

**A Review of Central Reclamation Phase III  
by applying the Court of Final Appeal's  
“Overriding Public Need Test”**

**April 2004**

# **A Review of Central Reclamation Phase III by applying the Court of Final Appeal’s “Overriding Public Need Test”**

## *Table of Contents*

### **PART ONE**

**Glossary**

**Abbreviation**

#### **Chapter 1 - Introduction and Background**

- Introduction
- History of CRIII
  - plan-making process
  - authorization and funding approvals
  - CRIII works
  - chronology of events
- The High Court Judgment on the draft Wan Chai North Outline Zoning Plan and the Engineering Review of CRIII based on the “Three Tests”
- The Court of Final Appeal’s Judgment

#### **Chapter 2 - The Review**

- Scope of the Review
- Approach of the Review
- Central – Wan Chai Bypass
- Road P2 network
- Airport Railway Extended Overrun Tunnel
- Cooling water pumping stations
- Ferry piers

- Public landing steps
- PLA berth
- North Hong Kong Island Line
- Conclusion

**Chapter 3 - Publicity and Public Consultations**

- The CRIII Website
- Leaflet on “*Our Harbour – Past, Present and Future*”
- Booklet on “*All About Central Reclamation Phase III*”
- Public Statements on the Harbour
- Other Public Consultations
- Legislative Council Joint Panel Meeting

**Chapter 4 - Implications on the Programme and Cost of CRIII**

**Chapter 5 - Conclusion**

**PART TWO**

**Enclosures**

**PART THREE**

**Appendices**

## **PART ONE**

### **Glossary**

Atrium Link	An elevated enclosed pedestrian deck connecting the Hong Kong Convention and Exhibition Centre and its Extension across the Convention Avenue and the water channel at Wan Chai North.
Bentonite slurry	A thin mixture of a liquid, especially water, with the absorbent aluminum silicate clay which is formed from volcanic ash.
Central Reclamation Phase III (CRIII) project	Reclamation of about 18 ha of land of the seabed in front of the Star Ferry Pier from Central reclamation phase I to Lung King Street which is part of the 23 ha of reclaimed land under the approved OZP No. S/H24/6 for Central District (Extension). The scope also includes construction of seawalls; roadworks; culvert extensions; drainage; sewer and service systems; cooling water pumping stations for future developments; reprovisioning of ferry piers, landing steps, cooling water pumping systems, public cargo working area and Government helipad; hinterland drainage improvement works and landscaping works at roadside amenity.
Cope line	A cope line is a reference vertical line along the outermost top corner of the coping of a seawall. The coping is the uppermost in-situ concrete portion of a vertical seawall.
Diaphragm wall (D-wall)	Diaphragm wall is a widely employed technique whereby reinforced concrete retaining walls are cast in-situ from existing ground down to the required depth. A trench or panel is excavated using special equipment and remains open in a stable condition due to the fact that it is kept full

of bentonite slurry. Reinforcement cages are lowered into the trench, after which concrete is introduced at the base by a tremie tube and the bentonite slurry is progressively displaced and drawn off. By constructing a series of panels, a continuous wall is achieved.

Dual-2 carriageway

A dual carriageway road with 2 traffic lanes on each side of the carriageway.

Dual-3 carriageway

A dual carriageway road with 3 traffic lanes on each side of the carriageway.

Environmental Impact Assessment (EIA)

The EIA refers to the Environmental Impact Assessment process under the Environmental Impact Assessment Ordinance, Cap.499 (EIAO). The purpose of the EIAO is to avoid and if total avoidance is not practical, to minimize and control the adverse impact on the environment of designated projects to acceptable levels through the EIA mechanism.

The EIAO came into operation on 1 April 1998. Designated projects specified under Schedule 2 of the EIAO, unless exempted, must follow the statutory EIA process and require environmental permits for their construction and operation (if applicable, and decommissioning). Designated projects specified under Schedule 3 of the EIAO that mainly cover feasibility studies require approved EIA reports but not environmental permit.

MPD

Metre above Principal Datum. Principal Datum is the reference datum generally used throughout Hong Kong and is 1.23 metres below the Mean Sea Level.

Volume to capacity (v/c) ratio

A v/c ratio is an indicator which reflects the performance of a road. A v/c ratio equal to or less

than 1.0 means that a road has sufficient capacity to cope with the volume of vehicular traffic under consideration and the resultant traffic will flow smoothly. A v/c ratio above 1.0 indicates the onset of congestion. A v/c ratio above 1.2 indicates more serious congestion with traffic speeds deteriorating progressively with further increase in traffic.

## **Abbreviation**

AEL	MTRCL Airport Express Line
AREOT	Overrun tunnel for the Airport Railway and Tung Chung Line
CBD	Central Business District
CFA	Court of Final Appeal
CRI	Central Reclamation Phase I
CRII	Central Reclamation Phase II
CRIII	Central Reclamation Phase III
CRC	Connaught Road Central
CTS	Comprehensive Transport Study
CTS-3	The Third Comprehensive Transport Study
CWB	Central – Wanchai Bypass
CWPS	Cooling water pumping station
EMSD	Electrical and Mechanical Services Department
GR	Gloucester Road
HKCEC	Hong Kong Convention and Exhibition Centre
HR	Harcourt Road
HyD	Highways Department
IECL	Island Eastern Corridor Link
IRAE	Initial Reclamation Area East in the construction sequence of CRIII
IRAW	Initial Reclamation Area West in the construction sequence of CRIII
ISL	MTRCL Island Line

JR	Judicial Review
LegCo	Legislative Council
MD	Marine Department
NIL	North Hong Kong Island Line
OZP	Outline Zoning Plan
PLA	People's Liberation Army
RDS-2	Second Railway Development Study
RDS-2000	Railway Development Strategy 2000
SPH	Society for Protection of the Harbour Limited
TCL	MTRCL Tung Chung Line
TD	Transport Department
TDD	Territory Development Department
TWL	MTRCL Tsuen Wan Line
v/c ratio	volume to capacity ratio
WDII	Wan Chai Development Phase II

## Chapter 1 – Introduction and Background

### 1.1 Introduction

- 1.1.1 Central Reclamation Phase III (CRIII) arises from a number of planning studies commissioned by the Government first dated back to the early 1980s. The CRIII has gone through a due process of statutory town planning procedures and public consultation, in which there had been thorough public discussion on matters including the scale of reclamation and the usage of the land to be made available by the project.
- 1.1.2 The need for the Central and Wan Chai Reclamation was first identified in the strategic study on “Harbour Reclamations and Urban Growth” undertaken between March 1982 and October 1983. The need was further confirmed in various planning studies, including the Territorial Development Strategy of 1984, the Port and Airport Development Strategy 1989, Metroplan 1991, and the Territorial Development Strategy Review of 1996. The whole Central and Wan Chai Reclamation project forms land for the construction of, among other things, strategic transport links, associated surface road networks, the Airport Railway and its Hong Kong Station and the Hong Kong Convention and Exhibition Centre Extension. The Central Reclamation Phases I, II and the Wan Chai Reclamation Phase I were completed in 1997 to 1998. CRIII is the fourth of the five phases of the Central and Wan Chai Reclamation. A plan showing the five phases of the Central and Wan Chai Reclamation is shown at **Appendix 1.1**.
- 1.1.3 CRIII is needed to provide land for essential transport infrastructure including the Central – Wan Chai Bypass (CWB) and Road P2 network. The need for the CWB was reconfirmed in the Comprehensive Transport Study (CTS-3) completed in 1999. In a recent rerun of the CTS-3 transport model, the results indicated that the demand for CWB remained firm. The CRIII is also needed to re-provision existing waterfront facilities (e.g. pumping stations

providing cooling water for buildings in Central, Star Ferry piers and Queen's Pier), which will be affected by the reclamation to provide the above-mentioned essential transport infrastructure.

- 1.1.4 Also accommodated in the CRIII will be –
- a military berth for the People's Liberation Army (PLA) as agreed under the 1994 Sino-British Defence Land Agreement;
  - an overrun tunnel for the Airport Railway and Tung Chung Line (AREOT) to allow them to operate at their full capacity; and
  - the future North Hong Kong Island Line (NIL).

All these essential infrastructure are shown in **Appendix 1.2**.

- 1.1.5 The land made available for the above items will provide an exceptional and unique opportunity for a vibrant waterfront promenade on the northern shore of Hong Kong Island extending from the Central Business District (CBD) to Wan Chai for the access and enjoyment by the community. About 5.1 ha of reclaimed land on CRIII is reserved for commercial uses. However, such uses are consequential to the reclamation extent determined by the need for the provision of essential transport infrastructure and reprovisioning of affected waterfront facilities. Stringent height restrictions are stipulated on the Central District (Extension) OZP so that mainly low-rise developments will be allowed. The commercial sites along the promenade are meant for waterfront related commercial and leisure uses such as low rise retail shops and cafes/restaurants to complement the function of the promenade for the enjoyment of citizens and tourists.

- 1.1.6 The Legislative Council, relevant District Councils (including Central & Western and Wan Chai District Councils), professional bodies (including Hong Kong Institution of Engineers, Hong Kong Institute of Planners, Hong Kong Institute of Architects, Hong Kong Institute of Surveyors, Hong Kong Institute of Landscape Architects and the Real Estates Developers Association of Hong Kong) and the

general public have all been consulted on CRIII. There is a general support for the Central District (Extension) OZP and the CRIII project.

## **1.2 History of CRIII**

### ***1.2.1 Plan-making process***

1.2.1.1 On 27 April 1998, the then Secretary for Planning, Environment and Lands under the delegated power of the Chief Executive directed the Town Planning Board (TPB) to prepare a new OZP for the Central Reclamation Phase III and its adjoining areas. Subsequently, the draft Central District (Extension) OZP was exhibited for public inspection on 29 May 1998 in accordance with section 5 of the Town Planning Ordinance (TPO). At that time, the draft OZP covered a proposed reclamation area of 38 hectares.

1.2.1.2 At the end of the two-month exhibition period, 70 valid objections were received, the majority of which were against the proposed scale of reclamation. After considering the objections, the TPB requested the Government to undertake a study to make recommendations to reduce the scale of reclamation. As a result, the area of reclamation was reduced to 23 hectares (i.e. the “minimum reclamation option”). The minimum reclamation option was presented to the objectors at the TPB hearing on 30 March 1999 and was considered generally acceptable by them as a suitable basis for the planning of the reclamation. After giving due consideration to the objections and the revised reclamation extent proposed by the Government, TPB agreed to adopt the minimum reclamation option as the basis for preparing amendments to the draft OZP.

1.2.1.3 On 10 June 1999, the Government presented the minimum reclamation option to the Panel on Planning, Lands and Works and the scheme was generally accepted. On 16 July 1999, the proposed amendments to the draft OZP (with the reclamation

extent reduced from 38 ha to 23 ha) were gazetted under section 6(7) of the TPO.

- 1.2.1.4 In mid-1999, the Government presented the amended draft OZP to the then Central and Western District Board and various professional bodies including the Hong Kong Institution of Engineers, Hong Kong Institute of Planners, Hong Kong Institute of Architects, Hong Kong Institute of Surveyors, Hong Kong Institute of Landscape Architects and the Real Estate Developers' Association of Hong Kong. They generally supported the minimum reclamation option. On 22 February 2000, the amended draft OZP incorporating this option was approved by the Chief Executive in Council and gazetted as Central District (Extension) OZP No. S/H24/2 on 3 March 2000. The Plan went through several changes in the subsequent years with the current approved Plan being Central District (Extension) OZP No. S/H24/6. However, apart from the incorporation of four piers, the extent of reclamation remains unchanged.

## ***1.2.2 Authorization and funding approvals***

- 1.2.2.1 Pursuant to the above plan-making process, the Government duly proceeded with the authorization of the reclamation and surface road networks within CRIII under the Foreshore and Sea-bed (Reclamations) Ordinance and Roads (Works, Use and Compensation) Ordinance respectively in December 2001. Relevant bodies including the Central & Western, Wan Chai and Eastern District Councils were consulted in March 2000 regarding the proposed CRIII works, and expressed no adverse comments. As a designated project under Schedule 2 to the Environmental Impact Assessment Ordinance, CRIII's environmental impact assessment report was endorsed by the Advisory Council on the Environment and approved by the Director of Environmental Protection (DEP) in August 2001. An Environmental Permit for the CRIII works was issued by the DEP in March 2002. The Finance Committee of the Legislative Council approved funding

for CRIII's detailed design and construction on 28 April 2000 and 21 June 2002 respectively.

- 1.2.2.2 Details of discussion at the District Councils, and the Panels and Finance Committee of the Legislative Council are at **Enclosure 1.1**.

### ***1.2.3 CRIII works***

- 1.2.3.1 The CRIII works contract as shown in **Appendices 1.3** and **1.4** was awarded to Leighton-China State-Van Oord Joint Venture (the Contractor) on 10 February 2003. The contract period is 55 months and is due for completion in September 2007.

- 1.2.3.2 The site was handed over to the Contractor on 28 February 2003. Thereafter, works commenced in various areas of the site and the Contractor commenced surveying, erection of hoarding, preparatory works, site establishment and mobilization. On 24 May 2003, the Contractor commenced marine site investigation at Initial Reclamation Area West and over the following months continued with the contract works including dredging, rockfilling and piling.

### ***1.2.4 Chronology of events***

- 1.2.4.1 The chronological events related to CRIII are set out at **Enclosure 1.2**.

## **1.3 The High Court Judgment on the draft Wan Chai North OZP and the Engineering Review of CRIII based on the “three tests”**

- 1.3.1 According to the Protection of the Harbour Ordinance (PHO), “the harbour is to be protected and preserved as a special public asset and a natural heritage of Hong Kong people, and for that purpose there shall be a presumption against reclamation in the harbour”. Furthermore, the Ordinance stipulates that all public officers and

public bodies shall have regard to the above principle for guidance in the exercise of any powers vested in them. On 27 February 2003 the Society for Protection of the Harbour Limited (SPH) commenced legal proceedings and applied for judicial review of the decisions of the TPB made in connection with the draft Wan Chai North OZP – the challenge concerned WDII and did not include the CRIII works.

- 1.3.2 The High Court delivered the judgment on 8 July 2003 in respect of the judicial review. In the judgment, with regard to the presumption against reclamation under section 3 of the PHO, the following three tests were laid down –
- “...the purpose and extent of each proposed reclamation ought to be individually assessed by reference to the three tests of –
- compelling, overriding and present need;
  - no viable alternative; and
  - minimum impairment.”
- 1.3.3 This interpretation of the PHO would apply to all future planning of harbour front areas which included reclamation. Because of the great general or public importance of the case, the TPB appealed to the Court of Final Appeal (CFA).
- 1.3.4 On 31 October 2003, after reassessing the purpose and extent of each individual component of the proposed reclamation based on the three tests laid down by the High Court, the TPB requested the Government to conduct a comprehensive planning and engineering review on WDII and to draw up a minimum reclamation option that would comply with the law. The TPB will reconsider the draft Wan Chai North OZP and the objections according to the provisions of the Town Planning Ordinance upon completion of the review. The review is scheduled to commence soon with a view to drawing up a conceptual scheme for public consultation by end 2004.
- 1.3.5 In respect of the CRIII works and the Central District (Extension) OZP, unless set aside by the Court, the Central District (Extension)

OZP remains lawful and valid. The Government has to discharge contractual obligations under the CRIII works contract.

1.3.6 Following the High Court judgment, the Administration publicly announced that it would review all reclamation proposals inside the Harbour against the High Court's three tests. Accordingly, the Administration completed in November 2003 a review of the reclamation extent of CRIII with the essential infrastructure therein by applying the three tests (hereafter referred to as "the November 2003 Review"). That Review has examined each component in CRIII individually and concludes that they meet the three tests. It has been endorsed by Professor Y S Li, Chair Professor of Coastal and Environmental Engineering & Head of Department of Civil and Structural Engineering of the Hong Kong Polytechnic University. Professor Li has confirmed in writing that in his view, the analysis as presented in the November 2003 Review Report has convincingly demonstrated that the CRIII reclamation can comply with the three tests laid down in the High Court's judgment. Professor Li also confirms that CRIII is an integral part of and a necessary continuation of the early and completed phases of the Central and Wan Chai Reclamations, and that apart from the proposed construction of the key infrastructure in Central, namely the CWB, Airport Railway Extended Overrun Tunnel and Road P2 network, the CRIII reclamation can enhance the tidal flow and water quality in the Victoria Harbour by eliminating a zone of rather stagnant water. A copy of Professor Li's letter is at **Enclosure 1.3**. The November 2003 Review Report has been released to Members of the Legislative Council Panel on Planning, Lands and Works and Panel on Environmental Affairs as well as representatives of deputations attending the Legislative Council (LegCo) joint Panel meetings on the subject and members of the public upon request. It has also been posted on the CRIII website for public scrutiny.

#### **1.4 The Court of Final Appeal's Judgment**

1.4.1 The CFA handed down its judgment on 9 January 2004 in respect of

the draft Wan Chai North OZP. The CFA held that the statutory principle of protection and preservation of the Harbour is a strong and vigorous one. The statutory presumption against reclamation in the Harbour is to implement the principle of protection and preservation. It does not prohibit reclamation altogether. As a presumption, it is capable of being rebutted.

- 1.4.2 The CFA dismissed the TPB's appeal and substituted the three tests laid down by the High Court with a single test of "**overriding public need**", which by its nature is a "demanding" test. A copy of the CFA judgment is at **Enclosure 1.4**. The presumption against reclamation can only be rebutted by establishing **an overriding public need for reclamation**. Such a need means a community need and would include "**the economic, environmental and social needs of the community**".
- 1.4.3 As stated in the CFA judgment, a need should only be regarded as overriding if it is a compelling and present need. The compelling need is far beyond "something nice to have, desirable, preferable or beneficial" but does not go as far as the "last resort" or something that the public "cannot do without". The present need is "taking into account the timescale of planning exercises, the need would arise within a definite and reasonable time frame". In addition, where there is a reasonable alternative to reclamation, there is no overriding need for reclamation. All circumstances should be considered as to whether there is any reasonable alternative and they would include the economic, environmental and social implications of each alternative. It is also relevant to take into account the cost, time and delay involved in respect of each alternative.
- 1.4.4 In order to satisfy the overriding public need test, there must be **cogent and convincing materials** before the decision-maker to establish an overriding public need for reclamation and rebut the presumption against reclamation. The burden to rebut such presumption is a heavy one and it falls on a public officer or public body in considering the exercise of any power in relation to any

reclamation proposal.

- 1.4.5 Finally, as regards the extent of the proposed reclamation, the CFA also stated that it should not go beyond the minimum of that which is required by the overriding need. Each area proposed to be reclaimed must be justified.
  
- 1.4.6 Following the CFA judgment, the Administration has stated that it would review CRIII by applying the CFA's overriding public need test. The conclusion reached in the following chapters is that the extent of the CRIII reclamation is required to meet an overriding public need, in the form of essential transport infrastructure, including the CWB, and the reprovisioning of the existing facilities along the waterfront affected by the reclamation, including the Star Ferry piers, the Queen's Pier, public landing steps and cooling water pumping stations. We also need to build a PLA berthing space. Both the Road P2 network and NIL are located to the south of the CWB. So they will not push the reclamation extent further into the Harbour. As regards the waterfront promenade, it will be built on land formed for the CWB and reprovisioned facilities.

## **Chapter 2 – The Review**

### **2.1 Scope of the Review**

- 2.1.1 A revisit of the history and sequence of the development of CRIII will clearly demonstrate that CRIII is part and parcel (being the fourth of the five phases) of the Central and Wan Chai Reclamation planned in the 1980s and implemented since the early 1990s. CRIII aims at providing essential transport infrastructure to meet public needs that will arise within a definite time frame, notably the CWB, the Road P2 network and the AREOT. The limits of reclamation under CRIII are determined by the alignment of the CWB and the reprovisioning of existing facilities affected by the proposed reclamation. Allegations that the CRIII has sought to reclaim more land than is needed for the essential transport infrastructure are unfounded. Even the oft-quoted waterfront promenade is not a cause for reclamation. It will only be developed on land formed for the CWB which will be constructed within the CRIII area in the form of a tunnel and the reprovisioning of cooling water pumping stations affected by the CWB.
- 2.1.2 Other land use proposals are planned consequential to the reclamation limit determined. Hence, the Review focuses on examining individual areas of the proposed reclamation area to confirm whether they can meet the overriding public need test. Land use zoning on the reclaimed land is not a subject matter to be reviewed for justifying the compliance of the overriding public need test.
- 2.1.3 The Central District (Extension) OZP includes the CRIII reclamation of about 18 hectares and a proposed reclamation area of about 5 hectares to the north of Lung King Street. It has always been the Administration's intention, justified on grounds of works sequencing and environmental consideration, to implement the 5 hectares reclamation as part of the Wan Chai Development Phase II (WDII) works. In light of the review to be undertaken on WDII pursuant to

the CFA judgment, this Review, as in the case of the November 2003 Review, covers only the CRIII, while the 5 hectares proposed reclamation area will be reviewed under the WDII. Upon completion of the WDII review, the Chief Executive in Council will be requested to consider whether the Central District (Extension) OZP should be referred to the TPB for amendment under section 12 of the TPO insofar as the 5 hectares of proposed reclamation are concerned. Such a procedure is not uncommon in the plan-making process.

