Planning Study on Liantang/Heung Yuen Wai Cross-boundary Control Point and its Associated Connecting Road in Hong Kong

Executive Summary

Ove Arup & Partners Hong Kong Ltd
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1 INTRODUCTION

1.1 Background

Currently, the overall distribution of cross-boundary vehicular traffic is mainly concentrated in the western part of the territory through the Shenzhen (SZ) Bay Port and Lok Ma Chau (LMC) boundary control point (BCP). In the east, the Man Kam To (MKT) and Sha Tau Kok BCPs could hardly meet the expectations of travelling convenience and comfort. Improvement to these two BCPs is constrained by lack of space in the BCPs and their associated connecting roads on both Hong Kong (HK) and Shenzhen (SZ) sides. Traffic congestion at MKT BCP also affects local traffic on MKT Road.

According to the SZ Comprehensive Plan (深圳市城市總體規劃) (1996-2010), an area of 12.3 hectares in Liantang (LT), which is opposite to Heung Yuen Wai (HYW) in HK, was reserved for BCP development. The proposed BCP will directly link up with a proposed expressway, the Eastern Corridor (東部過境通道), to the eastern part of the Guangdong (GD) Province (including Huizhou, Shantou, Shanwei) and the adjacent Provinces like Jiangxi and Fujian via Shenzhen-Huizhou (深惠高速) and Shenzhen-Shantou (深汕高速) Expressways. The BCP together with the Eastern Corridor serves to realise SZ’s transport planning principle of “East in-East out” (東進東出) for cross-boundary goods vehicular traffic. The Eastern Corridor is scheduled for completion in 2011 and will be connected to MKT BCP direct in the interim stage before the new BCP in LT is not yet in place.

A well-planned system of cross-boundary transport infrastructure is essential for long term economic growth of HK and SZ and further regional co-operation. Hence both the HK Special Administrative Region Government (HK Government) and SZ Municipal People’s Government (SZ Government) in December 2006 jointly commissioned a planning study, namely “Preliminary Planning Study on Developing Liantang/Heung Yuen Wai Control Point” (深港興建蓮塘/香園圍口岸前期規劃研究)(Joint Study). The Joint Study aims to explore the need, function and benefits of a new BCP in LT/HYW from a strategic perspective. In January 2007, the Planning Department of the HK Government assigned
Arup to carry out a study (Study) to look into, on the HK side, various impacts of the new BCP and its associated connecting road.

1.2 Study Objectives

Based on the recommendations of the Joint Study, the Study aims to:

(a) recommend a suitable and feasible layout for the BCP on the HK side having taken account of the operational requirements and constraints in the area;

(b) recommend a preferred alignment for the connecting road on the HK side;

(c) assess the sustainability of the preferred options for the BCP and connecting road having broadly assessed their various impacts; and

(d) study the feasibility of improving MKT Road to accommodate the forecast cross-boundary traffic before the new BCP is operational.
THE BOUNDARY CONTROL POINT

2.1 Major Recommendations of Joint Study

2.1.1 The Need

The Joint Study confirms the need for a new BCP in LT/HYW for the long-term development of HK and SZ.

2.1.2 Function of New BCP

The Joint Study recommends that the new BCP will serve the cross-boundary goods vehicles and passengers travelling between HK and SZ east, the eastern part of GD and other adjacent Provinces like Jiangxi and Fujian. Goods vehicles delivering fresh produce, livestock and poultry will continue to use MKT BCP.

2.1.3 Design of New BCP

Customs, immigration and quarantine facilities of HK and SZ will be accommodated in a two-storey structure within their respective territory. An integrated passenger hall over the SZ River is proposed to maximize crossing convenience for passengers. Besides, the new BCP will be of two-storey to minimize land requirement. Detailed design will be further studied at the next stage.

2.1.4 Traffic Forecast

It is estimated in the Joint Study that in 2030, there will be about 20,600 vehicular trips and 30,700 passenger trips using the new BCP a day. Table 2.1 below shows the breakdown of the figures.

