosure 1) to cover the cost of works under the project.

Encl. 1

BACKGROUND

3. The scope of **19GB** covers the site formation and infrastructure works of the Liantang/Heung Yuen Wai (LT/HYW) Boundary Control Point (BCP). After securing the support of the Panel on Development on 5 May 2014, we first invited the Public Works Subcommittee (PWSC) on 27 May 2014 during the 2013-14 legislative session to recommend to the Finance Committee (FC) the increase in the APE of **19GB** to cover the project's latest estimated cost but the discussion was deferred beyond the summer recess. We updated the programme,

phasing of expenditure and estimated cost for the project and invited PWSC to consider the item again on 26 November 2014; however, a motion to adjourn discussion of the item was passed. The Government invited PWSC again on 9 January 2015 to consider the project, but PWSC did not render its support to the proposal. At the PWSC meeting on 9 January 2015, some Members queried the justifications, the latest economic benefits and the traffic implications of the proposed BCP on the traffic in Fanling Highway. Our response to those queries is at Enclosure 2.

Encl. 2

URGENCY

4. The proposed BCP will enhance the cross-boundary transport handling capability and bring about substantial strategic and economic benefits to Hong Kong. It will enhance our connection with the eastern part of Guangdong. The proposed BCP is expected to be beneficial to our external trade and logistics industries, as well as the ancillary or supporting industries. The proposed BCP will also help re-distribute the cross-boundary traffic amongst the crossings in the east.

5. At the local level, with the new Connecting Road to be constructed to link Fanling Highway with the BCP under **19GB**, the existing road network in the North District will be substantially improved. The new Connecting Road will form part of the essential infrastructure serving the planned housing development at Queen's Hill as well as other potential long-term developments in the New Territories North.

6. As detailed in paragraphs 4 and 5 of Enclosure 1, **19GB** is being implemented under six works contracts. So far, the construction works of the three awarded contracts^{Note} are progressing satisfactorily. Of the three remaining contracts, two of them relating to the traffic control and surveillance system and the cross-boundary bridges are scheduled to commence later. We invited tenders in July 2013 for the remaining contract, viz. Contract 6, which is for the construction of the northern section of the Connecting Road between Sha Tau Kok Road and the BCP. The tender invitation and assessment of Contract 6 has been substantially completed. The contract is ready for award upon funding approval. The tender validity period of the contract, which has already been extended twice, will lapse on 31 July 2015. If funding approval is not available by the end of the current legislative session, the award of Contract 6 will be delayed to at least until the next legislative session. Significant further delay is possible due to expiry of the tender validity period. Given the escalating construction prices, the longer the delay, the more the Government needs to pay to complete the BCP project. Specifically, it

^{Note} The three contracts underway are Contract 2 on the southern section of the Connecting Road, Contract 3 on the Fanling Highway Interchange and Contract 5 on site formation works of the BCP. The total cost of these three contracts is \$12.3 billion.

will lead to the following undesirable implications on programme and cost –

- (a) works under three existing contracts are already under way. The delay in the award of Contract 6 will lead to programme mismatch of those works, and may lead to waste or idling of the works underway when they are completed;
- (b) the Shenzhen Municipal Government is proceeding with the construction works for the part of the BCP on its side based on the target completion date of 2018. If the whole LT/HYW BCP is delayed, there will be potential loss on the Shenzhen side due to wasted or idled construction works; and
- (c) Government's rough estimation is that on average, a month's delay in commencing Contract 6 will add some \$30 million to the total project cost.

7. Government sees an urgent need to invite FC to consider the application for an increase in the APE of **19GB** notwithstanding PWSC's reservation. Subject to approval of FC, we plan to commence Contract 6 as soon as possible and take all necessary steps to mitigate the delay to the works and resolve interfacing problems as far as possible. At this stage, we cannot commit to the completion of the BCP in 2018 due to the delay already accrued, but we will strive to bring forward the completion of the BCP as far as possible.

FINANCIAL IMPLICATIONS

8. Subject to FC's approval, the project estimate of **19GB** would be increased to \$24,973.1 million in MOD prices. The proposed increase in the APE will not give rise to any additional recurrent expenditure.

Development Bureau
May 2015

**For discussion
on 22 October 2014**

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 705 – CIVIL ENGINEERING

Support – Boundary facilities (other than road works)

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

Members are invited to recommend to the Finance Committee to increase the approved project estimate of **19GB** by \$8,719.9 million from \$16,253.2 million to \$24,973.1 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **19GB** is not sufficient to cover the cost of the works under the project.

PROPOSAL

2. The Director of Civil Engineering and Development, with the support of the Secretary for Development, proposes to increase the APE of **19GB** by \$8,719.9 million from \$16,253.2 million to \$24,973.1 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In July 2012, the Finance Committee (FC) of the Legislative Council approved the upgrading of **19GB** (the Project) to Category A at an estimated cost of \$16,253.2 million in MOD prices. The approved scope of **19GB** comprises –

/(a)

- (a) site formation of about 23 hectares of land for the development of the Boundary Control Point (BCP);
- (b) provision of a 1.8 kilometre (km) long perimeter patrol road at the BCP together with the associated gates and fencing;
- (c) construction of a pedestrian subway linking the BCP to Lin Ma Hang Road;
- (d) construction of an approximately 11 km long dual two-lane Connecting Road (with about 1.0 km of at grade road, 4.3 km of viaduct and 5.7 km of tunnel) connecting the BCP with Fanling Highway (with four interchanges along the Connecting Road at the junctions with Fanling Highway, Sha Tau Kok Road, Ping Yuen Road and Lin Ma Hang Road) and the associated administration building, ventilation adit and buildings, electrical and mechanical (E&M) works and traffic control and surveillance system;
- (e) design and construction of the Hong Kong Special Administrative Region (HKSAR) portion of four vehicular bridges and one pedestrian bridge¹ crossing Shenzhen River (cross boundary bridges);
- (f) associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road, access road to the resite of Chuk Yuen Village, Tai Wo Services Road East and West, Sha Tau Kok Road, and Wo Keng Shan Road, etc.;
- (g) provision of sewage collection, treatment and disposal facilities for the BCP and the resited Chuk Yuen Village;
- (h) provision of resite area(s) with supporting infrastructure for reprovisioning of the affected village houses;

/(i)

¹ The project scope does not include interior fitting works for the pedestrian bridge (HKSAR portion), which will be carried out separately under the BCP building works of **13GB** – Liantang/Heung Yuen Wai Boundary Control Point and associated works.

- (i) reprovisioning of the affected government facilities including Wo Keng Shan Road garden and a public toilet, the Architectural Services Department (ArchSD)'s depot at Lin Ma Hang Road and footbridges crossing Ng Tung River;
- (j) ancillary works such as the associated footpaths, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works etc; and
- (k) associated environmental mitigation measures, and Environmental Monitoring and Audit programme for the works.

