土木工程拓展署
Civil Engineering and
Development Department

Supplemental Agreement No. 1
to
Agreement No. CE 54/2001 (CE)

Wan Chai Development Phase II Planning and Engineering Review

ENVIRONMENTAL IMPACT ASSESSMENT FOR WAN CHAI DEVELOPMENT PHASE II AND CENTRAL-WAN CHAI BYPASS

EXECUTIVE SUMMARY

December 2007
Document Ref. 97103_ES (Dec07)

MAUNSELL CONSULTANTS ASIA LTD

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WAN CHAI DEVELOPMENT PHASE II
PLANNING AND ENGINEERING REVIEW

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1 INTRODUCTION

1.1 Project Background

1.1.1 Wan Chai Development Phase II (WDII) is the conclusion of a number of planning studies commissioned by Government, covering transport infrastructure and development along the shoreline of Central and Wan Chai, that date back to the early 1980s. The WDII project is undergoing a process of statutory town planning procedures and public consultation, in which there has 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 (HKCEC) Extension. The Central Reclamation Phases I, II and the Wan Chai Reclamation Phase I were completed in 1997 to 1998. Central Reclamation Phase III (CRIII) is currently under construction. WDII is the final phase, and an integral part, of the Central and Wan Chai Reclamation.

1.1.3 The Wan Chai Development Phase II Comprehensive Feasibility Study (the WDIICFS) was commissioned by the then Territory Development Department in June 1999. The main purpose of that assignment was to make provision for key transport infrastructure and facilities along the north shore of Hong Kong Island, in Wan Chai and Causeway Bay. Under the WDIICFS, a Trunk Road layout was derived, comprising the Central-Wan Chai Bypass (CWB) running along the Wan Chai shoreline in tunnel, and the Island Eastern Corridor Link (IECL) running behind the Causeway Bay Typhoon Shelter (CBTS) on elevated roadway, connecting to the existing elevated Island Eastern Corridor (IEC). New land was proposed along the Wan Chai and Causeway Bay shoreline, primarily for the construction of the Trunk Road and other key infrastructure, and also to provide an attractive waterfront with a new public promenade. A total reclamation area of some 28.5 ha along the existing Wan Chai and Causeway Bay shorelines was envisaged under the WDIICFS, from the interface with the CRIII project on the west side of the HKCEC Extension, to the east of the CBTS.

1.1.4 The Trunk Road and the associated land use proposals for the WDII project were incorporated in a draft Wan Chai North Outline Zoning Plan No. S/H25/1 (the draft OZP) which was gazetted under the Town Planning Ordinance on 19 April 2002. At the same time, the road works and reclamation proposed under the WDII project were gazetted under the Roads (Works, Use and Compensation) Ordinance and Foreshore and Sea-bed (Reclamations) Ordinance respectively.

1.1.5 Objections to the draft OZP were received and considered by the Town Planning Board, which decided to propose amendments to the draft OZP to meet or partially meet some of the objections after giving preliminary consideration and further consideration to the objections on 6 September 2002, and 29 November 2002 and 6 December 2002, respectively; and after giving consideration to further objections on 14 February 2003.

1.1.6 In February 2003, the Society for the Protection of the Harbour Limited sought a judicial review of the decisions of the Town Planning Board made on 6 December 2002 and 14 February 2003 in connection with the draft Wan Chai North OZP and its compliance with the Protection of the Harbour Ordinance (PHO). The High Court handed down its judgment on 8 July 2003, whereby the decisions of the Town Planning Board made on 6 December 2002 and 14 February 2003 in respect of the draft OZP were quashed. The Court also ordered the Town Planning Board to reconsider the draft OZP and the objections thereto. As this interpretation of the PHO would apply to all future planning of harbour-front areas which included reclamation, and due to the great general and public importance of the case, the Town Planning Board appealed directly to the Court of Final Appeal (CFA).

1.1.7 Objections were also received for the WDII road works and reclamation schemes gazetted under the Roads (Works, Use and Compensation) Ordinance and Foreshore and Sea-bed (Reclamations) Ordinance respectively. In the light of the on-going legal proceedings, it was considered not appropriate to submit the road works and reclamation schemes to the Chief Executive in Council for consideration. The above gazettals lapsed on 18 and 19 September 2003 respectively. The WDII project was re-gazetted under the relevant ordinances in July 2007.

1.1.8 In October 2003, the Town Planning Board considered the findings of a preliminary planning assessment on the draft OZP conducted by Planning Department according to the High Court's judgment on the judicial review and requested Government to conduct a comprehensive review of the planning and engineering proposals of the WDII project and draw up a minimum reclamation option for Wan Chai North that would comply with the law. The Town Planning Board is reconsidering the draft OZP and the objections according to the provisions of the Town Planning Ordinance upon completion of the review.

1.1.9 On 9 January 2004, the CFA handed down its judgment on the judicial review. The CFA ruled that the presumption against reclamation in the PHO can only be rebutted by establishing an overriding public need for reclamation (the "Overriding Public Need Test"), and that there must be cogent and convincing materials available to enable the decision-maker to be satisfied that the test is fulfilled for rebutting the presumption against reclamation.

1.1.10 Following the Town Planning Board request for a review of the WDII proposals and in the light of the CFA judgment, Government has undertaken to conduct a planning and engineering review of the development and reclamation proposals for the WDII project (the WDII Review). The WDII Review commenced in March 2004.

1.2 WDII Review

1.2.1 The main purpose of the WDII project is to provide land for the construction of the Trunk Road (comprising the CWB which runs from Central Interchange in Central Reclamation Phase I through the CRIII and WDII project areas, and the IECL which provides connection from the eastern portal of the CWB to the IEC), and other key transport infrastructure including the necessary ground level roads for connection to the Trunk Road and to cater for through traffic from Central to Wan Chai and Causeway Bay.

1.2.2 Rail infrastructure that would be accommodated by the WDII project includes the Hong Kong Island section of the Shatin to Central Link (SCL) and the future Mass Transit Railway (MTR) North Hong Kong Island Line (NIL).

1.2.3 The land formed for the above transport infrastructure will provide opportunities for the development of an attractive waterfront promenade for the enjoyment of the public.

