

15 CONCLUSION

15.1 Introduction

15.1.1 The Project is a designated project in accordance with Item 1 of Schedule 3 of the EIAO, which specifies an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100,000”. The Project also includes various individual designated projects defined in Schedule 2 of the EIAO including the followings:

- DP1 - Central-Wanchai Bypass including its road tunnel (Items A.1 and A.7 of Part I of Schedule 2 of the EIAO)
- DP2 - WDII major roads (including Road P2) (Item A.1 of Part I of Schedule 2 of the EIAO)
- DP3 - Reclamation works including associated dredging works (Item C.1 of Part I of Schedule 2 of the EIAO)
- DP4 - Temporary typhoon shelter (Item C.5 of Part I, Schedule 2 of the EIAO)
- DP5 - Wan Chai East Sewage Outfall (Item F.5 and F.6 of Part I of Schedule 2 of the EIAO)
- DP6 - Cross-harbour Water Mains from Wan Chai to Tsim Sha Tsui (Item C.12 of Part I of Schedule 2 of the EIAO); and

15.1.2 This EIA Report has provided an assessment of the potential environmental impacts associated with the construction and operation of the Project, with the consideration of the potential cumulative impact from other projects including the Central Reclamation Phase III (CRIII) and Hong Kong Convention and Exhibition Centre Atrium Link Extension projects. Since the details of the potential future railway projects, i.e. Shatin to Central Link (SCL) and North Hong Kong Island Line (NIL) were not available at the time of this EIA study, the cumulative impacts from these two railway projects could not be addressed. Specific mitigation measures requirements for the Project, as well as an environmental monitoring and auditing programme, have been developed during the assessment of the proposed developments. The Implementation Schedule of the recommendations is presented in Section 13. A summary of the environmental impacts associated with the Project are present in **Table 15.1**. The key assessment assumptions, limitation of assessment methodologies and all obtained relevant prior agreements with the EPD or other authorities on individual environmental media assessment components are given in **Appendix 15.1**. The key environmental outcomes arising from the EIA study and the principal findings of the study are summarized in Section 15.2.

Table 15.1 Summary of Environmental Impacts Associated with the Project

Environmental Issue	Sensitive Receivers/ Assessment Points	Impact Prediction Results	Relevant Standards/ Criteria	Extents of Exceedances	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts
Air Quality						
Construction Phase	48 assessment points	1-hour Average TSP Conc.: 88-434 µg/m ³ 24-hour Average TSP Conc.: 82-231 µg/m ³	EIAO-TM and Air Quality Objective	Nil	Four times daily watering with complete coverage of active construction area Requirements of the Air Pollution Control (Construction Dust) Regulation The following mitigation measures, good site practices and a comprehensive dust monitoring and audit programme are recommended to minimise cumulative dust impacts. <ul style="list-style-type: none"> Strictly limit the truck speed on site to below 10 km per hour and water spraying to keep the haul roads in wet condition; 	Nil

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Operational Phase	56 assessment points	1-hour Average NO ₂ Conc.: 73-255 µg/m ³ 24-hour Average NO ₂ Conc.: 62-135 µg/m ³ 24-hour Average RSP Conc.: 56-78 µg/m ³	Air Quality Objective	Nil	<ul style="list-style-type: none"> • Watering during excavation and material handling; • Provision of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary; and • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. 	Nil

Environmental Issue	Sensitive Receivers/ Assessment Points	Impact Prediction Results	Relevant Standards/ Criteria	Extents of Exceedances	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts
	Air quality inside CWB Tunnel & deckover for planned HKCEC Atrium Link	CWB Tunnel – achieve EPD recommended standard of 1 ppm NO ₂ concentration Deckover on Atrium Link – the predicted maximum NO ₂ concentrations (5 minutes average) under normal traffic flow and congested traffic flow would be 114µg/m ³ and 130µg/m ³ respectively.	EPD Tunnel Air Quality Guidelines	Nil	Not Applicable	Nil
	Planned ASR – Open space with sensitive use at the west of HKCEC and Northern Breakwater of CBTS breakwater, and waterfront related commercial and leisure uses and Water Sports Centre at Wanchai	The predicted odour concentrations range from 1.5 to 29 ou/m ³ over averaging time of 5 seconds under worst case condition.	EIAO-TM	Exceed the odour criterion up to 29 ou/m ³	The Project itself would not introduce any additional odour emission sources within the study area. Odour nuisance associated with the Causeway Bay Typhoon Shelter is an existing environmental problem and adverse odour impacts in the vicinity of CBTS would be expected during worst case conditions. The potential odour impact would likely be minimized by the following mitigation measures:	Residual odour impact is predicted at the planned ASRs for around 0.1% to 0.2% of time in a year, under worst case meteorological and tidal conditions. For the other ASRs, there is also a 0.1% probability that the actual odour levels as perceived at the ASRs would exceed the predicted odour concentration (taking into account of 0.1% probability of exceeding the predicted odour concentration inherent in the calculation method). This situation is not expected to result in

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Noise					<ul style="list-style-type: none"> Implementation of enhancement package for existing odour sources identified at CBTS as details in Appendix 15.1 	unacceptably adverse odour impact.
Construction Phase	N1, N2, N3, N6, N8, N11, N13, N15, N17, N18, N20 and N22	Predicted noise levels would be in the range of 57 to 101 dB(A).	<p>Domestic premises: 75dB(A)</p> <p>Educational institutions: 70 dB (A) during normal teaching periods & 65 dB(A) during examinations</p>	<p>Domestic premises: Exceed the noise standard by up to 26dB(A).</p> <p>Educational institutions: Exceed the noise standard by 20 dB(A) during normal teaching period and up to 25 dB(A) during examination period.</p>	<p>Use of quiet equipment, movable/temporary noise barriers and PME grouping to minimise construction noise impact</p>	<p>For N11 (Mayson Garden), the predicted noise level would exceed the noise standard of 75 dB(A) for 1 month by 10 dB(A) with Group 2 PME.</p> <p>For N17 (Harbour Heights), the predicted noise level would exceed the noise standard of 75 dB(A) by up to 5 dB(A) with Group 1 or Group 2 PEM for a total of 8 weeks.</p>

