2 PROJECT DESCRIPTION

2.1 Site Location

2.1.1 The proposed development under the Project includes the Western Coast Road (WCR), the Cross Bay Link (CBL), new developments at Town Centre South (TCS), Pak Shing Kok (PSK) and remaining areas of Tiu Keng Leng (TKL). The site areas comprise:

- WCR – the western shoreline of Junk Bay, Chiu Keng Wan Shan, Lei Yue Mun Road, Eastern Harbour Crossing ex-casting basin, Kaolin Mine Site at Cha Kwo Ling and Cha Kwo Ling Road;
- CBL – Junk Bay, land area south of TKO Area 86 and Wan Po Road;
- TCS – the newly reclaimed land south of Po Yap Road, Eastern Channel and the toe along TKO Stage 1 Landfill;
- TKL – the newly reclaimed land on the east of Ocean Shores (south of Chui Ling Road), Area 74 South (planned as district open space and school uses) and Area 73B West (planned as public housing development and a local open space); and
- PSK – the three large terraces on the east of TKO Stage 1 Landfill and Wan Po Road.

2.1.2 Other existing and planned land uses such as planned development above MTR station depot, TKO Industrial Estate, industrial uses in Area 137, etc, are not considered under this EIA study. Area 137 was originally a key element to be studied but taking account of the indefinite programme and commitment of the land uses, the study would not propose any recommendations for changes to the current adopted Layout Plan and approved Outline Zoning Plan (OZP). Under the approved OZP, Area 137 is currently planned for potentially hazard installation and Deep Water Front Industry.

2.1.3 A narrow strip of new land of approximately 12.3 ha will be formed along the western shoreline of Junk Bay to accommodate the toll plaza, the tunnel operation and management facilities, the interchange linking WCR with the CBL bridge and Road P2 to the north carrying traffic to TKO Town Centre. Based on the current design, there would be no reclamation required in the Victoria Harbour and no reclamation required for the new development at TCS.

2.2 Project Requirements, Scope and Benefits

Project Requirements

2.2.1 The Project is to review the overall planning for the TKO further development to take account of the recent changes in planning parameters and to ensure a comprehensive planning approach to the development of this area within the context of the South East New Territories Development Strategy.

2.2.2 The Project aims to formulate a comprehensive plan for the further development of TKO, covering TCS, PSK and the remaining area of TKL which will address all the issues arising from the development, and will integrate the new and existing/planned developments of the new town in a coherent manner.

2.2.3 The aim is to improve the overall design of the new town with the vision to build TKO into a new town that can boast of its convenience, vibrancy, distinctive urban design and quality living environment.
2.2.4 To support the further development of TKO, major highway infrastructure such as WCR and CBL are required. Optimum planning and engineering solutions for new development areas and major highway infrastructure elements must be found such that these together with the existing and planned developments in TKO, fit together in a coherent manner and provide for an optimum level of population and development.

Project Scope

2.2.5 The scope of the Project comprises:

(i) local road and engineering infrastructure for TCS, PSK and remaining areas of TKL;
(ii) local engineering infrastructure for the proposed recreational development at TKO Stage I Landfill;
(iii) modification of existing infrastructure to serve TCS development;
(iv) WCR to provide a linkage between TKO and the main urban area;
(v) CBL to provide a linkage between the western and south-eastern areas of TKO as well as a direct linkage from south-eastern areas of TKO to Kowloon via the WCR, bypassing the New Town Centre;
(vi) Road P2 to provide an extension of Po Shun Road to connect with WCR.

Project Benefits

2.2.6 The new planning has considered reduced residential density in TCS and the remaining area of TKL, use of TKO Stage I Landfill for leisure and recreation, extensive park developments and waterfront promenade providing a variety of open spaces and deletion of planned waterfront roads to create a traffic free pedestrian environment with easy access to bring people to the waterfront. The TCS development area provides opportunity to create a better living environment through good urban design planning with an attractive waterfront for the enjoyment of TKO residents. The Eastern Channel and Inner Junk Bay would be utilised for water recreation activities. More landscape open space in TKL will alleviate the impact of the surrounding high density environment.

2.2.7 The proposed WCR will serve as a relief to the existing TKO Tunnel as well as the existing TKO road network. The proposed CBL will provide the necessary relief to the existing Wan Po Road which is the only existing route linking south-east TKO including Area 86 development, TKO Industrial Estate and Area 137 development with the TKO Town Centre. It also diverts the industrial traffic away from the Town Centre.

2.2.8 The proposed Road P2, which is the southern extension of Po Shun Road, will connect with the WCR to bring the TKO Traffic to and from the Urban Area. Depressing of Road P2 adjacent to the existing development, Ocean Shores, has been explored firstly to reduce the possible adverse environmental impacts and secondly to provide a better linkage between Tiu Keng Leng and Town Centre South by making use of the depressed section of Road P2. This has taken into account that the original layout with a grade separated interchange and the Road P2 flyover in particular would pose serious traffic noise impact to the adjacent development and the extensive noise mitigation measures that envisaged along Road P2 flyover would create significant visual impact to the surrounding areas.

Consequences of Not Proceeding with the Project

2.2.9 Without the necessary local infrastructure to serve TCS, TKL and PSK, these development areas cannot be developed as now planned with reduced residential density and extensive park /waterfront promenade development. The land area will continue to be left vacant.
2.2.10 Without WCR and CBL, the traffic congestion envisaged at the existing TKO Tunnel and Wan Po Road due to the continual development of TKO cannot be relieved. The development potential of the south-eastern of TKO particularly Areas 87 and Area 137 is seriously constrained without these road infrastructure.

2.3 Consideration of Alternatives and Development of Preferred Option

Introduction

2.3.1 During the first phase of the study, the design of the Project has undergone a detailed evaluation of different alignments and form of structures for the WCR and the CBL, as well as alternative land use proposals for TCS and PSK to arrive at the optimum planning and engineering solutions which fit together in a coherent manner.

2.3.2 Public consultation was first held at the beginning of the study, in September/October 2002, to elicit public comments and views on the further development of TKO. These comments were then fed into the development of initial development options. These initial development options were then discussed at a Value Management Forum from which four alternative development themes were generated.

2.3.3 The four alternative development themes were evaluated against a range of performance criteria and subject to comparative assessments from planning and technical perspectives. They were then put to extensive consultation to seek the public’s views. Subsequent to this second round of public consultation, which was carried out in May 2003, a preferred development theme, incorporating the public feedback, was determined.

2.3.4 A Concept Plan was developed on the basis of the preferred development theme which presents the broad land use framework for the further development areas of TKO, including TCS, PSK and the remaining areas of TKL. The form of the CBL associated with the preferred development theme is a bridge scheme across Junk Bay linking the WCR on the western side of Junk Bay with Wan Po Road to the south of Area 86 on the eastern side of Junk Bay. The bridge scheme is incorporated in the Concept Plan.

2.3.5 At the same time as the evaluation of the alternative development themes, the alternative WCR tunnel and coastal alignments were also subjected to a detailed evaluation and put to consultation. The tunnel alignment of WCR has been selected as the preferred option and is incorporated in the Concept Plan. The Concept Plan was put out to the third round of Public Consultation in January/February 2004.

Continuous Public Involvement

2.3.6 The process of continuous public involvement (CPI) for the Project, which started in September 2002, focuses on four key stages:

- Stage 1: agenda setting (identifying the planning approach, objectives and key issues) and collection of public views/opinions;
- Stage 2: presentation, discussion and feedback on various possible development options;
- Stage 3: presentation, discussion and agreement of the recommended development option;
- Stage 4: after finalisation of the Final Report, the presentation of the study findings.
2.3.7 Throughout the formulation of the preferred option, a series of meetings/consultations was held to gather comments and recommendations from public on the proposed development options. During the CPI, public’s views and recommendations on various development options have been collected, reviewed and taken into account in the course of the option selection process.

2.3.8 Table 2.1 summarises the meetings/consultations conducted during the CPI process. Table 2.2 summarises the major public’s feedback and recommendations on the Project.

**Table 2.1 Summary of Meetings/Consultations During the CPI Process**

<table>
<thead>
<tr>
<th>Date</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td></td>
</tr>
<tr>
<td>28 Sept 2002</td>
<td>Public Consultation Forum at Leung Sing Tak Primary School, Hang Hau</td>
</tr>
<tr>
<td>30 Sept 2002</td>
<td>Sai Kung District Council</td>
</tr>
<tr>
<td>Stage 2</td>
<td></td>
</tr>
<tr>
<td>2 May 2003</td>
<td>LegCo Panel on Planning Lands and Works</td>
</tr>
<tr>
<td>7 May 2003</td>
<td>Sai Kung District Council</td>
</tr>
<tr>
<td>9 May 2003</td>
<td>Public Consultation Forum at Leung Sing Tak Primary School, Hang Hau</td>
</tr>
<tr>
<td>15 May 2003</td>
<td>TKO Area Committees at King Lam Community Centre</td>
</tr>
<tr>
<td>16 May 2003</td>
<td>Ocean Shores Resident</td>
</tr>
<tr>
<td>20 May 2003</td>
<td>Forum with Profession Institutes, Green Groups, Academic &amp; Business Representative</td>
</tr>
<tr>
<td>23 May 2003</td>
<td>Town Planning Board</td>
</tr>
<tr>
<td>WCR Consultation</td>
<td></td>
</tr>
<tr>
<td>29 July 2003</td>
<td>Kwun Tong District Council</td>
</tr>
<tr>
<td>30 July 2003</td>
<td>Eastern District Council (by circulation of DC paper)</td>
</tr>
<tr>
<td>5 August 2003</td>
<td>Sai Kung District Council</td>
</tr>
<tr>
<td>Stage 3</td>
<td></td>
</tr>
<tr>
<td>19 January 2004</td>
<td>Sai Kung District Council</td>
</tr>
<tr>
<td>27 January 2004</td>
<td>LegCo Panel on Planning, Lands and Works</td>
</tr>
<tr>
<td>30 January 2004</td>
<td>Public Consultation Forum at Leung Sing Tak Primary School, Hang Hau</td>
</tr>
<tr>
<td>3 February 2004</td>
<td>Forum with Professional Institutes, Green Groups, Academic and Business Representatives</td>
</tr>
<tr>
<td>4 February 2004</td>
<td>TKO Area Committee’s at Leung Sing Tak Primary School, Hang Hau</td>
</tr>
<tr>
<td>6 February 2004</td>
<td>Town Planning Board</td>
</tr>
<tr>
<td>18 February 2004</td>
<td>Ocean Shores Residents</td>
</tr>
<tr>
<td>24 February 2004</td>
<td>Sai Kung District Council  (2nd time)</td>
</tr>
<tr>
<td>31 March 2004</td>
<td>Tenants of TKO Industrial Estate</td>
</tr>
<tr>
<td>Stage 4</td>
<td></td>
</tr>
<tr>
<td>6 June 2005</td>
<td>Sai Kung District Council</td>
</tr>
<tr>
<td>17 June 2005</td>
<td>Town Planning Board</td>
</tr>
<tr>
<td>24 June 2005</td>
<td>Legco Panel on Transport</td>
</tr>
</tbody>
</table>
### Table 2.2  Summary of Public’s Views collected during the CPI Process