1.2.4 The WDII Review seeks to assess individually the purpose and extent of each proposed reclamation by reference to the Overriding Public Need Test and, if needed, to make recommendations on the revised alignment for the Trunk Road and at-grade roads, extent of reclamation and/or the land uses for the review area covered by the Assignment.

1.3 Harbour-Front Enhancement Review

1.3.1 The Harbour-front Enhancement Committee (HEC) was established in May 2004 to advise Government, through the then Secretary for Housing, Planning and Lands, on the planning, land uses and developments along the existing and new harbour-front of Victoria Harbour. As guidance for the planning, development and management of the Victoria Harbour and the harbour-front areas, the HEC has established harbour planning principles which should be followed when examining transport infrastructure, including the Trunk Road, and harbour-front enhancement schemes. These are:

- preserving Victoria Harbour
- stakeholder engagement
- sustainable development
- integrated planning
- proactive harbour enhancement
- vibrant harbour
- accessible harbour
- public enjoyment.

1.3.2 The HEC has set up a Sub-committee, namely the Sub-committee on WDII Review, to advise on the WDII Review. Government has accepted the recommendation by the Sub-committee on WDII Review that enhanced participation should be a key element of the Review. To achieve this, a public engagement exercise, namely the "Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Areas" (HER), has been carried out under the steer of the Sub-committee on WDII Review. Results of the HER project provide inputs to the WDII Review.

1.3.3 In order to achieve a better understanding of the opportunities for waterfront enhancement and to ensure a high degree of community support for the future draft OZPs and the draft Recommended Outline Development Plan (RODP), a 3-stage public engagement strategy has been formulated so as to enable a more structured approach to be adopted to the HER public engagement activities:

(i) "Envisioning Stage"	Public to provide their visions, wishes and concepts, as well as to compile Sustainability Principles and Indicators as a basis for the development of the Concept Plan
(ii) "Realization Stage"	Public to evaluate the Concept Plan to arrive at consensus
(iii) "Detailed Planning Stage"	Ensure draft OZPs and draft RODP reflect the consensus.

1.3.4 The Envisioning Stage was formally launched on 22 May 2005, with a wide range of public engagement activities taking place over a two-month public engagement period. The envisioning exercise was to engage the public in identifying the key issues and establishing principles in terms of improving the waterfront. The concept of sustainable development underpins the whole HER project. A list of sustainability principles and indicators was prepared and agreed through the public consultation process; these agreed sustainability principles and indicators have been used to evaluate the Concept Plan that was developed in the Realization Stage.

1.3.5 As part of the public engagement activities, the HEC Sub-committee on WDII Review convened an "Expert Panel Forum on Sustainable Transport Planning and Central-Wan Chai Bypass", to explore sustainable transport along the northern shore of Hong Kong Island and to deliberate on whether the Central-Wan Chai Bypass (ie the Trunk Road) is needed – one of the key issues of the project.

1.3.6 The various issues that were raised by participants during the public engagement process, particularly in respect of Trunk Road alignments and harbour-front enhancement ideas, were extensively considered and addressed by the Sub-committee on WDII Review as part of the process of consolidating harbour-front and Trunk Road ideas. The outcomes of this process then formed the basis of the preparation of the Concept Plan.

1.3.7 In the Realization Stage, a Concept Plan, for the development and enhancement of the harbour-front under the ambit of the WDII Review, was prepared for evaluation and consensus building by the public, using the HEC's harbour planning principles and the sustainability principles and indicators developed during the Envisioning Stage. At a Consensus Building Town Hall meeting on 16 December 2006, there was general agreement with the proposals put forward by the Concept Plan, in respect of the Trunk Road proposal and the envisaged land uses, although there was some discussion on various detailed aspects of the harbour-front enhancement schemes.

1.3.8 On the basis of consensus on the Concept Plan, detailed planning, engineering and environmental assessments have been carried out for the derivation of the draft OZPs and RODP, which reflect the consensus on the Concept Plan.

1.3.9 A detailed scheme for the WDII project and the section of Trunk Road (CWB) within the study area (hereafter referred to as "the Project") has been developed from the Concept Plan, with minimum reclamation necessary to meet the overriding public need, in conformance with the PHO. **Figure 1.1** shows the layout plan of the Project. This scheme has been subject to detailed environmental impact assessment (EIA) under the WDII Review.

1.4 Objectives of the Environmental Impact Assessment

1.4.1 An EIA for WDII and CWB projects has been undertaken in accordance with the EIA Study Brief and the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). According to the EIA Study Brief, the objective of this EIA is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the developments proposed under the Project and related works that take place concurrently. This information will contribute to decisions on:

(i) The overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project and associated works, and any related phased implementation.

(ii) The conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable.

(iii) The acceptability of residual impacts after the staged as well as the full implementation of the Project, the associated works and the related proposed mitigation measures.

1.5 Consideration of Environmental Impact Assessment Ordinance

1.5.1 The proposed Project is an engineering feasibility study of an urban development project with a study area covering approximately 90 ha (i.e. more than 20 ha). Under the Environmental Impact Assessment Ordinance (EIAO), this Project is classified as a Schedule 3 Designated Project (DP) under item 1 of the Schedule 3 "Major Designated Projects Requiring Environmental Impact Assessment Reports". A detailed environmental assessment for approval by the Director of Environmental Protection (DEP) is required.

1.5.2 The Project also contains various Schedule 2 DPs that, under the EIAO, require Environmental Permits (EPs) to be granted by the DEP before they may be either constructed or operated. **Table 1.1** summarises the six individual DPs under this Project. **Figure 1.2** shows the locations of these Schedule 2 DPs.