Environmental Issue	Sensitive Receivers/ Assessment Points	Impact Prediction Results	Relevant Standards/ Criteria	Extents of Exceedances	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts
						<p>For N18 (City Garden), the predicted noise level would exceed the noise standard of 75 dB(A) by up to 9 dB(A) with Group 1 or Group 2 PME for a total of 16 weeks.</p> <p>For N20 (Hong Kong Baptist Church Henrietta Secondary School), the predicted noise level with Group 1 or Group 2 PME would exceed the noise standard of 65 dB(A) by up to 12 dB(A) during examination periods for a total of 28 weeks in 2009, 2013 and 2015. For the normal teaching period, the noise level would exceed the noise standard of 70 dB(A) by 7 dB(A) with Group 1 or Group 2 PME for 13.5 weeks.</p>

Environmental Issue	Sensitive Receivers/ Assessment Points	Impact Prediction Results	Relevant Standards/ Criteria	Extents of Exceedances	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts
Operational Phase	N1 to N23 and P1 to P3	NSRs N1 – N5: 60 – 87 dB(A) NSRs N6 - N8: 78 – 85 dB(A) NSRs N9 – N17 and P1: 65 – 81 dB(A) NSRs N18 – N23, P2 and P3: 65 – 81 dB(A)	Domestic premises: 70 dB(A) Educational institutions and all others where unaided voice communication is required: 65dB(A) Places of public worship: 65 dB(A)	Domestic premises: Exceed the noise standard by up to 17dB(A). Education institution: Exceed the noise standard by up to 12dB(A) Places of public worship: Exceed the noise standard by 7dB(A).	1. About 500m length of noise semi-enclosure with transparent panel covering the westbound slip road from the IEC 2. About 230m length of noise semi-enclosure with transparent panel covering the main carriageways (eastbound and westbound) of the CWB and IEC 3. About 135m length of 5.5.m high cantilevered noise barrier with 3m cantilever with transparent panel inclined at 45° on the eastbound slip road to the IEC.	With the proposed noise mitigation measures in place, the 'New' road noise contributions to the overall noise levels at all representative NSRs would be less than 1.0 dB(A) and the 'New' road noise levels would all be below the relevant noise criteria. No adverse noise impacts arising from the 'New' roads are predicted at representative NSRs. Noise exceedances at the representative NSRs, if any, would be due to the existing roads.

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					<p>4. About 95m length of 5.5.m high cantilevered noise barrier with 1m cantilever with transparent panel inclined at 45° on the eastbound slip road to the IEC.</p> <p>5. About 350m length of 3.5.m high vertical noise barrier with transparent panel on the eastbound slip road to the IEC.</p> <p>6. Low noise road surfacing for the trunk road (except tunnel section and beneath the landscaped deck at the eastern portal area) with speed limit of 70 km/hour</p>	

Environmental Issue	Sensitive Receivers/ Assessment Points	Impact Prediction Results	Relevant Standards/ Criteria	Extents of Exceedances	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts
Water Quality					7. The openable windows of the re-provisioned Tin Hau Temple, if any, should be orientated so as to avoid direct line of sight to the existing Victoria Park Road as far as practicable	
Construction Phase	All water sensitivity receivers in Victoria Harbour, Western Buffer and Eastern Buffer WCZs	The model results indicate exceedances of WSD water quality (SS) criterion for flushing water intakes (at Kennedy Town, Kowloon South, Quarry Bay, Sai Wan Ho, Sheung Wan, Tai Wan and Wan Chai) and target SS level (at Admiralty Centre and MTRC cooling water intakes). Full compliance with the assessment criterion for sedimentation rate	WSD water quality criterion for SS: < 10 mg/l Target SS level at Admiralty Centre and MTRC cooling water intakes: < 40 mg/l	Full compliance with the assessment criteria with the implementation of mitigation measures.	Restriction on the maximum dredging rates at the sewage pipelines zone, water mains zone, TWB, TPCWA, HKCEC Stage 1 & 3 as well as the western seawall of WCR1 which is close to the WSD intake at Wan Chai; Deployment of silt curtains around seawall dredging and seawall trench filling in NPR, TCBR, WCR and HKCEC areas.	Nil

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Operational Phase	All water sensitivity receivers in Victoria Harbour, Western Buffer and Eastern Buffer WCZs	Operation of WDII and CWB would not cause unacceptable impacts upon the water quality in Victoria Harbour	Sedimentation rate at corals: <100g/m ² /day Relevant WQO for <u>marine water</u> : TIN level: <0.4 mg/l for annual mean UIA level: <0.021 mg/l for annual mean Depth-averaged DO level: > 4 mg/l for 10 th percentile Bottom DO level: > 2 mg/l for 10 th percentile Temperature increase: < 2°C from background	No WQO exceedance is induced by the Project	Deployment of silt screens at selected seawater intakes No mitigation measures are considered necessary.	Nil

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Waste Management Implications						
Construction Phase	Not applicable	<p>Main waste: dredged marine sediment with a total volume of approx. 1.15Mm³.</p> <p>Other wastes: general refuse from the workforce; chemical waste from plant and equipment maintenance; and C&D material from excavation works and the demolition of existing structures.</p>	<ol style="list-style-type: none"> 1. Waste Disposal Ordinance (Cap. 354) 2. Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) 3. Land (Miscellaneous Provisions) Ordinance (Cap. 28) 4. Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation 5. Annexes 7 & 15 of EIAO TM 	Not applicable	Refer to Table 14.4	Nil