Plans showing the proposed works are at Annex A.

PROGRESS OF THE PROJECT

4. The Project is implemented under six works contracts. Tenders for Contract 1, Contract 2 and Contract 3² were invited in 2012. The returned tender price of Contract 1, however, significantly exceeded the original estimate. To protect public funds, we cancelled the tender exercise for Contract 1 and re-packaged the works of Contract 1 into two contracts, namely Contract 5 and Contract 6³, with a view to enlarging the scope of contractors capable of undertaking the works and thus resulting in more competitive tender prices. We also introduced cost-saving measures to reduce risks to the tenderers and facilitate contractor's works on site (e.g. inviting alternative designs so that tenderers may submit a more competitive tender price due to better utilization of their resources and expertise; providing a barging point to facilitate delivery of the precast bridge deck segments to reduce handling and transportation cost; providing more working areas for the contractors' use; and reviewing the designs by taking into account feedback from the tenderers) in these two contracts as well as Contract 2 and Contract 3. Tenders for Contract 5 and Contract 6 were invited in 2013.

/5.

² The scope of Contract 1 comprises mainly the site formation works for the BCP and the construction of the northern section of the Connecting Road between Sha Tau Kok Road and the BCP (Connecting Road (Northern Section)). The scopes of Contract 2 and Contract 3 comprise mainly the construction of the southern section of the Connecting Road between Fanling Highway and Sha Tau Kok Road (Connecting Road (Southern Section)) and the construction of Fanling Highway Interchange respectively.

³ The scopes of Contract 5 and Contract 6 comprise mainly the site formation works for the BCP and the construction of Connecting Road (Northern Section) respectively.

5. The works under Contract 2, Contract 3 and Contract 5 commenced in 2013. As at end-September 2014, the construction works are progressing satisfactorily. Tender assessment of Contract 6 is in progress. Tenders for Contract 4 and Contract 7⁴ are yet to be invited. The status of the works contracts is summarized at Annex B.

JUSTIFICATION

6. Despite our efforts of arranging re-tender of Contract 1 and incorporating appropriate cost saving measures in the contracts as mentioned in paragraph 4 above, the overall prices of the returned tenders were still higher than the original estimates.

7. After reviewing the financial position of **19GB** and the tendering results of the works contracts, we consider it necessary to increase the APE of **19GB** by \$8,719.9 million from \$16,253.2 million to \$24,973.1 million in MOD prices to cover the additional costs arising mainly from the following –

- (a) recent surge in construction prices;
- (b) poor ground condition for tunnelling works;
- (c) tenderers' perception on higher risks associated with construction constraints;
- (d) increase in provision for price adjustment; and
- (e) increase in contingencies.

Details of the increases in the APE are elaborated in paragraphs 8 to 22 below.

/Recent

⁴ The scopes of Contract 4 and Contract 7 comprise mainly the traffic control and surveillance system for the whole Connecting Road and the cross boundary bridges respectively.

Recent surge in construction prices

8. When we applied for the funding for **19GB** in 2012, our cost estimate was based on the market situation and data available up to early 2012 by making reference to the cost information of similar infrastructure projects. Since then, there has been a surge in the construction prices, in particular for the sectors of heavy civil engineering works (such as viaduct and tunnelling works) and E&M works, leading to the higher-than-expected tender prices of the Project.

Heavy civil engineering works

9. The heavy civil engineering works have experienced a surge in construction prices since 2012⁵. The substantial surge in tender prices for heavy civil engineering works was attributable to the factors detailed in paragraphs 10 and 11 below.

Labour and plant costs

10. Currently, there are a number of major heavy civil engineering works projects involving viaduct and tunnelling works under construction in Hong Kong and adjacent regions. There is a strong demand for similar construction plant needed for the Project. In addition, there is also a higher-than-expected increase in labour cost. The relevant Census and Statistics Department's wage information of key trades involving viaduct works (including concreter, bar bender and fixer, rigger/metal formwork erector, carpenter (formwork) and construction plant mechanic) is at Annex C. Their average daily wages had increased in the range from about 18% to 46% within the 12 months' period from August 2012. We believe that the increase in wages of tunnelling workers should be at least comparable, if not higher, than that of the viaduct field because of the demanding working environment inside tunnels and the recent abundant job opportunities. The market prices of construction plant have also substantially increased since mid-2012. Within a year, the hiring rates of crawler cranes for heavy civil engineering works (for construction of viaducts) and plant for bored piling increased by about 30% and 40% respectively. Thus tenderers, having taken the most updated trend for labour and plant costs into account, have made prudent projection and reflected these factors in their tender prices.

/Specialist

⁵ For instance, in two recent mega infrastructure projects, namely Hong Kong – Zhuhai – Macao Bridge Hong Kong Link Road (**844TH**) and Tuen Mun – Chek Lap Kok Link – construction works (**825TH**), which were tendered in early 2012 and early 2013 respectively, the average unit cost of the land-based viaduct in **825TH** is some 100% higher than that of **844TH**.

Specialist sub-contractors

11. The installation of precast bridge segments requires prestressing operation which can only be carried out by specialist sub-contractors. Similarly, tunnel construction in the Project requires specialist sub-contractors to carry out both drill-and-blast tunnelling activities and to handle the sophisticated tunnel boring machine (TBM). The supply of prestressing and tunnel specialist sub-contractors is tight in the market where many viaduct and tunnelling works are being carried out locally and in adjacent regions, resulting in the higher-than-expected tender prices for precast bridge deck works and tunnelling works.

Electrical and mechanical works

12. The tunnelling works under this Project involve extensive E&M works including tunnel ventilation, power supply, fire services and lighting systems. The Building Services Tender Price Index compiled by the ArchSD is a reference for the general trend of tender prices on Government building services including E&M works. The indices of the first quarter of 2012 and the second quarter of 2013 were 149 and 230 respectively, representing an increase of some 54% in the tender prices for building service works over the corresponding period. Besides, as the majority of the E&M works would only be carried out at the late stage of the Project (i.e. 2017/18), tenderers might have put additional risk premium to cater for possible further market surge for the E&M works in their tenders.

13. Based on the factors mentioned in paragraphs 8 to 12 above, we estimate that the recent surge in construction prices has contributed an increase of about \$3,974.7 million, comprising \$3,321.2 million for the heavy civil engineering works and \$653.5 million for the E&M works. The increase in the heavy civil engineering works accounts for 38.1% of the proposed total increase, whereas the increase in the E&M works accounts for 7.5% of the proposed total increase.