Table 2.1 LT/HYW BCP Cross-boundary Traffic Forecasts in 2030

<table>
<thead>
<tr>
<th>Daily No. of Vehicles</th>
<th>Daily No. of Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>Bus / Coach</td>
</tr>
<tr>
<td>2030 Projections 2,400</td>
<td>800</td>
</tr>
<tr>
<td>Total</td>
<td>20,600</td>
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2.2 Consideration of New BCP Layout on HK Side

2.2.1 Operational Requirements

It is crucial that the BCP design needs to meet the operational requirements. The internal traffic flows and location of all the necessary facilities should avoid unauthorized access
and maximize the efficiency of operation. Hence a more compact design is always recommended for a BCP. **Diagrams 2.1 & 2.2** below show the preferred processing workflow.

**Diagram 2.1 Workflow for Processing of Goods Vehicles**
The following are the key considerations in accommodating the BCP facilities:

- for processing of goods vehicle, the 3 necessary components, namely the Vehicle Holding Area (VHA), processing kiosks and the cargo examination area for outbound goods vehicles must be arranged in a sequence for efficient circulation. It should also be able to allow selected vehicles for secondary examination;

- cargo examination area on each bound must not be separated. The search platform area of different operational departments should be close to each other, facilitating efficient and smooth communication between operational departments and traffic circulation;

- processing kiosks should be close to the operational departments’ offices;

- for processing of passengers, loading/unloading area for coaches should be located at the same level as the passenger hall;

- PTI should be located with easy access to the passenger hall; and
• provision of an integrated passenger hall building over the SZ River to minimize the walking distance for passengers.

2.2.2  Key Site Constraints

Consideration should also be given to the following constraints in the area (Figure 1):

• configuration of BCP site on the SZ side;

• avoid disturbance to existing graves, permitted burial ground, fung shui woodland, historical/cultural structures as far as practicable;

• minimize impacts on the existing recognized villages like Chuk Yuen, Tsung Yuen Ha, Heung Yuen Wai and Ha Heung Yuen in the area;

• SZ River which is subject to improvement works;

• consultation zone of the North East New Territories Landfill in the southeast;

• the historical structure, Macintosh Fort at Pak Fu Shan in the northeast; and

• the need to maintain the only access road, Lin Ma Hang Road in the area.

2.2.3  BCP Layout

Different layout options for the BCP have been examined and assessed. The recommended option is a compact and coherent BCP layout with a two-storey structure, which would basically address all the potential environmental and operational problems (Figures 2 to 4). It provides a larger separation between the BCP and the villagers in the area, thus resulting in less environmental nuisances, minimizes land requirement, and involves less vegetation clearance and slope cutting. The compact layout also makes the operation of the BCP more efficient and effective. However, it requires resumption and resite of an indigenous village, Chuk Yuen Village (竹園).

The current location of Chuk Yuen Village is the result of relocation after some serious floods in the 1970s. Unlike some other villages in the area, such as HYW or Tsung Yuen Ha, neither cultural/historic heritage nor fung shui woodland has been identified in the village.
Another option, which does not require resumption of village, has been considered. However, under this option, the BCP facilities have to spread out through a narrow corridor between village environs of the two existing indigenous villages, namely Chuk Yuen Village in the west and Tsung Yuen Ha in the east (Figure 5). Under this option, the BCP will require additional 3 hectares of land, involves more slope cutting and vegetation clearance. Under such a constrained BCP layout, the consequent separation between village houses of Chuk Yuen Village and the BCP facilities will be less than 50m. Villagers will therefore be subject to potential air, noise and glare nuisances arising from the operation of the BCP. One possible option to mitigate the potential nuisances is to construct a concrete boundary wall up to 6m above the existing ground between the BCP and villagers of Chuk Yuen Village. This option is also not preferred on security and operational grounds as the BCP facilities will spread over an extensive area.