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Land Contamination Impact						
Construction Phase	Construction Workers via direct ingestion of and dermal contact with contaminated soils.	Source of land contamination from past land uses of A King Marine Shipyard. Potential land contamination impacts might occur as a result of handling contaminated soil by construction workers during the remediation works at A King Marine. It is expected that land contamination impacts would be minimal if the proposed mitigation measures were properly implemented.	ProPECC PN3/94 - <i>“Contaminated Land Assessment and Remediation”</i> <i>“Guidance Notes for Investigation and Remediation of Contaminated Sites of: Petrol Filling Stations, Boatyards, and Car Repair /Dismantling Workshops</i>	Five contaminated areas (One area with heavy metals and TPH and 4 areas with heavy areas only) were identified. The estimated quantity of soil contamination is 633m ³	Refer to Table 14.5	After appropriate remediation actions (if required) have been completed, A King Marine will be cleaned up to acceptable standards and no adverse impact would be envisaged.
Marine Ecological Impacts						
Construction Phase	Ecological resources in the assessment area	Habitat loss - Permanent: 12.7 ha soft bottom benthic & subtidal habitat & 1 km artificial intertidal habitat	Not applicable	Not applicable	Avoidance - Revised design of alternative Trunk Road constructed in tunnel to avoid permanent loss of large area of marine habitats	No adverse residual impact as loss of approximately 12.7 ha of soft bottom benthic and subtidal habitats due to permanent reclamation works are of very low ecological value

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		<ul style="list-style-type: none"> - Temporary: 10.7 ha soft bottom benthic & subtidal habitat & 850 m artificial intertidal habitat <p>Changes in water quality</p> <ul style="list-style-type: none"> - More than 30% increase of SS at the immediate vicinity outside reclamation area - Insignificant elevation of SS at far-field sensitive receivers - Level of TIN is predicted to be slightly higher than WQO standard at several locations immediately outside reclamation area - Minimum depth-averaged DO at HKCEC is predicted to be slightly lower than 4.0 mg/L 	(See water quality assessment)	(See water quality assessment)	<p>Minimization</p> <ul style="list-style-type: none"> - Translocation of all coral colonies found within the reclamation areas - Mitigation measures to control water quality - Mitigation measures to avoid disturbance impact to nearby waterbird population <p>Other Measures</p> <ul style="list-style-type: none"> - Construction of about 1 km new vertical wave absorbing seawall to recover loss of artificial intertidal habitat 	

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Operational Phase	Ecological resources in the assessment area	Disturbance impact Disturbance impact Potential change in water quality in Victoria Harbour during operation of WDII and CWB caused by change in tidal flow	Not applicable Not applicable (See water quality assessment)	Not applicable Not applicable (See water quality assessment)	Mitigation measures are not required as no adverse impact is predicted.	Nil
Landscape and Visual Impact						
Construction Phase	All Landscape Resources / Landscape Character Areas and Visual Sensitive Receivers within the study area	Approximately 571 trees will be affected. None of these are LCSD Champion Trees or Registered Old and Valuable Trees. There are no rare species or endangered species but common species.	1. ETWB TCW No. 29/2004 - Registration of Old and Valuable Trees, and Guidelines for their Preservation 2. ETWB TCW No. 3/2006 - Tree Preservation	Not applicable	<ul style="list-style-type: none"> - Existing trees to be retained on site should be carefully protected during construction. - Trees unavoidably affected by the works should be transplanted where practical. - Compensatory tree planting should be provided to compensate for felled trees. - Control of night-time lighting. 	<p><i>Landscape Impacts</i></p> <p>With mitigation measures, the project will not create adverse impact to open space framework but have positive substantial impact to the waterfront from Central to North Point.</p> <p>Approximately 571 trees will be affected.</p> <p>There will be moderate residual impact on Victoria Harbour and Victoria Park.</p>

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Operational Phase	All Landscape Resources / Landscape Character Areas and Visual Sensitive Receivers within the study area		<ol style="list-style-type: none"> 1. EIAO and TM, particularly Annexes 10 and 18 2. EIAO Guidance Note 8/2002 	Not applicable	<ul style="list-style-type: none"> - Erection of decorative screen hoarding compatible with the surrounding setting. 	<p><i>Visual Impacts</i></p> <p>With implementation of mitigation measures, there will still be some moderate negative visual impact on the VSRs in the front row of high rise buildings along the waterfront from Central to North Point. Residual impacts VSRs further away the Victoria harbour will become slight.</p>
					<ul style="list-style-type: none"> - Aesthetic design of buildings and road-related structures, including viaducts, vent buildings, subways, footbridges and noise barriers and enclosure. 	<p><i>Landscape Impacts</i></p> <p>With implementation of mitigation measures, the residual impacts on Victoria Harbour are slight.</p>

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			<p>3. Town Planning Ordinance (Cap 131)</p> <p>4. ETWB TCW No. 2/2004 - Maintenance of Vegetation and Hard Landscape Features</p> <p>5. ETWB TCW No. 29/2004 - Registration of Old and Valuable Trees, and Guidelines for their Preservation</p> <p>6. ETWB TCW No. 3/2006 - Tree Preservation</p>		<ul style="list-style-type: none"> - Shrub and Climbing Plants to soften proposed structures - Buffer Tree and Shrub Planting to screen proposed roads and associated structures. - Aesthetic design of proposed waterfront promenade. - Aesthetic streetscape design. - Aesthetic design of roadside amenity areas. 	<p>There are slight negative impacts on Victoria Harbour and Victoria Park. The existing landscape characters along the waterfront will be further enhanced by the proposed open space. Specific themes for the open spaces will be proposed to the waterfront from Central to North Point.</p> <p><i>Visual Impacts</i></p> <p>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.</p>

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Cultural Heritage Impact						
Construction Phase	Marine archaeological resources in Victoria Harbour	Since there is no archaeological material present within the study area, no adverse cultural heritage impact is expected.	<ol style="list-style-type: none"> 1. Antiquities and Monuments Ordinance (Cap.53) 2. Environmental Impact Assessment Ordinance (EIAO) (Cap. 499, S.16) 3. Technical Memorandum on the Environmental Impact Assessment Process (EIAO-TM) 4. Guidance Notes on Assessment of Impact on Sites of Cultural Heritage in Environmental Impact Assessment Studies (GN-CH) 5. Hong Kong Planning Standards and Guidelines (HKPSG) 	Not applicable	No further archaeological investigation or mitigation measures is required	Nil

Environmental Issue	Sensitive Receivers/ Assessment Points	Impact Prediction Results	Relevant Standards/ Criteria	Extents of Exceedances	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts
			6. Marine Archaeological Investigation Guidelines.			