Poor ground condition for tunnelling works

14. The works under **19GB** include the construction of the 4.8 km long Lung Shan Tunnel between the proposed interchanges at Fanling Highway and Sha Tau Kok Road. Upon completion, it will be the longest land road tunnel ever built in Hong Kong. Progress of part of the further site investigation

/conducted

conducted in late 2011 was affected by access problems and adverse weather. The results of the further site investigation completed in mid-2012 revealed that the ground condition was poorer than we envisaged. A number of faults were found to be straddling a stretch of tunnel of some 1.4 km long. This calls for more extensive temporary works such as grouting, shotcreting, temporary supporting structures and strengthening works of the permanent lining along this tunnel section. For example, an additional 20% of rock bolts and 15% of rock anchors have to be installed to withstand the poor ground condition in the fault zones. Moreover, the extent of mixed ground, which is more difficult for tunnel construction, in the section of tunnel to be excavated by TBM was found to be longer-than-expected by about 120% from some 0.3 km to some 0.7 km. This would lead to a higher construction cost due to a slower rate of construction, higher construction risk, more wear and tear problem associated with the operation of TBM and the need of more temporary grouting work.

15. The project estimate for **19GB** was prepared in early 2012 with the design of the tunnel based on the ground information and site investigation results available at that time. The updated design for the tunnel construction due to poor ground condition, which was not reflected in the cost estimate prepared for the funding application of **19GB**, contributed to the increase of about \$698.6 million. It represents 8.0% of the proposed total increase.

Tenderers' perception on higher risks associated with construction constraints

16. Construction of the 4.8 km long Lung Shan Tunnel is very complex and technically demanding, and is highly constrained by limited access. As mentioned in paragraph 14 above, as a result of the poor ground condition along the tunnel alignment revealed in the further site investigation, the tunnel construction would become more difficult than originally anticipated. The contractor would need to plan the tunnelling works very prudently and to carry out more site investigation works to better assess the ground condition before tunnel construction works start. The above technical difficulties and site specific constraints would put pressure on the contractor. As a result, the contractor may have to deploy additional resources to complete the works as scheduled in a prudent manner.

17. There are some other construction constraints that may result in higher tender prices of the Project. For instance, the restrictive construction duration for viaduct works over the East Rail Line, the temporary traffic arrangements at Fanling Highway and remoteness of the works site may lead to additional risk premium to be placed by tenderers in their returned tenders.

18. We estimate that tenderers' higher-than-expected risk assessment to cater for construction constraints have led to an additional cost of about \$387.3 million, which is 4.4% of the proposed total increase.

Increase in provision for price adjustment

19. According to current government practice, monthly payments to contractors for construction contracts are adjusted to cover market fluctuation in labour and material costs, which are known as contract price fluctuation payment. The price adjustment is assessed based on the price adjustment factors derived from the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output together with the cash flow of the project.

20. When the project estimate of **19GB** was prepared in 2012, based on the Government's price adjustment factors available at that time and the original cash flow pattern, a provision of \$3,821.1 million was allowed for price adjustment. Due to differences in the original and latest cash flow of the Project to take account of the additional provisions as explained in paragraphs 8 to 18 above, as well as the progress of the Project, we need to seek an increase in the provision for price adjustment. Based on the latest project estimate, updated cash flow and the latest price adjustment factors adopted in October 2014, the provision for price adjustment has to be increased by \$3,324.0 million from \$3,821.1 million to \$7,145.1 million, contributing 38.1% of the proposed total increase. The latest cash flow of the project and the detailed assessment of the latest provision for price adjustment are at Annex D.

/Increase

Increase in contingencies

21. When we applied for the funding for **19GB** in 2012, an amount of contingencies at \$1,130.0 million has been provided. With the increase in construction costs mentioned in paragraphs 13, 15 and 18 above, we consider it necessary to increase the contingencies to \$1,465.3 million (about 9% of the revised estimated value of works), similar to other public works projects, to cater for unforeseen situations during the implementation of the Project.

Summary of Financial Position

22. In sum, the proposed increase of \$8,719.9 million is broken down as follows –

	Factors	Proposed increased amount in MOD prices (\$ million)	% of the total increase
	Increase due to –		
(a)	Recent surge in construction prices	3,974.7	45.6%
(b)	Poor ground condition for tunnelling works	698.6	8.0%
(c)	Tenderers' perception on higher risks associated with construction constraints	387.3	4.4 %
(d)	Increase in provision for price adjustment	3,324.0	38.1%
(e)	Increase in contingencies	335.3	3.9%
(f)	Total increase (f) = (a) + (b) + (c) + (d) + (e)	8,719.9	100%

A comparison of the cost breakdown of the original APE and the latest project estimate is at Annex E.

/FINANCIAL

FINANCIAL IMPLICATIONS

23. Subject to the approval of the FC, we will revise the phasing of the expenditure as follows –

Year	\$ million (MOD)
Up to 31 March 2014	597.7
2014 – 2015	1,506.5
2015 – 2016	2,629.9
2016 – 2017	5,102.5
2017 – 2018	5,917.8
2018 – 2019	4,537.9
2019 – 2020	2,872.2
2020 – 2021	1,808.6
	<hr style="width: 20%; margin: auto;"/> 24,973.1 <hr style="width: 20%; margin: auto;"/>

24. The proposed increase in the APE will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

25. The proposed increase in the APE does not involve any change in project scope. We consider it not necessary to conduct further public consultation on the proposed cost increase.

/26.

26. We consulted the Legislative Council Panel on Development on the proposed increase in APE on 7 January 2014. Members 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. We provided supplementary information and results of the review to Members on 11 April 2014 vide LC Paper No. CB(1)1248/13-14(08) and consulted the Panel on Development again on 22 April 2014 and 5 May 2014. The Panel supported submitting the Administration's proposal to the Public Works Subcommittee for consideration. The supplementary information requested by the Members will be submitted separately.