<table>
<thead>
<tr>
<th>Elements of the Projects</th>
<th>Major Comments</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Themes of TKO</td>
<td>Stage 2 Consultation:</td>
<td>The findings of Stage 2 Consultation have been fed into the evaluation process of the alternative development themes for the selection of the preferred development concept. The preferred development concept was then developed into a Concept Plan.</td>
</tr>
<tr>
<td>Further Development</td>
<td>objection to reclamation</td>
<td></td>
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<tr>
<td></td>
<td>environmental conditions, especially during reclamation and further development</td>
<td></td>
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<td></td>
<td>excessive population densities</td>
<td></td>
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<td></td>
<td>impact of more housing provision on property values</td>
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<tr>
<td></td>
<td>the need to improve the quality of life in TKO</td>
<td></td>
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<td></td>
<td>very long implementation time for completion of the TKO further development</td>
<td></td>
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<tr>
<td></td>
<td>need for provision of recreational and leisure facilities.</td>
<td></td>
</tr>
<tr>
<td>Western Coast Road</td>
<td>Stage 2 Consultation:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strong support for the tunnel alignment as the preferred WCR alignment mainly because:</td>
<td>In response to the need to minimise reclamation in Junk Bay, the precise layout of the seawall and extent of reclamation has been carefully examined to ensure that there is no unnecessary reclamation and minimise the potential impact to marine ecology. However, it should be noted that the layout of the tunnel alignment has been adopted such that there is minimum intrusion into Junk Bay, with the toll plaza tucked into a small embayment as much as possible, to minimise both the extent of reclamation and visual intrusion. The extent of reclamation is intended to provide a smooth shoreline and avoids the creation of embayed areas, taking account of possible water quality impacts.</td>
</tr>
<tr>
<td></td>
<td>the tunnel alignment does not require reclamation in Victoria harbour;</td>
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<tr>
<td></td>
<td>the tunnel alignment requires less land resumption and a shorter implementation period;</td>
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<td></td>
<td>there are no impacts to the Lei Yue Mun Villages;</td>
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<td></td>
<td>direct connections to EHC can be provided.</td>
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<tr>
<td></td>
<td>Major concerns on the tunnel alignment:</td>
<td></td>
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<tr>
<td></td>
<td>need to minimise reclamation for the toll plaza, including use of electronic tolling to reduce the toll plaza requirement;</td>
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</tr>
<tr>
<td></td>
<td>prefer to eliminate reclamation in Junk Bay by relocating the tunnel exits on TKO side to Tiu Keng Leng;</td>
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<tr>
<td></td>
<td>request for provision of a connection between WCR and Junk Bay Chinese Permanent Cemetery;</td>
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<td></td>
<td>need to minimise recurrent costs of the tunnel;</td>
<td></td>
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<tr>
<td></td>
<td>examine possible further improvement of slip road connections to EHC.</td>
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</tr>
<tr>
<td>Elements of the Projects</td>
<td>Major Comments</td>
<td>Responses</td>
</tr>
<tr>
<td>-------------------------</td>
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<tr>
<td></td>
<td>through the use of electronic tolling, the adoption of compulsory electronic tolling will require a policy decision by government.</td>
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<tr>
<td></td>
<td>With regard to elimination of reclamation in Junk Bay by relocating the tunnel exit on the TKO side to Tiu Keng Leng, it must be pointed out that a number of alternative tunnel options have been examined under this study with a view to either eliminating reclamation or, failing that, to minimise reclamation. A tunnel alignment which connects to the TKO road network through Tiu Keng Leng is constrained by the existing and committed developments in Tiu Keng Leng and the Town Centre, including existing residential development and the MTR TKO Extension and stations and, even if feasible, would create severe environmental impacts. For these reasons, inland routes from East Kowloon through Tiu Keng Leng are not feasible.</td>
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<tr>
<td></td>
<td>For connection between WCR and Junk Bay Chinese Permanent Cemetery (JBCPC), it is undesirable to connect a local access road linking JBCPC to a strategic trunk road with design speed of 80 km/hr, especially as traffic congestion on this road during Ching Ming and Chung Yeung Festivals will cause backing up of traffic onto WCR with risk of traffic accidents. Furthermore, as the level difference between the cemetery and the toll plaza is some 90m, construction of an access road will be very costly and create adverse visual impacts. It would also be difficult to justify financially because the utilisation of the road will be very low throughout the year except during the Ching Ming and Chung Yeung Festivals. On the other hand, the feasibility of providing pedestrian access from the bus stops at the toll plaza to the cemetery can be further investigated.</td>
<td></td>
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</tbody>
</table>

2-6

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<table>
<thead>
<tr>
<th>Elements of the Projects</th>
<th>Major Comments</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The <em>recurrent cost of the tunnel</em> is much higher than that of the coastal alignment mainly because of the great difference in operating cost between the tunnel and coastal options. Tunnel ventilation and tunnel lighting are the main expenses which account for high operating costs. However, the estimates of recurrent costs are still preliminary at this stage and subject to refinement during the detailed design of the WCR. Energy saving systems will be investigated at the detailed design stage for incorporation in the WCR in order to reduce the operating costs.</td>
<td></td>
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<tr>
<td></td>
<td>Improvement of <em>slip road connections</em> to EHC relate mainly to the possibility of direct connections between Trunk Road T2 and EHC. These are constrained by the planned development at Kaolin Mine Site, the proposed WCR viaduct above the EHC approaches and the slip road from WCR to EHC. Direct connection between T2 and EHC, on the basis of current planning in this area, is considered not feasible.</td>
<td></td>
</tr>
</tbody>
</table>
| Concept Plan | Stage 3 Consultation:  
General Support on the Concept Plan with no further reclamation in Town Centre South, reduced development density and stepped building height profile.  
Major issues:-  
Further reduction of development density and building height of the developments;  
Conversion of residential land in Tiu Keng Leng Area 74 for open space/recreation/community facilities uses;  
Improvement of cycletrack network and provision of more cycle parking areas;  
Relocation of the civic node to the central part of Town Centre South; | Responses to major issues:  
Excessive reduction of building height may, however, affect the financial viability of the remaining development sites. Thus the proposed densities that have been adopted have sought to strike a balance between maintaining a critical mass of development to maintain a vibrant and active waterfront district whilst achieving an optimisation of views from existing developments. |
### Elements of the Projects | Major Comments | Responses |
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of innovative/active recreational facilities to promote tourism; Improvement of linkage to “Oscar By the Sea”; Over provision of schools; Early decision of Area 56 development; Deletion of Town Centre Link Phase II; Adequacy of road infrastructure to serve south-eastern area of TKO; Need and environmental impacts of Road P2; Need and justification of the Western Coast Road and associated reclamation; Need of Cross Bay Link and its form causing impacts to the proposed developments; Early implementation of Western Coast Road and Cross Bay Link; Early implementation of open space and recreational facilities; and Implementation/Control mechanism.</td>
<td>The proposed civic node is located closer to the TKO MTR Station than the location shown on the existing OZP. Also the proposed location will be closer to Tiu Keng Leng, TKO Town Centre North and Town Centre South residents. Together with the planned GIC cluster in Area 72, the civic node will form a major hub of GIC facilities serving the New Town. As the proposed location is more convenient for residents as a whole, relocation of the civic node adjacent to the Town Plaza would not be considered from the planning and implementation strategy standpoints. The Tiu Keng Leng Area 74 now only provides open space and education uses. The current proposal should have addressed the public concern not to have residential development in the area. The need of Western Coast Road and Cross Bay Link is driven by traffic demand and development pace of TKO planned development.</td>
<td></td>
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</tbody>
</table>
Development Options of TKO Further Development

2.3.9 Alternative development themes were derived through reviews of opportunities and constraints, consideration of the public initial views from the first round of consultation and refinement through a value management process. The development themes included:

- Theme 1- No Further Reclamation (Figure 2.1)
- Theme 2- Maximise Recreation Potential- Recreation and Water Sports (Figure 2.2)
- Theme 3- Maximise Development with Water Frontage- Landscape Crescent (Figure 2.3)
- Theme 4- Maximise Housing and Recreation Development (Figure 2.4)

2.3.10 The differences between the alternative development themes lie essentially with the TCS and PSK proposals and therefore the focus of the evaluation of alternative themes was on these two areas. The choice of WCR tunnel or coastal alignment would not significantly affect the selection of the preferred theme and the evaluation of WCR options was carried out separately. However, the form of CBL does influence the TCS and its extension proposals and was therefore considered in the evaluation process.