## **2.2 Approach of the Review**

2.2.1 To satisfy the requirement of “no reasonable alternative” specified in the CFA judgment, we have in this Review examined all suggested alternatives in respect of the individual components of reclamation put forward or brought to our attention by concerned parties, professionals or other members of the public in recent months. They can be categorized into two groups – the alternatives and comments we received in the two Legislative Council joint Panel meetings held on 27 November and 8 December 2003, and alternatives contained in SPH’s Affirmations it submitted to the High Court in early February 2004 in the judicial review proceedings in relation to CRIII. It should be noted that the Judge hearing the CRIII JR only allowed the SPH to refer to the contents of those Affirmations for the limited purpose of supporting its contention that alternatives did exist; the Judge did not decide whether such alternatives were reasonable or viable, nor did he consider it within his purview to go into the merits of the reclamation.

2.2.2 In the following paragraphs, we will present the CRIII components and our review in accordance with the CFA’s “overriding public need test” one by one, followed by the suggested alternatives referred to in paragraph 2.2.1 above, and our responses to those suggested alternatives. With particular reference to the engineering alternatives put forth in respect of the alignment of the CWB, the form and construction of seawalls and the size, configuration and

operation of water cooling pumping stations, it should be pointed out that these are complex and inter-related physical infrastructural works the feasibility of which could only be assessed and confirmed through comprehensive studies. Likewise, the environmental acceptability of such alternatives could only be confirmed through environmental impact studies. Moreover, where affected parties are involved, such as in the case of the reprovisioning of pumping stations, these parties would have to be extensively consulted and their agreement obtained. Most of the suggested alternatives addressed in this Review are short of the necessary details. If the Administration were to assess the feasibility of each of these, it would give rise to significant implications in terms of time, delay and cost of the project which, according to the CFA judgment are valid considerations to be taken into account in deciding whether there exists a reasonable alternative. Nonetheless, despite the inherent limitations in assessing these alternatives, we have sought the opinion of independent experts and their views are reflected as appropriate in this Review Report with their expressed consent. A list of the experts who have provided comments and their respective areas of expertise is at **Enclosure 2.1**.

## **2.3 Central – Wan Chai Bypass**

2.3.1 The CWB is a strategic route connecting the Rumsey Street flyover at the west via the Island Eastern Corridor Link with the Island Eastern Corridor at the east as shown in **Appendix 2.1**. The *compelling and present need for CWB* is supported by various transport studies. Transport Department (TD) conducted periodic Comprehensive Transport Studies (CTS)<sup>1</sup>. The CTS-2 completed in 1989 confirmed the need to provide the CWB and the Island Eastern Corridor Link by the mid to late 1990s. After

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<sup>1</sup> According to Mr Tim Man, transport planning specialist, with the multi-modal modeling capability and its ability to assess policy options, the application of the CTS model to assess infrastructural needs is scientific. The CTS model is one of the most sophisticated ones which can cope with the complicated fabric of urban transport in Hong Kong's context [**Enclosure 2.2**].

completion of the CTS-3<sup>2</sup> Study in 1999, the CTS-3 traffic forecasts have been regularly updated taking into account the latest available traffic survey data as well as the latest circumstances like land use planning data including employment and population growth, inflation/deflation rates, economic growth, cross boundary traffic projections, port and airport throughputs, and other socio-economic data and forecasts. In a recent re-run of the CTS-3<sup>3</sup> in the fourth quarter of 2003, the results re-affirmed the need for the CWB despite changes in land use planning assumption and a decrease in population projection of the territory (including the deletion of the Western District Development project). The study model predicted that the traffic volume during the peak hours in 2011 on critical sections of the Connaught Road Central/Harcourt Road/Gloucester Road (CRC/HC/GR) Corridor would exceed their capacities by 30% if the CWB could not be built in time. It should also be noted that the existing CRC/HR/GR Corridor has been so heavily used for many years, major repair / reconstruction works would likely be

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<sup>2</sup> The CTS-3 transport model is a suite of conventional 4-stage transport model developed and further enhanced by the consultants in the series of comprehensive transport planning studies undertaken by the Hong Kong Government in the past few decades, with the latest version being developed and used in the CTS-3 Study completed in 1999. It was developed to evaluate at a territorial level the strategic transport infrastructure requirements for the short, medium and long term for Hong Kong. The model is capable of testing and evaluating a wide range of transport policies like demand management measures and other traffic management measures. For instance, vehicle restraint measures like raising the First Registration Tax (FRT), Annual Licence Fees (ALF), fuel taxes, etc. which would impede the ownership and usage of private vehicles, management measures like better coordination of public transport, fare integration, park-and-ride initiatives, etc. have been evaluated in the CTS-3 Study. The model is also capable of simulating the effect of congestion on trip distribution (i.e. to avoid going to the congested area) and change of mode (i.e. to change to non-road based public transport). Such simulation capability is adequately checked and confirmed when the model is calibrated and validated using the most up-to-date observed data on the traffic volume on major roads and usage of various modes of transport. With further adaptations and refinement, the model is capable of and was used in testing specific transport policy options and district traffic solutions, such as in the case of evaluating the ERP options and addressing district and local traffic issues.

<sup>3</sup> According to Professor Lo Hong Kam, transport expert and Associate Professor of the Department of Civil Engineering at the Hong Kong University of Science and Technology, the CTS-3 model is used to study the traffic impacts of demand management and transportation improvement schemes and represents the state-of-the-art in practice. As a 4-step transportation planning model with feedback between steps, it is among the most sophisticated of its kind. The CTS-3 model is calibrated by two data collection schemes that are among the most comprehensive in the world [**Enclosure 2.3**].

required in the next 15 to 20 years' time. If the CWB was not completed by then, the east-west traffic would be severely disrupted when part of the CRC/HR/GR Corridor has to be closed for carrying out the necessary repair / reconstruction works. Mr Tim Man, transport planning specialist, has pointed out that there is an apparent and pressing need for the CWB to relieve the prevailing traffic congestion experienced along the Corridor traversing through the CBD. With the additional traffic generated by committed developments in CRI, congestion can be expected to exacerbate to an intolerable level [Enclosure 2.2]. Professor Lo Hong Kam, transport expert and Associate Professor of the Department of Civil Engineering at the Hong Kong University of Science and Technology, has noticed that severe congestion now occurs on the roadway segment covering Connaught Road Central-Harcourt Road-Gloucester Road on a regular basis. According to Professor Lo, the traffic congestion "will only get worse with the opening of the International Finance Centre, urban re-development of Central and Western District, and future development of south-western part of Hong Kong Island. There will also be future traffic demands arising from further developments in Western Kowloon and North West New Territories. The CTS-3 result that the Corridor is overloaded to be beyond its capacity is, without a doubt, credible" [Enclosure 2.3]. Besides looking at the operational requirements like traffic projections and forecasts, the project evaluations conducted in the CTS-3 Study and subsequent updating reviews have taken into consideration various relevant factors like economic evaluation on the cost-benefit effectiveness of proposed projects, developmental considerations, environmental considerations, public acceptability, budgetary constraints, etc. Therefore, scoring systems with sensitivity tests using different weightings have been adopted to test the optimal solutions to be recommended. In addition, various other forms of alternatives like supply side and demand side management measures have been examined and recommended in the Study. The CTS-3 model is a tool that helps the Government to formulate a solution to cope with the anticipated traffic demand. The traffic studies confirmed and its subsequent

updating reviews re-confirmed the compelling and present need to build the CWB.

2.3.2 CWB is needed to meet the transport needs of the community within *a reasonable and definite planning time frame*. As pointed out above and illustrated in the Traffic Forecast in Central Business District, if CWB is not available by 2011, traffic conditions along the CRC/HR/GR Corridor will deteriorate and considerable traffic congestion will occur. At present, CRC, HR and GR are already operating beyond their capacities with the volume/capacity (v/c) ratio above 1.0. Congestion is not limited to the normal a.m. and p.m. peak hours. Without the CWB, traffic congestion will deteriorate to a v/c ratio of 1.3. Other east-west secondary corridor, such as Hennessy Road and Queensway would also be heavily congested by that time as the capacity of these roads would be constrained by the traffic signals and kerbside loading / unloading activities of buses, taxis and goods vehicles. The traffic on the CRC/HR/GR Corridor will in turn cause congestion in the neighboring roads in Central and Wan Chai creating gridlocks. CWB is therefore critically needed to provide a relief route to the existing road network to ease the traffic burden on the CRC/HR/GR Corridor on Hong Kong Island. This view is supported by Dr Cheng Hon-kwan, former Chairman of Transport Advisory Committee, who opines that the CWB is urgently needed to resolve the traffic congestion problem in Central and Wan Chai [**Enclosure 2.4**].

2.3.3 If CWB is not available by 2011, it is estimated that traffic conditions will worsen to a speed of 5 km/hr and it would take about 45 minutes for drivers to travel from Rumsey Street to Causeway Bay for the 4 km long CRC/HR/GR Corridor. According to Mr Fred Neal Brown, who is a transport expert, there will be substantial increase in travel by all modes to the north foreshore of the Hong Kong Island and the CBD. With the already protracted delay to the CWB, the travel and environmental prospects for CBD will worsen in terms of –

- Worsening traffic congestion;
- Increasing risk of gridlock;
- Substandard air quality, noise and physical environment;
- Deteriorating operating conditions for public transport; and
- Poor access to the waterfront and degraded environment for pedestrians.

Mr Brown further opines that the CWB is an essential component for the land use/transport/environmental revitalization and development of the CBD and the north foreshore of Hong Kong Island as a whole. The original planning for the CWB envisaged completion in the 1990s. The protracted delay in implementation is already causing degradation of the environment and accessibility in the CBD [**Enclosure 2.5**]. According to the Chartered Institute of Logistics and Transport in Hong Kong, the CWB will relieve the serious traffic congestion on the main roads along the north shore of the Hong Kong Island to an acceptable level [**Enclosure 2.6**].

2.3.4 Because of the unique position of the CBD, the social and economic costs of serious traffic congestion and gridlock are high. In measuring the cost effectiveness of a project, Government looks at the overall benefit brought to the community by the project. For transport infrastructure, the bulk of such benefit refers to the saving in travelling time for the public and congestion relief to adjacent roads. In assessing the cost-effectiveness of CWB, TD has estimated that on the first year of operation of CWB, about 365,000 road users will benefit from using the new road each day and the average time saved by each user will be 20 minutes and the cost of user time is \$60 per hour. These input assumptions will result in the cost of time saved amounting to \$2,193 million in the first year. Using the Internal Rate of Return equation, we evaluate that the investment on the CWB will generate an Economic Internal Rate of Return of about 28% over its estimated project life of 40 years. Using the CFA formulations, the CWB is clearly meeting the *social and economic needs* of the community.

2.3.5 The compelling need for CWB could also be appreciated by viewing

its significance in Hong Kong's strategic road network. As illustrated in **Appendix 2.2**, the CWB is the final and most vital road link that is currently missing on the northern shore of Hong Kong Island. This conduit is needed to divert through traffic away from the CBD, to cater for anticipated traffic growth beyond 2006 and to alleviate congestion on existing road networks (already operating at capacity) that feed into Central from the east to the west, and vice versa. Without CRIII, the CWB cannot be built and there will be a "missing link" between Kennedy Town and Causeway Bay along the northern shore of the Hong Kong Island, as well as in the territory-wide strategic road network. Professor Lo Hong Kam supports the argument that the CWB constitutes a missing link in the Hong Kong transportation network. Without the CWB, the CRC/HR/GR Corridor becomes the only linkage with insufficient capacity to serve the heavy demands between the Western Harbour Crossing, Cross Harbour Tunnel and Central, as well as the through traffic eastbound and westbound on Hong Kong Island, and northbound traffic from the mid-levels [**Enclosure 2.3**]. Professor C O Tong, Associate Professor of the Department of Civil Engineering at the University of Hong Kong, echoes Professor Lo's view by saying that "the CWB is needed to ensure the provision of a functional and balanced road network" [**Enclosure 2.7**]. In a letter to the Administration, the Hong Kong Institute of Planners "supports the early completion of the road network to resolve the increasing traffic congestion problems" [**Enclosure 2.8**].

- 2.3.6 The community need for the CWB has been well recognized throughout the planning stage of the project. At the 6<sup>th</sup> In-house Meeting of Central and Western District Council held on 23 July 1998, members passed a motion requesting the Government to build CWB close to the Central waterfront immediately. Highways Department consulted the Eastern District Council on 6 September 2001, the Central and Western District Council on 13 September 2001, and the Wan Chai District Council on 18 September and 20 November 2001 on the CWB works. Members expressed support for the project. At the Public Works Subcommittee of the Finance

Committee of the Legislative Council meeting on 5 June 2002 during which funding application for the CRIII project was discussed, Members expressed support for the CRIII on account of the need to provide land for construction of the CWB to ease the traffic congestion problem in Central. It is relevant to note that amongst those who had lodged objections to the Central District (Extension) OZP during the plan making process, only one objector said that there was no need for more roads. All the other objectors did not raise objection to the CWB. Some objectors actually indicated their support for the CWB during the objection hearings. At the joint meeting of the Panel on Planning, Lands and Works and the Panel on Environmental Affairs on 27 November 2003, the Chairman of GMB Maxicab Operators General Association Ltd (GMB) supported reclamation for the provision of essential road infrastructure, including CWB, to relieve traffic congestion in Central as this would facilitate the operation of the GMB Maxicab lines running between Central and Wan Chai. At the same meeting, the spokesman of the Hong Kong and Kowloon Taxi Merchants' Joint Committee supported the construction of the CWB to resolve the traffic congestion problem in Central.

2.3.7 In her judgment, Madam Justice Chu said that “the applicant is prepared to accept that as a matter of principle at least, reclamation for the CWB and the IEC Link may be able to satisfy the three tests propounded by the applicant”. In the CFA judgment, it was likewise pointed out that the position of SPH is that it accepts the proposed roads, being essential infrastructure, may satisfy the overriding public need test for rebutting the presumption. However, the Society appears to have changed its stance later in the CRIII judicial review hearing.

2.3.8 In the November 2003 Review, we have already analyzed the horizontal and vertical alignment options of CWB and concluded that the *extent of reclamation for the CWB under the CRIII is the minimum that is required*. The horizontal alignment of the CWB is fixed by the control points at both connecting ends, namely the

Rumsey Street Flyover to the west and the Island Eastern Corridor to the east. In addition, the Central District is already fully packed on the road surface as well as in the underground which makes it difficult to build the CWB on existing land. The Final Study Report for Central -- Wan Chai Bypass Tunnel Review under the Comprehensive Feasibility Study for CRIII Minimum Option in 1999 has identified the following constraints on the alignment of the CWB. These include –

- The Rumsey Street Flyover (the western end of the CWB) where provision has already been built for the future extension;
- The existing developments and on-going developments including Harbour Building, Exchange Square, One and Two International Finance Centre, Four Seasons Hotel, Hong Kong Convention and Exhibition Centre, its Extension and the Atrium Link between them, Wan Chai Towers and Central Plaza;
- Existing Roads including Connaught Road Central, Harcourt Road, Gloucester Road, Man Cheung Street;
- Existing underground structures including the existing MTR Tsuen Wan Line and Airport Railway;
- The existing MTR Cross Harbour Tunnel (Tsuen Wan Line) including the joints of the tunnel tube;
- The Cross Harbour Tunnel in Causeway Bay; and
- Existing Island Eastern Corridor (the eastern end of the CWB).

2.3.9 Apart from the above control point constraints, the curvature of the CWB alignment has been examined in order to bring the CWB as close as possible to the existing shoreline and thus reduce the extent of reclamation. However, since the CWB within the CRIII is in the form of a tunnel, it is important to avoid sharp curves and maintain the minimum sight distance for driving safety considerations. As a result, the horizontal alignment of the CWB cannot be shifted further southward/landward. We have also examined the alternatives of elevated or at-grade options of the

CWB within the CRIII but these are confirmed to be non-feasible, from the technical, environmental or visual impact angles. Details on this are contained in the November 2003 Review Report, a relevant extract is at **Appendix 2.3**.

2.3.10 The most reasonable, practical and optimal option that is environmentally acceptable is therefore to construct the CWB within CRIII area in the form of a tunnel through CRIII reclamation along the alignment as shown on the figure in **Appendix 1.3**. According to the Chartered Institute of Logistics and Transport in Hong Kong, alternative alignments for the CWB as proposed by various groups opposing reclamation are impractical [**Enclosure 2.6**]. From the engineering perspective, Mr Koo Yuk Chan, who is a civil and geotechnical engineer, comments that “extensive engineering studies have been carried out to investigate the feasibility of different alignment options for the CWB within the CRIII. The one presently adopted by the Government is the most practical, reasonable and environmentally acceptable option, requiring minimum reclamation and satisfying various constraints” [**Enclosure 2.9**].

### *Suggested Alternatives considered*

2.3.11 Despite extensive support for the CWB when the project was conceived and progressed between 1998 and 2003, the SPH and some community groups have in recent months proposed other “alternatives” to solve the traffic problems. At the LegCo joint Panel meeting on 27 November 2003, the following bodies voiced their comments and alternatives on the CWB –

- Conservancy Association [**Enclosure 2.10**]
- Urban Watch [**Enclosure 2.10**]
- 中重型貨車關注組 [**Enclosure 2.10**]
- Rights of Taxi Owners and Driver Association [**Enclosure 2.10**]

2.3.12 Their inputs can be classified into the following categories –

- To fully utilize the Western Harbour Crossing
- Extension of the MTR to Kennedy Town
- Provision of hillside escalators from Central to Mid-levels
- Provision of bus-bus interchanges at the fringe areas of Central
- Restricting loading and unloading times in Central
- Adoption of Electronic Road Pricing

2.3.13 TD has indeed considered the feasibility of these alternatives in relieving traffic congestion in the Central and Wan Chai areas and concluded that the CWB is needed to relieve the congestion problem. The considerations in respect of these alternatives are set out below.

2.3.13.1 *Full utilization of the Western Harbour Crossing (WHC)*

2.3.13.1.1 The suggestion of adopting an equal toll for WHC and Cross Harbour Tunnel (CHT) so as to increase utilization of the former is not expected to relieve significantly congestion in the Central and Wan Chai areas as most of the traffic would still need to go through Central, except for the small percentage of traffic from and to the western part of the Hong Kong Island<sup>4</sup>. For the testing of different possibilities of toll levels among the three cross harbour tunnels, we have evaluated the case in which the CHT charged a higher level of toll than that charged by the WHC. Under such a tolling regime, WHC would experience a great surge in traffic volume, a substantial proportion of which is diverted from CHT. This would strain further the already heavily congested Connaught Road Central (CRC) and the road network in the Central Business District

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<sup>4</sup> The actual average traffic throughput of WHC, CHT and EHC in response to the toll increase at CHT from \$10 to \$20 for private cars which took effect on 1 September 1999 were 37,800, 119,000 and 67,000 daily vehicles respectively for the 12-month period before the toll increase while the three tunnels recorded 42,300, 118,100 and 71,900 vehicles daily respectively for the 12-month period after the increase. Therefore, the effect of doubling the CHT toll on reducing traffic using CHT was only 900 vehicles daily or less than 1% of its original volume.

(CBD) if the CWB and related roads are not built to relieve these roads. Therefore, this suggestion would only further exacerbate the already serious congestion of the road network in Central. According to Mr Tim Man, “past experience suggested that even when the toll level was doubled at CHT, the shift of traffic to use the other two cross harbour tunnels was not significant. The under-usage of the WHC continues owing to the enduring traffic congestion along Connaught Road Rumsey Street Flyover with queues very often extending beyond Shun Tak Centre in the E/B direction in the morning peak period. In the W/B direction, traffic congestion is also experienced along the Gloucester Road/Connaught Road Central corridor. The capacity constraints at the western and eastern ends of the corridor result in an increase in travel time which offsets the benefits of using the WHC. This further supports the necessity of building the CWB to relieve the existing traffic congestion along the Gloucester Road/Connaught Road before better utilization of the WHC can be realized.”[Enclosure 2.2].

- 2.3.13.1.2 We have also assessed the scenario where CHT and WHC adopt similar toll levels. Our assessment indicates that there would be a very minor (of about 2% only) reduction of traffic to a section of Gloucester Road (GR) near Immigration Tower. However, the traffic condition along CRC and the road network in the CBD would be further aggravated due to the increase in traffic that needs to access WHC. According to the result of TD’s traffic model, it is predicted that the possible relieving effect of an equal toll on GR would be less than 2%.<sup>5</sup> This is

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<sup>5</sup> It is estimated that equalizing the toll will reduce the total traffic volume on Cross Harbour Tunnel (CHT) and Eastern Harbour Crossing (EHC) by about 14,000 vehicles per day while the traffic volume of WHC will increase by 24,000 vehicles per day when compared to the present daily traffic volumes on the three tunnels of 123,000, 74,000 and 40,000 vehicles respectively. The reduction of CHT and EHC traffic will cause a drop in this type of cross harbour traffic on Gloucester Road (GR) by 9,000 vehicles per day while this is partly offset by the increase in the GR traffic by 6,000 vehicles per day due to the increase in WHC traffic traveling via GR so that the net effect is a reduction of 3,000 vehicles per day on GR. This when compared to the

because the diversion of traffic from CHT to WHC is likely to result in a corresponding increase in traffic volume along CRC, adding to the traffic congestion thereat. Therefore, the overall traffic condition of the CRC/HR/GR Corridor is not expected to improve under such a hypothetical toll regime. Hence, the equal toll proposals would not be effective in solving the traffic congestion on the existing roads.