ENVIRONMENTAL IMPLICATIONS

27. The proposed increase in the APE will not have any environmental implications.

ENERGY CONSERVATION MEASURES

28. The proposed increase in the APE will not necessitate any additional energy conservation measures.

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

30. The proposed increase in the APE will not require any land acquisition.

BACKGROUND INFORMATION

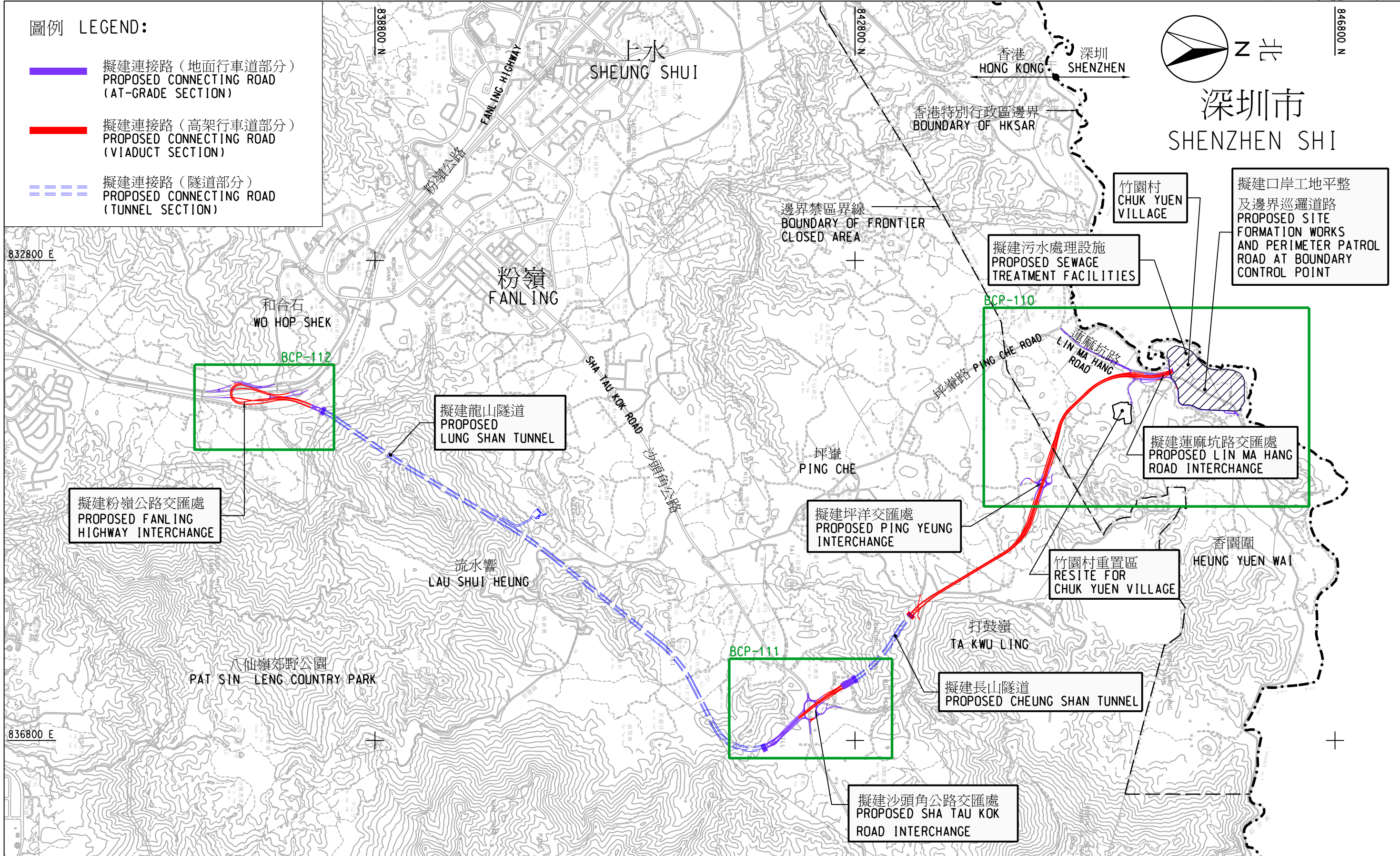
31. In July 2012, the FC approved the upgrading of **19GB** to Category A with an APE of \$16,253.2 million in MOD prices. Construction commenced in April 2013 for completion by end 2018.

32. The proposed increase in the APE will not involve any additional tree removal or planting proposal.

33. The proposed increase in the APE will not involve the creation of any additional professional/technical posts or job opportunities.

34. This paper supersedes PWSC(2014-15)13 which was not discussed by the Public Works Subcommittee during the 2013-14 legislative session. The programme, phasing of expenditure and estimated cost of the project have been updated due to the lapse of time.

Development Bureau
October 2014



圖例 LEGEND:

- 擬建連接路 (地面行車道部分)
PROPOSED CONNECTING ROAD (AT-GRADE SECTION)
- 擬建連接路 (高架行車道部分)
PROPOSED CONNECTING ROAD (VIADUCT SECTION)
- - - 擬建連接路 (隧道部分)
PROPOSED CONNECTING ROAD (TUNNEL SECTION)