2.3 Design Concept

2.3.1 Lower Floor

The lower floor will serve goods vehicular traffic. It occupies about 18.3 hectares and consists of facilities for goods vehicles including VHA, processing kiosks, and inspection facilities and offices for operational departments. It also accommodates a public transport interchange (PTI) of about 8100m², which is located underneath the integrated passenger hall building. The size of the PTI will be subject to further study. In addition, a holding area for public transport vehicles is also proposed. Details of public transport services to be provided will be examined in the detailed engineering study at the next stage.

2.3.2 Upper Floor

The size of this floor is only one-fourth of the total area of the lower floor (about 4.6 hectares). It comprises the integrated passenger hall building over the SZ River, processing kiosks for coaches and private cars, loading/unloading bays for coaches. Escalators, lifts and staircases will be provided for passengers’ movement to and from the PTI.
Flexibility has been given to the proposed layout to cater for future modification of services for passengers and passenger vehicles, which will be decided in the detailed engineering study at the next stage.

2.3.3 Improvement Works to Shenzhen River

The proposed BCP is located immediately to the south of the existing SZ River, which is still retained as a natural stream. The improved SZ River only covers the lower section up to its confluence with Ping Yuen River in the east. The new BCP development may bring about changes to the drainage and flood protection requirements of the river. Besides, the future alignment of the improved river may have implications on the BCP layout including the location and design of the integrated passenger hall building and connecting bridges. A reserved area of 60m in width is therefore proposed for future river improvement works. To optimize the BCP layout, well co-ordination between the BCP layout design and the implementation of the river improvement works is required.
3 TRAFFIC IMPACT ASSESSMENT

3.1 Assessment

A traffic impact assessment has been undertaken to appraise the impact on the total territorial cross-boundary traffic with the commissioning of the new BCP; identify different alignment options for the connecting road and assess the impacts under different options with a view to recommending a preferred alignment option for the connecting road.

A strategic transport model was developed to provide the traffic volume forecasts for the strategic highways and major distributor roads. A regional district highway assignment model was also developed to assess the traffic impact of the new BCP on the local road networks in Sheung Shui and Fanling.

3.2 Major Findings

The commissioning of the new BCP will not change the pattern of trip end distribution in HK but it will divert about 17% of the total cross-boundary vehicular traffic from other BCPs. In 2006, vehicular traffic flow of LMC BCP contributed to about 76% of the total cross-boundary traffic. It is estimated that the new BCP will help re-distribute the cross-boundary traffic more evenly. The projected daily vehicular trips are about 17,000 in 2020 and will increases to about 20,600 in 2030.

Currently, Lin Ma Hang Road is the only road serving the area. It joins Ping Che Road in the south and MKT Road in the west. To cater for the future cross-boundary traffic from the BCP, a new dual 2-lane trunk road is required to link up the new BCP to the other parts of the territory.
4 THE NEW CONNECTING ROAD

4.1 Alignment Options

In order to explore a preferred alignment option of the connecting road, options running in various directions have been identified. Having broadly examined their impacts in different aspects, three alignment options in the central, eastern and western directions were finally shortlisted for further assessments (Figure 6).

Comparing and evaluating the performance on planning and land, environment, transport, local community, and also their performance in costs, implementation programme and engineering aspects, the alignment in the eastern direction linking the new BCP with the Tolo Highway via Fanling Highway is recommended.

The new road provides sufficient capacity to meet the long-term cross-boundary traffic demand from the new BCP. No adverse traffic impact on the strategic highways and local roads in the North District is identified. The proposed alignment option will also help improve and enhance the overall transport network in the eastern part of the territory and provide a convenient access to the proposed Ping Che and Ta Kwu Ling New Development Area (NDA).

4.2 New Connecting Road

The new dual 2-lane trunk road is about 10 km in length, comprising 3 sections of tunnel (about 3.5 km) and viaduct (about 6.5 km). It will lead traffic from the new BCP to existing Fanling Highway near Wo Hop Shek. In order to minimize its impacts on the local area, 3 sections of tunnel are proposed.