2.3.11 Under the four development themes, the TCS and its possible extension will aim to enhance the living environment by reducing the new/undeveloped building sites, providing an interesting stepped building profile declining towards the waterfront and creating a vibrant waterfront serving as a focal point of attraction. The Eastern Channel will provide recreational and visual resources. For PSK, low to medium density residential development with associated educational/community facilities are proposed to avoid breaching the ridgeline as viewed from Silverstrand area.

2.3.12 The four development themes were submitted to the second round of public consultation. Theme 4 was dropped from consideration due to public concern on the extensive reclamation and the provision of more residential development in TKO. During the consultation exercise in May 2003, major objections were raised concerning further reclamation in TKO. The public also expressed a desire for lower density development and were also concerned about the adverse effects of the further development on the environment and quality of life. Some feedback also suggested a desire for Development Theme 1 but with the incorporation of the key features of Theme 2 and Theme 3 i.e. implementation of waterfront facilities and features, but without further reclamation for development purposes. A summary on the result of public consultation on the themes is in Appendix 2.3.

2.3.13 Following the public consultation exercise, the views of the public were combined with the technical assessments to provide a comprehensive evaluation of the alternative development themes. The combined evaluation yielded a ranking of the development themes which reflected public acceptability and that were sustainable from engineering, planning, and environmental perspectives. The combined evaluation showed that Theme 1 ranked first followed by Theme 2 and Theme 3. From the environmental perspective, Theme 1 without reclamation has minimum construction and ecological impacts as well as least landscape and visual impacts to adjacent development. Table 2.3 summarises the evaluation results of the four development themes. Please refer to Appendix 2.3 for more details.

2.3.14 On the basis of the preceding, Theme 1 was selected as the preferred development theme concept. In overview, the preferred theme envisaged that development within TCS area will comprise a range of low to medium rise residential developments with some commercial and educational facilities. No additional reclamation for development was proposed. Opportunity is taken of the eastern channel to create a riverine park environment along with recreational facilities within the TKO Stage 1 Landfill. Theme 1 was then refined into a Concept Plan.
### Table 2.3  Summary of Evaluation Results for Various Development Themes

<table>
<thead>
<tr>
<th>Requirement of Reclamation</th>
<th>Development Theme 1</th>
<th>Development Theme 2</th>
<th>Development Theme 3</th>
<th>Development Theme 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 ha</td>
<td>41 ha</td>
<td>55 ha</td>
<td>72 ha</td>
</tr>
<tr>
<td>Plot Ratio (average)</td>
<td>3 to 5 (4.1)</td>
<td>2 to 5 (4.7)</td>
<td>3 to 5 (4.6)</td>
<td>1 to 5 (4.0)</td>
</tr>
<tr>
<td>Planning</td>
<td>Lowest score - The smallest development area which has imposed more constraints on the provision of larger waterfront, additional open space and G/IC facilities.</td>
<td>Optimal scheme - With partial reclamation would accommodate an attractive waterfront park and a Leisure Island, additional public open space and G/IC facilities. It fulfils the need for more recreational facilities and partially meets the identified strategic housing requirements.</td>
<td>Meet most of the planning criteria but by comparison are less desirable than Theme 2.</td>
<td>Meet most of the planning criteria but by comparison are less desirable than Theme 2.</td>
</tr>
<tr>
<td>Socio-Economic</td>
<td>Lowest score – due to smaller land area for employment generating uses and tourist facilities</td>
<td>Highest score - Provide greater support to tourist facilities to Sai Kung.</td>
<td>Higher score - Provide more employment opportunities but by comparison are less desirable than Theme 2.</td>
<td>Higher score - Provide more employment opportunities but by comparison are less desirable than Theme 2.</td>
</tr>
<tr>
<td>Engineering</td>
<td>Most desirable because less engineering works are required.</td>
<td>Less desirable compared to Theme 1.</td>
<td>Less desirable compared to Theme 1.</td>
<td>Least desirable compared to Theme 1.</td>
</tr>
<tr>
<td>Traffic &amp; Transport</td>
<td>Most desirable</td>
<td>Less desirable</td>
<td>Less desirable</td>
<td>Least desirable</td>
</tr>
<tr>
<td>Environmental</td>
<td>Most environmentally favourable:</td>
<td>Less environmentally favourable:</td>
<td>Less environmentally favourable:</td>
<td>Least environmentally favourable:</td>
</tr>
<tr>
<td></td>
<td>• Shorter construction period due to the requirement of no further reclamation and less construction activities in overall terms and hence smaller construction dust and noise nuisance generated would be expected compared with other themes.</td>
<td>• Greater dust and noise nuisance would be expected compared to Theme 1 due to longer construction period and more construction activities.</td>
<td>• Similar to Theme 2, greater dust and noise nuisance would be expected compared to Theme 1 due to longer construction period and more construction activities.</td>
<td>• Greatest dust and noise nuisance would be expected compared to other themes due to longest construction period and more construction activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Direct loss of marine ecological habitats would be expected due to further reclamation.</td>
<td>• Greater direct loss of marine ecological habitats would be expected due to more reclamation compared with Theme 2.</td>
<td>• Greatest direct loss of marine ecological habitats would be expected due to greatest reclamation compared with Theme 2.</td>
</tr>
</tbody>
</table>
Further Development of Tseung Kwan O EIA Report

Development Theme 1

- Owing to no further reclamation, no direct loss of marine ecological habitats would be expected.
- No adverse water quality impact associated with dredging would be expected as further reclamation is required.
- Owing to no reclamation and medium density developments provided within TCS area, visual impacts to adjacent visual receivers would be minimal compared to other themes.
- No reclamation cause the least disturbance to the existing landscape setting and low rise development at PSK would minimize impacts to the existing natural environs.

Development Theme 2

- Potential water quality impact associated with dredging would be expected due to the requirement of reclamation.
- Due to partial land formations and development proposed on the new reclamation, more visual impacts to existing visual receivers in the adjacent areas would likely be generated compared with Theme 1.
- The proposed partial reclamation would generate some adverse impacts to the existing landscape character and the proposed development would generate adverse impacts to the existing bay setting. Medium rise development at PSK would have an impact on the existing natural environs.

Development Theme 3

- Potential water quality impact associated with dredging would be expected due to the requirement of reclamation.
- Due to partial land formations and development proposed on the new reclamation, more visual impacts to existing visual receivers in the adjacent areas would likely be generated compared with Theme 1. Nevertheless, due to CBL proposed in tunnel form under this theme, less visual impacts would be generated compared to Theme 2.
- Similar to Theme 2, the proposed partial reclamation would generate some adverse impacts to the existing landscape character and the proposed development would generate adverse impacts to the existing bay setting. Medium rise development at PSK would have an impact on the existing natural environs.

Development Theme 4

- Potential water quality impact associated with dredging would be expected due to the requirement of reclamation.
- Due to larger extent of reclamation and development, more significant visual impacts to existing visual receivers in the adjacent areas, particularly generating negative visual impacts to receivers at Ocean Shores, Oscar by the Sea and Area 86.
- Due to largest extent of reclamation, existing bay setting would be significantly altered. Medium rise development at PSK would have an impact on the existing natural environs.

Cost Effectiveness

<table>
<thead>
<tr>
<th>Cost Effectiveness</th>
<th>Least cost effectiveness</th>
<th>Most cost effectiveness</th>
<th>Less cost effectiveness</th>
<th>Less cost effectiveness</th>
</tr>
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Overall

With respect to planning, socio-economic and cost effectiveness, Theme 2 is the most desirable option. Nevertheless, in terms of engineering, traffic & transport, environmental aspects, Theme 1 is the most favourable option. During the CPI, the public expressed a desire for lower density development and some feedback suggested a desire for Development Theme 1 but with the incorporation of the key features of Theme 2 and Theme 3 i.e. implementation of waterfront facilities and features. Hence, Theme 1 was selected as the preferred development theme concept.
Alternative Development Options for WCR

2.3.15 The proposed WCR will be a trunk road linking TKO with Kowloon and the main urban area. Previously, CEDD have conducted several feasibility studies to investigate the possible alignments of the WCR. They include:

- Coastal alignment as proposed under Feasibility Study on Alternative Alignment for the WCR under Agreement No. CE 46/96;
- Study on Minimization of the Impacts of Western Coast Road on Lei Yue Mun Village under Agreement No. NTE 5/99; and
- Tunnel alignment as proposed under the Preliminary Feasibility Study on Tunnel Alignment Option of Tseung Kwan O Western Coast Road under Agreement No. NTE 1/2000.

2.3.16 The Agreement CE 46/96 has developed 34 alternative coastal alignments for selection and evaluation before coming up with the final route. The final route has undergone a detailed study for which the environmental impact assessment has been approved under EIAO on 20 October 1999. The approved coastal alignment as shown on Figure 2.5 however received considerable public opposition and objections with the main focus on the impact to commercial activities in Lei Yue Mun (LYM) Village. The Agreement NTE 5/99 then went on to review the impacts on the LYM villages and had reduced the required landtake to the approved coastal alignment particularly due to changing of road configuration from dual 3-lanes to dual 2-lanes as shown on Figure 2.6.

2.3.17 A new issue emerged with the Protection of the Harbour Ordinance which included a presumption against reclamation within Victoria Harbour. Under this presumption, a proposed reclamation may not proceed if a non-reclamation alternative solution for the intended purpose can be identified. The WCR coastal alignment involved reclamation within Victoria Harbour in the Yau Tong area.

2.3.18 The Agreement NTE 1/2000 was commissioned to identify and examine the feasibility for a dual 2-lane tunnel option alignment for WCR and under the Agreement NTE 1/2000, 13 initial tunnel options have been investigated for selection and evaluation before coming up with the preferred tunnel scheme as shown on Figure 2.7.