Table 1.1 Schedule 2 Designated Projects under this Project

Item	Designated Project	EIAO Reference	Reason for inclusion
DP1	Central-Wanchai Bypass (CWB) including its road tunnel and slip roads	Schedule 2, Part I, A.1 and A.7	Trunk Road and road tunnel 800 m in length
DP2	Road P2 and other roads which are classified as primary/district distributor roads	Schedule 2, Part I, A.1	Primary / district distributor roads
DP3	Reclamation works including associated dredging works	Schedule 2, Part I, C.1 and C.12	Reclamation more than 5 ha in size and a dredging operation less than 100 m from a seawater intake point
DP4	Temporary typhoon shelter	Schedule 2, Part I, C.5	A typhoon shelter designed to provide moorings for not less than 30 vessels
DP5	Wan Chai East Sewage Outfall	Schedule 2, Part I, F.5 and F.6	Submarine sewage pipelines with a total diameter more than 1,200 mm and include a submarine sewage outfall
DP6	Dredging for the Cross-harbour Water Mains from Wan Chai to Tsim Sha Tsui	Schedule 2, Part I, C.12	A dredging operation less than 100 m from a seawater intake point

1.5.3 Description of the six DPs are given below:

- DP1 - Central-Wanchai Bypass including its road tunnel and slip roads

  The Trunk Road is a duel-3 carriageway defined from the connection with the existing Rumsey Street Flyover in Central, through to a connection with the existing IEC to the east of the CBTS. At the Rumsey Street Flyover connection, a Central Interchange will provide connections into the Central area, and then the Trunk Road will drop down into tunnel and run along the Central shoreline, through CRIII, to the WDII project area. In WDII area, the Trunk Road will continue in tunnel until it needs to rise onto elevated structure to connect with the elevated IEC. Total Trunk Road length is around 4.5km and the total tunnel length is around 3.5 km. The section of Trunk Road within the study area is around 3 km and the tunnel length is around 2.5 km.

  In the Wan Chai North and Causeway Bay area, the Trunk Road will be connected to the local road system by slip roads.

  As the CWB is a trunk road and road tunnel within the study area is longer than 800m, it is classified as DP under Schedule 2 Part I, A1 & A7. The location of this DP1 is shown in **Figure 1.2a**.

- DP2 - Road P2 and other roads which are classified as primary/district distributor roads

  The major element of the future ground level road system is Road P2, which runs east-west from Central to connections with the existing road network in Wan Chai North. Road P2 is a dual 2-lane primary distributor that serves both local east-west movements and the distribution of north-south traffic movements.

  The Road P2 alignment has been planned to run over the top of the Trunk Road tunnel through CRIII and the HKCEC water channel, to the connection with Fleming Road, in order to minimise the overall road "footprint" and area of land sterilised by highway infrastructure. New junctions are formed along Road P2 with the north-south roads.

  Along the Wan Chai shoreline, the existing Hung Hing Road in front of the Wan Chai North Public Transport Interchange (PTI) is realigned to connect with the new Road P2 / Fleming Road junction, but the current Hung Hing Road alignment further east in front of the Wan Chai Sports Ground is retained. The length of the new Road P2 through WDII is approximately 0.6 km. The new at-grade road network also provides connections to slip roads of the Trunk Road in Wan Chai North. The total length of other new primary and district distributor road connecting to slip road of the Trunk Road is around 0.7 km.

  Since these are primary / district distributor roads, they are classified as a DP under Schedule 2, Part I, A1. The location of DP2 is shown in **Figure 1.2b**.

- DP3 - Reclamation works including associated dredging works

  The project is driven by the need for the implementation of the Trunk Road, which will form an east-west strategic route through Central and Wan Chai to existing IEC. Construction of this Trunk Road will, though, require permanent reclamation in the areas to the west of HKCEC, through the HKCEC water channel, along the Wan Chai shoreline and along the North Point shoreline. Permanent reclamation is not required in the ex-Public Cargo Working Area (PCWA) basin or in the CBTS.

  During the Trunk Road construction, temporary reclamation will be required in the ex-PCWA basin and the CBTS to facilitate cut-and-cover tunnel construction of the Trunk Road. After construction of the Trunk Road, the temporary reclamation will be removed and the ex-PCWA basin and the CBTS will be reinstated.

  The total volume of sediments to be dredged and disposed is estimated to be approximately 1.15 Mm^3.

  The minimum area of permanent reclamation required is summarised as follows:

(i)	HKCEC West:	3.7 ha
(ii)	HKCEC Water Channel:	1.6 ha
(iii)	Wan Chai Shoreline:	4.1 ha
(iv)	North Point Shoreline:	3.3 ha

  The total reclamation area is 12.7 ha. Since the reclamation is more than 5 ha in size, it is classified as a DP under Schedule 2, Part I, C1.

  For the mitigation of odour, dredging to remove the polluted sediments at the south-west corner of the CBTS will be carried out during the implementation of harbour-front enhancement and forms part of DP3.

  Further, as dredging will be carried out less than 100m from a seawater intake, it would also be classified as a DP under Schedule 2, Part I, C.12.

  The location of DP3 is shown in **Figure 1.2c**.

- DP4 – Temporary typhoon shelter

  The construction of the Trunk Road tunnel beneath the CBTS will temporarily affect the existing moorings. To maintain the operation of the CBTS during the construction period, it is necessary to reprovision a temporary typhoon shelter in the vicinity of the existing one. The Project therefore includes a temporary typhoon shelter with around 4 ha temporary mooring area for not less than 30 vessels at the north of the existing typhoon shelter. It involves the construction of a 400m long rubble mound breakwater some 180m offshore and parallel to the existing CBTS breakwater, together with 120m and 130m lengths of piled wave walls at the eastern and western ends of the sheltered mooring area respectively. As such, it is classified as DP under Schedule 2 Part I, C.5. The location of this DP4 is shown in **Figure 1.2d**.

- DP5 – Wan Chai East Sewage Outfall

  The Wan Chai West Sewage Screening Plant will be decommissioned once flows have been diverted to the Wan Chai East Sewage Screening Plant. The Wan Chai East Sewage Screening Plant will have adequate capacity to handle these flows. However, in the longer term, the existing sewage outfall will need to be upgraded to handle the future design flows. A new sewage outfall will be constructed under the project to replace and upgrade the existing Wan Chai East sewage outfall. The configuration of the new sewage outfall will comprise a landfall section of 2,250mm diameter pipe with approximate length of 180m, and a marine section of twin 1,600mm diameter submarine pipelines of about 550m length. As the twin submarine sewage pipelines comprise a total diameter more than 1,200mm and include submarine sewage outfall, it is classified as DP under Schedule 2 Part I, F.5 and F.6. The location of this DP5 is shown in **Figure 1.2e**.