15.2 Environmental Outcomes

15.2.1 A summary of the key environmental outcomes arising from the EIA study and environmental benefits of the environmental protection measures recommended are presented in **Table 15.2** below.

Table 15.2 Summary of Key Environmental Outcomes/ Benefits

Issue	Environmental Outcomes/Benefits
<p>The Project</p>	<p>Requirements:</p> <ul style="list-style-type: none"> • The Project is driven by the need for the implementation of the Trunk Road, which is defined as the section of road extending from Rumsey Street Flyover Extension to the IEC, comprising the CWB and the IECL. The Trunk Road will form an east-west strategic route through Central and Wan Chai and is an essential element of Government's strategic transportation planning for Hong Kong that is required to provide relief to the existing main east-west corridor (that is, Connaught Road - Harcourt Road - Gloucester Road). • The Project can create a coherent pattern of land use and for the development of an appropriate waterfront 'edge' to the existing urban area. The Project will therefore consider imaginative measures to develop a high quality waterfront for the enjoyment of the public and tourists. <p>Benefits:</p> <ul style="list-style-type: none"> • The Project provides essential land for the construction of the Trunk Road, the NIL, the SCL and other key transport infrastructure so as to relieve congestion on the strategic east-west routes through Central, Wan Chai and Causeway Bay and on the public transport system, and their implementation is a core element of Government's transport planning strategy. • The Project provides opportunity to create an attractive waterfront for the enjoyment of the public. The land formed through this Project will be used to regenerate the waterfront into an attractive public resource that could be used for a wide range of recreational and tourism-related uses and functions, with easy access from the urban hinterland. In so doing, the waterfront will become, as it should, an integral element of the public asset currently provided by the harbour. <p>Potential consequences without the Project:</p> <p>(i) <u>Not able to relieve traffic congestion</u></p> <ul style="list-style-type: none"> • Without the Trunk Road, the east-west strategic corridors of the hinterland such as Gloucester Road, Harcourt Road and Connaught Road Central will be severely affected. At the eastern end of the Trunk Road, long queues would be anticipated along the IEC as Victoria Park Road between Causeway Bay Flyover and Canal Road, already very congested, will become a bottleneck. At the western end, Connaught Road Central will be severely congested. Road connections from the hinterland will also not be able to operate due to congestion.

Issue	Environmental Outcomes/Benefits
	<ul style="list-style-type: none"> • From traffic point of view, given that the existing east-west corridor along the north shore is already overloaded at present, the future increase in general traffic growth on the Island due to territory-wide population and employment growth will exert additional pressure on the existing road network, thus causing further congestion and likely ‘gridlock’ situations to the north shore of Hong Kong Island, which may also have far reaching impacts to the harbour crossings. • A district traffic study has confirmed that a dual 3-lane Trunk Road (or Central-Wan Chai Bypass), together with intermediate slip roads, is required to divert traffic away from the existing east-west corridor and to provide adequate relief to the corridor and the local road network. The need for the Trunk Road has also been confirmed by the Expert Panel on Sustainable Transport Planning and Central-Wan Chai Bypass (‘Expert Panel’), which consists of independent local and overseas experts in the relevant fields. <p><u>(ii) Not able to provide land for NIL and SCL</u></p> <ul style="list-style-type: none"> • Land formed under the Project, in addition to providing for the construction of the Trunk Road, also provides for the construction of the NIL and the SCL. Should the Project not proceed, implementation of these rail routes will be severely constrained. This will have consequential adverse impacts on the planning and provision of public transport infrastructure. <p><u>(iii) No improvement of the waterfront</u></p> <ul style="list-style-type: none"> • Should the Trunk Road not be implemented the requirement for land formation is likely to fall away and opportunities to improve the existing waterfront would be limited. <p><u>(iv) Likely environmental conditions</u></p> <ul style="list-style-type: none"> • The existing odour nuisance at the CBTS would persist and no improvement of the situation would be expected. The Project will provide opportunities to remove the potential sources of odour nuisance within the CBTS 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. • In the absence of project, similar air quality conditions along the northshore areas of Wan Chai, Causeway Bay and North Point as currently exist would be expected to continue. There would be no opportunity to improve air quality condition by diverting traffic underground. With the project, air quality at the east tunnel portal area of the proposed Trunk Road would be enhanced by the introduction of an electrostatic precipitator system into the tunnel ventilation exhaust system and zero portal emission design of the East Tunnel Portal.