2.3.19 Under this feasibility study, a review of the tunnel alignment as proposed in the Agreement NTE 1/2000 and the coastal alignment as proposed under the Agreement NTE 5/99 was undertaken with reference to the relevant latest design standard, site constraints and improvement to connectivity in Kowloon and TKO.

2.3.20 The two refined WCR alignments as shown on Figure 2.8 and 2.9 respectively were subject to evaluation and comparative assessment leading to the recommendation of a preferred alignment from technical perspective.

2.3.21 From the environmental perspective, both alignment options would cause noise impact to different noise sensitive receivers which would need to be mitigated. The extent of sensitive receivers affected by the coastal option is greater than the tunnel option. Both options should comply with the Air Quality Objective during operation, however, the tunnel option only allows not more than 10% vehicle emission from the WCR Tunnel on the Kowloon side requiring a mid-ventilation building. For water quality impacts, the coastal option would have more impacts since it involves reclamation and viaduct construction along Yau Tong Shoreline. For ecology, the coastal option would run adjacent to the high value coral habitats near LYM Point while the tunnel option would not. The coastal option has a larger extent of reclamation and would therefore have a greater volume of dredged sediment to be disposed off and more contaminated sediment to be dealt with. The tunnel option has avoided physical
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Encroachments onto cultural heritage issues while the coastal alignment has minor encroachment to quarry face at LYM and LYM Burial Ground etc. In general, the extent and degree of residual visual impacts suffered by visual sensitive receivers would be considerably greater for the coastal option and it is similar for landscape character. In overall environmental terms, the tunnel alignment performs better than the coastal alignment.

2.3.22 The two alternative alignments were presented to the public through a consultation exercise in July/August 2003 in order to seek public views and opinions on these two alignments and the choice of the preferred alignment.

2.3.23 The feedback from the WCR consultation exercise indicated a clear preference for the tunnel alignment. This finding also supports the results of the technical evaluation with the WCR Tunnel Alignment being preferred from both technical and public viewpoints. The WCR Tunnel Alignment has been recommended as the preferred WCR alignment and subjected to detailed assessments.

2.3.24 The WCR needs to be tolled in order to balance traffic flows between it and the existing TKO Tunnel which is also tolled. The provision of a toll plaza is regarded as one of the functional requirements of WCR that has to be considered in the selection of an optimal alignment. The provision of an all-direction interchange with the CBL is also regarded as one of the essential functional requirements of WCR. The recommended WCR tunnel alignment as shown on Figure 2.9 has been derived through an alignment evaluation process and is considered to represent the least environmentally intrusive option and one which meets all necessary functional requirements.

2.3.25 The connection of WCR at TKO side is seriously constrained by completed developments in TKO and must tie in with the local road network which is already largely in place. Inland connection e.g. through TKL is not possible due to physical constraints where most areas have been developed or committed for development, the WCR therefore must connect to the south-western side of TKO and all feasible alignment schemes require some reclamation along the western side of Junk Bay in order to make this connection.

2.3.26 The various alternative tunnel alignment schemes on TKO side that have been considered in the alignment evaluation process under this feasibility study is shown on Figures 2.10 and 2.11, namely Schemes 1 to 4.

2.3.27 Scheme 1 is based on the alignment under the Agreement NTE 1/2000 which has been refined to incorporate two functional requirements as mentioned above. In Scheme 2, the alignment was moved further north to reduce the southward extent of reclamation. However, both options result in significant intrusion into Junk Bay, with associated reclamation. As Scheme 2 is much closer to residential developments as compared with Scheme 1, it will have greater visual, air and noise impacts. Scheme 1 is more preferred than Scheme 2 and Scheme 2 was therefore not taken forward for further consideration.

2.3.28 Scheme 4 was derived with a view to avoiding the interface with the Junk Bay Chinese Permanent Cemetery. However, this option requires a substantial reclamation and will cause adverse impacts to high value marine habitats near Lei Yue Mun Point and will also increase the construction cost due to increase of the travel distance of WCR Tunnel, Road P2 and CBL and was therefore not taken forward for further consideration.

2.3.29 Scheme 3 (the recommended alignment) on the other hand can provide a reclaimed land for the toll plaza and interchange without significant intrusion into Junk Bay or any major adverse environmental impacts to nearby residents or high value marine habitats. The toll plaza and interchange in Scheme 3 are tucked into embayment areas along the coastline as much as possible to minimise both extent of reclamation and visual intrusion.
2.3.30 After a comprehensive comparative evaluation of Scheme 1 and Scheme 3, Scheme 3 was selected as the preferred route for the tunnel alignment because it requires lesser reclamation in Junk Bay, provides better road connections and is more acceptable on environmental grounds. Scheme 3 is preferred in terms of noise, air quality, water quality and visual impacts than Scheme 1. It minimises the visual impact to the existing TKO residential areas. The smooth shorelines of the necessary reclamation would minimise the adverse water quality impacts. Table 2.4 summarises the comparative evaluation of Scheme 1 and Scheme 3.

2.3.31 Whilst the selected WCR tunnel alignment is one which requires the least reclamation in Junk Bay, minimisation of reclamation is nevertheless a major consideration. Further examination has been undertaken. At the toll plaza area, the original sloping embankment has been replaced by vertical reinforced earth wall. At the interchange location, the extent of reclamation is dictated by the at-grade slip roads at the seafront to connect with the CBL rising from the depressed Road P2. Raising the levels of those slip roads to reduce the extent of reclamation would mean that a depressed Road P2 could not be achieved.

Table 2.4 Comparison of Scheme 1 and Scheme 3 of WCR Tunnel Alignment

<table>
<thead>
<tr>
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<th>Scheme 1</th>
<th>Scheme 3</th>
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<tbody>
<tr>
<td>Reclamation Requirement</td>
<td>Requires approximate 14.5 ha of reclamation for toll plaza construction</td>
<td>Requires approximate 10.5 ha of reclamation for toll plaza construction</td>
</tr>
<tr>
<td>Engineering Consideration</td>
<td>WCR-Road P2 cannot be configured as the main route. WCR-CBL would be the main route and this arrangement contradicts the road planning proposal.</td>
<td>WCR-Road P2 can be configured as the main route with design speed of 80 km/hr. It is therefore considered more preferable in traffic terms.</td>
</tr>
<tr>
<td>Cost Effectiveness</td>
<td>Less costly for both construction and operation compared to Scheme 3.</td>
<td>More costly for both construction and operation compared to Scheme 1, but the order is not significant.</td>
</tr>
</tbody>
</table>
| Environmental Consideration | • The WCR/CBL/Road P2 interchange trumpet would cause significant visual impact to the residential area at TKO.  
• The trumpet shape shoreline of the proposed reclamation would cause more reduction in flushing capacity within inner Junk Bay compared to Scheme 3 and would likely cause greater adverse water quality impact.  
• Potential water quality impact associated with dredging would be expected due to the requirement of reclamation necessary for the construction of toll plaza. | • The shoreline oriented toll plaza allows the WCR/CBL/Road P2 to be constructed close to the shoreline and hence minimize the potential visual impact.  
• Smooth shoreline of the proposed reclamation would minimize the potential reduction in flushing capacity and adverse water quality impact.  
• Potential water quality impact associated with dredging would be expected due to the requirement of reclamation.  
• Direct loss of marine ecological habitats would be expected due to the reclamation for toll plaza construction. However, only average value marine habitats would be expected at the proposed toll plaza location. |
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### Table 2.3-1

<table>
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<th>Scheme 1</th>
<th>Scheme 3</th>
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| • Direct loss of marine ecological habitats would be expected due to the reclamation. However, only average value marine habitats would be expected at the proposed toll plaza location.  
• Since the toll plaza and WCR/Road P2/CBL interchange is closer to the existing and planned sensitive uses in TCS, greater impacts in term of air quality and noise would be expected as compared to Scheme 3. | • Lesser impacts in terms of air quality and noise would be expected as compared to Scheme 1. |

### Overall

| Overall | As discussed above, Scheme 3 is preferred in terms of air quality, noise, water quality and visual impacts as well as traffic. Hence, this scheme has been selected. |

**Alternative Development Options for CBL**

2.3.32 The proposed CBL is running across east to west in Junk Bay fronting TCS and its possible extension area, it is important that the alignment and structural form for CBL would be compatible with the alternative development themes for TCS development in the global context. In the local context, the CBL would need to be compatible with the connection on the west with the WCR.

2.3.33 Alternative route alignment options as shown on Figure 2.12 have been identified and appraised in term of traffic performance, land use impact and potential environmental impacts to re-affirm that the present alignment (Route Alignment Option 2) as shown on the current OZP is the preferred route. These include:

- Route Alignment Option 1- CBL at Fat Tong Chau;
- Route Alignment Option 2- CBL to the south of Area 86;
- Route Alignment Option 3- CBL to the north of Area 86;
- Route Alignment Option 4- no CBL scenario.

2.3.34 In reviewing the alternative CBL route alignment options in respect of traffic performance, compatibility with land use planning intentions and potential environmental impacts, the following were concluded:

- Route Alignment Option 1 requires longer distance to be travelled by the users of CBL with less degree of utilisation and longer length will be more costly than other options. This route also will have more ecological impacts in both terrestrial and marine aspects in particular corals at Fat Tong Chau. It was not selected for further consideration.

- Route Alignment Options 2 meets the requirements of traffic functionality. The bridge form is compatible with Development Theme 1 and Theme 2 and the tunnel form is compatible with Development Theme 3 and Theme 4. No insurmountable environmental impacts are anticipated as the major ecological impacts have been avoided. Nevertheless, since the road alignment is close to the Area 86 development...
(along the southern edge), the air and noise impacts would have to be addressed. It was considered suitable for further consideration.