2.3.13.1.3 This could be attributable to the fact that some additional traffic in the east would be attracted to use WHC via the Corridor. Similarly for cross-harbour traffic from the Southern District via the Aberdeen Tunnel, they would have to travel along the Corridor before they can use WHC to take advantage of the lower toll. On the other hand, traffic from the Central District originally destined to use CHT would be removed from the GR/HR but part of it would be added back to the CRC if they are diverted to use WHC under a cheaper toll. For the cross-harbour traffic from Wan Chai diverted from CHT to WHC, the reduction in traffic in the eastern part of GR will result in increase in traffic in the western part of the Corridor. There would hence be a balancing out effect overall. Furthermore, the amount of cross harbour traffic on the Corridor, estimated to be about 20%,<sup>6</sup> is relatively minor when compared to the bulk of the non-cross harbour traffic using the Corridor, the volume of which is not at all affected by the toll levels of the cross harbour tunnels.

2.3.13.1.4 When the toll levels of WHC and CHT become the same, some CHT traffic would shift to use WHC while some Eastern Harbour Crossing (EHC) traffic would shift to use CHT to take advantage of the relief of traffic congestion of CHT. The latter

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present daily traffic on GR west of CHT of 176,000 vehicles per day constitutes a net reduction of about 2%.

<sup>6</sup> According to the traffic proportions on GR as based on Base District Traffic Model run, 20% of the morning peak hours eastbound traffic is heading for CHT, 65% to Eastern District, and 15% to Canal Road Flyover.

will result in a slight increase of about 2% in traffic demand on the section of GR east of CHT (near Excelsior) aggravating the congestion thereat.

2.3.13.1.5 Therefore, the “equal toll” option does not provide an effective solution to congestion along the Corridor. Moreover, such arrangement would also be subject to a commercial agreement with the tunnel operators which will take time to negotiate but with no certainty over the outcome.

2.3.13.2 *Extension of the MTR to Kennedy Town*

2.3.13.2.1 The extension of the West Hong Kong Island Line to Belcher by 2011 was adopted as an assumption in a rerun of the traffic model in 2003 by TD. The results show that extending the MTR to Kennedy Town will not help relieve congestion in the Corridor. This is because most bus routes run along the inner roads including Des Voeux Road and Queen’s Road. Any reduction in bus service as a result of diversion of passengers to the MTR will be limited and will at most provide slight relief to the already congested inner roads.

2.3.13.3 *Provision of hillside escalators from Central to Mid-levels*

2.3.13.3.1 Providing additional escalator links will help relieve the traffic burden along the roads in the Mid-levels but will not help relieve congestion in the Central and Wan Chai areas. Experience of the existing Central – Mid-levels Escalator Link is that the Link helped to relieve pressure on public transport demand in the Mid-levels, but there was no drop in traffic volume after the Link was opened.

2.3.13.4 *Provision of bus-bus interchanges (BBIs) at the fringe areas of Central*

2.3.13.4.1 TD has taken active steps in rationalizing and restructuring bus

routes in the past five years. The number of bus trips going through Central has been reduced by more than 10% as a result. The Department is now examining a proposal on several potential BBIs in the Central Business District. The scope of further reduction in bus trips going through Central is unlikely to be of a significant scale.

2.3.13.5 *Restricting loading and unloading times in Central*

2.3.13.5.1 Confining the loading/unloading activities to night time could adversely affect the commercial activities in Central. We need to balance the interest of businesses and other trades. Currently, the loading/unloading facilities are already provided on a restrictive basis taking into account the need to minimize any adverse impact on traffic.

2.3.13.5.2 As a responsible government, we have to balance the interests of different parties, including the trucking industry, the business operators and other road users. TD has regularly received requests from the Associations of the truck operators demanding the opening up of restricted zones and reducing the restriction hours to help their business. In fact, we have already imposed severe restrictions on loading/unloading (L/UL) activities along majority sections of the CRC/HR/GR Corridor. Imposing further restrictions on L/UL activities along the internal roads of the CBD cannot help relieve the congestion along the CRC/HR/GR Corridor and will have serious impact on the business activities in the CBD.

2.3.13.5.3 Roads are built to serve different needs of the public. Reasonable loading/unloading activities will have to be allowed along the roads. In order to achieve the highest capacity of the trunk road corridor, we have imposed severe restriction on loading/unloading along CRC/HR/GR. As such, loading/unloading activities have to be allowed in the internal roads, such as Hennessey Road and Des Voeux Road Central. In

cases where capacities of the internal roads are constrained, they are due primarily to the signalized junctions rather than the loading/unloading activities.

#### 2.3.13.6 *Adoption of Electronic Road Pricing (ERP)*

2.3.13.6.1 A Feasibility Study on ERP (the Study) was completed in April 2001 to examine the practicability of implementing an ERP system in Hong Kong and the need for such a system to meet transport objectives. While the Study concluded that the implementation of an ERP system in Hong Kong is feasible from the technical point of view, it also considered that given that peak hour travel speed in urban areas is forecast to remain above 20 km/hour, drastic restraint measures such as ERP were not warranted on traffic management grounds before 2006 for Hong Kong Island and 2011 for Kowloon at the earliest if the growth of the private vehicle fleet is no more than 3% per year. The Study also pointed out that ERP could only be implemented where there was a high level of consensus in the community. After considering all the relevant factors with reference to the above conclusions, the Administration decided that ERP should not be pursued at that time. The decision was then presented to and agreed by the LegCo in early 2001. Professor Lo Hong Kam agrees that the acceptability of the ERP by the community must be duly considered [**Enclosure 2.3**].

2.3.13.6.2 In one of the Affirmations submitted by SPH, Professor William Francis Barron accuses that the Government has never released the full report on ERP. This accusation is factually wrong. We have advised that the Final Report of the Feasibility Study on ERP was released in April 2001. The “Executive Summary” quoted by Professor Barron is the full Final Report setting out the process, major findings and key recommendations of the Study. The road pricing concept, technological options, alternative traffic management measures,

need for ERP, possible system for Hong Kong, integration with other Intelligent Transport Systems, benefits and public consultation were examined in detail during the Study.

2.3.13.6.3 Professor Barron also alleges that no supporting evidence was given to the Government's assertion that various traffic management measures were not adequate to replace the CWB and the Road P2 network. Mr Hardy Lok Kung Chin, a Chartered Engineer authorized by SPH, raises a similar point, saying that a more comprehensive study needs to be undertaken with a view that the CBD can impose toll charges, which has proved to work well in other cities/countries in curbing the growth of traffic volume. We do not agree with these views. Hong Kong has been imposing one of the world's highest levels of First Registration Tax (FRT) on private car and fuel taxes as a form of managing the demand of private car ownership and usage. We also have a very good public transport system. In combination, they result in probably the highest usage of public transport (about 90% of all persons trips) amongst world-class cities with similar or higher level of developments. The scope and potential effect for further demand management to provide even higher usage of public transport could be limited and might not be acceptable to the public.

2.3.13.6.4 To unduly restrain traffic demand in the CBD could also have a significant impact on economic activities in this important financial center of Hong Kong. In the case of London, the London Chamber of Commerce had looked at how the congestion charge was affecting business within the charging zone. The results found that it had a negative effect particularly on smaller retailers and that a significant number were thinking of relocating. Moreover, the figures illustrate that the objective of such schemes is mainly to regulate the traffic to and from the charging zone. In the case of London, the charge applies only to vehicles traveling inside, not on, the boundary. The ring road around the charging zone provides an

alternative route for the through traffic not entering central London. Similarly, the Electronic Road Pricing System in Singapore also charges only those vehicles passing through the gantries installed at entry points into the CBD. In Hong Kong, because of the geographical constraints around the CBD, such an alternative route does not exist.

2.3.13.6.5 Another view expressed by Professor Barron in one of SPH's Affirmation is that the supply expansion option (i.e. construction of new road works) was assumed because the Government has rejected ERP. In fact, ERP is only a traffic management measure for regulating traffic demand in a designated area. While the Administration will continue to review the need for and effectiveness of ERP to manage local traffic, the CWB would still be necessary to provide an alternative route for the through traffic.

2.3.13.6.6 The availability of a reasonable alternative route is key to obtaining community support for the implementation of any such scheme. The magnitude of the forecast growth in traffic moreover demands infrastructure improvement in addition to traffic management measures. The provision of an alternative east-west corridor in the form of CWB is hence crucial in any proposal to address the congestion of the CBD. The completion of the CWB will provide a more efficient transport network to sustain the long term growth of Hong Kong. As pointed out earlier, ERP is a traffic management measure for the management of traffic demand in a specific area and cannot serve as a replacement of the CWB. The CWB would still be necessary to provide an alternative route for the through traffic. Mr Tim Man has expressed his support to this point. According to him, "with all the traffic management measures exhausted, it has been proved inadequate to resolve the persistent traffic congestion in the CBD area. While it is not disputed that traffic management measures or demand

management measures in the CBD would be needed subject to other considerations, it is considered that CWB would still be required regardless. There will still be a compelling need for CWB to address the traffic demand passing through the CBD” [Enclosure 2.2]. Likewise, the Chartered Institute of Logistics and Transport in Hong Kong has voiced its view that there is a need for the CWB [Enclosure 2.6]. Also, Professor Andrew Leung, Head and Professor of the Department of Building and Construction at the City University of Hong Kong, pointed out that “traffic management is an option but it would be unfair to ask those who just want to go by-pass Central to pay. Any traffic system must provide an escape route and that is not possible without more road works” [Enclosure 2.11].

- 2.3.13.6.7 The implementation of ERP would only affect the trips destined for the CBD area and is not designed to curb cross-district movements catered for by the CWB. Only a dual-3 CWB could have the capacity to receive the diversion of trips if ERP were to be applied to the CRC/HR/GR Corridor.
- 2.3.13.6.8 The Government has thoroughly assessed the ERP and has released the full report. The Government is not rejecting ERP but its implementation is not yet mature in the current circumstances. ERP is still one of the possible forms of traffic management measures providing that (a) there will be an alternative route bypassing the charging zone; and (b) there is community consensus on its implementation.
- 2.3.14 In sum, given that the predicted traffic volume during the peak hours in 2011 on critical sections of the Corridor will exceed their capacities by 30% and the alternative measures will not be able to achieve a reduction in traffic volume on the Corridor to within capacity level, constructing the CWB within the CRIII is the ultimate solution to the traffic congestion problem in the Central and Wan Chai areas. There is *no reasonable alternative to reclamation for the purpose of providing for Hong Kong’s*

*economic and social needs by way of relieving existing and projected traffic congestion along the CRC/HR/GR Corridor.*  
That congestion will be relieved by CWB.

- 2.3.15 At the LegCo joint Panel meeting on 27 November 2003, the SPH presented two alternatives as illustrated in a conceptual sketch supported by some brief notes, namely a no-CWB option and a reduced reclamation option [**Appendix 2.4**]. It should first of all be acknowledged that the planning and engineering feasibility of a works project, let alone a major transport infrastructural project like the CWB, can only be confirmed through a series of preliminary and detailed feasibility studies, followed by detailed design and impact assessments. The SPH's proposals are short of details and are no more than a piece of conceptual work. Nonetheless, we have considered these alternatives for what they are worth.
- 2.3.16 The SPH's *no-reclamation option* apparently relies on traffic management measures to reduce traffic flows into the area and a new surface road cutting through the open space strip between the existing Star Ferry and Queen's Piers and City Hall. The proposed surface road will not only degrade the concourse in front of the Star Ferry and the environment of the City Hall, it also does not address the main problem of taking traffic out of the CBD. It cannot be a substitute for the CWB. Besides, drastic traffic flow reduction options would adversely affect the commercial activities in the CBD. The inadequacy of traffic management measures to meet growing traffic demand is discussed in detail in the preceding paragraphs.
- 2.3.17 The SPH's *reduced reclamation option* which requires reclamation of 15.1 ha (as compared to the Government's 18 ha under CRIII or a total of 23 ha if the 5 ha to be reclaimed under the Wan Chai Development Phase II are to be included) portrays only the CWB alignment with no provision or regard for essential support such as the seawall; the reprovisioning of cooling water pumping stations affected by the reclamation; the impact on marine traffic; the construction staging and work sequence to ensure all existing

facilities could continue to function properly during the construction. When the seawall structure for the CWB and the affected facilities to be reprovisioned to the waterfront are added back to the reclamation, any reduction in the extent of reclamation under the SPH's alternative is more apparent than real.

2.3.18 Professor Wong Wah-sang of Urban Watch had proposed an alternative of building a road from Connaught Place to Lung Wui Road via the Star Ferry public car park (to be demolished) and Edinburgh Place and to build a podium on top of the new road to compensate for the loss of Edinburgh Place. We consider this proposed link road at Edinburgh Place not an acceptable alternative because of the following reasons –

- The section of CRC fronting the City Hall is only one of the bottlenecks along the main east-west trunk road corridor causing traffic congestion. In fact, both eastbound and westbound and many other sections of roads along the CRC/HR/GR Corridor are suffering from heavy congestion during most of the day. This is the reason why we need to build the CWB to provide an ultimate solution to the traffic problem along this Corridor.
- Other than not being able to adequately address the existing traffic problem along HR and GR and other sections of CRC, the proposed road from Connaught Road to Lung Wui Road cannot help relieve the eastbound traffic of CRC as the western end of the proposed new road is not directly connected with the CRC. The CRC traffic would have to route through the already overloaded CRC/Pedder Street junction before entering into the new road. The CRC/Pedder Street junction would not be able to cope with further additional traffic. On the other hand, the eastern end of the proposed new road would join Lung Wui Road. From this point, the traffic can turn right to re-join CRC/HR. However, traffic weaving would be a problem as the traffic along CRC/HR will remain heavy. The traffic can also turn left and join Lung Wui Road - Fenwick Pier Street heading

to Wan Chai North. However, the capacities of both Convention Avenue and Harbour Road in Wan Chai North are constrained at their junctions with Fleming Road. The spare capacities from these two junctions, if any, are quite limited and will not be able to provide real relief to the congestion problem along the main CRC/HR/GR Corridor. Moreover, it is observed that the traffic condition in Wan Chai North during evening peak hours has worsened since early 2003, mainly due to congestion along GR eastbound that leads to redistribution of through traffic into the local roads in Wan Chai North such as Convention Avenue, Harbour Road and Hung Hing Road.

- The new road will only serve at a district level to alleviate congestion at a few critical junctions on CRC in Central in the short term. The traffic leaving Central heading east will still be stuck in Wan Chai. In order to solve the regional traffic problem, a bypass between Central and the Eastern District is pertinent.
- Other than the above mentioned inadequacies, the proposed link road will give rise to considerable public concerns including physical and operational impacts on Jardine House, Star Ferry, City Hall and the ex-UC Headquarters Building and pedestrian access to Star Ferry, Queen's Pier and the promenade to the north of Lung Wui Road. None of these would be easy to resolve.

2.3.19 In one of the Affirmations submitted by SPH, Professor William Francis Barron accuses the Government of not having considered the combined effect of implementing more than one traffic management measure at a time. Even if all these measures were implemented together, the minor benefits from each will not be able to provide notable relief to the congestion along the trunk road corridor or in the CBD because these measures will only have short term or local effects. The need for CWB and Road P2 network is unquestionable.

- 2.3.20 Professor Barron has also presumed that urban planning and transport planning are separated. This presumption is incorrect. The Government has all along taken a holistic approach in our planning work whereby transport planning, environmental and engineering considerations are all integrated into urban planning. Examples of such integrated planning studies completed include “Study on Harbour Reclamation and Urban Growth”; “Territorial Development Strategy”; “Territorial Development Strategy Review” and “Central and Wan Chai Reclamation Feasibility Study”. Regarding the CWB and the Road P2 network, they form an integral part of the 5-phase Central and Wan Chai Reclamation which provides land for, amongst others, resolving the existing traffic congestion problem in Central and Wan Chai Districts as well as supporting the developments in the completed phases of the reclamation. The planning of the road works went through a rigorous and integrated planning and public consultation process.
- 2.3.21 In another of SPH’s Affirmation, Mr Richard Francis Di Bona alleges that the net impact of constructing new roads may often be worsening congestion, rather than congestion relief. We would submit that this is contrary to the tested experience in Hong Kong. As evident from the construction of Island Eastern Corridor, the completion of the project in the 1980s has brought about substantial relief to the then seriously congested King’s Road running inland in parallel along the eastern part of Hong Kong Island.
- 2.3.22 Mr Di Bona’s comparison between the need for building the CWB and road building to facilitate continuing growth in road traffic is misleading. The CWB and P2 are not proposed to facilitate growth in road traffic. They are required to solve existing traffic congestion problem and the growing demand due to committed developments.
- 2.3.23 Mr Di Bona has also proposed the idea of imposing a peak hour levy on CHT. The imposition of peak hour levy would cause the

spreading of the peak hour congestion to a wider range thus either prolonging or shifting the peak congestions to longer periods. It is important to note that the traffic volume of the CHT has been consistently high throughout the daytime and up to until at least 8pm. There is negligible or virtually no scope for redistributing the demand in the daytime traffic to the night. Such a proposal is similar in effect to raising the tolls of CHT.

- 2.3.24 Environmental consideration is one of the major objectives that should be given due regard in all new proposals including highway projects. In fact, the presence of serious traffic congestion would also cause an adverse effect on the environment by producing additional emissions and noise impacts during prolonged congestions. The CWB and related roads have been assessed by HyD and TDD in their feasibility assessments and comprehensive EIA studies have been undertaken which demonstrated that these projects are acceptable from the environmental point of view.
- 2.3.25 In Hong Kong, many transport infrastructure projects have provided the much-needed relief to the existing parallel corridors i.e. WHC in relieving CHT and Route 3 (Country Park Section) in relieving Tuen Mun Road. The Lantau Link provides the vital and sole road access to the Hong Kong International Airport. In the case of CWB and P2, apart from the traffic forecasts which confirm their need, the already serious congestions along the existing roads clearly demonstrate their need.
- 2.3.26 Mr Hardy Lok, authorized by SPH, alleges that the Government has not produced sufficient data and evidence to discard other options for the CWB, such as immersed tubes or partially immersed tubes, that may be superior in terms of reduction or elimination of reclamation. This is indeed not true. Both the immersed tubes and partially immersed tube options have been considered by the Government's consultants and found to be not feasible. The findings are summarized in the following.

### 2.3.26.1 *Immersed Tube Tunnel Option*

2.3.26.1.1 There are two potential options that could be considered in replacing the present cut and cover tunnel with an immersed tube tunnel. In the first option, the CWB is constructed as a conventional immersed tube tunnel. In this case there is in general no reclamation associated with the tunnel. The tunnel would run along the shoreline, off the existing seawall, embedded in the seabed (in much the same manner as the existing cross harbour tunnels). In the second option, the immersed tube tunnel is viewed as an alternative method of tunnel construction, to replace the cut-and-cover method of construction. Reclamation would still be formed over the CWB tunnel and other aspects of the project such as reprovisioning of cooling water facilities, ferry piers, ground level roads, etc, remain much as currently proposed.

2.3.26.1.2 In considering these immersed tube tunnel options, it has to be recognized that the current horizontal alignment of the CWB, i.e. along the Central and Wan Chai shoreline (passing through the water channel between the Hong Kong Convention and Exhibition Centre (HKCEC) and its Extension) and rising up to the Island Eastern Corridor Link (IECL) through the eastern portal located at the Wan Chai Public Cargo Working Area (PCWA) basin, is a major constraint. As explained in paragraph 2.3.8 above, no alternative horizontal alignment options exist.

### 2.3.26.2 *Immersed Tube Tunnel Constraints*

2.3.26.2.1 There are a number of physical and engineering constraints which make immersed tube tunnel construction impractical or even not possible.

2.3.26.2.2 At the western end of the CWB, a 250m section of the tunnel at the western portal cannot be constructed as an immersed tube

tunnel, where the precast tunnel units are floated into place, since the tunnel straddles the existing seawall. If an immersed tube tunnel technique is to be adopted, it would be necessary to remove the seawall to below the depth of the tunnel, and the land behind would need to be retained. It would not be practical to support a 20m deep excavation without lateral support. In order to retain the land behind the excavation, large diameter contiguous bored piles will need to be installed with ground anchors. Construction within a temporary cofferdam would also require support of a 20m deep excavation with anchors. A practical approach would be to carry out a cut-and-cover tunnel construction after reclaiming this area. Some reclamation in this area would be required in any event for the ventilation building at the portal and for the initial section of the approach tunnels to the western portal. Therefore, immersed tube tunnel method could not be implemented for the first 250m section of the CWB at the western portal.

- 2.3.26.2.3 The HKCEC water channel also presents a physical constraint to immersed tube tunnel construction. It would not be feasible to float in the precast tunnel units within this strip of water since a deep excavation with adequate lateral support cannot be achieved at the seawalls of the HKCEC and its Extension. Ground anchors are not an option due to the proximity of the existing buildings and their foundations. Struts cannot be used since they will interfere with the floating in of the immersed tube units. Also it would be extremely difficult to manoeuvre the tunnel units into this tight space. The access bridges to the HKCEC Extension would need to be demolished before replacement access can be provided over the CWB tunnel. Hence the CWB tunnel will need to be cast-in-place within a cofferdam or built as a cut-and-cover tunnel from reclaimed ground. As the cofferdam will require extra cost and time to build, the most practical engineering solution would be to construct the tunnel as a cut-and-cover tunnel after reclaiming

the water body between the two seawalls of the Convention Centres. This would have the minimum impact on the foundations of the two buildings and traffic access can be maintained at all times to the HKCEC Extension.