Issue	Environmental Outcomes/Benefits
	<ul style="list-style-type: none"> • In the absence of the project, the noise environment of the project area would be increased due to the natural growth of traffic. In the presence of the project, it would help lessen the traffic burden on Gloucester Road by diverting traffic to the proposed Trunk Road tunnel. There would be an improvement of the noise environment alongside Gloucester Road. Besides, the project would provide an opportunity to alleviate the noise impact at noise sensitive receivers along IEC at North Point area by installing the proposed landscaped deck at the east tunnel portal area of the Trunk Road and direct noise mitigation measures on the reconstructed IEC. In this regard, it is anticipated that the future noise environment would be improved in the presence of the project. • No improvement of the existing landscape and visual conditions of the waterfront would be expected. With the implementation of the Project, 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. • Water quality at Victoria Harbour would be similar for both the situations with and without the Project.
Development Alternatives	<p>Factors such as engineering, social, and environmental aspects have been considered in the light of different alternatives and construction methods. The following outcomes are found:</p> <ul style="list-style-type: none"> • A “foreshore” alignment of Trunk Road is considered the most reasonable and practical Trunk Road routeing, while “offshore” and “inland” alignments are found not feasible due to conflict with existing development and infrastructure. • Tunnel Option is selected in preference to Flyover Option, as it would serve better to protect and preserve the Harbour. • Trunk Road Tunnel Variation 1 scheme is selected as the preferred scheme in that it provides the necessary functional requirements of the Trunk Road in meeting the overriding need and results in the least affected area of the Harbour in conformance with the PHO.
Environmentally Friendly Designs Recommended	<p>The following environmental-friendly designs have been incorporated into the current project designs:</p> <ul style="list-style-type: none"> • The extent of reclamation under the current scheme has been minimized. Compared to original scheme in the previous approved EIA report, the reclamation area is substantially reduced by approximately 15.8 ha. • The length of elevated road section from east portal ramp of Trunk Road to existing IEC is approximately 1.2 km under the original scheme. In the current scheme, the Trunk Road will run in tunnel and connect directly to the existing IEC beyond the tunnel section. Open new road sections are greatly reduced. • The section of Trunk Road passing across RHKYC will be in the form of tunnel. Hence, RHKYC will not be affected.

Issue	Environmental Outcomes/Benefits
	<ul style="list-style-type: none"> • A landscaped deck has been proposed over the east tunnel portal area of the Trunk Road. This landscaped deck provides visual and noise screening effect to the nearby sensitive receivers. • Smooth curves have been adopted at indented areas rather than sharp corners along the shoreline. This smoothing of the shoreline will enhance flows and prevent accumulation of pollutants or floating refuse. • The current ventilation system proposed for the Trunk Road consists of three extraction fans for the East Tunnel Portal. Two fans will be adequate to extract all polluted air from the upstream tunnel section of the exit portal. The third fan will be used as standby in case one fan is under maintenance or out of order. Airflow direction sensors will be installed at the location of the exit portal to monitor the airflow direction of the tunnel. This sensor will be used to control the operation of tunnel portal extraction system to ensure that the target of “zero portal emission” will be met. • The polluted tunnel air extracted from the East Tunnel Portal will be filtered by electrostatic precipitator installed at the East Ventilation Building to filter about 80% of the emitted RSP. The filtered tunnel air will then be conveyed to the exhaust vent shaft proposed at the East Breakwater of the Causeway Bay Typhoon Shelter. The proposed ventilation scheme aims at enhancing the air quality of the tunnel portal areas.
<p>Environmental Problems Avoided</p>	<p>The environmental problems avoided/minimized due to the current scheme include:</p> <ul style="list-style-type: none"> • As a result of the tunnel design of the Trunk Road, potential vehicle emissions and road traffic noise impacts from the proposed Trunk Road on the air and noise sensitive receivers at Wan Chai and Causeway Bay would be avoided/minimized. • Noonday Gun at CBTS would not be affected and would be retained at the same location. • Kellett Island Archaeological Site at RHKYC would not be affected. • Potential environmental impacts including construction dust, water quality and marine ecology would be reduced compared to the original scheme in the approved EIA report due to the decrease in the extent of reclamation. • As there is no longer any development on reclaimed land formed with marine sediments in place within CBTS, potential biogas problem would be avoided in the current scheme. • Since the section of Trunk Road across RHKYC under the current scheme is more than 20m below ground level, land contamination impact associated with the construction of Trunk Road section at RHKYC would be avoided.

Issue	Environmental Outcomes/Benefits
	<ul style="list-style-type: none"> With the zero portal emission design of the East Tunnel Portal, potential air quality impact from the portal emission would be avoided. In addition, the air quality of the East Tunnel Portal area would be enhanced by locating the exhaust vent shaft proposed at the East Breakwater of the CBTS and the electrostatic precipitator system at the East Ventilation Building.
<p>Population and Environmentally Sensitive Areas Protected</p>	<p>The major environmentally sensitive areas within the study area include residential buildings, commercial buildings, hotels, recreational areas, and educational institutions at Wan Chai, Causeway Bay and North Point areas, and WSD flushing water intakes and cooling water intakes at the waterfront of Victoria Harbour. The population within the study area is approximately 125,000. With the implementation of the proposed control and mitigation measures, the air, noise and water quality sensitive receivers within the study area would be protected from adverse environmental impacts arising from the Project during both construction and operational phases. The population and environmental sensitive receivers protected, compensation areas included, and the environmental benefits of environmental protection measures recommended with respect to each environmental issue are summarized below.</p>
<p>Construction Air Quality Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>During construction phase, potential air quality impacts include dust nuisance and gaseous emissions from the construction plant and vehicles and dredgers and odour impact from contaminated sediment during dredging in the vicinity of Police Officers' Club.</p> <p>Mitigation measures for dust impact include four times watering a day on the active work areas and implementation of the <i>Air Pollution Control (Construction Dust) Regulation</i> and good site practices.</p> <p>For the dredging activities carried out in the vicinity of Police Officers' Club, the dredging operation will be restricted to only 1 small close grab dredger to minimise the odour impact during the dredging activity. The dredging rate should be reduced as much as practicable for area in close proximity to the Police Officers' Club.</p> <p>With the implementation of the recommended control and mitigation measures, no adverse air quality impacts are anticipated.</p> <p>Compensation areas included:</p> <p>Not required</p> <p>Population and environmental sensitive receivers protected:</p> <p>Existing air sensitive receivers within 500m of the project boundary.</p>