- Route Alignment Option 3 will increase congestion of Wan Po Road and is not acceptable from the traffic viewpoint. Also, being closer to TCS, different structural forms would result in some compromise of the land use planning. It was considered not suitable for further consideration.

- Route Alignment Option 4 will cause heavily traffic congestion through Town Centre and will overload its road network. Higher traffic flows through Town Centre will result in greater levels of air and noise impacts and the option is considered environmentally undesirable and was considered not suitable for further consideration in particular the CBL is intended to direct the industrial traffic away from Town Centre.

2.3.35 Route alignment option 2 has been subjected to further development into two feasible alternative schemes for CBL as Bridge Arrangement and Tunnel Arrangement as shown on Figures 2.13 and 2.14. These alternative schemes have also been subjected to preliminary technical comparison despite the selection is dictated by the selected development theme of TCS. In overall term, the bridge scheme is considered to perform better than the tunnel scheme in terms of engineering, environment and cost. Also, the tunnel scheme will require reclamation for protection of the eastern and western tunnel portals and should be implemented in conjunction with the Development Themes 3 and 4. The bridge scheme will be implemented with Development Theme 1 or 2 with no and less reclamation. A summary of the Environmental Review of the two schemes is provided below.

- Noise Impacts: impacts from the construction phase for the CBL either in bridge or tunnel forms can be mitigated. For the operational phase, noise mitigation measures will be required for both schemes to mitigate the impacts to the Area 86 development. Partial enclosure or cantilever barrier will be required along the eastbound carriageway south of Area 86.

- Air Quality Impacts: sufficient buffer distances have been allowed between the CBL and planned and committed developments, and adverse air quality impacts from both schemes of CBL are not expected. The tunnel scheme is separated from Area 86 by some 50m. Based on the currently envisaged traffic flows along the CBL, air quality impacts attributed to tunnel emission at the eastern portal are not expected.

- Water Quality Impacts: the potential hydrodynamic impact of bridge scheme arrangement would be smaller than that of tunnel scheme. The former would generate minor hydrodynamic impact near the bridge columns. The latter, which requires the formation of additional land for tunnel landfalls and protection and road connections to WCR, would be developed with the further reclamation scenario of the TKO Town Centre South that would alter the hydrodynamic regime within the Inner Junk Bay, although no major adverse impacts would be anticipated. Water quality impacts associated with the dredging and reclamation works can be minimised by the deployment of silt curtains and silt screens, and through control of dredging rates at the reclamation site.

- Waste Management: whilst no insurmountable impact is be anticipated for both schemes, the tunnel scheme will result in a greater volume of dredged sediment to be disposed off and more contaminated sediment to be dealt with than the bridge scheme.
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Marine Ecology: the bridge scheme would be preferred from the marine ecological perspective since this scheme would result in the relatively minor loss of low ecological value seabed area and because of its limited potential for adverse impacts to corals in Junk Bay. By contrast, direct loss of habitat and the potential for adverse impacts to corals would be markedly higher if the tunnel scheme is adopted.

Visual Impacts: in summary, the bridge scheme would be likely to generate considerably more residual visual impacts than the tunnel scheme. However, the bridge scheme has the opportunity to provide a feature bridge within TKO. The CBL could be designed as a high quality, aesthetically pleasing structure which would become a new landmark feature at the gateway of TKO. Assuming that an attractive feature bridge is implemented, visual impacts are likely to be acceptable.

2.3.36 From the environmental perspective, the bridge scheme performs better in term of air quality, water quality, marine ecology and waste management than the tunnel scheme. The tunnel scheme performs better in term of noise and visual impacts. Overall, the bridge scheme performs better in environmental term.

2.3.37 With the Development Theme 1 selected as the preferred development theme for TKO further development, the bridge scheme for CBL is selected as the preferred CBL scheme.

2.3.38 The primary objective of the TKO planning is to provide a high quality vibrant leisure and recreational area for enjoyment of TKO residents and visitors at the waterfront. The preferred CBL bridge scheme may cause negative impacts to visual receivers in the surrounding areas but can be ameliorated through design the bridge in an interesting manner.

2.4 Conceptual Plan and Proposed Development Option

2.4.1 The preferred Theme 1 has been developed into a Concept Plan that defines a suggested land use configuration for the preferred development option. An urban design approach has been developed to enable the definition of a broad disposition of land use layouts developed that includes provision for road and infrastructure needs. A basic open space structure has been defined that makes provision for public accessibility and circulation within the subject planning areas.

Concept Plan

2.4.2 Key features of the Concept Plan as shown on Figure 2.15 include:

- A riverine park along a landscape corridor adjacent to the Eastern Channel that provides connections to the waterfront;
- A high quality waterfront promenade with related leisure and commercial uses;
- An open space corridor linking the commercial centre adjacent to TKO Station to the waterfront;
- Land formation along the western shoreline of Junk Bay to provide land for WCR Tunnel Alignment;
- Reduced population density in TCS and TKL from that formerly proposed;
- A stepped height building profile diminishing towards the waterfront with modulations in building height at the waterfront to enhance variety in the built environment;
- A feature bridge across the mouth of the Eastern Channel;
- Low rise development at PSK; and
- A proposed feature bridge for the CBL.
2.4.3 Water sport recreation activities have been promoted mainly in the Inner Junk Bay (area north of CBL) and Eastern Channel (area south of the proposed northern bridge).

2.4.4 Comments and suggestions received during the course of the public consultation exercise were utilised in the development of the Concept Plan. The Plan was submitted to the third round of public consultation. The Plan was used for formulation of more detailed layout plans that provide the land use and infrastructure layout framework for testing in the various impact assessment studies including environmental impact assessment to confirm their feasibility. These layout plans will be modified to accommodate planning, engineering and environmental requirements or impact mitigation.

**Layout Plans for Proposed Development**

2.4.5 The Layout Plans as shown on Figures 2.16 to 2.18 have been prepared based on the existing Layout Plans and the Concept Plan for the three new development areas: TKL, TCS and PSK.

2.4.6 The total TKO population will be reduced from the current planning of 480,000 to around 450,000 due to reduced population quantum in TCS and TKL. It is assumed these new development areas to be completed around 2011 for impact assessment of purpose and infrastructure provision. The land use proposals of the three new development areas are broadly described in the following paragraphs.

**Remaining Area of Tiu Keng Leng**

2.4.7 Land use proposals for TKL include:

- More landscaped open space, including the proposed TKL Park north of Ocean Shores to help to alleviate the impact of the surrounding high density environment;
- Landscaped decks are proposed across a depressed Road P2 to provide pedestrian linkages to the waterfront;
- The civic node proposed for TCS extends across to TKL along the western side of Road P2 to form a significant civic cluster;
- Conversion of the originally planned residential sites in Area 74 South to district open space and GIC uses to further thin out the population in TKL;
- New land formation extends southwards from TKL to facilitate the construction of the WCR. This will include landscape buffering and the provision of promenade footpath and cycle track.

2.4.8 Due to conversion of planned residential sites to district open space, the design population of TKL Layout Plan is about 65,000 (original 72,000).

**Town Centre South**

2.4.9 Land use proposals for TCS include:

- Residential development south of Po Yap Road, with Waterfront development along the promenade to enhance activity and to create an interesting and vibrant waterfront for the use of the local residents and visitors;
- A Central Avenue extends from the centre of TCS to the waterfront providing physical and visual connectivity from the TKO MTR station to the waterfront. At the south end of the Central Avenue opens out to a town plaza which in turn extends to the waterfront;
- A Waterfront Park which is integrated with the Town Plaza, will contain high quality soft and hard landscape treatments and will be the new central gathering place for TKO residents;
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2.4.0 Further Development of Tseung Kwan O

- A Civic node is located on the western side of TCS with linkage to the waterfront area. This will be a new government complex;
- Committed schools are located on the eastern side (south of Bauhinia Garden) and additional schools are sited adjacent to the civic node on the western side;
- The promenade along the Eastern Channel is a leisure resource with direct access to the water activity potential of the Eastern Channel (rowing, water cycling and dragon boat racing);
- A water sport centre and boat facilities will be provided along the TKO Stage 1 Landfill site. Active recreation will be located at the toe of the Landfill site whilst remaining areas will provide a park environment for passive recreation (kite flying area, walking and cycling trails).

2.4.10 The design population in Town Centre South is about 32,600 including the existing Bauhina Garden (original 55,000).

Pak Shing Kok

2.4.11 Land use proposals for PSK include high quality low to medium density housing on the existing platforms. Heights are restricted to avoid compromising the existing ridgeline. A number of schools also need to be provided. The design population in Pak Shing Kok is about 5,200.

WCR Tunnel Alignment

2.4.12 The preferred WCR Tunnel Alignment connects to Road P2 and CBL on the TKO side. A toll plaza together with administration building and other tunnel operator facilities as well as a bus interchange is provided on reclamation along the western shoreline of Junk Bay. The alignment then runs in tunnel under Devil’s peak, exiting in Lam Tin where the WCR runs on viaduct and in another short length of tunnel to connect with the future Trunk Road T2 in elevated form at the planned Dangerous Goods Vehicular (DGV) Ferry Pier under the Southeast Kowloon development near Cha Kwo Ling. The highway layout is shown on Figures 2.19 to 2.26.

2.4.13 The preferred WCR tunnel alignment on the Kowloon side is mostly in elevated form before entering though the reserve within the planned Kaolin Mine Site development. The benefit of the current proposed arrangement is that direct connections with Eastern Harbour Crossing (EHC) can be provided which avoids the traffic to and from EHC to route though the local road network in the Cha Kwo Ling and Yau Tong areas and thus traffic and environmental impacts on the local road network can be minimised.