深圳市
SHENZHEN SHI

香港 HONG KONG 深圳 SHENZHEN

香港特別行政區邊界
BOUNDARY OF HKSAR

邊界禁區界線
BOUNDARY OF FRONTIER CLOSED AREA

竹園村 CHUK YUEN VILLAGE

擬建口岸工地平整及邊界巡邏道路
PROPOSED SITE FORMATION WORKS AND PERIMETER PATROL ROAD AT BOUNDARY CONTROL POINT

擬建污水處理設施
PROPOSED SEWAGE TREATMENT FACILITIES

擬建蓮麻坑路交匯處
PROPOSED LIN MA HANG ROAD INTERCHANGE

擬建粉嶺公路交匯處
PROPOSED FANLING HIGHWAY INTERCHANGE

擬建龍山隧道
PROPOSED LUNG SHAN TUNNEL

擬建坪洋交匯處
PROPOSED PING YEUNG INTERCHANGE

竹園村重置區
RESITE FOR CHUK YUEN VILLAGE

擬建長山隧道
PROPOSED CHEUNG SHAN TUNNEL

擬建沙頭角公路交匯處
PROPOSED SHA TAU KOK ROAD INTERCHANGE

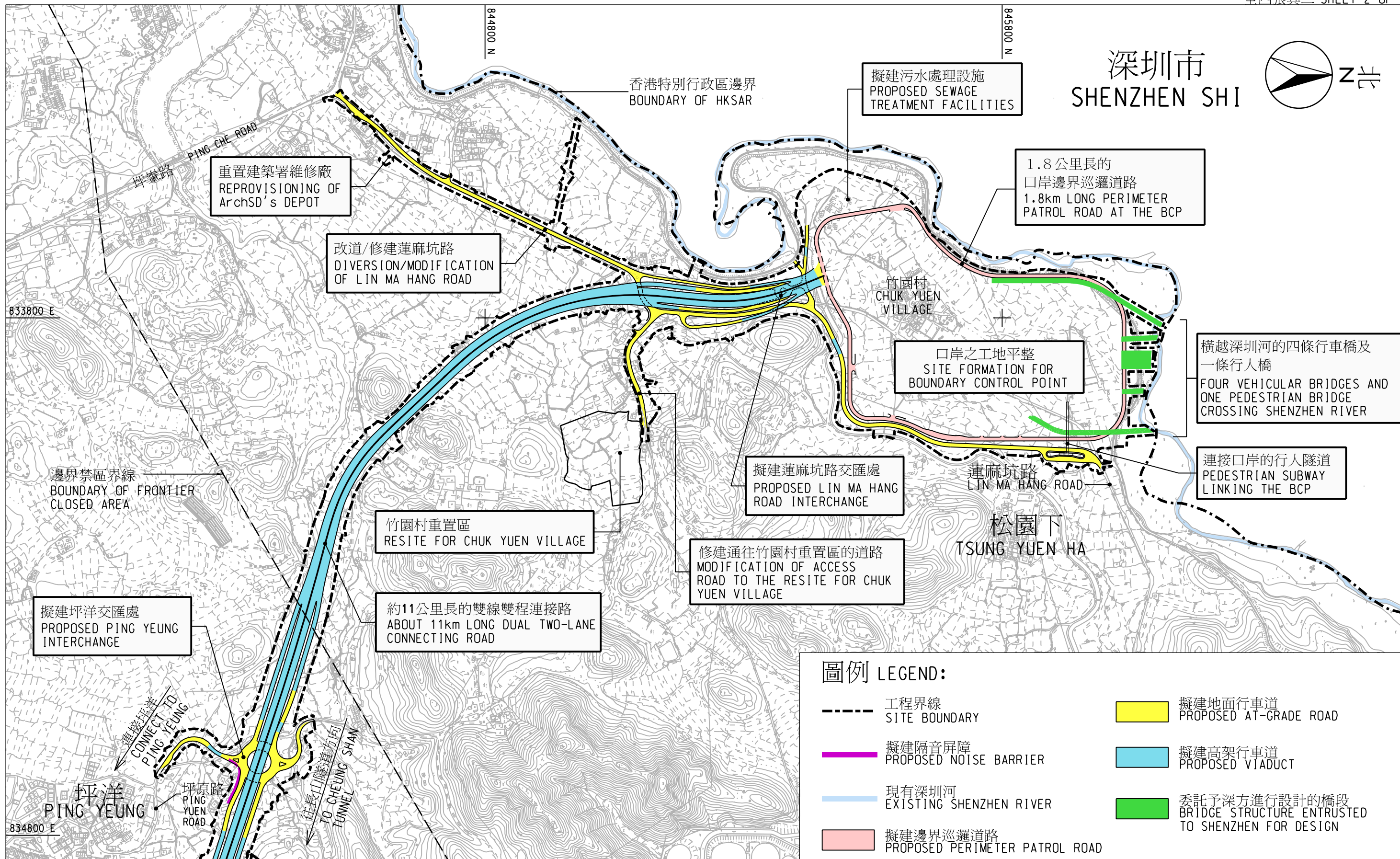
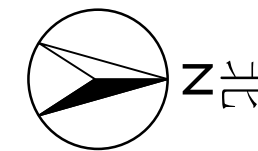
drawing title 圖則名稱

蓮塘/香園圍口岸與相關工程 - 擬建口岸及連接路之平面圖
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS
- LAYOUT OF THE PROPOSED BOUNDARY CONTROL POINT AND CONNECTING ROAD

drawing no. 圖則編號 scale 比例
BCP - 109 1 : 30 000



深圳市
SHENZHEN SHI



圖例 LEGEND:

- 工程界線 SITE BOUNDARY
- 擬建地面行車道 PROPOSED AT-GRADE ROAD
- 擬建隔音屏障 PROPOSED NOISE BARRIER
- 現有深圳河 EXISTING SHENZHEN RIVER
- 擬建邊界巡邏道路 PROPOSED PERIMETER PATROL ROAD
- 擬建高架行車道 PROPOSED VIADUCT
- 委託予深方進行設計的橋段 BRIDGE STRUCTURE ENTRUSTED TO SHENZHEN FOR DESIGN

drawing title 圖則名稱

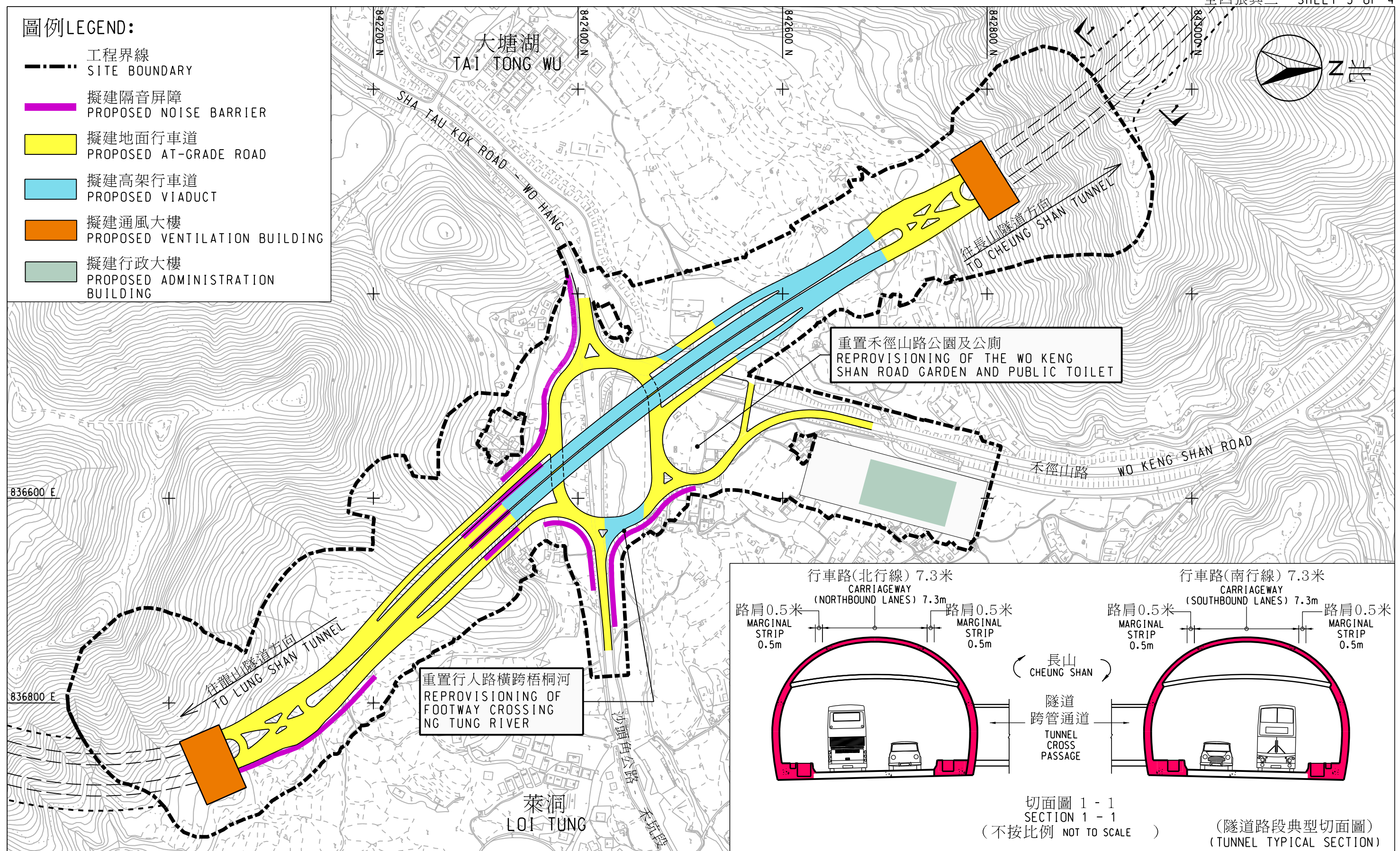
擬建蓮塘/香園圍口岸工地平整及相關連接路
PROPOSED SITE FORMATION FOR LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT
AND ASSOCIATED CONNECTING ROAD