Detailed engineering study will be carried out to ascertain the technical details and implications.
5  LAND USE PLANNING & LAND IMPACTS

5.1  Impacts on Existing & Planned Land Uses

The proposed BCP is within the Frontier Closed Area (FCA), which is currently not covered by any statutory outline zoning plan. The BCP development including the diversion of Lin Ma Hang Road and the provision of works area will require clearance and resumption of total 27.7 hectares of area to the west of Kong Yiu Drainage Channel, in which 18.3 hectares are private land. It is anticipated that with the development of the BCP and its associated connecting road, the character of the area will change. The connecting road alignment has been designed to minimise disturbance to the existing and planned land uses, but it is inevitable that some of the land uses will be affected. The connecting road will encroach on various land use zonings including “Government/Institution or Community”, “Recreation”, “Agriculture” and “Green Belt”. It is also in close proximity of some “Village Type Development” zones and an “Open Storage” zone in Ping Che and Ta Kwu Ling. The connecting road will also be in conflict with some permitted burial grounds on Lung Shan, Lau Shui Heung, Tei Leng Pei, Sze Tei Shan and Cheung Shan. The land affected by the new connecting road will be subject to detailed engineering study at the next stage.

5.2  Frontier Closed Area & New Development Areas

In the Study, the alignment and linkage of the connecting road are recommended with due considerations given to the on-going studies on FCA and NDAs. At the next stage of the project, the proper coordination between the detailed design of the BCP and other relevant on-going studies shall continue.
6  BROAD ENVIRONMENTAL ASSESSMENT

6.1 Assessment

Broad environmental assessment on ecology, cultural heritage, air quality, noise and river water quality have been conducted. Environmental impacts during construction stage have also been assessed.

6.2 Ecology

The overall ecological impacts of the new BCP are insignificant with mitigation measures properly in place. The moderate to high ecological impacts from the connecting road could be mitigated by suitable mitigation measures, such as compensatory planting of woodland. With such mitigation measures in place, the residual impacts would be low to moderate. Detailed ecological and landscape impacts assessment should be carried out at the next stage of the project.

6.3 Cultural Heritage

The proposed location of the BCP is not situated in the vicinity of any known archaeological sites. A cultural heritage impact assessment should be conducted at the next stage to identify any unknown archaeological sites and built heritage resources.

6.4 Air Quality

Idling emissions from the goods vehicles in the BCP is the major concern. With optimization of layout and the road alignment design, the new BCP layout and its connecting road are environmentally acceptable.

6.5 Noise

Office buildings in the BCP will provide noise screening effect to the sensitive receivers nearby, resulting that the predicted noise level during operation will be within the acceptable noise level. The connecting road would be environmentally acceptable with noise mitigation measures.
6.6 River Water Quality

With proper treatments and discharge of sewage generated from the site, significant river water quality and odour impact is not expected.

6.7 Follow-up Works

The broad assessment concludes that with the implementation of effective control and mitigation measures, environmental impacts of the new BCP and its connecting road could be appropriately controlled to meet the established criteria. Detailed environmental assessments to meet the requirements of the Environmental Impact Assessment Ordinance should be conducted at the next stage.
7 ASSESSMENT ON OTHER ASPECTS

7.1 Geotechnical Assessment

The preliminary geotechnical assessment initially identifies thirty existing geotechnical features that may affect or be affected by the new BCP and connecting road. However, as the past ground investigation records within the project area are fairly limited, a comprehensive ground investigation and detailed geotechnical assessment and further investigation at the detailed design stage will be required to reveal the ground conditions and to assess the geotechnical risks and constraints within the project area. As the new BCP is located within a relatively flat alluvial plain, no natural terrain hazard study (NTHS) is required. However, as some NTHS catchments have been identified along the proposed connecting road alignment, detailed NTHS including recommendations on the necessary hazard mitigation measures will be required. The proposed three tunnel sections also require comprehensive geotechnical assessment for the tunnel works to identify the geotechnical risks and constraints.