- 2.3.26.2.4 Supporting the argument for cut-and-cover construction at the HKCEC is the presence of two slip roads for entry to and exit from the tunnel between the Convention Centre buildings. These cannot be constructed without prior reclamation. Some reclamation will also be required to the west of the HKCEC Extension to accommodate the slip road from the east-bound CWB tunnel leading traffic on to Expo Drive at the HKCEC Extension.
- 2.3.26.2.5 The MTR Tsuen Wan Line crossing, to the west of the HKCEC, is another constraint to immersed tube tunnel construction. The CWB tunnel will pass over the existing MTR Tsuen Wan Line, which is an immersed tube tunnel. The CWB tunnel must not impose any loads on, or cause any significant movement of the existing immersed tube tunnel. The proposed scheme for this tunnel crossing, developed and agreed in consultation with MTRC, involves construction of a row of bored piles along either side of the Tsuen Wan Line tunnel with precast tunnel sections supported by these piles for the CWB tunnel which spans over the MTR tunnel. The CWB tunnel would rise out of the seabed at this crossing point.
- 2.3.26.2.6 The foundation of the CWB tunnel causes further constraint to immersed tube tunnel construction. Conventionally, an immersed tube tunnel would be founded on a firm soil stratum with the soft marine sediments dredged away to form a trench in which a foundation base is prepared for the tunnel units. The CWB tunnel level varies around -10mPD. However, the alluvial clay layers along the alignment of the CWB are found at levels down to around -20mPD. Typically, the thickness of the material to be dredged would therefore be around 10m, with

the trench then backfilled with suitable foundation material. As an associated issue, dredging of an immersed tube tunnel trench to -20mPD alongside the existing gravity structure seawalls, the bases of which are at around -5mPD, would undermine the seawalls.

2.3.26.2.7 It would be feasible to found the tunnel units on underwater piles (though their construction would be difficult) instead. This solution would avoid the need for excessive dredging for foundations and the adjacent seawalls would not be adversely affected. Piled foundations would also solve the problem of differential settlement at the interfaces with the sections of the tunnel that must be piled in any event, e.g. the MTR Tsuen Wan Line crossing and the cut-and-cover section through the HKCEC water channel. In overcoming the foundation constraints, therefore, immersed tube tunnel construction would require piled foundations.

2.3.26.2.8 In view of the above constraints, consideration of the immersed tube tunnel options (with and without reclamation) must assume cut-and-cover tunnel through the HKCEC water channel and for the last 250m length at the western tunnel portal, with reclamation required at the western tunnel portal area, in the HKCEC water channel and to the west of the HKCEC Extension (up to the MTR Tsuen Wan Line crossing). Immersed tube tunnels over the remaining lengths of the CWB would be piled.

### 2.3.26.3 *Immersed Tube Tunnel without Reclamation*

2.3.26.3.1 Constructing the CWB as an immersed tube tunnel, without reclamation over the top of it, will result in problems associated mainly with the fact that the tunnel structure will be above seabed level (it is assumed that this is what Mr. Lok refers to as “partially submerged tubes”). The top of the tunnel structure will be at levels ranging from -2.5mPD to +2.9mPD (over the

MTR Tsuen Wan Line). Over most of the tunnel length, the top of the tunnel will, therefore, lie immediately below the water surface or even completely above water level. A number of issues arise from this situation.

2.3.26.3.2 The tunnel structure itself would be an eyesore, especially with debris being deposited on the roof, creating an unsightly waterfront. The tunnel would be visible through the water and, of course, there are sections where it rises above water level.

2.3.26.3.3 The concrete of the tunnel structure will be exposed to an extremely aggressive marine environment, in particular where the tunnel lies in the intertidal zone, and prevention of rapid deterioration of the concrete structure will be of great concern. In addition, the tunnel will be exposed to wave action, and protective measures will be required.

2.3.26.3.4 The tunnel structure would also need to be protected against ship impact. A physical barrier would need to be constructed along the seaward side of the tunnel to prevent entry of all marine traffic; in effect, a breakwater or a seawall abutting the seaward side of the tunnel, stretching along the entire length of the waterfront. This breakwater would cause negative visual impacts, significantly affecting the aesthetics of the Harbour at an important location such as next to the HKCEC. Access to the shoreline by marine craft would not be possible, including ferries to the Wan Chai ferry pier and the Star Ferry piers and the crafts using Queen's Pier.

2.3.26.3.5 In view of these constraints and adverse impacts, the option of constructing the CWB as an immersed tube tunnel, without reclamation over the top of it, is not considered feasible.

#### 2.3.26.4 *Immersed Tube Tunnel with Reclamation*

2.3.26.4.1 It would be technically feasible to reclaim over the immersed

tube tunnels, after the tunnel units have been placed in position, assuming the tunnels are piled. Unlike the case above, the tunnel will then be adequately protected, affected shoreline facilities (ferry piers, etc) can be reprovisioned, the necessary ground level roads can be built and the shoreline can be improved in line with the original planning intentions of this project.

2.3.26.4.2 The arguments against this form of construction are principally those relating to greater construction complexity, cost and, not least, practicality.

2.3.26.4.3 A staged construction (similar to that currently proposed for the implementation of the project) will be required, even for the immersed tube tunnel option. Advance reclamation areas are needed for reprovisioning of affected facilities, such as the Wan Chai ferry pier, the Star Ferry pier and Queen's Pier, before the existing facility can be taken out of service to facilitate the construction of the CWB tunnel and reclamation. This means that it will not be possible to construct the immersed tube tunnel by placing the tunnel units in sequence from one end to the other. Instead, the sequence in which immersed tunnel units are floated in and placed in position will have to follow the sequence of the reclamation staging. This staggered construction sequence, as well as the fact that the immersed tube tunnel sections need to be connected to cut-and-cover tunnel sections at several locations along the overall length of the CWB tunnel, will result in a large number of in-site construction joints between tunnel units. The construction of these joints requires underwater construction works and these are one of the most difficult aspects of immersed tube construction.

2.3.26.4.4 The tunnel units would be founded on submerged piles. This would also involve complex construction, especially since underwater construction techniques would be involved,

particularly for the connections of the tunnel units to the piles. Cost would be a major factor to be considered; the cost of the CWB tunnel construction would increase by some 50% as a result of the piled foundations.

- 2.3.26.4.5 From a practical point of view, the use of immersed tube tunnel construction in between sections of cut-and-cover tunnel construction, will result in a piecemeal approach to construction.
- 2.3.26.4.6 Taking into account practical aspects as well as the greater construction difficulties and the substantially increased costs, the option of constructing the CWB as an immersed tube tunnel, with reclamation over the top of it, is not considered feasible.
- 2.3.26.4.7 Instead, the most sensible, practical and cost effective approach will be to construct the CWB as a cut-and-cover tunnel over the entire length, after carrying out the least amount of reclamation, which would enable and facilitate the construction of the tunnel and all other project works with the least amount of difficulty and disruption.
- 2.3.27 On the CWB, the Hong Kong Institute of Architects has the following views. “HKIA accepts that the most reasonable, practical, environmental sensitive and optimal solution to resolve the predictable traffic congestion problem in the Central and Wan Chai areas is to construct the CWB within CRIII area in the form of a tunnel through CRIII reclamation to the minimum extent. We do not see any acceptable alternative but to conform to this criteria” [Enclosure 2.12].
- 2.3.28 The Real Estate Developers Association of Hong Kong (REDA) “acknowledges the need for a 3+3 lane Central/Wan Chai bypass and acknowledges that reclamation is needed to construct and protect this submerged road” [Enclosure 2.13].

### 2.3.29 *Conclusion*

2.3.29.1 Based on the above re-examination, the CWB within the CRIII goes far beyond “something which is just nice to have, desirable, preferable or beneficial”. Given its many social and economic justifications supported by cogent and convincing materials and the broad community support as revealed in the comprehensive statutory consultation process, the CWB certainly satisfies the “overriding public need test”. In order to build the CWB, land must be reclaimed, and there is no reasonable alternative to reclamation. The Government has considered a whole package of traffic management measures. The Government has adopted and will adopt both demand side traffic management and supply side traffic management measures in resolving traffic congestion problems. Even with the practicable demand side traffic management measures in place, there is still a compelling and present need to provide the CWB.

2.3.29.2 The Government has been active in pursuing other traffic management alternatives to provide relief in the short term. In the long term, CWB offers the only viable solution. Traffic management measures will complement CWB but cannot replace it. There are no reasonable alternatives to CWB.

## 2.4 **Road P2 network**

2.4.1 While the limits of the reclamation under CRIII are determined by alignment of the CWB, the timing of CRIII is dictated by two other important pieces of transport infrastructure, namely the Road P2 Network which is needed by 2006 to relieve growing traffic demand within Central and the AREOT which is needed to ensure safe operation of the Airport Express Line and the Tung Chung Line.

2.4.2 The Road P2 Network consists of surface roads to be built on land formed for the CWB. With the exception of areas between the existing shoreline and the CWB alignment which have to be

reclaimed anyway for environmental reasons as they are no longer connected with the Harbour, these surface roads will be built on land so formed and will not push the reclamation extent further into the Harbour. This road network will provide much needed relief to the existing roads.

- 2.4.3 At present, traffic generated from the completed Central Reclamation area north of Exchange Square (CRI) has to route through some already congested roads and junctions in Central such as Man Po Street, Man Yiu Street and Man Cheung Street/Man Yiu Street junction. Traffic along the Connaught Place east-bound outlet has to wait for several traffic light cycles before it can join CRC. There is high potential of a gridlock in the CRI area as traffic is unable to exit onto CRC, seriously affecting the operation of the Exchange Square, Airport Railway Station, One and Two International Finance Centre, the hotel development, the ferry piers and other commercial developments in the same area. The gridlock will in turn cause traffic to pile up along routes carrying incoming traffic to CRI including CRC, Pedder Street and Queen's Road Central.
- 2.4.4 The forecast transport need will arise within a definite and more imminent time frame – by 2006 upon full occupation of the IFC II and commissioning of the new hotel on CRI. According to findings of the Strategic Traffic Review for the Business District completed by TD in 2003, by the year 2006, traffic along this main east-bound outlet is forecast to double its current volume.<sup>7</sup> Critical junctions in the CBD, such as CRC/Connaught Place, CRC/Pedder Street, Connaught Place/Harbour View Street and Man Yiu Street/Man Cheung Street will be seriously overloaded. Without the Road P2 Network, traffic will queue up to about 850 meters along the full carriageway width of Connaught Place/Man Yiu

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<sup>7</sup> The estimate was based on the results of the Strategic Traffic Review Study traffic model run which showed that traffic along Connaught Place will increase from about 700 vehicles per hour in 2002 to about 1,400 vehicles per hour in 2006 during the morning peak period.

Street/Man Cheung Street around the Airport Railway Station and International Finance Centre throughout the day. If tourists and travelers using the Airport Express Line from and to the Airport were caught in this traffic jam, the appeal of the Airport Railway would be reduced. Traffic congestion in the vicinity will also adversely affect thousands of island residents using the ferry piers daily for commuting to and from work. TD has estimated that if the Road P2 Network was not built by 2007, each day some 26,000 road users would have to tolerate a 20-minute delay at the junction of Connaught Place and CRC, incurring an economic cost of \$156 million annually.<sup>8</sup> Dr Cheng Hon-kwan, Chairman of Transport Advisory Committee, agreed that the Road P2 network is urgently needed to resolve the traffic congestion problem in Central and Wan Chai [**Enclosure 2.4**]. Mr Koo Yuk Chan has also pointed out that a delay in the construction of the Road P2 network “will adversely affect the operation of the Airport Railway Station, the IFC and the facilities in the CRI area, resulting in considerable economic loss and public inconvenience” [**Enclosure 2.9**]. To Professor C O Tong, the Road P2 network, together with the CWB, is needed to ensure the provision of a functional and balanced road network. There is no reasonable alternative but to build the planned roads in order to increase the capacity of the existing crowded road network”. Professor Tong has given his support for the building of the CWB and Road P2 network [**Enclosure 2.7**].

- 2.4.5 There are *no reasonable alternatives* to the Road P2 Network. Restricting traffic into the area will result in considerable economic loss and adversely affect the operation of the Airport Railway Station, the IFC, the ferry piers, etc. Various traffic management measures in lieu of building the Road P2 Network have been

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<sup>8</sup> The economic cost refers to the cost to road users due to additional traveling time. In deriving the cost, TD has taken into account the delay in time that road users will suffer from congestion in the CRI area, namely along Connaught Place, Man Yiu Street and Man Cheung Street, for not having the CWB and Road P2 in place by 2011. The daily congestion period is expected to span over 12 hours and 25,920 road users will be affected with average additional 20 minutes spent in the traffic congestion. This comes to about 2.6 million man-hour per year, or approximately \$156 million per year.

considered. These include restricting loading/unloading times in Central, reducing bus trips in Central, implementation of ERP, etc. Many of these measures are controversial. Even with all the traffic management measures, traffic in CRI will be paralyzed by 2011 if Road P2 network is not built, because continuous traffic queues will be found along CRC (without CWB), and vehicles from Connaught Place will not be able to exit onto CRC even when the traffic lights are in their favour.

2.4.6 TD has explored practical traffic management measures such as road and junction improvement schemes and bus rationalization measures. These measures can however only maximize the capacity of the existing road network and ease existing congestion, but are not capable of addressing the further growth in traffic flows in the CBD.

2.4.7 To conclude, there is an overriding public need for the Road P2 Network. This need will arise within a more imminent time frame, by 2006. There are no reasonable alternatives as restricting traffic into the area will result in considerable economic loss and adversely affect the operation of the Airport Railway Station, the IFC, the ferry piers, etc. The traffic condition in the area will continue to deteriorate before completion of the Road P2 Network.

## **2.5 Airport Railway Extended Overtake Tunnel**

2.5.1 During the feasibility study and design stages of the Airport Railway (AR), it was identified that an overtake tunnel was required east of Hong Kong Station (requiring demolition of the Star Ferry piers) to ensure trains failing to stop at the design position do not collide with the tunnel end (the safety requirement) and to allow trains to be turned back on the east side of the station without hindering trains approaching from the west, thereby enabling the AR to operate to its design capacity and allow the use of separate platforms for Airport Express Line (AEL) arrivals and departures (the full design capacity requirement). Due to phasing problems with the Central Reclamation, the Government and the MTRCL have agreed during

negotiations on the AR project in 1991 that the overrun tunnel will be constructed in two stages. Under stage one, a short overrun tunnel of approximately 84m was completed and put into operation when the AR opened in mid-1998. The overrun tunnel was to be extended to its full extent for both safety and design capacity requirements under the scheduled CRIII works.

2.5.2 For safety reasons, an overrun tunnel of sufficient length is required at all terminal stations to ensure trains failing to stop at the design position, as a result of human error or defective equipment, would not collide with the tunnel end. These train overruns occur infrequently and pose no safety risk provided adequate overrun tunnel is available. As it is not possible to eliminate overruns, overrun tunnel is a compelling need. Mr R J Black, Project Director of MTRCL, has pointed out that “the provision of an adequate length of overrun tunnel is a safety issue”. As far as the extended portion to meet safety requirement is concerned, approximately another 40m is needed as early as possible as the existing short overrun tunnel of 84m is only marginally tolerable. Annual reports on risks assessment submitted by the MTRCL to the Hong Kong Railway Inspectorate confirm the urgent need for the extended overrun tunnel. According to Mr Black, “the current overrun tunnel arrangement will only remain acceptable until 2006 based on recent trends in railway patronage growth”. He concludes that “MTRCL’s firmly held view is that the overrun tunnel extension is required as soon as practically possible” [Enclosure 2.14].<sup>9</sup>

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<sup>9</sup> The line capacity of the AR can be enhanced by having longer trains (maximum 8-car for TCL and 10-car for AEL) running at shorter headways (shortest at 2.25 minutes for TCL and 4.5 minutes for AEL) to meet the increase in demand. Alternatively, the safety of the AR can be improved by an appropriate signaling system imposing speed restriction and having shorter trains (currently at 8-car trains for TCL and 7-car trains for AEL) at longer headways (currently at 5 minutes for TCL and 10 minutes for AEL). Capacity and safety are therefore conflicting attributes. While safety must not be compromised, without the 40m overrun tunnel to be constructed as early as possible within CRIII, MTRC will have to sacrifice capacity for safety. Bearing in mind the anticipated demand for the AEL and TCLs’ capacities will increase, and the

- 2.5.3 As regards the further extended portion (approximately another 460m) to meet the full design capacity requirement,<sup>10</sup> although a review by the MTRCL in 2002 based on the latest projections for growth in demand indicates that the AEL and TCL will only be required to operate at their full design capacity by 2014 the earliest, the necessary railway route protection measures have to be incorporated in the CRIII project.
- 2.5.4 The AREOT will accommodate two scissor-type crossovers and stabling facilities for both the AEL and TCL. The full overrun tunnel for the TCL will also give opportunities for extensions into the eastern part of Hong Kong Island as part of the NIL proposed by RDS-2000.
- 2.5.5 Current alignment of the AREOT has no reasonable alternative in engineering terms. Like the CWB, its alignment is constrained by existing control points. At the western end, the extended overrun tunnel has to link up with the existing 84m overrun tunnel. At the other end, the extended overrun tunnel has to join up with the protected route for the NIL which is in turn constrained by the water channel of the Hong Kong Convention and Exhibition Centre. The purpose of overrun tunnel is to provide additional braking distance beyond the station platform in case trains overshoot. Relatively straight tracks are highly desirable for overrun tunnels. The

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fact that the planning and building of the overrun tunnel will take several years, this work should commence at the earliest opportunity. Otherwise, MTRCL will not be able to meet the increasing passenger demand on those two lines.

<sup>10</sup> In order to operate AEL and TCL to full design capacity, the existing crossovers west of Hong Kong Station have to be removed and re-provisioned east of Hong Kong Station and an overrun tunnel of sufficient length (approximately 500m) for trains to reverse is required. This modification will bring about four features. Firstly, it provides approaching trains with a clear path free of trains leaving the TCL platform. Secondly, it enables MTRCL to lift the speed restrictions on approaching trains due to enhanced geometry/track arrangement. Thirdly, maximum 10-car AEL trains can be operated. Fourthly, approaching AEL trains does not have to wait until the single platform is cleared.

extended overrun tunnel alignment is already tucked as close to the existing shoreline as possible.

- 2.5.6 To conclude, it is clear that the existing short overrun tunnel east of Hong Kong Station was a compromise solution to reclamation phasing problems and is not adequate to meet safety and operational requirements at improved service levels. Reclamation to provide the AREOT can satisfy the overriding public need test and that need is an integral part of the Airport Railway at the time when the project was conceived. An extended overrun tunnel to meet safety requirement is very much a current need and its non-availability could not be tolerated for long. There is no reasonable alternative and the extent of reclamation is the minimum that is required based on an acceptable alignment.

## **2.6 Cooling water pumping stations (CWPS)**

- 2.6.1 The limits of the CRIII reclamation, as illustrated in cross section diagrams in the November 2003 Review Report and the CRIII Booklet, are determined by the CWB alignment, the essential facilities along the existing shoreline that need to be reprovisioned to the future waterfront and the new seawall. There is a present and compelling need for these facilities and reprovisioning them elsewhere so as to avoid or reduce reclamation within the CRIII is not an acceptable alternative as explained below..
- 2.6.2 The CWPSs affected by reclamation for the CWB are serving a large number of important buildings in Central and Queensway, including the LegCo Building, City Hall, HSBC Main Building, Central Government Offices, Murray Building, Queensway Government Offices, High Court, Police Headquarters, Pacific Place, Prince's Building Group<sup>11</sup>, Admiralty Centre, etc. All these buildings are

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<sup>11</sup> The Prince's Building Group is made up of Chater House, Prince's Building, Alexandra House, Standard Chartered Bank Building, Nine Queen's Road Central, Gloucester Tower, Edinburgh Tower and the Landmark.

designed for seawater cooling system only. These CWPSs have to be reprovisioned to initial areas of reclamation before the existing ones could be rendered inoperative by reclamation to ensure continued operation of the buildings as shown in **Appendix 2.5**. The owners of these buildings strongly opined that even a short duration of disruption in serviceability of their buildings is unacceptable, from the economic and social angles. We have considered other systems of providing cooling to the buildings which may avoid or reduce the extent of reclamation in consultation with the affected owners and conclude that there is *no reasonable alternative* taking account of all relevant circumstances.