- DP6 – Dredging for the Cross-harbour Water Mains from Wan Chai to Tsim Sha Tsui

  An existing cross harbour fresh water mains of about 1.1 km length and comprising twin 1,000 mm diameter steel submarine pipelines runs from Tsim Sha Tsui, along the west of the MTR Tsuen Wan Line to a landfall at the seafrontage north of the Wan Chai West Sewage Screening Plant, near Lung King Street. The reclamation works could potentially damage the watermains and diversion of these mains will be necessary. The total dredged volume for the construction of the cross-harbour watermain is estimated to be approximately 0.06Mm^3. As dredging for the installation of the new cross harbour watermains will be carried out less than 100m from a seawater intake, it is classified as DP under Schedule 2, Part I, C.12. The location of this DP6 is shown in **Figure 1.2f**.

1.5.4 Apart from DP4 (temporary typhoon shelter), the original schemes of the Schedule 2 DPs in **Table 1.1** have been previously assessed in the approved EIA Reports for the WDII and/or CWB & IEC. As the original schemes for the DP5 (Wan Chai East Sewage Outfall) and DP6 (Dredging for the Cross-harbour Water Mains from Wan Chai to Tsim Sha Tsui) have not changed materially, the related EIA assessments of the approved EIA Report for these works remain valid. This EIA study therefore focuses mainly on those elements of the Project, including the Schedule 2 DP's 1, 2, 3 and 4, that have changed significantly from the schemes as presented in the approved EIA Reports. For DP5 and DP6, this EIA Study has still included the cumulative impact assessment, updated the assessment assumptions and the corresponding mitigation measures.

1.5.5 The detailed EIA for the Project (ie the Schedule 3 DP) as well as separate presentation of the EIAs for individual Schedule 2 DPs (DP1 to DP6 above) are presented in the EIA Report for WDII and CWB. This Executive Summary presents a summary of the key findings of the EIA for the Project.

2 PROJECT DESCRIPTION

2.1 Site Location and Study Area

2.1.1 The Project is located mainly in Wan Chai, Causeway Bay and North Point, and is demarcated by Gloucester Road and Victoria Park Road to the south, Fenwick Pier Street to the west and Tong Shui Road Interchange to the east, as shown in **Figure 1.1**.

2.1.2 The study area encompasses existing developments along the Wan Chai, Causeway Bay and North Point shorelines. Major land uses include the HKCEC Extension, the Wan Chai Ferry Pier, the ex-Public Cargo Working Area (ex-PCWA), the Royal Hong Kong Yacht Club (RHKYC), the Police Officers' Club, the CBTS and commercial and residential developments.

2.2 Project Requirements, Scope and Benefits

Project Requirements

2.2.1 The basis of the WDII project and the core transport infrastructure for which the project provides is the Trunk Road. The Trunk Road is defined from the connection with the existing Rumsey Street Flyover in Central, through to a connection with the existing IEC to the east of the CBTS. At the Rumsey Street Flyover connection, a Central Interchange will provide connections into the Central area, and then the Trunk Road will drop down into tunnel and run along the Central shoreline, through CRIII, to the WDII project area. In WDII, the Trunk Road will continue in tunnel until it needs to rise onto elevated flyover structure to connect with the elevated IEC. The section of the Trunk Road that runs in tunnel through CRIII and WDII is also known as the CWB, whilst the section of the Trunk Road on flyover, for the connection with the IEC, is also known as the IECL.

2.2.2 The Trunk Road will form an east-west strategic route through Central and Wan Chai. The Trunk Road is an essential element of Government's strategic transport planning for Hong Kong; it is the "missing link" in the strategic highway running along the northern part of Hong Kong Island. The Trunk Road is required to provide relief to the existing major east-west route (Connaught Road Central – Harcourt Road – Gloucester Road).

2.2.3 The Trunk Road was originally proposed under the Central and Wanchai Reclamation Feasibility Study, completed in 1989, where its feasibility was established. The need for the Trunk Road was reaffirmed in the WDIICFS, completed in 2001, which demonstrated an urgent need for the link to be put in place in order to relieve the existing and growing congestion along the east-west corridor of Hong Kong Island North. A number of strategic traffic studies have also confirmed the need to improve the flow of the east-west traffic through Central and Wan Chai, including the Long Term Road Study completed in 1968 and the First, Second and Third Comprehensive Transport Studies (CTS) completed in 1976, 1989 and 1999 respectively. A recent rerun of the CTS-3 transport model also confirmed the need for the CWB despite changes in land use planning assumptions and population projections.

2.2.4 Following the 9 January 2004 CFA ruling on compliance with the PHO, the compelling and present need for the Trunk Road to meet the transport needs of the community within a reasonable and definite planning time frame, and to meet the social and economic needs of the community, was established under the CRIII project, and is presented in "A Review of Central Reclamation Phase III by applying the Court of Final Appeal's "Overriding Public Need Test", April 2004".

2.2.5 Under the WDII project, the compelling and present need for the Trunk Road has also been confirmed. Reference can be made to the "Report on Cogent and Convincing Materials to demonstrate Compliance with the Overriding Public Need Test, February 2007".

2.2.6 Apart from providing land for key transport infrastructure and reprovisioned waterfront facilities, the Project can also create a coherent pattern of land use and provide for the development of an appropriate waterfront 'edge' to the existing urban area.

Project Scope

2.2.7 The scope of the Project comprises:

(i) Land formation for key transport infrastructure and facilities, including the Trunk Road (CWB) and the associated slip roads for connection to the Trunk Road and for through traffic from Central to Wan Chai and Causeway Bay. The land formed for this transport infrastructure will provide opportunities for the development of an attractive waterfront promenade for the enjoyment of the public.

(ii) Reprovisioning / protection of the existing facilities and structures affected by the land formation works.

(iii) Extension, modification, reprovisioning or protection of existing storm water drainage outfalls, sewage outfalls and watermains affected by the revised land use and land formation works.

(iv) Upgrading of the hinterland storm water drainage system and sewerage system, which would be rendered insufficient by the land formation works.

(v) Provision of ground level roads, road bridges, footbridges, necessary transport facilities and associated utility services.

(vi) Construction of the new waterfront promenade, landscape works and the associated utility services.

(vii) The Trunk Road (i.e. CWB) within the study area and the associated slip roads for connection to the Trunk Road.