drawing no. 圖則編號
BCP - 110
scale 比例
1 : 7 000



圖例LEGEND:

- 工程界線
SITE BOUNDARY
- █ 擬建隔音屏障
PROPOSED NOISE BARRIER
- █ 擬建地面行車道
PROPOSED AT-GRADE ROAD
- █ 擬建高架行車道
PROPOSED VIADUCT
- █ 擬建通風大樓
PROPOSED VENTILATION BUILDING
- █ 擬建行政大樓
PROPOSED ADMINISTRATION BUILDING



drawing title 圖則名稱

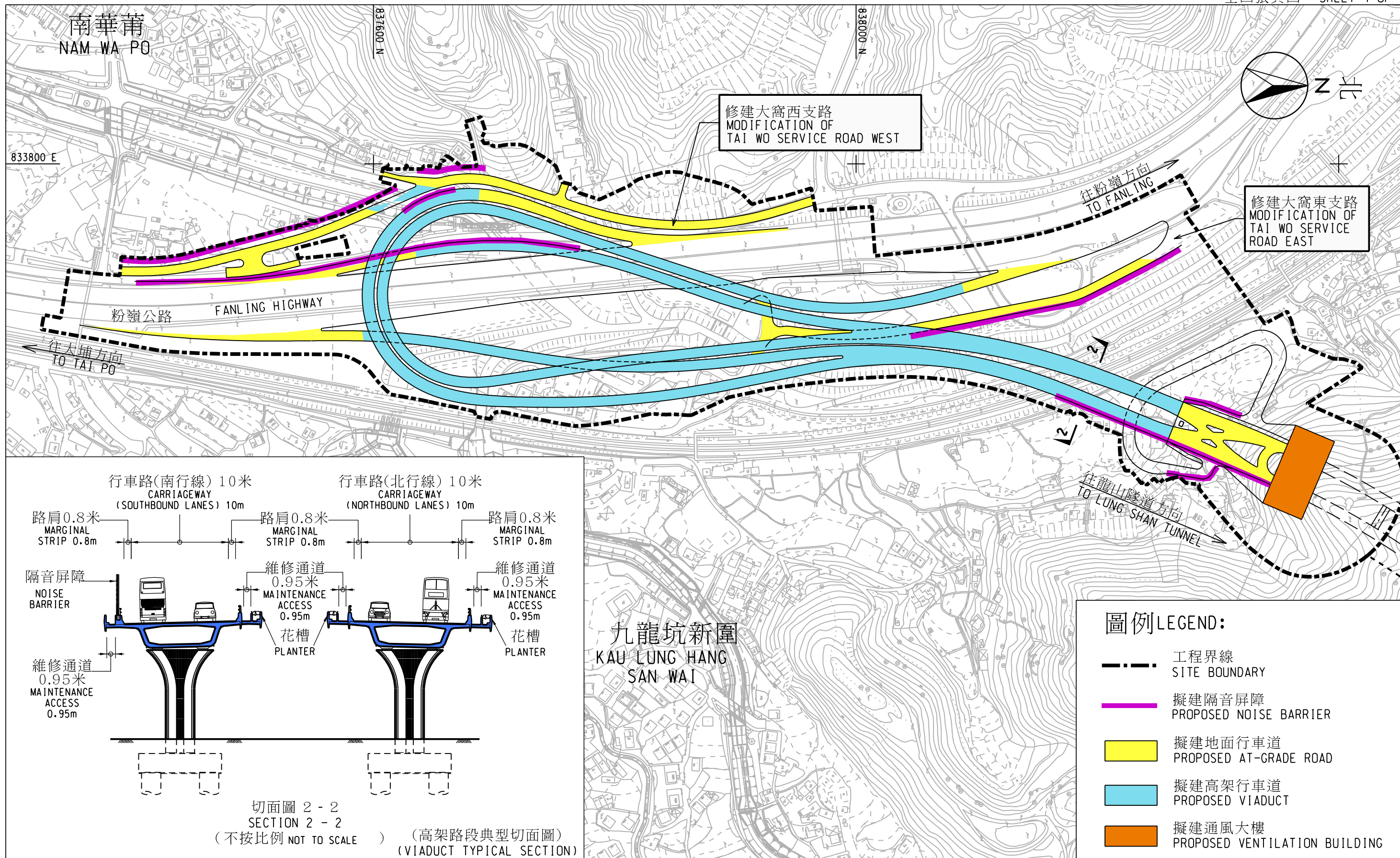
擬建沙頭角公路交匯處

PROPOSED SHA TAU KOK ROAD INTERCHANGE

drawing no. 圖則編號
BCP - 111

scale 比例
1 : 3 500





drawing title 圖則名稱