- 2.6.3 Switching to *fresh water cooling towers* from the existing seawater systems serving the buildings affected by the CRIII project is technically problematic. Professor Andrew Leung pointed out that “to switch to fresh water cooling towers, extra floor space and structural loads in the affected buildings are required [**Enclosure 2.11**]. Moreover, as the fresh water cooling towers are less energy-efficient than sea water systems, additional plants may need to be installed to provide the same amount of cooling. The additional floor space for plants and equipment may not be available in the affected buildings. Certain major components of the existing seawater cooling systems would need to be replaced to suit the new fresh water cooling tower systems. With these technical constraints, the alternative of using fresh water for water-cooled air-conditioning in the affected buildings is considered not feasible. Mr Albert Cheng Wai-shing, a chartered engineer from Black & Veatch Hong Kong Limited, remarks that “the continued adoption of seawater cooling is a logical technical solution for the end users as there will be minimum interruption to the formal operation of existing pumping stations during the reprovisioning works [**Enclosure 2.15**].
- 2.6.4 An *air-cooled system* option is not viable as it requires additional floor space in the buildings to install the air-cooled plants as well as additional switch rooms to cater for the greater electricity demand. Loading constraints in existing buildings are difficult if not

impossible to overcome. Air-cooled system is also less energy efficient than water-cooled systems.

- 2.6.5 The option of *individual evaporative cooling towers* requires additional floor space in the buildings to install the evaporative cooling tower. Similar to air-cooled systems, loading constraints are very difficult to overcome. Also, it would require the supply of mains fresh water which subject to further study may not be catered for by the present water supply network in the district. Again, this option is less energy efficient than sea water-cooled systems.
- 2.6.6 The option of *district cooling system* requires a centralized sea water pumping station as well as a District Cooling Plant site. Although the footprint of the sea water pumping station will be smaller, the Government will need to identify additional land to accommodate the District Cooling Plant. A service provider is also required to operate the plant for serving all buildings connected to the plant and that will require a redesign of the pipe route and a tender for the service provider, not to say the need to resolve the legal, land and institutional issues.
- 2.6.7 The option of *centralized sea water system* requires a centralized sea water pumping station which will have a smaller footprint than the District Cooling System. Similar to the District Cooling System, this option requires a service provider to operate the plant for serving all buildings connected to the plant and that will also require a redesign of the pipe route and a tender for the service provider. There are the same legal, land and institutional issues to be resolved. Furthermore, the development of a centralized cooling water system is very complicated. A large number of varying equipment is available in the market but each owner has his own favourite. Complex issues on apportionment of installation and operation costs, future operational requirements and peak demand of individual building owners, maintenance liabilities, equipment backup, property right and so on are difficult to reach a compromise. A much longer time in negotiations, with possible Government

intervention, is necessary for the centralized system to materialize. The continual running of the system to the satisfaction of all owners is also problematic. Any centralized system will resemble a mini-public utility service that would preferably require a designated company and a proper legal framework. To achieve a satisfactory outcome on all these complex issues in the CRIII project given the time constraints is simply unrealistic.

2.6.8 Some comments and suggested alternatives on the CWPS and the associated issue of seawall design have come to our attention and they can be categorized into the following groups –

- Size of the CWPS
- Number of the pump-cells
- Location of the CWPS
- Seawall foundation options / seawall structure position / other seawall design options
- Lagoons and reservoirs
- Alternative cooling systems
- Other general comments

TDD's response in respect of these suggestions is set out below.<sup>12</sup>

2.6.8.1 *Size of the CWPS*

2.6.8.1.1 The current size of the pumping stations are designed to take into account affected owners' requests to provide a safe working environment for future maintenance and routine cleaning and aims to overcome complaints about disturbance by members of the public as evidenced in the pumping stations constructed within CRI. On this aspect, TDD points out that "under the design of the CRIII pumping stations, closing off

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<sup>12</sup> TDD's response to the "alternatives" put forth has been formulated with expert input from Atkins China, Maunsell Consultants Asia Limited, and Black & Veatch Hong Kong Limited. Maunsell is at present TDD's consultant for the WDII Design and Construction Consultancy. The firm is therefore the expert in commenting on the difference between the sizes of the WDII and CRIII pumping stations and the impracticability of constructing the CWB in the form of an immersed tube tunnel in such a capacity.

part of the public promenade to gain access to the pumping station is not necessary”.

2.6.8.1.2 Mr Robert Chu Ka Yun, a retired Mechanical Engineer providing views in one of SPH’s Affirmations, alleges that the proposed promenade of 60m in width is justified on the basis of providing some 26 pump-cells. According to him, the Government did not explain what efforts, if any, had been made to reduce the size and number of the pump-cells or the extent of this “massive” reclamation.

2.6.8.1.3 The size of the pump cells are determined from the technical requirements of the respective pump house owners and by the shortcomings in pump cell size and arrangements experienced from CRI. The size of the CWPS in CRI has been heavily criticized. Swire Properties Ltd. representing also other private enterprises, had submitted an enhancement proposal to the CWPS. They complained about the operational difficulties and maintenance drawbacks inside the small pump house compartment in CRI and highlighted the obstruction and nuisance to the public resulting from the frequent cleaning and maintenance of pumping equipment on the promenade which is a place for enjoyment by the public at large. In the current CRIII case, the CWPS which is larger than that in CRI, has been designed to overcome the shortcomings in the CRI experience and is based on practical and safety requirements necessary for routine maintenance and cleaning to be carried out inside the pump house compartment. The present design would hence provide a safe working environment to the maintenance personnel and will eliminate inconvenience to the public. The 5m wide base heel at the base of the CWPS is required to attain sufficient soil dead load to achieve the adequate factors of safety against flotation, sliding and overturning. The current size of the CWPS is therefore essential. Furthermore in CRIII, the enlarged pump house has been delicately designed to blend in with the two-level

promenade. Steps are included to connect the two levels so that people can enjoy the harbour without the disturbance due to the existence of CWPS.

2.6.8.1.4 Moreover, the arrangement of the CWPS is determined by the relationship of the distance between CWPS and CWB. The rubble mound foundation of the CWPS will have to be set at a distance of about 2m from the CWB tunnel Diaphragm wall (D wall). If the rubble mound is in contact with the D wall, the following problems will likely occur –

- overbreak in the D wall construction;
- leaking of bentonite slurry through the rubble layer of the foundation (as the particle size of the rubble is large) and contaminating the underground water and the harbour;
- collapse of the D wall trench due to undermining or decrease of stability;
- increase in construction cost; and
- increase in construction time.

2.6.8.1.5 Mr Robert Chu has further suggested that the reclamation extent can be reduced by reducing the size and number of pumping stations as per those adopted in the proposed WDII. TDD however pointed out that the rationale for the arrangement and size of WDII's CWPS preliminary design is different from that of CRIII which had undergone a detailed design stage. It is thus premature to argue on the basis of those preliminary designs in WDII that reasonable alternatives exist for CWPSs under CRIII. In practice, the actual arrangement and size of CWPSs in WDII could only be ascertained at the detailed design stage of WDII taking account of the reprovisioning needs and construction sequencing of the reclamation and the CWB tunnel, in order to ensure that the operation of these cooling systems is maintained at all times during construction. Nonetheless, the claim that the design of CWPS in WDII could be adopted for CRIII in order to minimize the amount of reclamation is refuted below.

- 2.6.8.1.6 As shown in Drawing No. SK66 [**Appendix 2.6**], the pumping station under WDII is integrated with the wave energy absorbing seawall for more efficient construction and to minimize the extent of reclamation required for its installation. The cooling water intake feeds into a wet well immediately behind the seawall. Seawater is then drawn into the pumping system which is located in a dry well, behind which is a service chamber. The overall dimension of the pumping station is 20.4m, comprising 3.5m for the seawall and intake structure, and 16.9m for the pumping chamber. The pumping station is designed to be below the promenade level, with maintenance access provided from above through access covers. A 5m wide utility zone is allowed behind the pumping station.
- 2.6.8.1.7 The dimensions of the pumping chamber have been designed in a manner such that sufficient room will be available to accommodate all the necessary pumps, valves, fittings, etc, on the basis of the existing pumping system that will be reprovided. Operational and maintenance provision is similar to the existing cooling water system, and appropriate to the scale of the pumping station facilities.
- 2.6.8.1.8 The pumping stations proposed under the CRIII project are also located immediately behind the new seawalls, with similar rationale in respect of minimizing the extent of reclamation as the WDII proposal. Dimensions of the CRIII pumping station do differ slightly from those of the WDII pumping station. The seawall and intake structure is approximately 10m wide, mainly due to the pumping chamber being set back further from the edge of the seawall to cater for different access needs than those in WDII. The pumping chamber itself (wet wells, dry well and service chamber) is approximately 20m wide; a cross-over well is incorporated in the CRIII design, which accounts for the approximate 3m difference in dimension from that of the WDII pumping chamber. Other than the cross-over

well, pumping chamber dimensions are quite similar between the WDII and CRIII designs, with the overall dimensions of the main elements almost identical. Differences are mainly in respect of the detailed arrangements of the pumping facilities.

- 2.6.8.1.9 The incorporation of a cross-over well in the CRIII design arises out of the requirements of the operators of the affected buildings in Central, and is mainly a function of the more onerous maintenance requirements and constraints of the cooling facilities in CRIII than those of the Wan Chai pumping station. In the Wan Chai Development Phase II Comprehensive Feasibility Study (WDIICFS), no requirement for a cross-over well was raised by the building operators, nor was an essential need for one identified in the study. In addition, no specific requirements for access arrangements were raised by the operators in the WDIICFS, nor was any special need for access other than that which is conventionally provided and identified in the study.
- 2.6.8.1.10 The remaining difference in dimensions between the two pumping station designs is a 5m wide 'heel' at the base of the CRIII pumping station, which performs a structural function in resisting flotation, sliding and overturning. The WDII pumping station is not as deep as the CRIII pumping station, and the preliminary design undertaken in the WDIICFS indicates that this 'heel' is not required. Nevertheless, the 5m wide utility zone behind the WDII pumping station provides flexibility to accommodate the foundation requirements of the pumping station that may arise during the detailed design of the structure in the later detailed design stage.
- 2.6.8.1.11 In sum, the differences in dimensions between the WDII and CRIII pumping stations lie essentially in the greater set back of the CRIII pumping chamber from the edge of the seawall and the incorporation of a 3m wide cross-over well in the CRIII design. Both of these differences arise from the need to take

into account building operators' specified operational and maintenance requirements and the much larger scale of the cooling facilities in CRIII, which requires a design tailored to meet site specific constraints. Discounting these factors, the dimensional differences between the CRIII and WDII pumping stations are not substantial.

- 2.6.8.1.12 Another major difference between the CRIII and WDII cases is the scale of the cooling water supply systems. In Wan Chai, for example, the design is based on a two cell pumping chamber which will supply the Sun Hung Kai Centre with cooling water through 450dia intake pipelines, while in CRIII, Pacific Place for example will be supplied by a four cell pumping station (which has an operational capacity of 3,000 litres per second) through a 1200dia pipeline. Furthermore, the pumping stations in CRIII for different owners are grouped together to ensure the maintenance and operation activities are confined to as small an area as possible. This grouping of pumping stations further increases the scale and complexity of the pumping station facilities and their operational and maintenance activities. This difference in scale of the pumping station facilities leads to special requirements in CRIII, in particular for access to the pumping stations. In CRIII, to facilitate the much higher level of usage by the operators' personnel and so as not to cause unnecessary obstruction to the public, a side door entrance is provided off a widened promenade area. Closing off part of the public promenade to gain access to the pumping station is not necessary in this case. In WDII, the smaller scale of the pumping facilities and fewer number of building operators using the pumping station means that a more conventional below ground structure, with access from above, can be implemented without undue disruption to the public or inconvenience to the operator. The site specific requirements that determine the design of these CWPSs are illustrated in another case. The pumping station in Causeway Bay is slightly larger than that at the Wan Chai shoreline, as it is

located in a specially widened promenade area and accessibility has not been identified as cause for concern. There are good reasons for differences in the design of the cooling water pumping stations for WDII and CRIII.

- 2.6.8.1.13 The use of the WDII pumping station design in CRIII is not appropriate. Each project must incorporate designs specific to its own needs and constraints. In this respect, both the CRIII and WDII designs are fit for purpose within their separate contexts. The replacement of one design by the other would result in a product which is not fit for purpose and would not meet the end users' needs.
- 2.6.8.1.14 To conclude, the CRIII pumping stations are designed in a way such that a balance is struck between the need to limit the floor plan area and make adequate provision for operation and maintenance requirements. The interests of the private and public sector end users in grouping, maintenance access and safety issues have been considered and reflected in the general arrangement of the design.
- 2.6.8.1.15 Assuming that the locations of the new CWPS are acceptable to the various landlords/users, Mr Hardy Lok on behalf of SPH argues that the present foundation design for the CWPS should be re-examined and scrutinized. According to Mr Lok, the CRIII review completed in November 2003 by TDD has acknowledged that the adoption of driven pile, bored pile or mat foundation methods can at least reduce approximately 6m of reclamation extent. On this, TDD has the following response.
- 2.6.8.1.16 The extent of the rubble mound foundation is only one of the factors governing the distance between the CWPS and the CWB tunnel. The critical factor is the space required to accommodate the supply pipelines from the CWPS. Using piled foundation or mat foundation for the CWPS cannot reduce the overall width if the space required for the cooling water

pipelines and their thrust block cannot be reduced. The proposed distance between the pipelines and the tunnel wall construction is already less than 5m, which is considered minimal. Any reduction of this distance will significantly increase the risk of ground movements and damage to the pipes, which would be unacceptable.

2.6.8.1.17 If a piled foundation was employed, it would involve significant construction challenges and risks as it requires a significant amount of working in deep water. Deep foundations would also have a major adverse impact on the overall re-provisioning costs. Professor Andrew Leung pointed out that “employing techniques such as driven pile, bored pile and mat foundations would result in negligible saving in reclamation (about 1%) and such saving can only be achieved at longer construction time, at more than ten times of the initial construction cost and at many times more of the life long maintenance cost when compared to the proposed design [Enclosure 2.11]. The current rockfill foundation design is a reasonable and most cost effective solution.

#### 2.6.8.2 *Number of the pump-cells*

2.6.8.2.1 Mr Robert Chu on behalf of SPH also alleges that among the 29 pump-cells along the new waterfront, only 17 pump cells are required to serve the existing buildings and 12 are needed for new developments. He suggests that the former restriction in the use of fresh water for cooling systems imposed by the Government has in the past few years been lifted and sea water cooling is no longer needed for new buildings. Therefore a maximum of only 17 pump cells will be needed and even these can be further reduced.

2.6.8.2.2. According to TDD, the numbers of pumping stations and layouts of the current arrangement were determined from years of extensive consultations with the relevant Government departments and respective private owners during the design

phase. The Government has examined other alternatives than the seawater cooling to the existing buildings and considers that such alternatives are not reasonable. Moreover, the area within CRIII project is not within the Pilot Scheme area for fresh water cooling. The provision of pumping station for the future developments in the area alongside the reprovisioned CWPS is a compelling and present need.

2.6.8.2.3 In regard to the reduction of the number of pump cells, the number of pumping stations was reduced wherever possible, for example, the opportunity was taken to delete the pumping station belonging to the Furama Hotel when its site was redeveloped. Also, the Government pumping stations were combined wherever possible to reduce the overall numbers, for instance, the pumping stations for LegCo Building, City Hall, Central Government Offices, Murray Building, Queensway Government Offices, High Court, Police Headquarters are grouped together to form a new pumping station.

2.6.8.2.4 Furthermore, TDD has pointed out that additional pumping station cells at the new pumping stations at the Wan Chai shoreline and in the Causeway Bay typhoon shelter are also provided for new development sites which may require their own cooling water supply.

### 2.6.8.3 *Location of the CWPS*

2.6.8.3.1 Some commentators have suggested the option of relocating the pumping stations elsewhere in order to avoid reclamation and introducing suction culverts around the CWB. Mr Albert Cheng Wai-shing, a Chartered Engineer, however, points out that such an option will impose hydraulic constraints in the long supply culvert and deep chamber downstream to the penstock, which will subsequently cause solids settlement and hence maintenance problems [**Enclosure 2.15**].

- 2.6.8.3.2 Mr Nigel John Easterbrook, a Chartered Civil Engineer, has suggested in one of SPH's affirmations that the CWPSs proposed by TDD should be removed. He is of the view that the CWPSs are not needed and, in any event, can be relocated elsewhere. Such a view is however unsubstantiated. Site selection at the seafront is a logical engineering solution for satisfying the hydraulic requirements for the cooling water pumping systems.
- 2.6.8.3.3 Mr Robert Chu, in a separate affirmation filed by SPH, on the other hand, has suggested that the reclamation extent can be reduced by adopting the option of relocating the pumping stations to the two sides of the new waterfront. On this alternative, TDD commented that the proposal fails to look at the construction sequence, and conflicts with existing ferry and pumping station operations. This alternative has ignored the severe constraints associated with the construction phasing and the essential requirement to maintain the existing CWPS/marine facilities in continuous operation until the reprovisioned facilities are commissioned.
- 2.6.8.3.4 If the pumping stations were to be provided on the two ends, accommodating the western group of pumping stations (PS-1) will require construction of a large portion of reclamation; this will block safe marine access to the existing Edinburgh Place piers (which are used by the "Star Ferry Co. Ltd. and Discovery Bay Transportation Services Ltd.) and Queen's Pier. Furthermore, there is insufficient existing land space to accommodate the large number of new cooling water mains that would be required. The only way to overcome this would be to construct an area of reclamation to the north of the General Post Office but this is not feasible as it would block the existing pumping station intake and discharge pipelines. Similar problems would occur for the proposed eastern group of pumping stations (PS-2) as they require a portion of reclamation immediately to the north of the existing pumping

stations which will block the existing discharge pipelines of Pacific Place, Police Headquarters Phase I, II and III, Queensway Government Offices and High Court. On the contrary, the current scheme with most of the pumping stations located in the central portion of the new seawall, was developed specially to ensure that safe marine access can be maintained to the existing piers during construction so that the existing pumping stations can operate without interruption. The grouping of the pumping stations in the current scheme also enables the supply pipelines to be laid close together thereby making access for maintenance better and limiting the extent of the wayleaves required.

- 2.6.8.3.5 Mr Hardy Lok on behalf of SPH does not agree that the CWB will act as an imperishable barrier so as to necessitate the pumping stations to be on the north harbour side of the CWB. From the engineering point of view, he argues that it is quite possible and without any great expense to relocate the pumping stations to the south side. Mr Michael Chu Ka Sein, a Chartered Engineer, in his letter to the Administration, has also suggested that the pumping chambers can be located on the landward side of the CWB. On this, TDD has the following comments.
- 2.6.8.3.6 There are substantial technical, construction risk and long term maintenance problems with the proposed conceptual scheme. It has not addressed the method and risks associated with the construction of the deep shafts, the culvert under the tunnel or the breaking through of the diaphragm wall. The large groundwater pressures at this depth will have to be firmly controlled. From an engineering perspective, the proposed scheme is not a reasonable alternative because of its inherent technical problems and maintenance burden and would almost certainly be completely unacceptable to the system owners.
- 2.6.8.3.7 In suggesting relocation of the CWPS to the south of the CWB,

Mr Hardy Lok has not proposed a feasible alternative location. Based on the two conceptual sketches, A and B, provided by Mr Lok in one of SPH's affirmations [**Appendix 2.7**], TDD has the following response.

- 2.6.8.3.8 It is presumed that sketch A suggests that the pumping station would be adjacent to the south side of the CWB Tunnel, with isolating penstocks at the inlet of the CWPS. A multi-compartment supply culvert is proposed. The means of isolation and the distribution method to the individual pumping stations cannot be determined from sketch A. Looking at the hydraulics of the supply culvert arrangement, the water level in the sea will be identical to the water level inside the chamber downstream of the penstock. Therefore, a self cleansing velocity cannot be achieved, and there will be possible settlement of solids in the section of the supply culvert under the CWB Tunnel. In addition, it is possible that solids/debris will settle in the chamber downstream of the penstock and create additional maintenance problems for the end users. Furthermore, there is no horizontal access to the pumping stations. Access to the pumping stations will be from the road surface south of the CWB.
- 2.6.8.3.9 Sketch B suggests an inverted siphon design for the section of the return culvert around CWB Tunnel. The maintenance responsibility and ownership of the multi-compartment return culvert would need to be resolved. The proposed manhole does not satisfy its primary purpose of providing adequate access to undertake routine maintenance and repair in such a massive and deep underground structure. A bigger size desilting opening at both ends of the return culvert, preferably accessible by public road, is required for loading/unloading of plant and equipment for servicing this culvert. An additional above-ground ventilation building/structure should be provided if man entry is required for maintenance and repair of the return culvert. Also, lighting and fire services equipment need to be

considered.

2.6.8.3.10 For such a single multi-compartment structure, maintenance or repair for one part of the compartment would interrupt the pumping operation of the whole multi-compartment. It is not generally acceptable from the perspective of operation and maintenance of the pumping system to have such a deep underground structure for the water cooling system. Furthermore, leakage or damage to the return culvert would have the potential to cause settlement of the CWB due to loss of filling material surrounding the structure.

2.6.8.3.11 It is noted that the existing seawater cooling system for HSBC required the excavation of a 7m diameter tunnel from the harbour to the location of the heat exchanger system. Provision of a similar arrangement would be a major addition to the current scheme which implies that more reclamation of land is needed.