2.3 Works Programme

2.3.1 The Project construction works are anticipated to commence on site in early 2009, with completion of the project by 2016.

2.4 Related Projects

2.4.1 The following projects are related to the WDII project:

(i) Civil Engineering and Development Department's CRIII project, comprising reclamation along the Central waterfront for transport infrastructure needs (including CWB) and basic land use requirements. A section of CWB tunnel will also be constructed under CRIII project. Construction started in February 2003 and is scheduled for completion in September 2012.

(ii) Trade Development Council's Atrium Link Extension project, comprising a link bridge spanning across the water channel between the HKCEC Phase I and HKCEC Extension. Construction started in May 2006 and is scheduled for completion in March 2009.

3 SUMMARY OF THE EIA

3.1 Introduction

3.1.1 The following paragraphs summarise the nature and extent of the key environmental impacts and outcomes arising from the construction and operation of the Project and related activities taking place concurrently. Details of the environmental impact assessment of the Project including the recommended mitigation measures, as well as separately presented findings for the individual Schedule 2 DPs, are provided in the EIA Report for WDII and CWB. Section 3.12 of this Executive Summary also provides a summary of key environmental impacts avoided and protection and benefits afforded to sensitive environmental resources and populations.

3.2 Air Quality

Construction Phase

3.2.1 During construction, reclamation filling and surcharging have been identified as the major dust sources. Trunk Road tunnel works would also generate dust. Due to the complex sequencing of the construction activities, six worst case scenarios of the construction schedules have been identified and assessed. The findings of the construction phase air quality assessment indicate that no exceedences of the 1-hour and 24-hour total suspended particulates (TSP) criteria are predicted at air sensitive receivers (ASRs) in the vicinity of the construction sites. In order to ensure compliance with the TSP criteria at the ASRs at all times, the dust suppression measures and requirements of the Air Pollution Control (Construction Dust) Regulation shall be adhered to during the construction period. In addition, a comprehensive dust monitoring and audit programme are recommended to ensure the effective implementation of dust suppression measures.

Operational Phase

3.2.2 The cumulative air quality impacts arising from the background pollutant levels within and adjacent to WDII, vehicle emissions from open road networks, tunnel portal and ventilation building emissions from the Trunk Road, tunnel portal emissions from the Cross Harbour Tunnel and portal emissions from existing underpasses and planned deckovers, have been assessed. Results show that the predicted 1-hour and 24-hour average nitrogen dioxide (NO_2) concentrations and 24-hour average respirable suspended particulates (RSP) concentrations at the ASRs would comply with the AQO criteria. No mitigation measures are required. The air quality inside the tunnel section of Trunk Road and planned deckovers at the HKCEC Atrium Link, Road P2 and Expo Drive would also comply with the Environmental Protection Department's (EPD's) in-tunnel air quality standards.

3.2.3 With the Trunk Road tunnel ventilation system designed for zero portal emission at the eastern portal, at North Point, potential air quality impacts from the tunnel portal emission would be avoided. In addition, the air quality at the eastern portal area would be enhanced by locating the vent shaft at the end of the eastern breakwater of the CBTS and by the introduction of an electrostatic precipitator system at the East Ventilation Building to screen RSPs from the tunnel emissions.

3.2.4 During operational phase, this Project will not create any new odour source. However, odour nuisance associated with the CBTS is an existing environmental problem. In order to improve the environment, this Project will take the opportunity to mitigate the potential sources of odour nuisance within the Project area so as to alleviate this existing environmental problem, as well as to provide an acceptable environment for the future land uses within the project area. Enhancement measures have been formulated to alleviate this existing odour problem. These include rectification of expedient connections, regular collection of floating debris, dredging to remove the polluted and odourous sediments at the corner of CBTS and clean up the slime attached on CBTS seawall. With the implementation of these enhancement measures, the predicted odour levels in the vicinity of CBTS would be reduced significantly. In other words, this Project will alleviate the existing odour problems in the vicinity of CBTS to a large extent by implementing the proposed enhancement measures. However, some exceedances of the odour criterion are still predicted at planned ASRs at the northern breakwater of the CBTS and the marine recreational area at the Wan Chai waterfront (ex-PCWA basin), under the worst case conditions. Nevertheless, the residual odour impact at these planned ASRs is not persistent, with a time of exceedance of the odour criterion expected to be less than 0.2% of time in a year. In view of this infrequent likelihood of occurrence, no unacceptable adverse odour impact would be expected at the planned ASRs within the study area.

3.3 Noise

Construction Phase

3.3.1 The construction noise impacts of the Project during normal daytime working hours have been assessed, taking into account other concurrent projects including the CRIII and HKCEC Atrium Link Extension projects.

3.3.2 With the implementation of noise mitigation measures such as the use of quiet powered mechanical equipment (PME), movable and temporary noise barriers, PME grouping, together with the implementation of noise mitigation measures proposed in the CRIII project, the noise levels at the noise sensitive receivers (NSRs), except for some NSRs in North Point, would comply with the construction noise standards.

3.3.3 In North Point, it is expected that the predicted noise level at Mayson Garden would exceed the noise standard of 75 dB(A) for 1 month by 10 dB(A), while at Harbour Heights the predicted noise level would exceed the noise standard of 75 dB(A) by up to 5 dB(A) for a total of 8 weeks. At City Garden, the predicted noise level would exceed the noise standard of 75 dB(A) by up to 9 dB(A) for a total of 16 weeks. At the Hong Kong Baptist Church Henrietta Secondary School, the predicted noise level would exceed the noise standard for examination periods of 65 dB(A) by up to 12 dB(A) for a total of 28 weeks in 2009, 2013 and 2015. Noise levels would exceed the noise standard of 70 dB(A) for normal teaching periods by 7 dB(A) for 13.5 weeks. However, the school has been noise insulated with air conditioners and, by keeping the windows closed during construction activities, noise impacts at the indoor environment can be avoided. Whilst the impact assessment does indicate some noise exceedances for limited periods of time, during the actual construction period as much as practically possible would be done to reduce construction noise still further, and there will be on-going liaison with all concerned parties and site monitoring to deal with and minimise any exceedances.