Issue	Environmental Outcomes/Benefits
<p>Operational Air Quality Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>No unacceptable residual traffic emission impacts are anticipated at the existing and future ASRs.</p> <p>Air quality inside CWB Tunnel and deckover for planned HKCEC Atrium Link would comply with standards of EPD Tunnel Air Quality Guidelines.</p> <p>Potential odour impacts are identified at the corner of CBTS near the Police Officers' Club and the area in the vicinity of Outfall Q. With the removal of seabed sediments at the corner of CBTS and removal of slime attached on the CBTS seawall during construction phase, as well as rectification of expedient connections to CBTS and the implementation of Enhancement Package for existing identified odour sources at CBTS, odour impact will be significantly reduced. Although modelling results indicate that some residual impact is still predicted at the nearest planned ASRs (open space at CBTS Breakwater and Water Sports Centre), this impact would occur infrequently and mainly under a combination of extreme weather and tidal conditions.</p> <p>Monthly monitoring (from July to September) of odour impacts, for a period of 5 years, is proposed during the operational phase of the Project to ascertain the effectiveness of the Enhancement Package over time, and to monitor any on-going odour impacts at the ASRs.</p> <p>Air quality monitoring for the operation performance of the East Ventilation Building and the East Vent Shaft will be conducted.</p> <p>Compensation areas included:</p> <p>Not required</p> <p>Population and environmental sensitive receivers protected:</p> <p>Existing and planned air sensitive receivers within 500m of the project boundary.</p>
<p>Construction Noise Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>The predicted mitigated noise levels would range from 44 to 85 dB(A) at the representative NSRs. With the implementation of quiet PME, movable barriers, temporary barriers, PME grouping and good site practices for construction tasks under the Project and implementation of the noise mitigation measures proposed in the CR III Reports, the predicted noise levels at the NSRs selected for construction noise impact assessment except N11, N17, N18 and N20 would comply with the construction noise standard.</p> <p>Compensation areas included:</p> <p>Not required.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Noise sensitive receivers within 300m of the project boundary.</p>

Issue	Environmental Outcomes/Benefits
<p>Road Traffic Noise Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>The following mitigation measures would be recommended:</p> <ul style="list-style-type: none"> • about 500m length of noise semi-enclosure with transparent panel covering the westbound slip road from the IEC; • about 230m length of noise semi-enclosure with transparent panel covering the main carriageways (eastbound and westbound) of the CWB and IEC; • about 135m length of 5.5m high cantilevered noise barrier with 3m cantilever inclined at 45° with transparent panel on the eastbound slip road to the IEC; • about 95m length of 5.5m high cantilevered noise barrier with 1m cantilever inclined at 45° with transparent panel on the eastbound slip road to the IEC; • about 350m length of 3.5m high vertical noise barrier with transparent panel on the eastbound slip road to the IEC; • low noise road surfacing for the trunk road (except tunnel section and beneath the landscaped deck at the eastern portal area) with speed limit of 70 km/hour; and • the openable windows of the re-provisioned Tin Hau Temple, if any, should be orientated so as to avoid direct line of sight to the existing Victoria Park Road as far as practicable. <p>Predicted mitigated noise levels would be in the range of 60 dB(A) to 87 dB(A). Noise exceedances at the representative NSRs are due to the existing roads. The ‘new’ road noise contributions to the overall noise levels at all representative NSRs would be less than 1.0 dB(A) and the ‘new’ road noise levels would all be below the relevant noise criteria. No adverse noise impacts arising from the ‘new’ roads are predicted at any of the representative NSRs.</p> <p>In general, the noise environment for the NSRs would be improved by the Project and the direct noise mitigation measures. As compared with the prevailing noise environment, the predicted road traffic noise levels at the existing NSRs in year 2031 would be reduced by:</p> <ul style="list-style-type: none"> • 1-10 dB(A) at N2 to N5 (Wan Chai area) • 1-3 dB(A) at N6 to N8 (Causeway Bay area) • 1-27 dB(A) at N12 to N17 (Tin Hau area) • 1-27 dB(A) at N18 to N21 (North Point area) <p>Compensation areas included:</p> <p>Not required.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Existing and planned NSRs within 300m of the project boundary.</p>
<p>Fixed Plant Noise Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>Operation of the proposed permanent helipad, ventilation buildings and PTI will not impose adverse noise impacts on the existing and planned NSRs.</p>

Issue	Environmental Outcomes/Benefits
	<p>Compensation areas included:</p> <p>Not required.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Noise sensitive receivers within 300m of the proposed helipad, ventilation buildings and PTI.</p>
<p>Water Quality Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>Implementation of the proposed mitigation measures including use of closed grab dredging, the deployment of silt curtains at appropriate dredging areas, and installation of silt screens at selected seawater intakes along the water front of Victoria Harbour would reduce the predicted water quality impact to an acceptable level.</p> <p>Compensation areas included:</p> <p>Not required.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Seawater intakes along the waterfront of Victoria Harbour and corals identified in Junk Bay, Green Island and Cape Collinson.</p>
<p>Waste Management Implications</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>With the implementation of the recommended mitigation measures and practices (refer to Section 6.7 for details), potential air, odour, noise, water quality for the handling, transportation and disposal of the identified waste arisings, no adverse environmental impacts are expected.</p> <p>Limited amount of refuse and debris may be unintentionally brought from the site into the harbour during heavy rains or typhoons. Given that the Project would not worsen the shoreline configuration and the implementation of appropriate control measures during construction phase, it is considered that the future quantity of refuse to be found along the shoreline would be similar if not better than the existing situation. With the implementation of a refuse collection system within the project area, no insurmountable environmental impact with regard to floating refuse would be anticipated during the construction phase, or after completion of the Project.</p> <p>Compensation areas included:</p> <p>Not required.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Water quality, air, and noise sensitive receivers at or near the Project site, the waste transportation routes and the waste disposal site.</p>