2.4.14 The layout of Trunk Road T2 and DGV Ferry Pier under the Southeast Kowloon development is based on the previous Comprehensive Feasibility Study which is available at the time of the WCR Study. Two slip roads S1 and S2 have been proposed for the Trunk Road T2 under this study. The EIA has covered these two slip roads, however, the future implementation of these two slip roads would be by the Road T2 project. The Road T2 is currently being reviewed under the Kai Tak Planning Review Study and the outcome would not be known until mid-2007. The layout of WCR on the Kowloon side will be subjected to change to match with the Road T2 at a later stage which would be taken account of in the detailed design stage of the WCR project.
Minimisation of Reclamation

2.4.15 At the toll plaza area, the sloping embankment previously allowed is now replaced by a long reinforced earth wall as a measure to reduce the extent of reclamation. Also, a 3.5m wide maintenance access is now proposed in front of the RE wall instead of the 6.5m wide access for footpath and cycletrack behind the seawall. The 3.5 wide maintenance access will also be served as pedestrian access.

2.4.16 At the interchange location, the extent of reclamation is governed by the at-grade CBL slip roads (Link Roads L6 and L7) before rising to the CBL bridge. The levels of these slip roads are dictated by the depressed Road P2 at +3.0 mpD. The smooth shoreline is to avoid embayment.

2.4.17 At the northern end, the reclamation is for Road P2 which is generally depressed and a smooth shoreline is generally maintained to match with the existing arrangement, avoiding embayment.

CBL Bridge Scheme

2.4.18 The CBL begins at WCR/CBL/Road P2 Interchange at the west side of TKO which includes all the links road, crosses Junk Bay as bridge structure, dropping down to run at-grade along the southern boundary of the planned MTRC development at Area 86 and connects to a signalized junction which provides access to Area 86 development and then to Wan Po Road via another signalised junction. The highway layout is shown on Figure 2.27 to 2.31.

Road P2 and D4 Flyover

2.4.19 Road P2, the extension of Po Shun Road, is the north-south direction primary road sandwiched between TKL and TCS areas. Depressing of Road P2 adjacent to the existing residential development, Ocean Shores has been allowed to reduce the possible adverse environmental impacts (the original layout is a grade separated interchange having a flyover fronting Ocean Shores with extensive noise mitigation measures) and to provide a better pedestrian linkage between TKL and TCS by making use of the depressed section of Road P2. A flyover across Road P2, namely Road D4 flyover linking Po Yap Road and Chui Ling Road is required to maintain the continuity of traffic flow from Po Shun Road onto Road P2 and vice versa. The highway layout of Road P2 including Road D4 flyover is shown on Figures 2.32 to 2.34.

2.5 Construction Methods and Engineering Requirements

Reclamation

2.5.1 The proposed reclamation of some 12.3ha in Junk Bay under the Project is for the WCR Tunnel Alignment to accommodate a conventional toll plaza with the associated tunnel operation and management facilities, an all-direction interchange between WCR, Road P2 and CBL and a section of Road P2 extension from TKO Town Centre.

2.5.2 The seabed within the reclamation area is underlain with soft mud, which overlies alluvium and completely decomposed volcanic. Marine sand is also encountered closer to the shoreline. The present policy on reclamation design is that where possible marine mud should be left in place and that the reclamation extent be minimised as much as possible. Therefore, a drained reclamation approach, where the mud is left in place has been recommended with only a small section to be dredged. It is also recommended that mud is left in place under the seawall and be treated to found the seawalls.
2.5.3 The preferred reclamation scheme is a drained reclamation where the mud is left in place and treated with vertical band drains and surcharging in order to achieve an overconsolidation of the compressible soft muds under working load conditions. A limited section of the reclamation at the southern end, is to be dredged to remove all soft mud sediments. Dredging in this area is required in order to provide stability to the high approach embankment to the WCR TKO portal and to minimise the residual settlements of the embankment.

2.5.4 The reclamation approach that is recommended is to achieve where possible all primary consolidation of the underlying soft and compressible mud under the working load conditions before handover of the site and that in areas sensitive to residual and differential settlement, an adequate overconsolidation ratio is induced into the underlying sediments with surcharging; thereby significantly reducing the on-going settlements arising from the secondary consolidation of the soft compressible materials.

2.5.5 The reclamation is proposed to be carried out in three phases as shown on Figure 2.35 and they are described briefly as follows:

- Phase 1 - Dredged reclamation with dredged seawalls at the southern end to form the land for the tunnelling works;
- Phase 2 - the reclamation will be a drained reclamation with band drains and surcharge to treat the mud under the reclamation;
- Phase 3 - the reclamation will be a drained reclamation with band drains and surcharge to treat the mud under the reclamation.

2.5.6 It is necessary to carry out Phase I reclamation as a dredged reclamation for the following engineering reasons:

- Since a 9 m high approach embankment will be built on this reclamation, immediately behind the seawalls, in order to ensure the stability of the seawalls, it is necessary to dredge out the soft marine muds and soft alluvial clays from the base of the seawalls and the reclamation areas.

- The embankment is to provide vehicular access to and from the tunnel portal on this proposed major dual 2-lane carriageway of WCR. If the road is constructed on a high embankment over soft muds, it would be subject to residual settlements arising from the secondary consolidation settlements and possibly some contribution from residual primary consolidation settlements from the soft muds. Since the tunnel portal will be in rock, at the portal it would form a hard/soft interface on the road and any residual differential settlements will be clearly visible requiring regular repair works and disruption to the traffic flow on the WCR.

2.5.7 Since this section of the reclamation is adjacent to the shoreline, the thickness of marine muds and soft alluvial clay will be small ranging from 0 m to about 4 m. Therefore, the total volume of mud to be dredged is estimated to be about 20,000 m³. The area identified for the Phase I reclamation has been selected in such a manner that the dredged volumes of soft muds are kept to a minimum. Hence, the area selected is the minimum in order for the contractor to proceed with the tunnelling works.
2.5.8 The northern seawall of this Phase I reclamation will be built as a temporary seawall, while the eastern seawall will be built as a permanent seawall within a dredged seawall trench. A temporary access ramp will then be built on the newly formed reclamation to reach the proposed tunnel portal location and to commence forming the TKO tunnel portal. A surcharge about 4 m (4 m higher than the final embankment height) will also be placed and maintained for a period of about 4 months in order to consolidate any entrapped soft muds or any siltation at the dredged base.

*Phase II Reclamation*

2.5.9 The Phase II reclamation is to be carried out as a drained reclamation where the soft marine muds are left in place and are treated. Vertical band drains and surcharging will be used to treat the soft muds. Since the reclamation fill material will be public fill, it will be necessary to install the vertical band drains from marine plant since it would be difficult to install them from land plant through public fill without initially pre-drilling. Therefore, the seabed will need to be initially prepared by placing a separator geotextile on the seabed and a 1.5 m thick clean sand drainage blanket over it before installing the band drains from barges. After the band drains are installed the public fill can be carefully placed on the prepared seabed by bottom dumping barges in order to ensure that mud waves are not generated.

*Phase III Reclamation*

2.5.10 The Phase III reclamation, which is the final reclamation phase, is also to be carried out as a drained reclamation where the soft marine muds are left in place and are treated. As in the case of the Phase II reclamation, vertical band drains and surcharging will be used to treat the soft muds. Since the reclamation fill material will be public fill, it will be necessary to install the vertical band drains from marine plant since it would be difficult to install them from land plant through public fill without initially pre-drilling. Therefore, the seabed will need to be initially prepared by placing a separator geotextile and a clean sand drainage blanket over it before installing the band drains from barges. After the band drains are installed the public fill can be carefully placed on the seabed by bottom dumping barges in order to ensure that mud waves are not generated. The preparation of the seabed and the installation of the vertical band drains within this Phase III reclamation can commence immediately after these activities are completed in the Phase II reclamation area.

2.5.11 The eastern permanent seawall of the Phase III reclamation can also be built immediately after completing the section of seawall within the Phase II reclamation area. The same technique adopted to improve the ground for the Phase II section of the seawall can be used here as well.

2.5.12 The stormwater diversion schemes during the reclamation construction are presented in Appendix 2.1.

2.5.13 Public fill material will be used in most areas of reclamation. However, public fill is not to be used for construction of the seawalls or within the Phase I reclamation, where marine sandfill is proposed instead.

2.5.14 The reason for using sandfill is that it is necessary to ensure that the required shear strength is attained by the fill that will be placed in the reclamation in order to achieve the factors of safety. If laboratory and field tests can demonstrate that the shear strength parameters required for stability can be achieved by the public fill, then public fill can be used in the Phase I reclamation. It therefore is necessary to impose certain control measures to ensure the quality of fill that will be placed if public fill is to be used in the Phase I reclamation. Public fill generally comprise construction and demolition material (C&D) and hence it is generally granular in nature. The public fill material should be devoid of organic material, steal, plastic,
etc. The maximum size shall be 200mm and the fine content shall be less than 35%. The material will be transported to site mainly by barge.

2.5.15 Public fill is not to be used for construction of the road embankments and as fill material behind retaining walls. Public fill will be placed between the sand blanket that is first placed on the seabed and up to about 1.5m below the final site formation. General fill and selected fill need to be used above the public fill up to the formation level. Where reinforced earth retaining structures are used, granular material will need to be used.

2.5.16 Public fill material will be used as surcharge fill material and can then be used in the reclamation, thus minimising the need to remove and dispose of off-site the remaining surcharge fill material. Surcharge fill material under Reclamation Phases 1 and 2 will be used as fill material for Reclamation Phases 2 and 3, respectively. The surcharge fill material for Reclamation Phase 3 will need to be disposed off-site.

2.5.17 The seawalls will be constructed first and filling being carried out behind seawalls. Deep Cement Mixing (DCM) is proposed for the seawall foundation where the mud is left in place i.e Phase 2 and Phase 3 reclamation. Before carrying out the ground treatment, it is proposed to carry out full scale field trials when carrying out the Phase 1 reclamation as this type of method has not been employed in Hong Kong before but it is well established in other countries in the world.