Operational Phase

3.3.4 The potential road traffic noise impacts have been assessed based on the worst case traffic flows in 2031. NSRs in Wan Chai, Causeway Bay, Tin Hau and North Point are expected to be affected by exceedances of EIAO-TM traffic noise criteria. Direct mitigation measures have been proposed for the noise impacts at NSRs in North Point (Victoria Centre, Harbour Heights, City Garden, Hong Kong Baptist Church Henrietta Secondary School) and planned NSRs near Oil Street where 'new' road noise levels (in this case arising from the reconstruction of the IEC at the connection with the Trunk Road) would exceed the relevant noise criteria and 'new' road noise contributions to the overall noise levels would be more than 1.0 dB(A).

3.3.5 With the proposed noise semi-enclosure, cantilevered noise barrier and vertical noise barrier in place at these reconstructed sections of the IEC, the predicted overall noise levels at Harbour Heights, City Garden and planned NSRs near Oil Street would be in the range of 51 to 66 dB(A) which would comply with the noise limit of 70 dB(A). For all other affected NSRs, the 'new' road noise contributions to the overall noise levels would be less than 1.0 dB(A) and the 'new' road noise levels would all be below the relevant noise criteria, although the overall noise criteria would still be exceeded. However, it should be noted that such noise exceedances at these NSRs are due to the existing roads, not the 'new' roads. Nevertheless, there will be an overall reduction of noise brought about by the Project, which may be considered an environmental benefit.

3.3.6 For noise mitigation at the proposed site of the reprovisioned floating Tin Hau Temple, at the south-east corner of the CBTS, a 2.5m high boundary wall along the southern and eastern boundary of re-provisioned Tin Hau Temple has been examined for its noise reduction effectiveness. However, in view of the traditional design of a Tin Hau Temple, it would not be considered desirable to erect a boundary wall along the western boundary of the temple, as this would block the seaview. With the southern and eastern boundary wall in place but without the western boundary wall, the predicted noise levels at the temple would still exceed EIAO-TM noise limit of 65 dB(A) by 4 dB(A) due to the existing roads. Instead of a western boundary wall, the openable windows of the temple should rather be orientated so as to avoid direct line of sight to the existing Victoria Park Road as far as practicable. An indicative layout for the temple has demonstrated that the traffic noise criterion would be met with proper orientation of the sensitive façade. The project proponent of the temple will need to take into account such environmental requirements/constraints and review the mitigation measures during the detailed design of the temple with a view to eliminating the need for the boundary wall.

3.3.7 No adverse impacts in respect of the Noise Control Ordinance (NCO) and the EIAO-TM noise criteria arising from the operation of the proposed permanent helipad and fixed noise sources including ventilation buildings and the reprovisioned Wan Chai North Public Transport Interchange (PTI) are anticipated at existing and planned NSRs.

3.4 Hydrodynamics and Water Quality

Construction Phase

Marine-based Impact

3.4.1 The water quality impacts during the reclamation of WDII and CWB have been quantitatively assessed by numerical modelling. Suspended sediment is identified as the most significant water quality parameter during the reclamation. The worst-case scenarios during reclamation, taking into account the anticipated reclamation stages and possible overlapping dredging and filling activities, have been assessed. The assessment also takes into account the cumulative effects that arise from other concurrent marine works in the Harbour. It is predicted that potential water quality impacts could occur at seawater intakes along the Central and Wan Chai shorelines and in the CBTS. However, the water quality impacts at the seawater intakes can be effectively minimised with the implementation of proposed mitigation measures, which include silt curtains around the dredging operations, silt screens at the intakes, restricted dredging rates and bulk filling behind constructed seawalls. With the implementation of these mitigation measures, there would be no unacceptable residual water quality impacts due to the WDII and CWB reclamation and due to the cumulative effects from other concurrent reclamation activities. A water quality monitoring and audit programme will be implemented to ensure the effectiveness of the proposed water quality mitigation measures.

Land-based Impact

3.4.2 Water quality impacts from land-based construction, including road works, waterfront facilities and public utilities, are associated with surface runoff and effluent discharge from the site. Impacts can be controlled to comply with statutory standards by implementing mitigation measures such as on-site drainage and sediment traps to control run-off. No unacceptable residual impact on water quality is anticipated.

Operational Phase

3.4.3 An assessment of the hydrodynamic and water quality impacts due to the Project has been carried out by numerical modelling, taking into consideration all other concurrent developments and water pollution sources. For both hydrodynamics and water quality, the baseline (without the WDII and CWB reclamation) and operational phase (with the WDII reclamation) simulations have been compared. The model results indicate that the WDII and CWB reclamation would have minimal impact on the hydrodynamic regime of the study area. The model results also suggest that the levels of pollutants near Wan Chai and the neighbouring areas are similar under both baseline and operational scenarios. No unacceptable impacts associated with the operation of the WDII project upon the water quality in Victoria Harbour are therefore anticipated.

3.4.4 The key water quality issue in relation to the operation of the CWB would be the potential oil-contaminated surface road runoff and tunnel seepage. However, the CWB will be designed with adequate drainage systems and appropriate oil interceptors, as required, and no adverse water quality impact is therefore expected.

3.5 Waste Management

3.5.1 The total volume of dredged sediments for the WDII reclamation is estimated to be approximately 1.15 Mm^3. A review of the sediment quality data from the marine ground investigation works indicates that some 0.75 Mm^3 of the marine sediments to be dredged for the WDII and CWB reclamation would be classified as Category M and H (i.e. high levels of contaminants). The contaminated marine sediments will therefore not be suitable for open sea disposal. However, with the implementation of mitigation measures in accordance with the requirements of Environment and Transport Works Branch Technical Circular ETWB TCW No. 34/2002, and confined disposal to the designated contaminated mud pits depending on their levels of contamination after consultation with the Marine Fill Committee (MFC) and EPD, where appropriate, no residual adverse impact is predicted. The contaminated marine sediments would be disposed of at confined marine disposal facilities at East of Sha Chau or other disposal sites after consultation with the MFC and EPD.

3.5.2 In the CBTS, dredging of highly contaminated Category H sediment (approximately 0.05 Mm^3) will be required. Containment of these contaminated sediments in geosynthetic containers before disposal at the designated contaminated mud pits is proposed to prevent release of contaminants to the marine environment.