7.2 Impacts on Drainage and Watermains

Currently, the concerned section of the SZ River at the BCP is a natural river course. The improvement works to the SZ River only covers the lower section up to its confluence with Ping Yuen River near Lo Shue Ling. It is expected that improvement works to the upper section will follow to cater for the future development on both HK and SZ sides. The proposed BCP may bring about changes to the drainage and flood protection requirements of the SZ River. As the river improvement works would constrain the design and development of BCP, a reserve area (60m in width) for future river improvement works starting from its confluence of Ping Yuen River up to eastern end of the BCP (about 4km) is proposed. Besides, the proposed road alignment will also affect some of the existing watermains and may require temporary or permanent diversion. For the new connecting road, it will run through the tunnel, viaduct and at grade and cross a trained section of Ng Tung River and also tributary of Ping Yuen River. These crossings will be designed as bridge crossings with no piers located within channel/stream course. Therefore, proposed alignment will not cause any adverse impact to the capacity of existing channel/stream.
7.3 Sewage Collection, Treatment and Disposal

Two sewage treatment options for the BCP were proposed in the Study: (1) convey sewage from the BCP site to Shek Wu Hui Sewage Treatment Works in Sheung Shui by upgrading/laying pumped main along Lin Ma Hang Road and MKT Road; (2) construct a tertiary treatment works to treat sewage from the BCP site. The assessment concludes that an onsite sewerage treatment facility providing a tertiary level treatment works will be required to treat the sewage from the new BCP so as to reduce the environmental impact and to comply with no net increase requirement in Deep Bay.

7.4 Other Aspects

The new BCP will require fresh water supplies, electricity, gas and communications services. These services can be laid underground along Lin Ma Hang Road with connections at Ping Che Road. This section of Lin Ma Hang Road will also be upgraded or widened.
8 BROAD SUSTAINABILITY ASSESSMENT

8.1 Assessment

A broad sustainability assessment on environmental, social and economic impacts has been conducted, with a view to analysing the sustainability implications of the preferred options for the new BCP and its connecting road.

8.2 Findings

The new BCP helps improve mobility and brings positive impacts to the economy. The new connecting road does not impose any insurmountable impacts on the area. The proposed improvement works of the SZ River will also benefit the area in the long run.

However, the BCP development will cause changes to the existing rural character and potential adverse impacts on the environment, natural resources and cultural vibrancy. As the proposed BCP layout will require clearance and resite of Chuk Yuen Village, effects on the local community are anticipated. With improved accessibility and better local services, property price in the area would increase.

It is anticipated that with proper resettlement arrangement, and re-provisioning of facilities at the village resite, the extent of impact on village displacement is considered acceptable. Potential environmental impacts like air quality and noise pollution problems can be mitigated. The overall sustainability of the project should be assessed in greater details at the next stage.
9 BROAD COST ESTIMATES

The total cost of the proposed development including the BCP, connecting road, SZ River improvement works and land resumption and clearance is about HK$9.6 billion. A summary of the cost estimates is shown in Table 9.1.

Table 9.1 Summary of Cost Estimates

<table>
<thead>
<tr>
<th>Costs</th>
<th>Million HKD</th>
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<tr>
<td>Capital Costs for Connecting Road &amp; Civil Works for BCP</td>
<td>6100</td>
</tr>
<tr>
<td>Capital Costs for BCP Building &amp; Associated Works</td>
<td>1900</td>
</tr>
<tr>
<td>River Training Works</td>
<td>600</td>
</tr>
<tr>
<td>Land Clearance &amp; Compensation</td>
<td>1000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9600</strong></td>
</tr>
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10 IMPLEMENTATION

It is estimated that further studies and assessments for the new BCP and connecting road will be completed by 2014 and the construction work will be completed by 2018.
11 STUDY ON MAN KAM TO ROAD IMPROVEMENT

The SZ Government has indicated that if there is no new BCP on the HK side, the Eastern Corridor will be connected to the MKT BCP. The following is the assessment on the potential impacts on the existing MKT Road and the associated road network.