2.6.8.4 *Seawall foundation options / seawall structure position / other seawall design options*

2.6.8.4.1 Some commentators have also queried the selected foundation option for constructing the pumping stations, namely the rubble mound foundation. TDD points out that the seawall and pumphouse resting on a rubble mound (with marine mud removed) is a proven safe design worldwide. There are other structural forms for the CWPS foundation such as driven pile, bored pile and mat foundation. However, these alternatives could cost as much as a hundred-fold and are not reasonable alternatives in view of the costs involved. Typical cross-sections of the three alternatives and the respective cost estimates and reduction in reclamation limit (by approximately 6 metres) are included in **Appendix 2.8 (a) – (d)**. Moreover, the driven pile, bored pile and mat foundation all require maintenance. On the other hand, the rubble mound foundation

is virtually maintenance-free.

- 2.6.8.4.2 Mr Edwin Chung Kwok Fai, a Chartered Engineer, from Black & Veatch Hong Kong Limited, has studied some pumping station design alternatives other than the one proposed by the Government. His comments are that the other designs are either impractical, or do not follow the common practice, or will impose severe constraints to the design of the pipe and the CWB structure as well as its method of construction. He is of the view that the other designs would not be adopted in normal practice [**Enclosure 2.16**]. Thus, taking account of the economic and cost factors, the current design of the pumping stations represents the most optimal solution. Any allegations that we are over-reclaiming for these pumping stations are unfounded. Moreover, the use of land reclaimed for reprovisioning these pumping stations is for community and leisure purposes. To further re-assure the public, the Administration has undertaken to find means within the plan making system to make sure that land reclaimed will only be used for the purpose for which reclamation was originally justified.
- 2.6.8.4.3 Mr Nigel John Easterbrook on behalf of SPH has suggested re-aligning the CR III foreshore with a refined seawall structure position adjoining the CWB and enabling 35 m (TDD's 60 m - 25 m = 35m) of the promenade zone to be saved over about a 700m length, i.e. 24,500 sq.m (700m by 35 m = 24,500 sq.m or 2.45 ha) of reduced reclamation. According to TDD, such a reduction of reclamation area is not achievable. The relocation of the CWPS elsewhere is not a reasonable alternative. In the Government's scheme, the spacing between the CWPS and the CWB is considered to be the minimum required looking at the amount of seawater discharge pipework, electric cables and other utilities required for the operation and maintenance of the pumping stations and the pipelines, cables and utilities therein.

- 2.6.8.4.4 Mr Easterbrook has also proposed a refined seawall structure in the promenade zone, without the CWPS, which would reduce the TDD structural set-out of 60m to only a total of 25m. This proposal assumes that the pumping station will be removed from its current position. Moreover, this cross-section indicates that the refined seawall is of 15m. In comparison with the Government's wave absorption seawall without the pumping station as its back, this refined seawall does not result in any reduction of width. The alternative refined seawall design simply has not taken into account the requirements for the seawater intake pipe or culvert. It is thus not a reasonable alternative as such.
- 2.6.8.4.5 The refinement of the seawall structure and the claimed reduction in the reclamation area in Mr. Easterbrook's alternative is based on baselines different from those in the Government's design, the most significant difference being the assumption that the CWPS will be relocated or not needed. Mr Easterbrook has not gone further to address problems associated with relocation of the CWPSs away from the seawall. There are obvious hydraulic, maintenance and operational deficiencies which render such a proposal unreasonable.
- 2.6.8.4.6 On the technical side, it is considered that there are major aspects in his scheme that are impractical or do not follow the common practice. For example, Mr Easterbrook's alternative requires construction of a temporary seawall. The construction of a temporary seawall may require a larger amount of dredging, and a large area of temporary reclamation to accommodate the sloping seawall, than the current scheme proposed by the Government. The temporary seawall construction and removal activities will have an increased environmental adverse impact, as the temporary seawall filling and removal will create pollution. The additional construction phases involved will also substantially extend the works

programme and increase the construction costs. Furthermore, the method requires a temporary seawall filling on both sides of the CWB so that the structure will not become unbalanced and overloaded – this will expose the tunnel structure to an unnecessary risk of damage. In summary, the proposed design and its construction are not a reasonable alternative.

2.6.8.4.7 The current design adopted in the Government’s scheme, i.e., a rubble foundation for the seawall, is the most commonly adopted solution. It represents the most cost-effective form of seawall design. The proposed CWPS will rest on the seawall rubble foundation which is an appropriate foundation material without the need of piles or other form of foundation. The design is therefore considered as cost-effective and low construction risk.

2.6.8.4.8 The Government’s scheme is considered a minimum option in view of the following –

- As shown on Drawing No. HK I-Z624A by TDD [**Appendix 1.4**], the tip of the rubble foundation at the inside of the seawall would be about 2m from the proposed diaphragm wall for the future CWB Tunnel. This is considered appropriate from an engineering point of view for diaphragm wall construction and will avoid potential difficulties of the rubble mound being in contact with the diaphragm wall as mentioned in paragraph 2.6.8.1.4 above.
- In addition, without the needed distance, disturbance of the rubble seawall by the diaphragm wall construction could cause undesirable movement of the seawall. The situation would be particularly unacceptable if the pumping station founding on the seawall rubble is disturbed.
- From the same TDD Drawing No. HK I-Z624A [**Appendix 1.4**], it is noted that the clearance between the cooling water pipes and thrust blocks from the pumping station and the future CWB Tunnel is only about 7m. This space is required for diaphragm wall construction to avoid

disturbing the pipes. The risk of disturbing the pipes will increase as this clearance distance reduces. The risk of disturbance must be kept to an acceptable level as disturbance to the pipes causing malfunctioning of the cooling systems of the CBD buildings could have tremendous effect on their operation. The space allowed in the design of the reclamation layout is considered to be the minimum.

- A robust temporary support system is essential to ensure stability of the adjoining ground. Diaphragm walls have been allowed for the construction of the future CWB Tunnel. This scheme is much more reliable in minimizing any ground movement outside the excavation which is not acceptable in consideration of the essential cooling pipes connecting the pumping station.
- It must be realized that the distance between the cope line of the seawall and the northern edge of the CWB is determined by various design features, i.e., the wave absorbing seawall, pump house chambers, emergency vehicular access, cooling water mains, utilities and other services and their construction, maintenance and operation. Further reduction of that distance would not be a reasonable alternative.
- The results of the recent site investigation (SI) by the CRIII contractor to confirm the design assumptions indicate that the dredge level in the vicinity of the CWPS to the east of the PLA Berth is -19.5mPD and the seabed level is -12.0mPD. The distance from the cope line to the tip of the rubble mound foundation at such dredged level (-19.5mPD) is 58.7m according to the current design and the updated SI results. It tallies approximately with the planned distance between the cope line and the northern diaphragm wall of the CWB, i.e. 60m.

2.6.8.4.9 The positioning of the CWPS is governed by a number of factors. The inlet pipe must be positioned between the sea level

(0mPD) and the existing seabed (-12mPD). It must be located a few metres below sea level so that there is sufficient water head to convey seawater to feed the pumps. This requirement is to prevent the burning out of the pumps. The temperature of the intake water is also important to the effective performance of the cooling water system. If there is adjacent heated water discharge, the separation between the discharge and the intake pipe becomes a crucial factor. Previous water quality sampling and mathematical modeling had shown that a plume of heated water quickly spreads along the line of the seawall under the influence of tidal currents. During summer the heated water stays within a relatively shallow surface layer of less than 2m thick. Vertical separation is therefore much more important than horizontal separation. Therefore, the current layout for the CWPS is the minimum extent of reclamation required.

#### 2.6.8.5 *Lagoons and reservoirs*

2.6.8.5.1 Mr Robert Chu has in one of SPH's affirmations further suggested that the reclamation extent can be reduced by adopting the alternative of providing either lagoons or reservoirs as a source of water.

2.6.8.5.2 On this alternative, TDD considers that the two identified locations for lagoon would pose major barriers to roads, utilities, culverts and other infrastructure. Both of the lagoons proposed would be located above MTRC NIL tunnel, which would not be acceptable at the very least from maintenance point of view. The lagoons also present serious technical challenges, such as the size and arrangement of the supply pipelines required to ensure the water in them is adequately replenished. The suggested scheme also has not demonstrated how the existing pumping stations would be kept in operation during construction of reclamation – the very reclamation required to construct the lagoons will block the existing

pumping station intake and outfall pipes. It is an important criterion for continuity of supply of cooling water throughout the reclamation works, the construction phasing has to be designed such that the reprovisioning system will be fully commissioned prior to any works commencing directly in front of the existing intakes. This major shortcoming would make the alternative technically not feasible.

2.6.8.5.3 The intention of the lagoon scheme appears to be to retain the existing pumping stations. However, it could not be true as there is greater head loss associated with the increased in length of intake pipe from each lagoon to the respective pumping stations and this leads to the size of intake pipe increasing so as to reduce the flow velocity and preventing the occurrence of cavitation in the intake pipe. Any extra bends in the intake pipe routings also increase the head loss. The existing pumping systems need to be upgraded to suit this requirement. Moreover, without the necessary technical details, the feasibility of the scheme is questionable. If this alternative were to be pursued, the net positive suction head requirements of the existing pumps would have to be reviewed by the individual pumping station owners to assess whether the increase in suction distance would cause cavitation problems or affect the normal operation of the existing pumping equipment. Any such evaluation would come to a conclusion similar to the above that the existing pumping systems require upgrading. However, there would not be sufficient space in the existing pumping station to accommodate the new pumping system with increased capacity. It is also not feasible to increase the size of the pumping stations at their present location. The idea of retaining the existing pumping stations at their present location cannot stand.

2.6.8.5.4 The new suction culvert from the Harbour to the proposed lagoons would have to pass around the CWB Tunnel and the hydraulics must be reviewed critically to make it a feasible

option. As mentioned above, supplementary pumping facilities at the new seafront would be required and as a result, the objective of this option – “to reduce reclamation” – would not be fulfilled. Moreover, the provision of the new pipe suction culvert under the CWB Tunnel will impose construction difficulties and maintenance problems. Mr Albert Cheng Wai-shing, a Chartered Engineer, also points out that such an option will impose hydraulic constraints in the long supply culvert and deep chamber downstream to the penstock, which will subsequently cause solids settlement and hence maintenance problems [Enclosure 2.15].

- 2.6.8.5.5 The viability of this alternative also hinges on the feasibility of constructing pipes or culvert underneath the CWB tunnel. From a general engineering perspective, this scheme will impose severe constraints to the design of the pipe and CWB structure, as well as the method of construction of the CWB, and would not be adopted in normal practice. Since two locations are identified in this alternative, two sets of pipes may be needed and would run underneath the CWB tunnel. These sections of pipe cannot be inspected or maintained underneath the CWB. One of the drawbacks for deeply embedded pipes is that it is extremely difficult if not impossible to remove siltation inside the pipe as it is fully submerged under water. In addition, there would be high risk of damaging the pipes by settlement/movement during and after the construction of the CWB. These concerns will impose severe and stringent constraints to the design of the pipe and CWB structure, as well as the method of construction of the CWB. Special provisions and mitigation measures would need to be incorporated to resolve the concerns. All these provisions would not just increase the construction cost but also increase the cost in the operation and maintenance side. The large quantities of harbour water required in the lagoon could present environmental and health risks. If the water is not adequately circulated and used then it would result in an increase in level

of pollutants. Mediation measures would have to be included to ensure the water quality would be up to an acceptable standard. This would certainly increase the cost. Such a scheme would not be cost-effective. A Chartered Engineer, Mr Edwin Chung Kwok Fai from Black & Veatch Hong Kong Limited, has studied such alternatives and that proposed by the Government. His comments are that the alternative designs are either impractical, or do not follow the common practice, or will impose severe constraints to the design of the pipes and the CWB structure as well as the method of construction. He is of the view that the alternative designs would not be adopted in normal practice [**Enclosure 2.16**].

2.6.8.5.6 In summary, the proposal to have lagoons or reservoirs would not be a reasonable alternative scheme for CR III because of its incompatibility with the congested infrastructure in the area, shortcoming to meet the criterion to provide continuous water supply throughout the reclamation works and wrong assumption of retaining existing pumping system. The increase of cost during construction, operation and maintenance would also be of concern. Connection of these lagoons/reservoirs to the Harbour may be more complex than envisaged and difficulties in delineating maintenance responsibilities would arise. Moreover, if “mechanical aid” which effectively means pumping were required to feed these lagoons/reservoirs, then the benefits offered by this proposal in terms of minimizing reclamation would be negated. Finally, this scheme purposely dismisses the environmental concerns associated with the lagoon/reservoirs. This is a potential for serious problems and should not be overlooked in any reasonable alternative worth considering.

2.6.8.5.7 Mr Hardy Lok in one of SPH’s affirmations has on the other hand suggested that a central cooling water well can be built within the project site, with a simple intake structure along the waterfront towards the Convention Centre area and sea-water

can be pumped across to an intermediary station (location to be identified) distributed to the various buildings concerned. The main benefit of such a proposal is the potential elimination of the numerous pumping stations from the foreshore, thus allowing for a reduction in the overall width of the reclamation.

2.6.8.5.8 According to TDD, the suggestion of a central cooling water well for distribution to the various buildings without supporting details is not a reasonable alternative. Connection of this well to the Harbour may be more complex than envisaged and maintenance responsibilities would have to be resolved. If “mechanical aid”, which effectively means pumping, is required to feed this well, then the benefits offered by this proposal in terms of minimizing reclamation would be negated. Thus, this is not a reasonable alternative. Environmental concerns and operational problems of such a facility have not been addressed at all.

#### 2.6.8.6 *Alternative cooling systems*

2.6.8.6.1 Alternative air conditioning systems using different cooling methods such as ponds or lakes acting as heat sinks or fresh water supply systems or evaporative cooling towers have been suggested by Mr Nigel John Easterbrook on behalf of SPH. As discussed in paragraphs 2.6.3 to 2.6.7, these are not reasonable options.

2.6.8.6.2 It was not Government’s policy at the time of the design to utilize fresh water supply as cooling water for air conditioning systems. Even now, the fresh water system in Central has inadequate capacity to provide water for the air conditioning systems of new large developments. The area within CRIII project is not within the Pilot Scheme area for fresh water cooling. The current pumping station provision for future developments is, therefore, a reasonable and justifiable solution.

- 2.6.8.6.3 As discussed in paragraph 2.6.3, air-conditioning alternative by fresh water cooling towers is technically problematic. In practice, the change to fresh water supply would also require the agreement of the respective owners because of the additional financial implications and the time and delay thus caused would render such an alternative not a reasonable alternative for CRIII.
- 2.6.8.6.4 Mr Robert Chu has in one of SPH's affirmations suggested using Centralized Piped Supply System for Cooling Tower (CPSSCT) for new buildings. On this alternative, TDD's view is the CPSSCT is only in preliminary study stage. Under the CPSSCT system, a centralized sea water pumping station and a service provider is required to operate the plant for serving all buildings connected to the plant. There are legal, land and institutional issues to be resolved. Furthermore, the development of a centralized cooling water system would involve complex issues such as apportionment of installation and operation costs, future operational requirements and peak demand of individual building owners, maintenance liabilities, equipment backup, property right, etc. These would have to be addressed and resolved before a CPSSCT system is developed. In addition, CPSSCT system will normally require cooling towers located on the roof of each building and hence will impose a restriction to the floor usage of the new building. Therefore, it is not considered as an alternative to seawater pumping station for new building which will impose any floor usage restriction to new buildings.
- 2.6.8.6.5 Mr Hardy Lok has suggested the HSBC Tunnel Solution as an alternative. According to him, the present sea water supply to the Headquarters of the HSBC at No. 1 Queen's Road Central makes use of two vertical shafts; one located (on the waterfront) at Edinburgh Place and the other at the basement of the Hong Kong Bank. The shafts are connected by a large diameter service tunnel bored through bed-rock estimated to be in excess

of 300m long, and in fact the sea water pipes are housed in the service tunnel. The advantage of this is the ease of maintenance for both the pipes and the pumps. The new proposed relocated scheme does not provide a continual tunnel feature connection to the existing Hong Kong Bank pipework within a tunnel, and indeed it will be a much inferior setup than what they enjoy at present. On this, TDD has the following comments.

2.6.8.6.6 The existing cooling water system for HSBC comprises a relatively shallow intake pipe at the seawall that is connected to a large diameter vertical shaft, which is approximately 70m deep. The existing pumps are located within the shaft and these pump the seawater through pipes that run vertically down the shaft. At the base of the shaft the pipes run inside a tunnel to the location of the HSBC main building. Under the current reprovisioning scheme the existing pipe and pump system will not be altered. The new pumping station, at the new seawall, and its connecting pipework will simply form an extension of the existing shallow intake pipe back to the existing pumps in the shaft. The suggested extension of the existing deep tunnel to the new seawall pumping station would, therefore, not be a reasonable scheme as the intake pipes would be far too deep to connect to the existing pumps. This would require a completely new deep pumping station at the new seawall which would probably occupy more space than the current pumping station design. In summary, the proposal for a deep tunnel to take the seawater intake pipes back to the existing HSBC pumping station is not a reasonable alternative as it is technically inappropriate, expensive and unlikely to result in a reduction in the reclamation.

2.6.8.6.7 Mr Hardy Lok has further contended that the centralized pipe supply system with intermediary pumping stations, as an alternative scheme, should prove technically feasible. However, no details have been provided on the layout or size of

the system. TDD opines that the system is likely to require two sets of pumps for each user, which would be both less efficient and less reliable than the current scheme. The central pump required would be huge but there is no indication by the proponent of its likely size or location. TDD envisaged that the intermediary pumping station at the seawall would be very large, probably larger than the current pumping stations, resulting in the distance between the seawall and the CWB tunnel actually being increased rather than reduced. The proposal is therefore not a reasonable alternative scheme.

#### 2.6.8.7 *Other general comments*

- 2.6.8.7.1 Mr Ian Thomas Brownlee, a Town Planner, in one of SPH's affirmations, has argued that some 9 ha (approximately 1 million square feet) of reclamation to the north of the CWB is justified by the need for some 29 pumping stations. To him, this area could be significantly reduced by reducing the number of pumping stations, exploring alternative cooling systems, adopting a centralized cooling water system, etc. He further contended that there is no legal obligation for the Government to re-provision the pumping stations and that these pumping stations are not for public use and therefore the need for these pumping stations is not a public need. There is a public need in that the pumping stations are required to maintain the economic and social viability of Central by providing an essential uninterrupted utility to the buildings. These pumping stations are located on the existing waterfront and are affected by the reclamation for essential infrastructure. In commenting on the public need justifying reclamation, Professor Andrew Leung [**Enclosure 2.11**] commented that "similar pumping services to the existing buildings must be provided continuously during the development because a civilized society has to respect those facilities people had paid for and are entitled to enjoy. I consider the claim that the pumping stations are not needed as uncivilized".

2.6.8.7.2 On the public need test, we should point out that the reclamation works under CRIII will affect several groups of CWPS serving both Government and private buildings in the vicinity, including Central Government Offices, Queensway Government Offices, High Court, Murray Building, LegCo Building, City Hall, Police Headquarters, Hongkong and Shanghai Bank Main Building, Pacific Place, Admiralty Centre, and Prince's Building Group. All these Government offices and private buildings cannot properly function and operate without reprovisioning of their seawater intakes and discharge outlets for central air-conditioning systems. The continued operation of the pumping stations is vital to the smooth and efficient operation of the CBD. Any disruption to the continued operation of these buildings will create adverse social and economic impact.

2.6.8.7.3 The CFA judgment has pointed to the need to take into account factors like cost, time and delay in assessing reasonable alternatives. This is particularly relevant in considering alternatives to the CWPSs under the CRIII. For private buildings with affected CWPSs, the respective private owners are required to pay for the reprovisioning costs in accordance with existing Government agreements. As such, they have to be consulted on the detailed design of their CWPS.<sup>13</sup> After extensive discussion and consultation with Electrical and Mechanical Services Department (EMSD) and the respective owners (including Hongkong and Shanghai Banking Corporation Ltd, Hongkong Land Ltd, Swire Properties Management Ltd and MTRCL), the consultants came up with the current design of the CWPS that is acceptable to all parties concerned. The locations of the CWPSs have also been

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<sup>13</sup> TDD first met the private owners formally in June 2000 for the CRIII reprovisioning arrangement. From June 2000 to February 2003 when the CRIII main contract commenced, there is a period of 33 months of active negotiations.

agreed by the affected private owners. Re-opening such negotiations with affected private owners on alternative systems would render it impossible to complete CRIII within the needed timeframe.

- 2.6.8.8 We have in this Review addressed at length the reclamation for the CWPS, covering the need for reprovisioning, the size and number of the pumping stations, their configuration and foundation, with a view to dispelling any misconception or allegation that more land than needed is to be reclaimed under CRIII for reprovisioning these essential facilities. The current design and work sequencing represents the solution for which there is no reasonable alternative, taking into account time, delay and costs implications and involves minimum reclamation.

## 2.7 Ferry piers

- 2.7.1 The “Central – Tsim Sha Tsui” ferry services have been in operation since 1888. The Tsim Sha Tsui (East) and Hung Hom ferry services are existing passenger services that have been in operation since 1986 and 1965 respectively. The reprovisioning of ferry piers meets *the compelling and present need* of the community. During the course of extensive public consultations on the CRIII project, none have expressed the slightest indication that these ferry services could be dispensed with. On the contrary, both the Star Ferry operator as well as some LegCo Members have expressed a strong wish to reprovision the Star Ferry piers to preserve and restore its iconic value to Hong Kong and enhance its attraction to tourists.
- 2.7.2 There is *no reasonable alternative* to a permanent reprovisioning of the Star Ferry piers. At present, the existing Pier No. 1 is used by Government vessels and fireboats. It is not feasible for the pier to accommodate additional services. TD has reviewed the utilization of the Piers No. 2 to 7, the locations of which are shown in **Appendix 2.9**. The findings are set out in the following

paragraphs.