Issue	Environmental Outcomes/Benefits
<p>Land Contamination Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>Based on the review of the previous WDIICFS EIA Report and investigation on the historical/current land uses, the proposed re-development of A King Marine might pose potential land contamination impacts during the construction phase of the Project. Site investigation (SI) was carried out in accordance with the endorsed CAP. Based on the analytical results, exceedances in relevant criteria of heavy metals and total petroleum hydrocarbons (TPH) were identified and an estimated 633 m³ of contaminated soil (mainly heavy metals) were found to require remediation. Landfill disposal and cement solidification / stabilisation were proposed as the soil remediation method.</p> <p>The land contamination impacts associated with A King Marine would be the handling of contaminated soil by construction works during the remediation works. If the proposed mitigation measures (refer to Section 7.10 for details) were properly implemented, adverse land contamination impacts are not anticipated.</p> <p>Compensation areas included:</p> <p>Not required.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Construction workers at A King Marine Shipyard.</p>
<p>Marine Ecological Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>The benthic, intertidal and subtidal habitats within the affected area are of very low ecological value and direct impact on some small and isolated coral colonies attached to movable boulders at the coastlines within ex-PCWA Basin and along seawall at North Point would be avoided by translocation to a nearby suitable habitat such as Junk Bay. Hence, no adverse direct ecological impact is expected. Water quality and noise control measures (as described above) would minimise indirect impact on marine habitats and associated flora and fauna due to change in water quality and noise environment during the construction phase.</p> <p>Compensation areas included:</p> <p>Construction of about 1 km vertical wave absorbing seawall along the coastlines of the newly reclaimed land would provide large area of hard substrata for settlement and recruitment of similar intertidal fauna.</p> <p>Population and environmental sensitive receivers protected:</p> <p>Ecological resources in the assessment area.</p>

Issue	Environmental Outcomes/Benefits
<p>Landscape and Visual Impact</p>	<ul style="list-style-type: none"> • Environmental benefits of environmental protection measures recommended: • Under the proposed development, approximately 13.8 ha of new waterfront open space and nine new pedestrian links to the new harbour-front will be provided. This will strengthen the existing waterfront character from Wan Chai to North Point and enhance the connectivity between the waterfront and the hinterland. The overall urban landscape framework will be strengthened and enhanced by the proposed project. • Approximately 12.7 ha (1.8% of total 700ha harbour area) of Victoria Harbour will be permanently lost. Causeway Bay Typhoon Shelter will be temporarily alienated. A temporary typhoon shelter of approximately 6ha will be constructed outside existing typhoon shelter. • The bowling greens will be temporarily affected by the construction of Slip Road 8 and will be reprovisioned within the Victoria Park during the operation phase. • Under the proposed development, Fenwick Pier Street Public Open Space will be temporarily affected during the construction stage. However, this open space will be replaced by the new district open space at the site of the Hong Kong Academy of Performing Arts Extension in the future. • Approximately 571 trees will be affected. None of these are LCSD Champion Trees, Registered Old and Valuable Trees, rare or endangered specie, all trees are common species. Approximately 1500 new trees and other proposed planting will be planted in the new waterfront and along roadside amenity areas after the new open space is built to compensate the felled trees. • During construction, substantial negative impacts on the Fenwick Pier Street Public Open Space landscape character and the CBTS landscape character, and moderate residual impact on Victoria Harbour and Victoria Park. • During operation, slight negative impacts on Victoria Harbour due to the loss of harbour area. There are slight negative impacts on the Victoria Park due to the slight reduction in park area. • 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 to North Point. • With implementation of mitigation measures during construction, there will still be some moderate negative visual impact on the VSRs in the front row of high rise buildings along the waterfront from Central to North Point. Residual impacts on VSRs further away the Victoria Harbour will become slight. • 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 Project.

Issue	Environmental Outcomes/Benefits
	<p>Compensation areas included: Approximately 13.8 ha of new waterfront open space and nine new pedestrian links to the new harbour-front will be provided</p> <p>Population and environmental sensitive receivers protected: Existing and planned Landscape Resources , Landscape Character Area and VSR at and near the project site.</p>
<p>Cultural Heritage Impact</p>	<p>Environmental benefits of environmental protection measures recommended:</p> <p>Since there are no marine archaeological resources within the study area that would be affected by the project, marine archaeological impact due to the construction activities is not expected. The current project design would avoid the potential impact on the Kellett Island Archaeological Site at RHKYC and Noonday Gun at CBTS. No environmental protection measure is required.</p> <p>Compensation areas included: Not required.</p> <p>Population and environmental sensitive receivers protected: Potential archaeological resources, and historical buildings and structures within the project area.</p>

15.3 Air Quality Impact

Construction Phase

- 15.3.1 During construction, reclamation, filling and surcharging were 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 exceedance of the 1-hour and 24-hour total TSP criteria are predicted at 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* should 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

- 15.3.2 The cumulative effect arising from the background pollutant levels within and adjacent to the WDII, vehicle emissions from open road networks, tunnel portal and ventilation building emissions from the Trunk Road, tunnel portal emissions from the CHT and portal emissions from existing underpasses and planned deckovers have been assessed. Results show that the predicted air quality 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 EPD in-tunnel air quality standards.
- 15.3.3 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.
- 15.3.4 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 two planned ASRs A100 and A101 under the worst case condition. 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.
- 15.3.5 Monthly monitoring (from July to September) of odour impacts, for a period of 5 years, is proposed during the operational phase of the Project to ascertain the effectiveness of the Enhancement Package over time, and to monitor any on-going odour impacts at the ASRs. If residual odour impact is still found at the end of the odour monitoring programme, further investigation would be carried out to review the odour problem and to identify the parties responsible for further remedial action.