3.5.3 Wastes generated by construction activities will include construction and demolition (C&D) materials (including excavated material), general refuse and chemical waste. The quantity of C&D materials generated is estimated to be approximately 2.915Mm^3 of which around 1.17Mm^3 will be reused on-site and the remaining surplus of around 1.745Mm^3 will be disposed off-site. Provided that these identified waste arisings are handled, transported and disposed of using approved methods and that recommended good site practice are strictly followed, adverse environmental impacts are not anticipated. The C&D materials should be sorted on-site into inert C&D material (ie public fill), for reuse in the reclamation, and C&D waste for recycling or disposal.

3.6 Land Contamination

3.6.1 The potential land contamination impacts in the study area resulting from the planned development have been examined. No land contamination impacts are expected during the operational phase of the development, however, there would be land contamination concerns associated with handling contaminated soil by construction workers at A King Marine shipyard.

3.6.2 A site investigation has been carried out at the A King Marine shipyard site under this EIA study. Based on the analytical results, exceedances in heavy metals and total petroleum hydrocarbons (TPH) were identified and an estimated 633m^3 of contaminated soil (mainly heavy metals) would require remediation. A Remediation Action Plan (RAP) has been drawn up to formulate the necessary remedial measures; cement solidification / stabilisation and landfill disposal are proposed as the soil remediation methods. Mitigation measures for the remediation works have been proposed and, with the proper implementation of these mitigation measures, no adverse land contamination impacts are anticipated. After the completion of appropriate remediation actions, contaminated areas at A King Marine shipyard site would be cleaned up to acceptable standards and no adverse residual impact is envisaged.

3.7 Sewerage Impact and Sewage Treatment Implications

3.7.1 The impacts on the existing sewerage system in the study area resulting from the planned development have been assessed. Findings indicate that the sewage from the planned development would have no adverse impact on the existing local sewerage system. For the connections to the trunk sewer, sufficient allowance has been made in the design of existing deep trunk sewer system and no modification work is required. Reprovisioning of the existing Wan Chai East Sewage Outfall will be required as a result of the WDII reclamation and this sewage outfall will be upgraded under the WDII project to cope with the future design flows.

3.8 Marine Ecology

3.8.1 Literature reviews of existing information supplemented with the results of recently undertaken field surveys on marine ecological resources indicate that identified marine habitats within the study area are of low ecological value. There are no ecological sensitive receivers, such as Sites of Special Scientific Interest (SSSIs) and Marine Parks and / or Reserves or other areas of ecological importance or conservation interest, in and within the immediate vicinity of the study area.

3.8.2 The Project will result in the permanent loss of approximately 12.7 ha of soft bottom benthic and subtidal habitats. Considering that the benthic, intertidal and subtidal habitats within the affected area are of very low ecological value, and as direct impacts on some small and isolated coral colonies attached to movable boulders would be avoided by translocation, no adverse direct ecological impact is expected.

3.8.3 Indirect disturbance impact on the associated waterbirds and other avifaunal species of conservation interest in the CBTS and Victoria Harbour was expected to occur during the construction and operation phases of the Project. Considering the existing background of intense human activities in these areas, the affected avifauna are considered already well adapted to human disturbance and therefore no adverse indirect impact is expected to occur.

3.8.4 Other impacts arising from the Project would be temporary and minimised with implementation of proper mitigation measures. Overall, no adverse ecological impacts on marine resources are anticipated.

3.9 Landscape and Visual Impact Assessment

3.9.1 The proposed development and associated works follow in principle the planning intentions of the Visions and Goals for Victoria Harbour prepared by Town Planning Board and the views of the public received during the engagement exercises of the HER that was carried out under the steer of HEC Sub-committee on WDII Review. In response to the CFA judgement on the PHO, the extent of reclamation has been reduced to the minimum. With the new waterfront development proposals together with enhanced connectivity to the waterfront from the hinterland and east-west linkages along the northshore, the landscape planning framework of the waterfront from Wan Chai to North Point is strengthened and reinforced by the proposed project.

3.9.2 Approximately 12.7 ha (1.8% of total 700 ha harbour area) of Victoria Harbour will be permanently lost under the proposed land formed for the construction of the Trunk Road. CBTS will be temporarily alienated for the construction of the Trunk Road tunnel. The temporary reclamation will be removed and sea-bed reinstated after the completion of the tunnel construction. A temporary typhoon shelter with mooring area of approximately 4 ha will be constructed in Victoria Harbour just outside the existing typhoon shelter. It is considered that the residual landscape impacts on Victoria Harbour are moderate during construction phase but slight during operation phase with implementation of mitigation measures.

3.9.3 Under the proposed development, Fenwick Pier Street Public Open Space will be temporarily affected during the construction stage. In the longer term, this open space will be permanently lost for the development of the Hong Kong Academy of Performing Arts Extension. Approximately 0.24 ha of Victoria Park will be permanently lost for the construction of Slip Road 8 of the Trunk Road. Alternative schemes of Slip Road 8 and reprovisioning options of affected facilities in Victoria Park, including a bowling green, have been examined to minimise the intrusion into the Victoria Park and minimise the impacts. Construction works will temporarily affect the operations of the CBTS. During the construction phase, therefore, there will be substantial negative impacts on the Fenwick Pier Street Public Open Space landscape character and on the CBTS landscape character, and moderate residual impact on Victoria Park. Under the proposed development, approximately 13.8 ha of new waterfront open space will be provided to strengthen the existing landscape framework from Central to North Point. It is considered the proposed development with mitigation measures will not create adverse impact to open space framework and have positive impact to the waterfront from Central to North Point.

3.9.4 It is estimated that approximately 571 trees will be affected by the construction of Road P2, Slip Road 8, the reprovisioning of bowling green and the landscaped deck connecting Victoria Park to the Causeway Bay waterfront, the HKAPA Extension, the HK Visual Arts Education Centre and the helipad. None of these are Champion Trees or Registered Old and Valuable Trees. There are no rare or endangered species; all trees are common species. All trees with high amenity value which are unavoidably affected by the works will be transplanted where possible. Detailed tree preservation, transplanting and felling, including compensatory planting proposals, will be submitted to relevant government departments for approval. New trees will be planted along roadside amenity areas and along the new waterfront to compensate for the loss of existing trees.