- 2.7.3 Pier No. 2 - At present, the western berth of Pier No. 2 is used for the “Central – Ma Wan” service and is fully utilized. The eastern berth, now vacant, is earmarked for possible ferry service to Penny’s Bay when Disneyland starts to operate by late 2005. The berth, in theory, can be released for temporary use for ferry service for about 1.5 years until mid 2005. From the marine safety perspective, however, it is potentially dangerous to allow the “Central – Hung Hom” and “Central – Tsim Sha Tsui East” services to use the eastern berth of Pier No. 2 even on a temporary or transitional basis because the eastbound sailings to Hung Hom and Tsim Sha Tsui East will create heavy cross marine traffic with the westbound sailings to outlying islands. This will also cause delays to the ferry services which will likely be objected by the ferry operators. Marine Department has the same observation.
- 2.7.4 Pier No. 3 - At present, Pier No. 3 is used for the “Central – Discovery Bay” service. The pier is fully utilized and cannot accommodate additional services.
- 2.7.5 Pier No. 4 - At present, Pier No. 4 is used for the “Central – Sok Kwu Wan” and “Central – Yung Shue Wan” services and it is fully utilized during peak periods. It cannot accommodate additional services.
- 2.7.6 Piers No. 5 and 6 - At present, these 2 piers are used for the “Central – Cheung Chau”, “Central – Peng Chau” and “Central – Mui Wo” services. A detailed survey was conducted on 7 October 2003 to ascertain the berthing utilization. The survey examined the feasibility of using only 3 berths of the two piers for the above 3 services but it is found out that such a proposal is not feasible because –
- any slight delay of one sailing will affect the timetable of services of all three routes;
  - any delay due to high wind or bad weather will have a

knock-on effect due to its extremely tight utilization and may easily affect the service level; and

- no allowance has been made for vessels to berth at the piers for purposes other than loading and unloading. Hence, vessels have to frequently move in and out of the piers to make way for vessels engaging in active loading and unloading causing operational inefficiency. Furthermore, idle berthing needs to be arranged elsewhere or has to stay in the fairway which may cause congestion to the marine traffic.

2.7.7 It is concluded from the above that 4 berths are needed for the 3 outlying ferry services mentioned above.

2.7.8 Pier No. 7 - This pier is earmarked for the permanent reprovisioning of Star Ferry's "Central – Tsim Sha Tsui" service after refurbishment in 2005. Its 2 berths will be fully utilized.

2.7.9 Since only Pier No. 7 can be spared for the permanent reprovisioning of Star Ferry's "Central – Tsim Sha Tsui" service, the reprovisioning of the remaining existing services viz "Central-Hung Hom" and "Central-Tsim Sha Tsui East" services would require a new pier, i.e. Pier No. 8.

2.7.10 Pontoons – Marine Department has commented that it may be possible to moor a pontoon at the tip of Pier No. 7 to create an extra berth for temporary reprovisioning of Star Ferry's "Central – Hung Hom" service. However, judging from experience in Central Reclamation Phase I where the ferries using a pontoon for temporary berthing were small hovercrafts which were small and highly maneuverable as compared with the Star Ferry, it is doubtful that Star Ferry will accept that such a proposal is practical to suit its operation in terms of the safety of its passengers as well as the smooth running of its schedules and the maintenance of the Star Ferry icon.

2.7.11 In order to ensure that the Star Ferry services will not be interrupted during the implementation stage of CRIII, a small piece of land called Initial Reclamation Area West (“IRAW”) will have to be constructed at the beginning to provide land for the construction of Pier No. 8 and associated passenger and traffic circulation facilities as shown in **Appendix 2.5**. The temporary shorelines on the south and south east of IRAW have been designed to maintain a maximum width of navigation channel to ensure that the construction activities for IRAW will not affect the operation of the existing Star Ferry services. After the construction of IRAW and Pier No. 8 and the refurbishment of Pier No. 7, the existing ferry services will be moved to Piers No. 7 and 8.

2.7.12 The proposed location of Pier No. 8 is aligned with the existing Piers No. 1 to 7. This integral pier arrangement will provide convenient interchange facilities with other modes of transport. The drop-off facilities and public transport interchange will be fully utilized as these facilities can be shared by all passengers (including passengers from the future public landing steps, i.e. Piers No. 9 and 10). The design and location of Pier No. 8 is intended to avoid serious interruption to the existing ferry services at Edinburgh Place during the construction of Pier No. 8. Moreover, the following points have been taken into consideration –

- Minimum requirements for land and sea frontage;
- Convenient and short walk access under cover, with no conflict with other transport modes;
- Integration of ferries with other transport modes;
- Good uncongested interchange with bus, taxi and other nearby modes of transport with reasonable walking distances to the interchange;
- Sufficient waiting and circulation areas with minimum conflict with non-passengers waiting for other services;
- Smooth ferry operation to minimize delays;
- Efficient ferry operation to reduce operation costs;
- Attractive and convenient facilities to retain patronage; and
- Minimization of conflicts with existing land uses.

2.7.13 The current arrangements to re-provision the ferry piers as embodied in the CR III works are the outcome of a prolonged negotiation with the “Star” Ferry Co. Ltd. which has made strong objections during the statutory plan making process. The “Star” Ferry Co. Ltd.’s objection, being the only unwithdrawn further objection to the amended OZP with the minimum reclamation option incorporated, was mainly against the proposed relocation of its piers to Pier No. 7. It had subsequently taken the “Star” Ferry Co. Ltd. and the relevant Government Departments another two years to sort out the details relating to the re-provisioning. This prolonged and thorough examination would have met the CFA formulation of no reasonable alternative taking all circumstances into consideration. Any re-opening of negotiations on Star Ferry piers re-provisioning would inevitably lead to significant delays and abortive costs. No alternatives to re-provisioning the Star Ferry piers have been put forward by commentators or deputations attending the LegCo joint Panel meetings. There is no reasonable alternative to re-provisioning the ferry piers as planned.

## **2.8 Public landing steps**

2.8.1 CR III will change the current shoreline and thus the existing 15 sets of public landing steps at Queen’s Pier and the original Central waterfront area will be affected as shown in **Appendix 2.10**. Queen’s Pier is the most popular and busiest public pier in Central. There is a heavy demand from vessels engaged in port operations, harbour tours and other recreational activities. Marine Department’s record shows that more than 50 vessels use the pier per hour during the peak period. Re-provisioning is necessary to ensure their continued operation. A total of 12 sets of landing steps will be re-provisioned within CR III through Piers No. 9 and 10 adjacent to the pier cluster in the Central Waterfront so that users may benefit from the transport infrastructure in the vicinity.

2.8.2 Queen’s Pier cannot be closed during the implementation stage of

CRIII. The public pier at Tsim Sha Tsui is fully utilized during Saturday, Sunday and Public Holidays and has no reserve capacity. Besides, its location cannot substitute the Queen's Pier and other public landing steps located in Central.

2.8.3 The two public piers No. 9 and 10, which have a total of 12 sets of landing steps, are required to replace the existing 15 sets of landing steps at the Queen's Pier and the Central Waterfront. The location of Piers No. 9 and 10 has been chosen after taking the following factors into consideration –

- The landing facilities should be located to the east of ferry piers. This is because Central Piers No. 1 to 8 have occupied the main Central waterfront. Landing steps located within this strip is not possible due to over-congestion. To the west of these piers, the Hong Kong-Macau Ferry Terminal is the constraint that prohibit further addition of landing steps;
- Site should be located in an embayment of water away from fairways to provide buffer for layby and waiting vessels;
- Adequate road transport infrastructure including public transport interchange, layby for cars and car parks etc. should be available near the landing facilities; and
- The acceptability of the community and users.

2.8.4 At the southeast corner of Pier No. 8, CRIII shoreline will turn clockwise by 45° and connect to the shoreline which is offset at an average of 60m northwards from the edge of CWB. Piers No. 9 and 10 are located on this section of shoreline. By turning the direction of the shoreline 45° clockwise, the layout of Piers No. 9 and 10 has been designed such that on one hand there is a sheltered berthing area from the waves generated from the ferry vessels, and on the other hand, vessels using these piers will not interfere with the operation of the PLA berth on the east.

2.8.5 The orientation of this section of shoreline will also avoid the creation of a dead corner and a zone of stagnant water which is

likely to result in localized adverse water quality if the shoreline is turned 90° clockwise forming a sharp corner.

- 2.8.6 To conclude, there is an overriding public need to re-provision the public landing steps affected by the CR III works to the new waterfront. There is no reasonable alternative and the extent of reclamation is the minimum that is required for the purpose.

## **2.9 PLA berth**

- 2.9.1 The 1994 Sino-British Defence Land Agreement provides, inter alia, that “the Hong Kong Government will leave free 150 meters of the eventual permanent waterfront in the plans for the Central and Wan Chai Reclamation at a place close to the Prince of Wales Barracks for the construction of a military dock after 1997.”
- 2.9.2 Discussion with PLA indicated that the PLA berth must be located in front of the Central Barracks. Apart from the 150m long berth, two 75m long and straight approaches must also be reserved at both ends of the berth for the safe maneuvering of the necessary warships during berthing. The agreed PLA berth layout is based on a planning intention to visually integrate the proposed military dock with the promenade along the waterfront of Central and Wan Chai Reclamation, and that the dock area would be open to public access when it is not in military use.
- 2.9.3 Since the CR III is the final phase of Central Reclamation through which the permanent shoreline will be provided, the Government is obliged to fulfill the above requirement. There is no other alternative. The shoreline in front of the Central Barracks is constrained by Piers No. 9 and 10 on the west and the cooling water pumping stations on the east as shown in **Appendix 2.11**. It cannot be shifted further southward or landward, otherwise, the berthing requirements stated above cannot be met. The reclamation is no more than what is required for the length of the berth as stipulated in the Agreement.

## **2.10 North Hong Kong Island Line**

- 2.10.1 The CRIII has given due consideration to a future North Hong Kong Island Line (NIL) and has sought to protect its alignment. Although the NIL will not be needed before 2016, the alignment for this strategic rail link which is supported by numerous transport modeling studies conducted by the Government and the MTRCL should be protected administratively to ensure its future construction would not be jeopardized. According to MTRCL's Mr R J Black, "if the proposed NIL is to remain an achievable element of Hong Kong's future railway network, the physical alignment requires planning route protection from the encroachment of other infrastructure" **[Enclosure 2.14]**.
- 2.10.2 The Railway Development Strategy 2000 (RDS-2000) published in May 2000 provides the planning framework for the expansion of Hong Kong's railway network up to 2016. The RDS-2000 recommends the implementation of the NIL to relieve the existing Island Line (ISL) and Tsuen Wan Line (TWL) Nathan Road corridor. The NIL is an extension of the existing MTR TCL along the north shore of Hong Kong Island to run from Hong Kong Station through onto the eastern half of the existing MTR ISL at Fortress Hill. The RDS-2000 recommends that the target completion window for the NIL would be between 2008-2012. In late 2002, Government, in view of the reduction in forecast employment and changes in land use assumptions since the Second Railway Development Study (RDS-2), reviewed the need for the NIL. The assessment is that there is no strong need to implement the NIL, within the window of 2008 to 2012 as set out in the RDS-2000. The completion of the NIL is to be deferred to beyond 2016, but the alignment for the NIL should be protected administratively to ensure the future construction of the NIL would not be jeopardized.
- 2.10.3 As far as the limits of reclamation are concerned, the NIL alignment is in fact fixed by various control points. It has to join the Airport

Railway Extended Overrun Tunnel to the west, run along the water channel of the HKCEC as the columns and foundation of the HKCEC at this water channel were specifically designed for this purpose and at the eastern end, connect up with the existing station at Fortress Hill. The alignment of NIL is already tucked as close to the existing shoreline as possible and is on the landward side of the CWB. Any shifting of the NIL alignment outside and inland of this water channel will affect the foundation of the HKCEC.

## **2.11 Conclusion**

2.11.1 To conclude, we have applied the CFA's "overriding public need test" and its formulations to each area proposed to be reclaimed under the CRIII. The CRIII meets the test based on social, economic and environmental needs within our planning horizon, with some needs more imminent than others. There is no reasonable alternative to reclamation. The extent of reclamation is the minimum that is required for the purpose. Dr the Hon. Raymond Ho has written to the Administration expressing his support for the CRIII. To quote from him, "I do not think that the reclamation extent in CRIII is excessive. The 18 ha required for reclamation under CRIII is already minimum" [**Enclosure 2.17**]. Dr Ho's view is echoed by Mr Maurice Lee Wing Woo, a civil, environmental, geotechnical and structural engineer, who points out that "the extent of reclamation in CRIII is the optimal solution to the needs. Any delay in CRIII will delay such required works and induce negative social and economic impacts". On the future coastline of CRIII, Mr Lee adds that "the new coastline after CRIII will enhance the existing coastline with respect to continuation of land use and infrastructure, aesthetic performance of the coastline, and water current" [**Enclosure 2.18**]. Professor Bernard V Lim of the Department of Architecture at the Chinese University of Hong Kong comments that "reclamation, limited yet not massive, needs to be viewed in a positive light, in the context of promoting the importance of urban design as a means to deliver better and more sustainable environment, and enhancing the public realm of Hong

Kong to elevate its status as a world city” [Enclosure 2.19].

- 2.11.2 Some engineers have further pointed out that CRIII can enhance the tidal flow and water quality of the Victoria Harbour. Professor Y S Li, Professor Andrew Leung and Dr the Hon. Raymond Ho have all made this point. According to Professor Y S Li, Chair Professor of Coastal and Environmental Engineering and Head of Department of Civil and Structural Engineering, “the CRIII reclamation will enhance the tidal flow and water quality in the Victoria Harbour by eliminating a zone of rather stagnant water” [Enclosure 1.3]. Professor Andrew Leung [Enclosure 2.11] and Dr the Hon Raymond Ho have made very similar remarks [Enclosure 2.17].

## **Chapter 3 – Publicity and Public Consultations**

In view of the public concern over the issue of reclamation in the Harbour, the Government has stepped up efforts to reach out to the community to explain the justifications and scope of CRIII. In the following we have summarized the publicity and public consultation measures related to the CRIII project.

### **3.1 The CRIII Website**

3.1.1 The Housing, Planning and Lands Bureau (HPLB) has set up a website at [www.hplb.gov.hk/cr3](http://www.hplb.gov.hk/cr3) in order to enable the public to have a better understanding of CRIII so that they can discuss the issues concerned in an informed and rational manner. The website came into being on 25 October 2003 and comprises the basic facts, maps, plans, feature articles, court judgments and relevant LegCo papers on CRIII. The website also gives a full account of the Government's position on the issue of Harbour reclamation through the press releases, statements and open letters published in the past several months. The website has received 37,818 visits as of end March 2004. At **Enclosure 3.1** we have printed out the main contents of the CRIII website.

### **3.2 Leaflet on “*Our Harbour – Past, Present and Future*”**

3.2.1 The HPLB has produced a leaflet (in separate bilingual versions) summarizing the Government's stance and commitment to protect and preserve the Harbour. Contained in the leaflet are the key messages that looking ahead –

- The Government wants the Harbour to be a harbour for the people and a harbour of life;
- The Government has abandoned the proposals of reclamation at Kowloon Point and Tsim Sha Tsui;
- The Government will amend relevant OZPs to eliminate the reclamation plans for Tsuen Wan and the Western District;
- The CRIII project was approved after extensive public

consultation and it enables the essential road networks to relieve traffic congestions in Central; and

- The Government will continue to listen to views of the public and hold discussions with different sectors of the community on the task of protecting and preserving the Harbour.

3.2.2 We have distributed a total of 107,600 Chinese copies and 37,700 English copies of the leaflet to the public since late November 2003. The leaflet has been distributed to DCs, secondary and primary schools, youth centres, libraries, professional bodies, green groups, LegCo, port groups, and counters of relevant bureaux and departments. Bilingual copies of the leaflet can be found at **Enclosure 3.2**.

### **3.3 Booklet on “*All About Central Reclamation Phase III*”**

3.3.1 The Government has produced a combined bilingual booklet on CRIII to provide a comprehensive factual account of CRIII. Contained in the booklet are the history, scope, and justifications as well as the due diligence and scrutiny that CRIII has gone through. We have distributed a total of 134,000 copies of the booklet to the public since 18 December 2003. The booklets were sent to all concerned professional institutes, green groups, public organizations and schools, etc. To reach out to the community, we arranged an on-the-street distribution to passers-by in Central and Admiralty on 19 December 2003 and more than 20,000 copies of the booklets were distributed. The booklet has been sent to DCs, secondary and primary schools, youth centres, libraries, professional bodies, green groups, LegCo, port groups, and counters of relevant bureaux and departments. A copy of the booklet is attached at **Enclosure 3.3**.

### **3.4 Public Statements on the Harbour**

3.4.1 To reiterate the Government’s commitment to protect and preserve the Harbour, numerous public statements have been made over the

past few months. The more prominent ones are described in the following.

### 3.4.2 *2030 Study consultative documents*

3.4.2.1 The Government wishes to develop a land use, transport and environment strategy under the Hong Kong 2030 Study to guide the long-term development of Hong Kong. The views of the public on a number of planning options and alternatives have been sought during the public consultation. Based on public views expressed in the first two stages of consultation, the Stage 3 consultation has adopted as one of its broad directions for development the provision of a quality living environment through better design of the harbourfront and public space and better protection of the natural and cultural heritage. In connection with this, the Government has reiterated its commitment to preserve and protect the Victoria Harbour. Specifically, the consultative document contains the statement that the Government will not undertake any further reclamation in the Harbour apart from the works in Central, Wan Chai North and South East Kowloon to meet essential needs.

3.4.2.2 An extract of *Hong Kong 2030 Planning Vision and Strategy, Stage 3 Public Consultation – Consultation Booklet* is attached at **Enclosure 3.4**.

### 3.4.3 *2004 Policy Commitments of the Secretary for Housing, Planning and Lands*

3.4.3.1 Issued on 7 January 2004, the 2004 Policy Agenda lists the Government's new and ongoing initiatives over the next three and a half years. The one relating to Harbour development under SHPL's purview read as follows – "Ensuring that our planning and land use objectives are geared towards our mission to protect the Victoria Harbour and enhance it for the

enjoyment of our residents and visitors alike. Apart from Central, Wan Chai North and South East Kowloon, the Government will not undertake any further reclamation in the Harbour. Our policy will be reflected in relevant town plans.” Such a statement is reproduced in a paper entitled “Briefing on the work of the Housing, Planning and Lands Bureau (Planning and Lands Branch) and Public Consultations underway” which is submitted to all the 18 District Councils (DC) as a basis for consultation of DCs by representatives of HPLB. Between January and March 2004, HPLB officials attended all 18 DC meetings and the subject matter of harbour reclamation was discussed at length at several of these meetings.

### **3.5 Other Public Consultations**

- 3.5.1 Since mid 2003, SHPL and his colleagues have been reaching out to the community, green groups, professional institutes, advisory bodies, political groups, and business organizations to explain CRIII. Relevant officials participated in public forums and activities organized by the Citizen Envisioning @ Harbour and attended radio and TV programmes to explain the Government’s position and articles in Chinese and English newspapers and letters to editor were written to explain the Government’s position. Copies of the latter are at **Enclosure 3.5**.
- 3.5.2 The Government has also actively engaged SPH. SHPL and his colleagues have met with SPH on five occasions in the month of November 2003 under its new chair-lady, including two technical sessions to discuss CRIII and to listen to their “alternatives” of lesser reclamation and no reclamation.

### **3.6 Legislative Council Joint Panel Meetings**

- 3.6.1 SHPL led a team of officials to attend a joint meeting of the Panels of Environmental Affairs and the Planning, Lands and Works on 13 October 2003, in which CRIII was explained in detail. The LegCo

Brief prepared by the Housing, Planning and Lands Bureau has presented the background, latest development and the Government's position regarding CRIII. A copy of the paper is at **Enclosure 3.6**.

- 3.6.2 To help gauge public views, the Joint Panels held two meetings on 27 November and 8 December 2003. Representatives from 20 deputations attended the meeting, including the SPH. A list of the deputations is at **Enclosure 3.7**.
- 3.6.3 The 20 deputations presented their views, mainly on CRIII, in the first joint Panel meeting of 27 November 2003. The main concerns expressed by the deputations are summarized in the following –
- Engaging the public in proposed Harbour reclamations
  - Traffic and transport justifications for the CWB
  - The impact of the High Court judgment regarding the draft Wan Chai North OZP on CRIII and future reclamations
  - CRIII's reclamation extent
  - Environmental impact of CRIII
  - Public participation in the use of reclaimed land and design of the waterfront
- 3.6.4 Most deputations did not dispute the need for the CWB but expressed the wish for the Government to listen to the views of the community and carefully examine whether the present proposed scale of reclamation at CRIII is the "real" minimum. Some other deputations, in particular the Conservancy Association, requested the Government at the meeting to provide more robust transport justifications for the CRIII project, and to consider other traffic management measures as a long-term measure to tackle the traffic problems in Central and Wan Chai.
- 3.6.5 The papers submitted by the Administration at the above joint Panel meeting and the minutes of the meeting are attached at **Enclosures 3.8 and 3.9** respectively.
- 3.6.6 At the second joint Panel meeting of 8 December 2003, the

Government responded to the views presented by the 20 deputations in the previous meeting. The Secretary for the Environment, Transport and Works presented the transport justifications for the key traffic infrastructure to be constructed under CRIII. SHPL said that the Government would continue to listen to views of the public and hold discussions with different sectors of the community on the matter. He reiterated that the Government was committed to protecting and preserving the Harbour and shared the vision of the TPB of providing an easily accessible and lively waterfront for enjoyment of the public.