擬建粉嶺公路交匯處
PROPOSED FANLING HIGHWAY INTERCHANGE

drawing no. 圖則編號

BCP - 112

scale 比例

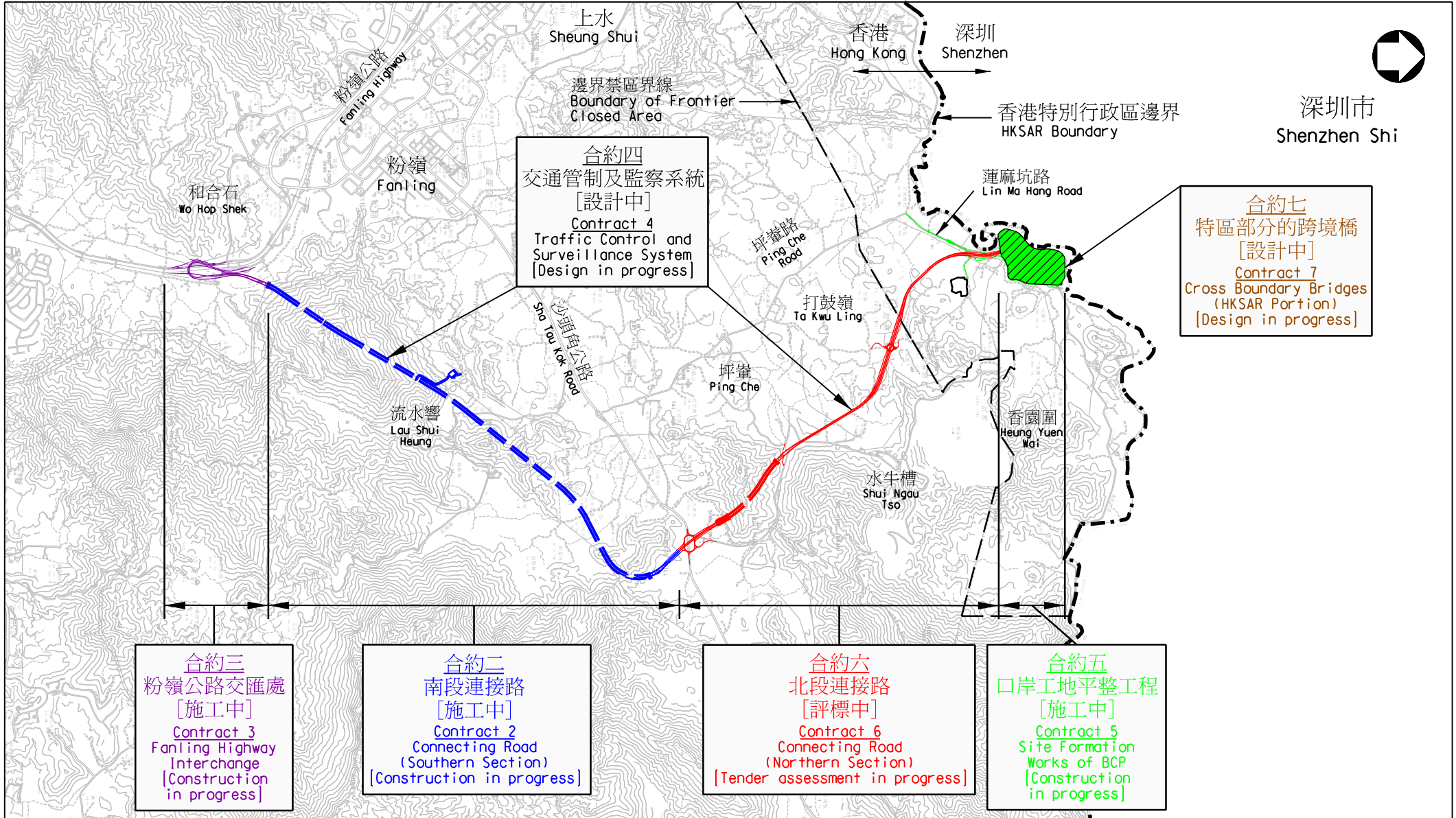
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CIVIL ENGINEERING
AND DEVELOPMENT
DEPARTMENT
HONG KONG



深圳市
Shenzhen Shi



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]

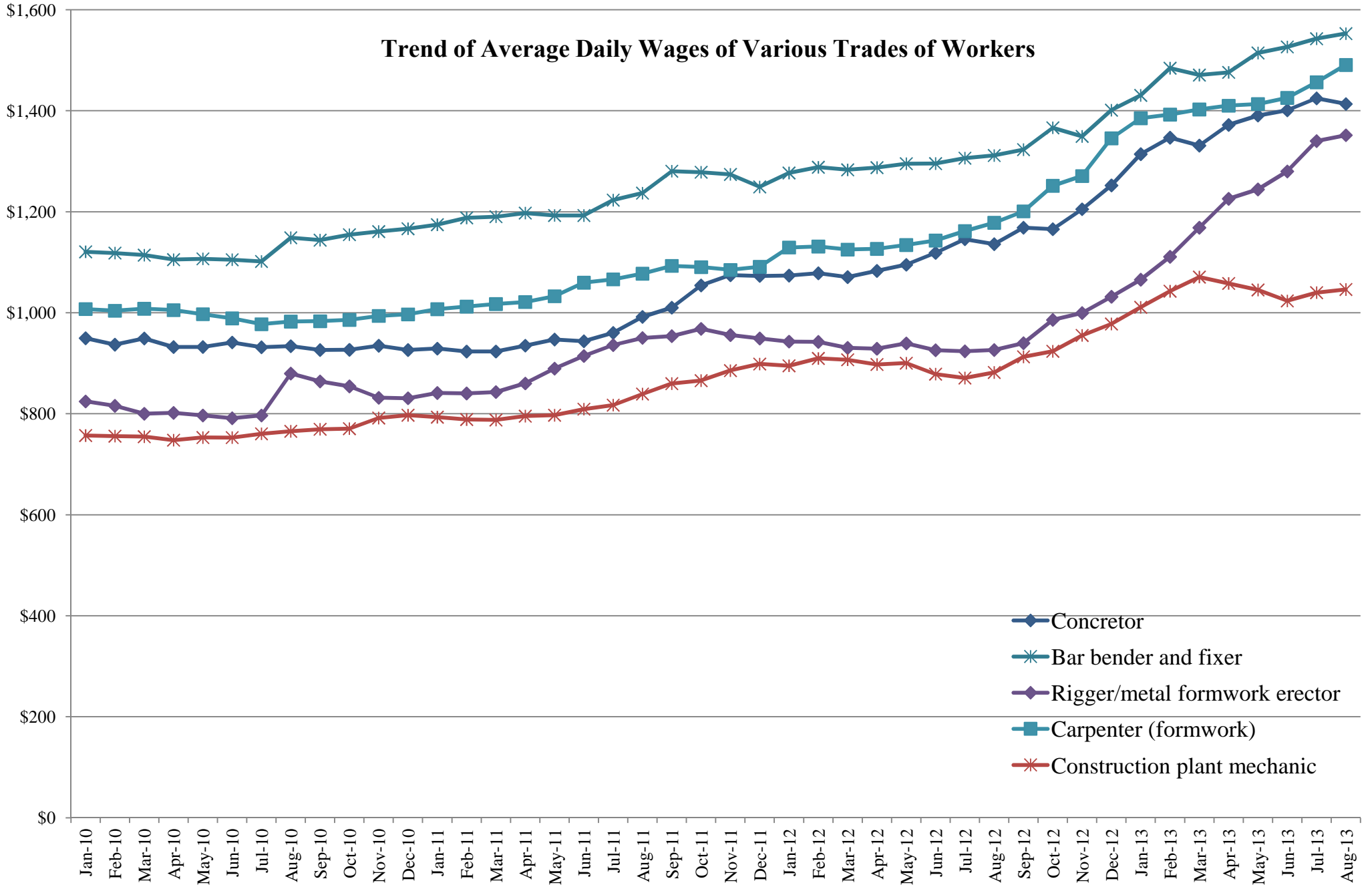
合約五
口岸工地平整工程
[施工中]
Contract 5
Site Formation
Works of BCP
[Construction
in progress]