3.9.5 The proposed Trunk Road consists primarily of a road tunnel, administration building, Central Ventilation Building, eastern tunnel portal, East Ventilation Building and an associated exhaust vent shaft at the eastern breakwater of CBTS. At the eastern end, the Trunk Road rises on flyover structure to connect with the existing IEC. Most of the Trunk Road is underground or underneath the CBTS and there will not be significant visual or landscape impacts. The eastern tunnel portal will be covered by a landscaped deck with lush planting. The noise barriers/semi-enclosures on the IEC will mainly compose of transparent noise barrier panels above and green panels below. Amenity planting will provided along the eastbound and westbound of IEC with vertical greening of noise barriers/semi-enclosures for around 3m above the planter to soften the structures. The location of the administration building is selected at the least prominent location along the available waterfront area; it is proposed at a location underneath the elevated IEC and climbers will be planted on the building façade to soften the structure.

3.9.6 The Central Ventilation Building, East Ventilation Building and its associated exhaust vent shaft will be the main source of impact. These buildings will be structures with compatible disposition, form and finishing which match with the future harbour environment to achieve visual conformity. Tree and shrub planting is proposed to soften the Central Ventilation Building and East Ventilation Building. The location of the East Ventilation Building at the north of the FEHD Whitfield Depot and at the west end of the North Point reclamation area has been selected in order to increase the distance to the nearby residents as far as practicable. The building height has been minimised by placing some E&M equipment in a basement. The overall height of the building will be lower than the adjacent existing IEC elevated road. The exhaust of the East Ventilation Building has been separated from the East Ventilation Building and extended to the tip of the eastern breakwater of CBTS to further increase the distance to the residents. The vent shaft will be a structure with compatible disposition, form, colour and finishing to create a harmonious visual relationship with the Harbour. Finishing materials will be sensitively designed in form, basic color, color/tone variation, micro- and macro-texture, and reflectivity/light absorbance to avoid glare. The maximum height of the vent shaft will be restricted to +25mPD.

3.9.7 With implementation of mitigation measures during construction, there will be some moderate negative visual impacts on visually sensitive receivers (VSRs) in the front row of high rise buildings along the waterfront from Central to North Point. Residual impacts on VSRs further away from Victoria Harbour and in the hinterland will become slight or insubstantial. During operation, there will be substantial to moderate positive visual impact on VSRs along the new waterfront as the landscape and visual amenity are generally enhanced and strengthened by the proposed project. The visual impacts from the hinterland and from the harbour will be slight or insubstantial.

3.9.8 Under the proposed scheme, there will be a significant area of new open space (13.8 ha) and a substantial number of new trees and other proposed planting (approximately 1500 new trees will be planted in the new waterfront and along roadside amenity areas after the new open space is built to compensate the felled trees). The existing landscape characters along the waterfront will be enhanced. There will still be slight residual visual impact due to the provision of noise barriers/screening/semi-enclosures in North Point. However, there will be significant area of new waterfront open space from Tin Hau to Oil Street with at-grade pedestrian connection to North Point. Therefore, overall, it is considered that the residual landscape and visual impacts of the proposed development and the associated designated projects are considered acceptable with mitigation measures during construction, acceptable with mitigation measures during operation up to10 years and beneficial with mitigation in the long run after 20 to 30 years.

3.10 Cultural Heritage

3.10.1 A marine archaeological investigation has been carried out for the seabed that will be affected by the reclamation under the Project. It is concluded that there are no marine archaeological resources within the study area. It follows that there are no related constraints on the proposed development, and there is no need for any further archaeological investigation or mitigation measures.

3.11 Environmental Monitoring and Audit

3.11.1 Environmental monitoring and audit are recommended for construction stage dust, noise, water quality and marine ecology, to check compliance with relevant statutory criteria and to ensure the effectiveness of the mitigation measures. Site inspection and audit are also recommended for waste management during construction and for implementation of landscaping measures during operation. Details of the recommended mitigation measures, monitoring procedures and locations are presented in a stand-alone Environmental Monitoring and Audit (EM&A) Manual. This will enable the Contractor to have early warning and provide necessary action to reduce impacts at specific areas if the critical assessment criteria are approached. The effectiveness of on-site control measures would also be evaluated through a monitoring exercise. All the recommended mitigation measures will be incorporated in an EM&A programme during implementation.

3.12 Environmental Benefits, Designs, Key Protection Measures and Enhancements

3.12.1 The key benefit associated with the Project is that the provision of land required for the construction of the Trunk Road will provide the opportunity to create an attractive waterfront for the enjoyment and benefit of the public. Environmental benefits arising from the Project include:

- The Project will take the opportunity to mitigate the potential sources of odour nuisance within the Project area so as to alleviate this existing environmental problem as well as to provide an acceptable environment for the future land uses within the project area. Enhancement measures have been formulated to alleviate this existing odour problem. With the implementation of these enhancement measures, the existing odour impact would be reduced significantly.
- Landscaped decks, noise semi-enclosures and barriers will be installed at the reconstructed IEC at the connection with the Trunk Road. Road traffic noise along the future IEC at North Point area will be reduced. The landscaped deck over the east tunnel portal area of the Trunk Road provides both visual and noise screening effect to the nearby sensitive receivers.
- Air quality at the east tunnel portal area would be enhanced by the introduction of an electrostatic precipitator system into the tunnel ventilation exhaust system and zero portal emission design of the eastern tunnel portal.
- There will be substantial to moderate positive landscape and visual impact along the new waterfront as the landscape and visual amenity are generally enhanced and strengthened by the Project.

4 OVERALL CONCLUSION

4.1.1 The findings of this EIA have provided information on the nature and extent of environmental impacts arising from the construction and operation of the Project. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards.

4.1.2 Overall, the EIA for WDII and CWB has predicted that the Project will generally comply with environmental standards and legislation after the proposed construction and operation stage mitigation measures are implemented. This EIA has also demonstrated the general acceptability of the residual impacts from the Project and the protection of the population and environmentally sensitive resources. Environmental monitoring and audit mechanisms have been recommended before and during construction and operation, where necessary, to verify the accuracy of the EIA predictions and the effectiveness of recommended mitigation measures.