Deep Cement Mixing

2.5.18 Deep cement mixing (DCM) method involves the injection and mixing of a cement slurry (dry cement powder also can be used) with the low strength material i.e. the soft marine muds of the Hang Hau Formation and soft alluvial clay, to be treated. A chemical reaction between the cement and the in-situ material increases considerably the strength of the clay and reduces the water content.

2.5.19 DCM is a commonly used technique of ground improvement in Japan and can be carried out either by land-based plant or by marine plant in water depths comparable to and considerably deeper than those within the study area. The depth of treatment for this project is within the range of plant available.

2.5.20 An area of DCM is designed such that it is considered to act as a rigid structure either end bearing onto a firm sub-base or acting in friction with the adjacent material. Typical patterns of treatment (depending upon strength requirements) may comprise individual walls, a lattice of walls, individual piles (where horizontal loads are minimal) or a solid block of treated ground. A blanket layer of sand fill would be required to prevent the escape of cement slurry into the water and disturbance of sediment fines during the mixing. The construction sequences for DCM are summarised as follow:

- Carrying out site investigation to determine the property, grading, chemical composition of the sediment.
- Obtaining sediment samples for laboratory investigation to produce design mix of cement slurry.
- Placing of sand blanket to cover the seabed at the area where DCM would be carried out.
- Positioning of marine DCM plant.
- Inserting piling pipe of mixing treatment equipment into the soft layer at the designated level.
- Pulling up of piling pipe together with the injection of cement slurry and mixing of soft material by the agitator.
- Monitor, control, review and adjust the cement slurry content during mixing.
- Repositioning of the marine DCM plant and repeat the mixing procedure until the required pattern of strengthened material is formed.
- Taking core samples of strengthened material and carrying out associated tests to verify the integrity of the strengthened material.
- Removal of the sand blanket and heaved material where necessary.

2.5.21 The treatment ratio of DCM improved ground to non-improved ground (expressed as a percentage), will depend on the strength/bearing capacity improvement required and will be controlled by mix ratios for the cement slurry. Typically treatment ratios of 60% to 90% are recommended for seawall foundation improvements.

2.5.22 Both Ordinary Portland Cement (OPC) and Portland Blast Furnace Cement (PBFC) are commonly used for DCM. Use of locally supplied Pulverised Fuel Ash (PFA) within any DCM works for the project will not be possible due to environmental reasons.

2.5.23 Average mixes for OPC range from 120kg/m$^3$ to 160kg/m$^3$ of treated ground, with mixes for PBFC ranging typically from 140kg/m$^3$ to 210kg/m$^3$ of treated ground. Mixes using up to 300kg/m$^3$ of OPC have been used in Japan. Both fresh and salt water can be used and is typically 60% to 80% of the dry weight of the cement.

2.5.24 The increase in strength of the treated clays depends on the initial properties of the ground to be treated, the weight and type of cement used. In Japan, mixes using 100kg/m$^3$ of OPC and PBFC have resulted in unconfined compressive strengths of treated mud ranging from 1MPa to 3.7MPa and 1.2MPa to 2.5MPa respectively, at 91 days. Mixes using 200kg/m$^3$ of OPC and PBFC have given unconfined compressive strengths of treated mud ranging from 0.9MPa to 9.5MPa and 3.5MPa to 8.5MPa respectively, at 91 days.

2.5.25 Indications from Japan suggest that DCM may not be an effective form of foundation treatment in sediments with total organic contents in excess of 10% (Please refers to Appendix 5.14). Tests undertaken for the Study suggest that the total organic content for the Hang Hau Clays and Silts is generally less than 5%.

Seawall

2.5.26 The seawall of the proposed reclamation will be exposed towards Po Toi Group of Islands located to the south of Hong Kong Island and to the south of Tathong Channel and the wave forces could be significant. Seawall construction will adopt 1 in 1.75 sloping seawall with 4.5 tonnes armour rocks.

Tunnel Construction

2.5.27 Based on the available geological information, the WCR Tunnel would be excavated through hard rock (Grade II/III Granite) with sufficient depth. Drilling and Blasting method is the commonly used method for excavation through hard rock, like for other past tunnel projects such as Route 3, Tate Cairn Tunnel, and MTR TKO line. It is therefore appropriate to assume that this method of construction would be employed for WCR tunnel construction for the EIA Study purpose.

2.5.28 For the drilling and blasting method, the blast-induced vibrations at the potential significant sensitive receivers such as residential buildings above, cemetery, existing tunnels must be limited to acceptable values at all times. Vibration monitoring will need to be carried out at the sensitive receivers during excavation of the tunnel.
CBL Foundation

2.5.29 The piers of CBL will be supported by socketted large diameter bored piles. The piles will be constructed by marine bored piling plant. Dredging or dewatering will not be required for this kind of construction. The construction method of marine bored piling are briefly described below.

- **Dolphins** - Bored piles or equivalent system would be provided for the dolphin. The piles are to be bored with a permanent steel casing, which remains to combine with the concrete hearthing to sustain the design impact loading. The dolphin piles would be installed from a “spud” barge (i.e. jack-up) with templates and gates used to preserve the positioning. A derrick would be used to lift the tubes and the lowering off would be carried out on close monitoring of verticality. The pile would be driven into the bedrock head level with the soft material being excavated. While excavating within the casing, the excavation depth will not be deeper than the casing head depth at any time.

- **Marine Bored Piling for the Viaduct** - Following completion of pile construction for the dolphin ring beams, the temporary stagings used to access the pile heads would be removed and replaced by a steel platform which serves as a piling platform for bored piles of the main cap. The intention is that these platforms enable the bored piling and cap construction to be carried out effectively as ‘land based’ operations with benefits in terms of output, safety and environmental protection. The platforms would be designed for convenience of construction and would be fully decked out, with wastewater collected for controlled discharge into a derrick lighter or other collection system.

- The platforms would be designed to allow the piling rigs to stand in their best position for piling efficiency; and the decking would have circular upstands round each pile location such that a protective skirt formed in lapped conveyor belting can be strapped/clamped to the casing and upstand as sketched below. This is for effective control over spillage of excavated material or wash water.

- Temporary steel casings would be provided for each pile; and this also protects the excavation against slumping. The casings would be driven into the seabed with soft material inside the temporary casing being excavated. After the bored pilling, steel reinforcement would then be placed into the excavated pile followed by concreting works. The concrete will be ready mixed off-site and delivered by truck which would drive onto a vessel from a facility on site adjacent to landing point. A mobile crane on the vessel or other service crane will lift the concrete to the piles by means of concreting skips.

- All wastewater generated from the piling activities will be collected by a derrick lighter or other collection system and be treated before controlled discharge. Spoil will be collected by sealed hopper barges for proper disposal.

2.6 Operation of the Project

2.6.1 Operational activities, on completion of the project, would comprise essentially new residents moving into the new development areas, traffic movements on the new roads and public use of the GIC, open spaces and waterfronts and recreational activities in Eastern Channel and Inner Junk Bay.
2.7 Project Programme

2.7.1 The traffic impact assessment conducted for the proposed TKO further development has identified the proposed Town Centre South, Pak Shing Kok and Tiu Keng Leng (remaining area) development areas to be developed by year 2011 could be completed without WCR, CBL and Road P2 in place. The WCR and CBL would be required around 2016 subject to the development pace of the planned development in TKO particularly the south-eastern side of TKO and the programme for the Trunk Road T2 under South East Kowloon development. Road P2 and Road D4 Flyover would be implemented to tie in with WCR and CBL.

2.7.2 The Project construction works are anticipated to commence in January 2008 with completion of the Project by December 2017 with all the major roads such as WCR, CBL and Road P2 in operation by December 2016 (the remaining year is for laying of salt water main along Wan Po Road). A construction programme where the use of public fill and minimisation of off-site disposal have been considered in the WCR reclamation is provided in Appendix 2.2. This programme provides the basis for the assessments presented in the EIA report.

2.7.3 Based on the above, the proposed infrastructure needed to support the TKO further development is divided into 4 Development Packages as follows as shown on Figures 2.36 to 2.39:

- TCS, TKL, PSK & TKOL Development (by year 2011);
- Western Coast Road (around year 2016);
- Cross Bay Link (around year 2016);
- Road P2 and D4 Flyover (around year 2016).

**TCS, TKL, PSK & TKOL Development Package**

2.7.4 The TCS, TKL, PSK & TKOL Development Package which provides the essential infrastructure to service the proposed development sites in Town Centre South, Tiu Keng Leng, Pak Shing Kok and the recreational development in TKO Stage 1 Landfill, is subdivided into 3 construction packages:

- Town Centre South and Tiu Keng Leng Construction Package;
- Pak Shing Kok Construction Package;
- Tseung Kwan O Landfill Construction Package;

**Town Centre South and Tiu Keng Leng Construction Package**

2.7.5 The Town Centre South and Tiu Keng Leng Construction Package is to provide all local road and engineering infrastructure to service the proposed development in Town Centre South Areas 65 to 68 (residential, G/IC, Schools, Open Space) and also Tiu Keng Leng Area 72 (G/IC Cluster and Open Space).
2.7.6 Although the development sites in Town Centre South are likely to be implemented in phases, it is not proposed to separate the works in phases in order not to constrain the future land disposal strategy by Lands Department which is subject to prevailing market condition. Also, the proposed drains need to fall towards the south for discharge into Junk Bay through the two drainage reserves designated in the Waterfront Park. Implementation in phases would require provision of temporary drains to be laid for the works in the northern part of Town Centre South. It is therefore cost-effective to implement the drainage works in one complete contract.

2.7.7 Early completion of the road and engineering infrastructure to serve the GIC Cluster in Area 72 of Tiu Keng Leng to facilitate some of these GIC uses to come on line early to meet local demands is one major consideration for programming the infrastructure works.