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	

Trend of Average Daily Wages of Various Trades of Workers



Average Daily Wages of Various Trades of Workers

Trade	8/2010 (\$/day)	8/2011 (\$/day) [%increase per year]	8/2012 (\$/day) [%increase per year]	8/2013 (\$/day) [%increase per year]
(a) Concretor	934.0	991.9 [6.2%]	1,136.0 [14.5%]	1,413.5 [24.4%]
(b) Bar bender and fixer	1,148.6	1,237.0 [7.7%]	1,311.5 [6.0%]	1,552.9 [18.4%]
(c) Rigger/metal formwork erector	879.7	950.2 [8.0%]	926.4 [-2.5%]	1,351.6 [45.9%]
(d) Carpenter (formwork)	982.7	1,077.4 [9.6%]	1,178.3 [9.4%]	1,490.7 [26.5%]
(e) Construction plant mechanic	765.4	839.2 [9.6%]	881.9 [5.1%]	1,046.2 [18.6%]

**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 2014 prices) ^^ b	Latest price adjustment factors (October 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	503.9^	597.7^	1.00000	597.7^		
2014-2015	1,270.0	1,506.5	1.00000	1,506.5	e = d – a	f = e - A
2015-2016	2,091.6	2,481.0	1.06000	2,629.9		
2016-2017	3,828.4	4,541.2	1.12360	5,102.5		
2017-2018	4,188.8	4,968.7	1.19102	5,917.8		
2018-2019	3,030.2	3,594.4	1.26248	4,537.9		
2019-2020	1,822.3	2,161.6	1.32876	2,872.2		
2020-2021	1,092.8	1,296.3	1.39519	1,808.6		
Total	17,828.0	21,147.4		24,973.1	7,145.1	3,324.0

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.

- ## Price adjustment factors adopted in October 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.
- ^ \$503.9 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 1.18620 for conversion to September 2014 prices. The figure of 1.18620 represents the changes in price movement for public sector building and construction output between September 2011 and September 2014.

Annex E

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

Comparison between Approved Project Estimate 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) Reprovisioning 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	1,465.3	335.3
Sub-total	12,432.1	17,828.0	5,395.9
	(in September 2011 prices)	(in September 2011 prices)	
(o) Provision for price adjustment	3,821.1	7,145.1	3,324.0
Total	16,253.2	24,973.1	8,719.9
	(in MOD prices)	(in MOD prices)	

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 Cppgz.

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 condition 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 \$335.3 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 \$3,324.0 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 cash flow and the increase of the latest price adjustment factors.

**Responses to Members' queries at the
Public Works Subcommittee meeting on 9 January 2015**

(a) Justifications and economic benefits for the implementation of the Liantang/Heung Yuen Wai Boundary Control Point (LT/HYW BCP)

Currently, cross-boundary traffic using the two BCPs on the eastern side of the New Territories at Man Kam To (MKT) and Sha Tau Kok (STK) to eastern Shenzhen (SZ) and Guangdong has to travel through busy local roads in Hong Kong (HK) and SZ before joining the respective highway systems. Due to physical constraints, the existing MKT and STK BCPs could not be expanded to meet the anticipated future demand for cross-boundary traffic. The LT/HYW BCP will help re-distribute the cross-boundary traffic amongst the crossings in the east and greatly enhance the overall handling capacity of the BCPs at the eastern side of HK and SZ.

The LT/HYW BCP was designed to handle 30 000 passenger trips and 17 850 vehicle trips daily. The latest assessment indicates that the forecast daily passenger and vehicle trips using the LT/HYW BCP would fully utilize the LT/HYW BCP by 2030.

The proposed LT/HYW BCP will directly connect with the Shenzhen Eastern Corridor in SZ and will provide an access to eastern Guangdong via the Shenzhen-Huizhou and Shenzhen-Shantou Expressways. This will significantly shorten the travelling time between HK/SZ and eastern Guangdong (e.g. the travelling time from Longgang district in SZ to Tai Po in HK will be reduced from the current 50 minutes to within 30 minutes with the commissioning of the LT/HYW BCP), and greatly facilitate future regional cooperation and development. The LT/HYW BCP will facilitate people and cargo movement, and will play a strategic role in supporting our long-term economic growth.

At a local level, the new connecting road to be constructed will link up the proposed LT/HYW BCP with Fanling Highway, improving the existing road network in the North District as a whole.

We have reviewed and updated the quantifiable benefits¹ of the LT/HYW BCP project, which amounts to be about \$64 billion at 2014 prices over a 32-year period (from 2018 to 2050). This outweighs the total construction cost of all the LT/HYW BCP related projects estimated to be around \$30 billion at the same price level.

¹ We provided the same information to the Panel on Development on 20 November 2012 in response to members' request raised at the Panel on Development meeting on 30 October 2012. At that time, we estimated that the quantifiable benefits on the HK side on savings in vehicle operation costs and value of time saved for travellers over a 32-year period (from 2018 to 2050) would be about \$50 billion at 2010 prices.

(b) Traffic implications to Fanling Highway for the implementation of the LT/HYW BCP

In planning the development of the LT/HYW BCP, the Government has taken into account the need to improve the road network in the North District. Having regard to the results of the traffic impact assessment carried out for the LT/HYW BCP, the Government has, in addition to constructing a connecting road to provide a direct access to the BCP, commenced the works for widening the relevant part of Fanling Highway from a dual 3-lane to a dual 4-lane carriageway near the interchange with the connecting road. Upon completion of the widening works, the most critical section of the Fanling Highway is able to cope with the additional traffic generated by the cross-boundary traffic from the LT/HYW BCP and the associated connecting road, and the corresponding volume to capacity (v/c) ratio² will be 1.04 during the morning peak in 2031, which is considered acceptable.

² The v/c ratio is an indicator which reflects the performance of a road. A v/c ratio equal to or less than 1.0 means that a road has sufficient capacity to cope with the volume of vehicular traffic under consideration and the resultant traffic will flow smoothly. A v/c ratio above 1.0 indicates the onset of congestion; that above 1.2 indicates more serious congestion with traffic speeds deteriorating progressively as a result of further increase in traffic.