- 3.6.7 The papers submitted by the Administration at the above joint Panel meeting and the minutes of the meeting are attached at **Enclosures 3.10 and 3.11** respectively.

### **3.7 Aspirations for the Harbour**

- 3.7.1 In the course of the above-mentioned public consultation, the Government's stated position to provide more accessibility and more public amenities on the harbour-front is generally welcome and supported by the public. This view is illustrated in the Report of the Citizen Envisioning @ Harbour, a copy of which is at **Enclosure 3.12**.
- 3.7.2 The Government's vision is to make the Victoria Harbour a harbour for the people and a harbour of life, easily accessible for the enjoyment of all.
- 3.7.3 As mentioned before, the land required for the essential infrastructure items will provide an exceptional and unique opportunity for a vibrant waterfront promenade on the northern shore of Hong Kong Island extending from the CBD to Wan Chai for the access and enjoyment by the community. Stringent height restrictions are stipulated on the relevant OZP such that only low rise developments will be allowed on the waterfront. The commercial sites along the promenade are meant for waterfront

related commercial and leisure uses such as low rise retail shops and cafes/restaurants to complement the function of the promenade for the enjoyment of citizens and tourists.

- 3.7.4 With the CWB built underground, the greenfield site formed by the CRIII will provide an excellent opportunity to create a vibrant waterfront fully equipped with leisure, tourism and related retail facilities. From the Waterfront Promenade, residents and visitors alike will be able to enjoy the spectacular view of Victoria Harbour and Hong Kong's stunning skyline.
- 3.7.5 Apart from the Waterfront Promenade, the Central District (Extension) OZP envisages a Statue Square Open Space Corridor. This corridor will extend from Statute Square and Hong Kong Bank Building towards the waterfront. Pedestrians will be able to stroll along this corridor to access the waterfront. It will end at the re-provisioned Star Ferry Pier and public piers. There is a plan to recreate the 1912 Star Ferry terminal which will become a new landmark in Central and a major tourist attraction. This will enhance enjoyment of the waterfront by residents and tourists.
- 3.7.6 The creation of a vibrant waterfront is supported by the Hong Kong Institute of Architects (HKIA). In its letter to the Administration endorsing the CRIII, HKIA comments that, "the harbour is a valuable amenity and it is not sufficient to only demonstrate that there is a need for reclamation. Justification must be also on works that will enhance the overall environment of the waterfront, i.e. a continuous pedestrian environment that can be used by the people and which allows easy access to and from surrounding districts and supported by a range of leisure, recreational, well designed and integrated commercially operated attractions such as outdoor cafes, festival markets, kiosks, shaded sitting areas, cultural facilities including a maritime museum, and other water-related uses and features" [Enclosure 2.12].
- 3.7.7 HKIA supports minimum reclamation with minimal amount of the

reclaimed land reserved for commercial use. It also supports that such limited commercial use along the promenade be designated for waterfront related commercial and leisure uses such as low rise retail shops and cafes/restaurants to serve as attractions.

## Chapter 4 – Implications on the Programme and Cost of CRIII

- 4.1 In its judgment, the CFA has emphasized that “there must not be any undue delay in applying for judicial review. With any reclamation proposal, substantial public funds and third parties rights would be involved. It is of obvious importance and in the interests of good public administration that all concerned should know where they stand as soon as possible so that the earliest opportunity for any challenge should be promptly taken. If not, the courts have the discretion to refuse relief.” [Para. 70 of the CFA judgment refers] Dr the Hon Raymond Ho fully agrees with “the CFA judgment which has emphasized that there must not be any undue delay in applying for judicial review” [Enclosure 2.17]. We consider this guidance by the CFA a relevant consideration in this Review. In the following paragraphs, we will demonstrate that substantial public funds are involved and third parties rights have been created under CRIII to the extent that the consequences of aborting the CRIII now would be costly.
- 4.2 From initial proposal to start of work, CRIII has been under detailed study and consideration for five years, including extensive public consultations. In his letter to the Administration, Dr the Hon. Raymond Ho agreed that the “CRIII has undergone a process of due diligence and scrutiny” [Enclosure 2.17]. According to Mr Koo, “the proposed CRIII is based on a series of professional engineering studies conducted over the years and a long process of consultations with the general public and professional bodies” [Enclosure 2.9]. In its letter to the Administration, the Hong Kong Institute of Planners (HKIP) stated that the Central District (Extension) OZP had gone through a “very transparent plan making process and many professional institutes and members of the public were involved”. HKIP also considered that the OZP “should be implemented as soon as possible to help relieve traffic congestion in Central and to provide a waterfront promenade worthy of Hong Kong’s status as an international business and tourist centre” [Enclosure 4.1]. The major milestones in CRIII and lists of statutory and advisory bodies,

professional bodies and affected parties consulted on CRIII as well as the main ordinances involved are contained in the Section “A Process of Due Diligence and Scrutiny” in the Booklet *All About Central Reclamation Phase III*.

- 4.3 The approved Central District (Extension) OZP remains lawful unless the court rules otherwise and the Government has to discharge contractual obligations under the CRIII works contract. The SPH has publicly demanded that all current works under the CRIII should be stopped and the Central District (Extension) OZP should be referred by the CE in C to the TPB for reconsideration. This will have grave consequences.
- 4.4 Unlike the Wan Chai Development Phase II where the extent of reclamation is the subject of a draft Plan, the CRIII is based on the Central District (Extension) OZP approved by the CE in C in February 2000. If SPH’s request that the Central District (Extension) OZP be referred to TPB for reconsideration is acceded to, the Planning Department estimates that the preparation of a new plan and the statutory process involving gazettal of the plan under section 5, processing of objections, and submission of the draft plan to the CE in C for approval under section 8 will take at least 14 months.<sup>14</sup> This has not allowed for the time required for preparing the engineering and planning review, the needed public consultations with LegCo, relevant District Councils and interested groups, re-opening negotiations with stakeholders whose existing facilities will be affected by any proposed reclamation, etc. Once a

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<sup>14</sup> The 14-month period is made up of 3 months of administrative processing (including preparing and circulating the draft plan for departmental comments, consolidating departmental comments and preparing documents for TPB consideration, and preparing gazetting of the new plan under s.5 of the TPO). We have compressed the administrative processing as much as possible. The remaining 11 months are statutory provisions in the TPO, which is made up of 2 months of exhibiting the new plan for public inspection and 9 months for considering objections and submitting the draft OZP to CE in C for approval.

preferred and acceptable option is available, funding approval for the detailed design and construction, preparation of tender documents, detailed design and tendering of the works will have to be carried out. From start to finish, the entire process (including the 14 months for the plan-making process as mentioned above) may take 39 months to complete, assuming a fast-track approach (including an expedited funding application and approval process, and that the detailed design is conducted in parallel with the gazettal and authorization of the OZP, reclamation scheme and road works) and that the review and the redesign are not extensive. Otherwise, the entire process may take as long as 59 months to complete.

- 4.5 The consequences of such delays should be obvious. Without the 40m extension in the Airport Railway Extended Overrun Tunnel to be constructed as early as possible within the CRIII, the Airport Express Line and Tung Chung Line cannot operate at their full, design capacity due to safety concerns. The non-availability of the Road P2 Network in 2007 at the earliest would give rise to unacceptable traffic congestion within Central. If the CWB is not available by 2011, traffic conditions along the CRC/HR/GR Corridor will deteriorate and unacceptable traffic congestion will occur. Also, the northern shore of the Hong Kong Island would continue to be deprived of the “missing link” critically needed to improve the traffic flow between the western and eastern parts of the Hong Kong Island. As estimated above, the deteriorating traffic conditions and the traffic congestion would lead to very significant social and economic costs.
- 4.6 CRIII is subject to a \$3,790 million contract awarded in February 2003. The contract is expected to last 55 months and works have commenced on site in February 2003. If the Central District (Extension) OZP were to be returned to the drawing board and has to go through the planning, authorization, design and tendering process again likely to last for 39 months to 59 months as discussed above, the current CRIII contract could not be preserved. If the CRIII works contract were to be terminated, there would be immediate loss

of about 400 direct jobs. More job opportunities of up to 1,100 additional jobs that could have been created as the project progressed over the next four years would not be available. Based on the limited information available as at 31 January 2004, the possible losses are estimated to be over \$600M, which is subject to substantiation by the Contractor and Consultant.

4.7 Mr James Bruce Humphrey, a Chartered Quantity Surveyor, has in one of SPH's affirmations made an assessment of the likely cost consequences based on the several possible positions under the CRIII contract that may arise as a result of the SPH's application for an Order by the Court to remit the Central District (Extension) OZP to the TPB for reconsideration. Mr Humphrey's main points are summarized as follows –

- Mr Humphrey has dealt with the likely costs (to the Employer) that might arise on a project like CRIII in the event of frustration, termination or abandonment, and suspension.
- According to Mr Humphrey, if the CRIII contract came to an end by frustration, the estimate of the likely real loss to the Government is in the order of HK\$30 to HK\$40 million. That is the likely cost of stopping operations and re-starting.
- Mr Humphrey does not agree with TDD that, if the Government orders a suspension which lasts 90 days (plus a further 28 days within which the Engineer must decide whether to give permission to resume work), the contractor will treat the contract as abandoned or terminated.
- Mr Humphrey adds that TDD's estimate of \$403.3 million for "loss of profit" is based on what the Engineer has told TDD the contractor says his claim would be.
- Mr Humphrey argues that the most natural, and sensible, way forward is for the Engineer to order a suspension for a sufficient time for the requested review to be undertaken.
- Mr Humphrey has also examined the likely re-tender price level if for any reason CRIII comes to an end. He does not envisage any significant increase as a result of inflation in

the light of the foreseeable industry workload in projects of comparable scale. Nor does he see much scope for a lowered tender due to further deflation.

- 4.8 TDD's response to the above points is summed up in the following.
- 4.9 The estimates of Mr Bruce Humphrey at HK\$30 to 40 million for "likely real loss" have been based on the assumption of a "frustration" situation for which GCC Clause 85 will apply, and the contractor would then not be entitled to payment for loss of profit according to GCC Clause 84. There is however doubt with this "frustration" assumption, and the applicability of GCC Clauses 84 and 85 has yet to be established. It is noted that the present situation of CRIII is not similar in nature to the various types of "special risks" as listed in Clause 84 or "war" as quoted in Clause 85. If the assumption of "frustration" could not sustain, we would be faced with a situation of "breach of contract" under which any "loss of profit" claim would become valid.
- 4.10 Mr Humphrey has assumed that all the works done and services carried out so far need not be scrapped and would not be wasted and that quite a lot of them could proceed as originally planned despite the OZP were to be referred to the TPB for review. This is an unrealistic assumption tantamount to implying that the TPB review would come up with the same scheme and shoreline configuration such that the precast seawalls could be re-used. It would be imprudent for the Government to estimate possible financial loss to Government based on a minimal impact scenario.
- 4.11 Whether or not the existing partial suspension of the Works would lead to an abandonment/termination pursuant to Clause 55 by the contractor is a matter to be examined taking account of the extent of works suspended, the programmed inter-relationship of the suspended works and the numerous sections of works in the contract, the actual length of the suspension, etc. However, it should be noted that implementation of CRIII works with a contract period of

55 months is only at an early stage and if CRIII were to be aborted now the total value of the suspended works and other works that would be consequentially affected amounts to 95% of the value of the contract.

4.12 The current suspension of the CRIII works has been ordered in a way to enable the Government to preserve its flexibility to respond to the court decisions expeditiously for provision of the much needed infrastructure. There is no basis for the Engineer to order a suspension for a sufficient time for the requested review to be undertaken (Mr Humphrey has assumed that the review of OZP by the TPB will take only between 4-6 months to complete), as the TPB review process will take at least 14 months and carries with it the uncertainty that CRIII may or may not proceed in the same manner.

4.13 Based on the available limited information as at end January 2004 and subject to substantiation by the contractor and consultant, TDD has estimated that termination of the CRIII contract on 1 April 2004 could involve a substantial loss of over \$600 million, broken down as follows –

(a) Cost of abortive works physically completed up to 31.3.2004	\$166M
(b) Materials on Site	\$23M
(c) Precasting works in Mainland China	\$46M
(d) Materials ordered but not yet delivered	\$37M
(e) Demobilization of plant	\$10M
(f) Resident site staff (RSS) cost up to end 31.3.2004 plus 3-month notice period plus RSS for finalization of contract account	\$75M
(g) Consultants' cost	\$6M
(h) Reinstatement cost	\$60M
(i) Contractor's claim for loss of profit etc	\$236M

4.14 Third parties' rights have been created under the CRIII works.

Contractors and subcontractors have already raised strong concerns over the deferral or termination of the project as they have made a huge upfront investment in the project. This includes the purchase of precast materials, electrical and mechanical equipments and water pumps. They are also concerned about the storage cost in both Hong Kong and the Mainland that has to be incurred due to the temporary suspension of some of the CRIII marine works in Hong Kong.

## **Chapter 5 – Conclusion**

- 5.1 This Review shows that there are cogent and convincing materials demonstrating that CRIII meets the “overriding public need test” laid down in the CFA judgment. To obtain community support and third-party endorsement of the project, CRIII has undergone a five-year due and diligent process of scrutiny. During the various statutory processes, objections had been carefully considered and amendments made to the OZP with the benefit of a comprehensive feasibility study that helps identify the minimum reclamation option. All these satisfy the heavy demand in terms of standard of proof. Reinforced by the reviews conducted in the light of the court judgment, there is no reasonable alternative to reclamation.

## **PART TWO**

<b><u>List of Enclosures</u></b>	<b><i>Ref. Para.</i></b>
Enclosure 1.1 Details of CRIII Discussion at the District Councils, and the Panels and Finance Committee of the Legislative Council	1.2.2.2
Enclosure 1.2 The Chronological Events Related to CRIII	1.2.4.1
Enclosure 1.3 Letter dated 25 November 2003 from Professor Y S Li, Chair Professor of Coastal and Environmental Engineering & Head of Department of Civil and Structural Engineering, Hong Kong Polytechnic University	1.3.6
Enclosure 1.4 Court of Final Appeal's Judgment of 9 January 2004	1.4.2
Enclosure 2.1 List of Independent Experts and Endorsers Who Have Given Written Submissions in Support of CRIII	2.2.2
Enclosure 2.2 Opinion dated 6 February 2004 from Mr Tim Man, Transport Planning Specialist	2.3.1 <sup>1</sup>
Enclosure 2.3 Opinion dated 6 February 2004 from Professor Lo Hong-kam, Transport Expert and Associate Professor of the Department of Civil Engineering at the Hong Kong University of Science and Technology	2.3.1 <sup>3</sup>
Enclosure 2.4 Letter dated 6 February 2004 from Professor Cheng Hon-kwan, Former Chairman of Transport Advisory Committee	2.3.2
Enclosure 2.5 Opinion from Mr Fred Neal Brown, Transport Expert	2.3.3
Enclosure 2.6 Fax Message dated 7 February 2004 from the Chartered Institute of Logistics and Transport in Hong	2.3.3

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- Enclosure 2.7 Letter dated 6.2.2004 from Professor C O Tong, Associate Professor of the Department of Civil Engineering, the University of Hong Kong 2.3.5
- Enclosure 2.8 Letter dated 2 February 2004 from the Hong Kong Institute of Planners 2.3.5
- Enclosure 2.9 Letter dated 16 March 2004 from Mr Koo Yuk-chan, Civil and Geotechnical Engineer 2.3.10
- Enclosure 2.10 Extract of Minutes of the LegCo Joint-Panel Meeting of 27 November 2003 – Comments and Alternatives on the CWB voiced by Conservancy Association, Urban Watch, (中重型貨車關注組), Rights of Taxi Owners and Driver Association 2.3.11
- Enclosure 2.11 Opinion dated 17 February 2004 from Professor Andrew Leung, Head and Professor of the Department of Building and Construction at the City University of Hong Kong 2.3.13.6.6
- Enclosure 2.12 Letter dated 16 February 2004 from the Hong Kong Institute of Architects 2.3.27
- Enclosure 2.13 Letter dated 11 February 2004 from The Real Estate Developers Association of Hong Kong 2.3.28
- Enclosure 2.14 Letter dated 6 February 2004 from Mr. R J Black, Project Director of MTRCL 2.5.2
- Enclosure 2.15 Report dated 30 March 2004 by Mr Albert Cheng Wai-shing, Chartered Engineer from Black & Veatch Hong Kong Limited 2.6.3
- Enclosure 2.16 Report dated March 2004 by Mr Edwin Chung Kwok-fai, Chartered Engineer from Black & Veatch Hong Kong Limited 2.6.8.4.2

Enclosure 2.17	Letter dated 8 February 2004 from Dr the Hon. Raymond Ho, LegCo Member	2.11.1
Enclosure 2.18	Letter dated 16 March 2004 from Mr Maurice Lee Wing-woo, Civil, Environmental, Geotechnical and Structural Engineer	2.11.1
Enclosure 2.19	Letter dated 12 February 2004 from Professor Bernard V Lim of the Department of Architecture at the Chinese University of Hong Kong	2.11.1
Enclosure 3.1	Site Map of the CRIII Website	3.1.1
Enclosure 3.2	The Leaflet “Our Harbour – Past, Present and Future”	3.2.2
Enclosure 3.3	The Booklet “All About Central Reclamation Phase III”	3.3.1
Enclosure 3.4	Extract of the Booklet “Hong Kong 2030 – Stage 3 Public Consultation”	3.4.2.2
Enclosure 3.5	HPLB’s articles appearing in Chinese and English Newspapers	3.5.1
Enclosure 3.6	LegCo Paper on CRIII for the Joint Panel Meeting held on 13 October 2003 and Minutes of the Meeting	3.6.1
Enclosure 3.7	List of Deputations attending the LegCo Joint Panel Meetings held on 27 November and 8 December 2003	3.6.2
Enclosure 3.8	LegCo Papers on CRIII for the Joint Panel Meeting held on 27 November 2003	3.6.5
Enclosure 3.9	Minutes of the LegCo Joint Panel Meeting of 27 November 2003	3.6.5
Enclosure 3.10	LegCo Papers on CRIII for the Joint Panel Meeting held on 8 December 2003	3.6.7

Enclosure 3.11	Minutes of the LegCo Joint-Panel Meeting of 8 December 2003	3.6.7
Enclosure 3.12	Report of the Citizen Envisioning @ Harbour	3.7.1
Enclosure 4.1	Letter dated 19 February 2004 from the Harbour Institute of Planners	4.2

## **PART THREE**

<b><u>Table of Contents</u></b>	<b><i>Ref.Para.</i></b>
Appendix 1.1 Central and Wan Chai Reclamation	1.1.2
Appendix 1.2 CRIII – Essential Infrastructure	1.1.4
Appendix 1.3 CRIII – Reclamation extent for minimum option	1.2.3.1
Appendix 1.4 CRIII - Typical Cross-section	1.2.3.1
Appendix 2.1 Proposed Central-Wan Chai Bypass from Rumsey Street Flyover to Causeway Bay	2.3.1
Appendix 2.2 CRIII – “the Missing Link”	2.3.5
Appendix 2.3 Extract of the November 2003 Review Report in relation to the analysis of the horizontal and vertical alignment options of CWB	2.3.9
Appendix 2.4 SPH’ s conceptual sketches on no-CWB option and a reduced reclamation option presented in the LegCo Joint-Panel Meeting on 27 November 2003 A. No-CWB option B. Reduced reclamation option	2.3.15
Appendix 2.5 CRIII – Reclamation Sequence	2.6.2
Appendix 2.6 Drawing No. SK66 – Section at Wan Chai Area	2.6.8.1.6
Appendix 2.7 Extract of SPH’s affirmations – Mr. Hardy Lok’s Conceptual Sketches A & B in suggesting relocation of the CWPS to the south of the CWB	2.6.8.3.7
Appendix 2.8 Typical cross-sections of the driven pile, bored pile and mat foundation, and their respective cost estimates and	2.6.8.4.1

- reduction in reclamation limit
- a. - Various Foundation Options for Cooling Water Pumping Station
  - b. - Typical Section of Driven Pile Foundation for Cooling Water Pumping Station
  - c. - Typical Section of Bored Pile Foundation for Cooling Water Pumping Station
  - d. - Typical Section of Caisson Foundation for Cooling Water Pumping Station

Appendix 2.9	Piers in Central	2.7.2
Appendix 2.10	Existing Public Landing Steps in Central Waterfront before the commencement of CRIII	2.8.1
Appendix 2.11	Arrangement of Piers with the marine operation requirement	2.9.3