11.1 Existing Queuing Problems on Man Kam To Road

Further improvements to the MKT BCP is constrained by lack of space and capacity of connecting road on both HK and SZ sides, in particular, the limited VHA at the Wenjindu BCP on the SZ side. This has resulted in queuing of goods vehicles on the northbound slow lane of MKT Road, extending from the BCP to Sheung Shui town and sometimes further extending to the Fanling Highway Interchange (up to 2km from the BCP). The traffic queue has caused disruption to the local traffic and in turn, hinders the normal performance of road junctions.

11.2 Findings and Recommendations

Unless there are parallel improvements to the handling capacity of Wenjindu BCP on the SZ side, the queuing problem on MKT Road cannot be resolved simply by road widening or provision of additional VHA. Besides, such improvement schemes will also cause potential adverse air quality impacts on the sensitive receivers on MKT Road.

However, it should be noted that the opening of the SZ Bay Port has, to some extent, been helping re-distribute the overall cross-boundary traffic and the queuing problem at MKT BCP has become less frequent. The situation is expected to continue to improve should the users be more familiar with the new routing. Ultimately, with the implementation of the new BCP, it is anticipated that the overall handling capacity of BCPs in the east will be enhanced and the queuing problem will be relieved. It is suggested that the HK Government should keep close liaison with the SZ side to implement traffic management measures if necessary before the completion of the new BCP scheduled for 2018.
12 CONCLUSION & RECOMMENDATIONS

Based on the recommendations from the Joint Study, a preferred layout option for the BCP on the HK side has been drawn up (Figure 7). Broad assessment of the proposed layout has confirmed that it could meet the operational need and would be able to address the environmental and technical issues. The proposed connecting road alignment is selected from various options having taken into account site constraints, engineering feasibility, costs and programme, as well as results of the broad assessments in the sustainability, environmental, ecological, land use planning, traffic, socio-economic, archaeological, geotechnical, sewerage and drainage aspects. The Study has suggested that should the project be taken forward, the detailed engineering study at the next stage should consider the various issues below.

12.1 Interfacing with Other Projects

Widening of Tolo Highway/Fanling Highway

Detailed design of widening existing dual 3-lane section of Tolo Highway, between Island House Interchange in Tai Po and Wo Hop Shek Interchange in Fanling, to dual 4-lane arrangement is currently in progress. A review of the proposed interchange and connection design for the proposed connecting road to tie in with the widening works will be required.

Studies on New Development Areas and Frontier Closed Area

The BCP and part of the connecting road is within the FCA while the Ping Che and Ta Kwu Ling NDA is located to the south of the connecting road. Currently, the Study “Land Use Planning for the Closed Area”, which aims to examine the development potential and constraints of the areas to be released from the FCA, is being undertaken by the Planning Department. It is scheduled for completion in 2009. Besides, the “NENT NDA Planning and Engineering Study – Investigation” jointly commissioned by the Planning Department and Civil Engineering and Development Department commenced in June 2008 and seeks to propose a development plan for the area. The study is scheduled for completion in late 2010. The proposed BCP development may generate land use demand for supporting facilities like carpark and storage yard/warehouse in the area. On the other hand, detailed
design of the connecting road shall need to take account of the future land uses of the Ping Che and Ta Kwu Ling NDA and possible connection to it. Hence well co-ordination of these studies is required.

12.2 Further Assessments

The following further assessments should be conducted at the next stage:

**Environmental Impacts Assessment (EIA)**

Following review of the BCP design at the next stage, the EIA shall include air quality, water quality and noise impacts assessments to ensure the jointly designed BCP and connecting road are environmentally acceptable. A detailed heritage impact assessment and ecological and landscape impacts assessment shall also be conducted.