2.7.8 The road and engineering infrastructure works include:

- Roads L651, L661, L662, L671, L672, L673, L681, L721 and L722 and the associated junction works;
- Drains, sewers, water mains (fresh water and salt water) and utilities (by utility undertakers) along roads, footpaths and drainage reserves;
- Landscape soft works and hard works;
- Realignment of existing single cell box culvert in Area 72 to facilitate future construction of the depressed section of Road P2;
- Removal of the existing preloading mound in Town Centre South (Areas 67 and 68) and Tiu Keng Leng Area 72 left from the existing TKO construction contract;
- Raising of the existing Town Centre South seawall; and
- Pile deck for protection of the tidal gate at Western Box Culvert including removal of existing temporary culvert.

2.7.9 The fill material from the existing preloading mound would need to be removed for construction of Road L671, L672, Road L673, Road L681, Road L721 and Road L722. Part of the fill material from the existing preloading mound will be to provide as fill source for site formation of the three platforms for Pak Shing Kok development under the Pak Shing Kok construction package and also the slope embankment of the Northern Bridge across the Eastern Channel under the TKOL construction package. The site formation in Pak Shing Kok will take away some 400,000m³ out of the 924,000m³ fill material.

Pak Shing Kok Construction Package

2.7.10 The second construction package is to provide the local road and engineering infrastructure to service the Pak Shing Kok development in Area 78 (residential and schools).

2.7.11 Infrastructure works include:

- Road L781 and the associated junction improvement works with Wan Po Road and Road L782 (including the slope works);
- Junction improvement works at Wan Po Road/Shek Kok Road;
- Drains, sewers, water mains and utilities (by utility undertakers) along roads and footpath;
- Landscape soft works;
- Site formation (laying of some 2 to 2.5m thick fill material on the three development platforms- about 400,000m³ of fill material is required);
- Construction of a freshwater service reservoir, water pumping station and access road to service reservoir and the associated distribution mains.
Further Development of Tseung Kwan O
EIA Report

Tseung Kwan O Landfill Construction Package

2.7.12 The third construction package is to provide supporting sewerage and water supply infrastructure to serve the proposed recreational development in TKO Stage 1 Landfill (Area 77) including the watersport centre on the south-western edge of the Landfill site as well as the proposed cycletrack and footpath along the toe of TKO Stage 1 Landfill. Early completion of cycletrack and footpath is required to enable early function of the emergency vehicular access to serve the south-eastern side of TKO.

2.7.13 Infrastructure works include:

- Northern and Southern Footbridges across Eastern Channel (no bridge piers located in the channel);
- Construction of the proposed sewage pumping station (small size capable of handling 53m³/day of average sewage flow) near the roundabout of Road L861;
- Laying of twin rising mains along Road L861 to connect to the existing sewer along Wan Po Road;
- Laying of water mains (freshwater and salt water) along Road L861 to connect to the existing water mains along Wan Po Road;
- Cycletrack and footpath along the toe of Tseung Kwan O Stage 1 Landfill from the end of Road L861 to the open space under the cul-de-sac of Fung Loi Road; and
- Landscape soft works and hard works adjacent to the cycletrack and footpath along the toe of Landfill site.

Western Coast Road Development Package

Works Phasing Considerations

2.7.14 As the WCR tunnel is a major generation of C&D material and the reclamation is a major receiver, the construction of these two elements somehow has to be linked up. Since the Kowloon Portal of the WCR tunnel is located under the existing Lei Yue Mun Road, major excavation works would be required before tunneling can commence from the Kowloon Portal. There will also be a long period of disruption due to the tunnel work. Furthermore, it would be more difficult to muck out the tunnel spoil from the Kowloon Portal due to the road access difficulties, traffic congestion and due to environmental restriction on dust and noise. The work involved in establishing the TKO Portal and commencing tunnel excavation from the TKO Portal will be much quicker. It is therefore proposed that tunneling will commence from the TKO side.

2.7.15 In planning the phasing of the reclamation, an advanced reclamation area will need to be created at the southern end of the proposed reclamation area in order to provide access to the proposed TKO Portal for construction of the Portal and then for the subsequent tunneling works. This advanced reclamation area is aimed to provide land for: an adequate works area for the tunnel contractor's offices, storage areas, maintenance yards, workshops and batching plants; area for Engineer's Office; a temporary barging point for equipment handling, materials delivery and export of tunnel spoil; an access ramp to reach the portal from the reclamation.
Construction Packaging

2.7.16 The WCR Development Package is sub-divided into 4 construction packages as follows:

- Reclamation Phase 1 (first reclamation phase and the DCM trial);
- Reclamation Phase 2 and Phase 3 and Associated Works (reclamation phases 2 and 3, toll plaza and its associated facilities and at-grade roads on the Phase 1 and Phase 2 reclamation areas);
- Main Tunnel and Associated Works (twin tunnels including civil and E&M works and the Eastern Portal, Mid and Western Portal ventilation buildings); and
- Kowloon Section- Viaducts and Roads (all the works on the Kowloon side including reprovisioning of the Lam Tin Ambulance Depot).

2.7.17 The “Reclamation Phase 1” construction package comprises the Phase 1 reclamation area and the DCM trial. The “Reclamation Phase 2 and Phase 3 and Associated Works” construction package comprises the construction of the remaining two reclamation phases and the toll plaza and the at-grade roads on the Phases 1 and 2 reclamation areas.

2.7.18 The “Main Tunnel and Associated Works” construction package comprises the construction of the twin tunnels including civil and E&M works and the mid-ventilation building and also provision of traffic control and surveillance system, fire fighting and operational facilities. The rock material generated from the tunnel excavation will be reused in the Phase 2 reclamation and Phase 3 reclamation seawall and reclamation.

2.7.19 The “Kowloon Section-Viaducts and Roads” construction package covers all the works of WCR on Kowloon side from the Western Tunnel Portal to the planned Trunk Road T2 near the planned Dangerous Good Vehicle Ferry Pier under the Southeast Kowloon development. This construction package has been programmed to commence early in order to provide sufficient time for reprovisioning of the Lam Tin Ambulance Depot which requires to be put in operation before demolishing the existing one. To minimize the length of viaduct, it is proposed that the ex-EHC casting basin will be filled up from around +5mPD to about +22mPD. This proposed filling would serve a major receiver of fill material generated from the project. As the material from WCR construction on Kowloon side would not be able to fill up the site to the required level, the site will be opened for dumping of C&D material from outsider during the specified period.

Cross Bay Link Development Package

2.7.20 The CBL Development Package would be implemented as a single construction package covering the slip roads of WCR/CBL/Road P2 Interchange, the bridge across Junk Bay and the at-grade road along the southern edge of Area 86 development including the associated junction modification works. The proposed 300mm diameter salt water main running along Wan Po Road south of Wan Po Road/Road L861 junction and the proposed 900mm diameter salt water main along Wan Po Road and CBL will also be implemented under this construction package. The water main along Wan Po Road will be constructed after opening of the CBL. The commencement of WCR/CBL/Road P2 Interchange would hinge on the land availability from the WCR Phase 2 reclamation. Other works can be carried out independently.
Road P2 and D4 Flyover Development Package

2.7.21 The Road P2 and D4 Flyover Development Package would be implemented as a single construction package covering the Road P2 and its associated slip road, landscape decks, pumping station and the Road D4 Flyover and its associated slip road. The construction of the depressed section within the reclamation area will hinge on the availability of land from the WCR Phase 3 reclamation.

2.7.22 The proposed Road P2 is to be depressed for the section fronting the existing residential development, Ocean Shores to minimize the traffic noise impact. Also, at the depressed section, two landscape decks are to be provided to facilitate at-grade pedestrian movements between Town Centre South waterfront and Tiu Keng Leng. This serves to remove the barrier of two districts.

2.8 Concurrent Projects

2.8.1 Concurrent projects with likely interaction with this Project are identified and summarised in Table 2.5. The status of these concurrent projects is based on the available information at the time of the submission of this Report. It should be noted that the implementation of individual projects would be subject to the on-going review by relevant project proponents.

Table 2.5 Concurrent Projects

<table>
<thead>
<tr>
<th>Concurrent Project</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development at Cha Kwo Ling Kaolin Mine Site</td>
<td>According to Kaolin Mine Site Development Study, the site formation of Kaolin Mine Site and Road A would be completed before WCR construction. The building construction by Housing Department would likely be in parallel with WCR construction.</td>
</tr>
<tr>
<td>Trunk Road T2 under South East Kowloon Development</td>
<td>The completion of Trunk Road T2 should tie in with WCR and vice versa.</td>
</tr>
<tr>
<td>1200mm diameter fresh watermain in Cha Kwo Ling area</td>
<td>Unknown at this stage based on WSD’s information.</td>
</tr>
<tr>
<td>Area 137 development</td>
<td>Uncertain at this stage, TIA under this study assumed completion of 11ha of DWI and 12ha PHI and 15ha SENT Landfill Extension by 2016.</td>
</tr>
<tr>
<td>Area 86 Housing Development</td>
<td>To be implemented in phases and construction take place between 2005 and 2015.</td>
</tr>
<tr>
<td>Recreational Development in TKO Stage 1 Landfill</td>
<td>Infrastructure to be provided along the toe of the landfill to serve the development. Development is assumed to take place after infrastructure provision.</td>
</tr>
<tr>
<td>Road L861</td>
<td>Construction is to commence in mid-2006 and to complete around late 2008.</td>
</tr>
<tr>
<td>TKO South MTR Station</td>
<td>April 2006 to March 2009</td>
</tr>
</tbody>
</table>

Remark: Lei Yue Mun Underpass project is assumed to be completed before commencement of WCR construction on Kowloon side. (Original programme start in Dec 04 - Dec 07).