**Preliminary Design of Highway and Infrastructure Works**

Preliminary design including structural scheming, construction methods and maintenance issues for connecting road and other supporting infrastructure works should be carried out. With respect to the management and operation of road tunnels, it is recommended to assess the need of a road traffic management agency.

**Drainage & Sewerage Impacts Assessments**

The improvement of upper section of the SZ River shall be investigated as part of the detailed drainage impact assessment (DIA). The detailed DIA shall take into account various scenarios of project implementation, upstream and downstream constraints, foundation for connecting bridge, and other on-going projects. Besides, the alignment of the proposed connecting road will be designed to avoid diversion of the Dongjiang watermains.

For sewerage, it is proposed to identify and quantify source of effluent which is currently discharged into nearby stream in the further study. Apart from this, reuse of effluent shall be considered for various purposes such as flushing toilets, irrigation for landscaping etc. It is recommended to calibrate and verify the unit flow factors from the BCP development.
Ground Investigation

Ground investigation of the site is required to aid the preliminary design of BCP and associated connecting road and infrastructure works, in particular for the planning and design of tunnels and foundations. It is also suggested to carry out a comprehensive ground investigation and detailed geotechnical assessment to reveal the ground conditions and to assess the geotechnical risks and constraints.

Detailed Site Surveys

Detailed survey of the site and its land status is required for the design of BCP and connecting road, and also for the preparation of land status plans.

Detailed Sustainability Assessment

A detailed sustainability assessment would be required to confirm that the proposal is sustainable.

Village Resettlement

Clearance of Chuk Yuen Village is required for the BCP development. The resettlement arrangement and programme will directly affect the implementation programme of the project. Full consultation with the concerned villagers is necessary.

12.3 Joint Review with SZ

Joint Review of the Function & Design

Further review of the BCP layout including the design of the integrated passenger hall building should commence as early as practicable.

Operational Needs & New Requirements

Review and adjustment in the provision of facilities like the number of kiosks, loading/unloading area, operational hours etc. may be required in order to fulfill the latest operational needs, or new requirements that may arise.
Study on SZ River Improvement Works

As the future alignment of the improved SZ river will affect the design and layout of the BCP, the river improvement works should be packaged with the proposed BCP development. A 60m wide reserve zone is proposed for the river training works. Site investigation, design and construction for the river improvement works should be jointly agreed between both HK and SZ Governments. It is also preferable to confirm at an early stage the alignment of the improved river so as to optimise the design of the BCP including the integrated passenger hall building over the river.

Joint Investigation of MKT BCP

With respect to the queuing problem of goods vehicles on MKT Road northbound and completion of the Eastern Corridor before the completion of the new BCP, close liaison with SZ Government on the interim traffic management measures at the MKT BCP is recommended.
Proposed Heung Yuen Wai BCP - Lower Floor

Figure 3
Figure 5
Proposed Heung Yuen Wai BCP - Layout to Avoid Village Resumption

Legend
1. Passenger Hall at Upper Level
2. Cargo Examination Area
3. Processing Kiosks for Goose Vehicles
4. Vehicle Holding Area

- HK/SZ Administrative Boundary
- Village Enviro Boundaries
- Premixed Bitul Ground
- Main Drainage Watercourse
- Major Road Network

Proposed Shenzhen Liantang Boundary Control Point

Connecting Road to HVW BCP

Kong Yu Channel

Haung Yuen Wall

Heung Yuen Ha

Provisional

Macintosh Fort
Proposed Alignment Options

- Western Alignment Option
- Central Alignment Option
- Eastern Alignment Option
Legend
- - - HK/ZJ Border
- - - Revised Alignment Options
- - - Tunnel Section
- - - Frontier Closed Area
- - - Expressway
- - - Local Distributor roads
- - - Feeder Bypasses under Planning
- - - NENT NDAs under Planning

Heung Yuen Wai BCP and Connecting Road

Figure 7