15.4 Noise Impact

Construction Phase

- 15.4.1 This assessment has predicted the construction noise impacts of the Project during normal daytime working hours, taking into account other concurrent projects including the CRIII and HKCEC ALE projects. The predicted unmitigated noise levels would range from 57 to 101 dB(A) at the representative NSRs. With the use of quiet PME, movable barriers, temporary barriers and PME grouping for construction tasks under the Project and implementation of the noise mitigation measures proposed in the CRIII Reports, the noise levels at the NSRs selected for construction noise impact assessment except N11, N17, N18 and N20 would comply with the construction noise standard.
- 15.4.2 Having exhausted practicable noise mitigation measures, the predicted noise level at N11 (i.e. Mayson Garden) would exceed the noise standard of 75 dB(A) for 1 month by 10 dB(A) with Group 2 PME. For N17 (i.e. Harbour Heights), the predicted noise level would exceed the noise standard of 75 dB(A) by up to 5 dB(A) with Group 1 or Group 2 PME for a total of 8 weeks. For N18 (i.e. City Garden), the predicted noise level would exceed the noise standard of 75 dB(A) by up to 9 dB(A) with Group 1 or Group 2 PME for a total of 16 weeks. For N20 (i.e. Hong Kong Baptist Church Henrietta Secondary School), the predicted noise level with Group 1 or Group 2 PME would exceed the noise standard of 65 dB(A) by up to 12 dB(A) for Group 1 or Group 2 PME during examination periods for a total of 28 weeks in 2009, 2013 and 2015. For the normal teaching period, the noise level would exceed the noise standard of 70 dB(A) by 7 dB(A) with Group 1 or Group 2 PME 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. Notwithstanding this, it is recommended that the particularly noisy construction activities be scheduled to avoid examination period as far as practicable.
- 15.4.3 Whilst this impact assessment does indicate some noise exceedances for limited periods of time, even with the consideration of all practicable mitigation measures, during the actual construction period as much as practically possible will 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.
- 15.4.4 The proposed cross harbour water mains will extend from Wan Chai near the HKCEC Extension to connect to the existing system near the Museum of Arts at the Tsim Sha Tsui promenade. Insignificant construction noise impacts are expected on the indoor environment of the NSRs such as the HKCEC Extension, the Hong Kong Space Museum and the Museum of Arts, which are close to the construction sites at Wan Chai and Tsim Sha Tsui, as they have blank façades / fixed windows and are provided with central air conditioning, and therefore do not rely on openable windows for ventilation.
- 15.4.5 An indicative assessment has been undertaken for possible construction activities during restricted hours (1900 to 2300) associated with the reclamation works of the Project. With the adoption of quiet PME and movable noise barriers, the predicted noise levels at the NSRs selected for noise impact assessment except NSR N2 would comply with construction noise criterion of 65 dB(A). It should be noted that the results of the construction noise impact assessment for restricted hours (1900 to 2300) are for indicative purposes, the Noise Control Authority will process any CNP application based on the NCO and the relevant technical memoranda in addition to considering the contemporary situations / conditions.
- 15.4.6 A construction noise EM&A programme is recommended to check the compliance of the noise criteria during normal daytime working hours.

Operational Phase

- 15.4.7 The potential road traffic noise impacts have been assessed based on the worst case traffic flows in 2031. The noise levels at most of the NSRs in the areas of Wanchai, Causeway Bay, Tin Hau and North Point are predicted to exceed the EIAO-TM traffic noise criteria due to the existing roads. Without the noise mitigation measures in place, the predicted noise levels at the NSRs would range from 60 to 87 dB(A). As a result, direct mitigation measures have been proposed to mitigate the noise impacts at NSRs N16, N17, N17-A, N18, N18-A, N18-B, N19, N19-A, N20, P2 and P3 where 'New' road noise levels would exceed the relevant noise criteria and 'New' road noise contributions to the overall noise levels would be more than 1.0 dB(A).
- 15.4.8 With the proposed noise semi-enclosure, cantilevered noise barrier and vertical noise barrier in place, the predicted overall noise levels at N17, N17-A, N18, N18-A, N18-B, N19, N19-A, P2 and P3 would be in the range of 51 to 66 dB(A) which 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 levels would still exceed the relevant noise criteria. However, it should be noted that such noise exceedances at the representative NSRs are due to the existing roads. Nevertheless, there will be an overall reduction of noise brought about by the project, which may be considered an environmental benefit.
- 15.4.9 A section of the noise semi-enclosure (~265m long) located in between the Electric Centre and CDA(1) site would only be required to be constructed before the occupation of future/planned NSRs (i.e. P2 – A land zoned as "CDA(1)" near Oil Street and P3 – A land zoned as CDA near Oil Street), while the remaining sections of noise semi-enclosure and vertical noise barrier shall be implemented before commencement of operation of the proposed road project.
- 15.4.10 For noise mitigation at the proposed site of the re-provisioned 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 will 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.
- 15.4.11 No adverse impacts in respect of the 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 re-provisioned Wan Chai North PTI are anticipated at existing and planned NSRs.
- 15.4.12 Monitoring of road traffic noise is recommended to verify the effectiveness of the mitigation schemes during the first year after road opening. Besides, as part of the design process, monitoring of operation noise from proposed EVB during the testing and commissioning stage would be recommended to verify the maximum sound power levels as assumed in the noise assessment in this EIA.

15.5 Water Quality Impacts

Construction Phase

Marine-based Impact

- 15.5.1 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

- 15.5.2 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

- 15.5.3 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.
- 15.5.4 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.

15.6 Waste Management Implications

- 15.6.1 A review of the sediment quality data from the marine ground investigation indicated that the majority of marine sediments to be dredged for the WDII and CWB reclamation were classified as contaminated. The total dredged volume was estimated as approximately 1.15 Mm³, of which 0.7 Mm³ was classified as contaminated (Category M and H) requiring Type 2 confined marine disposal, and 0.4 Mm³ was classified as Category L and would be suitable for Type 1 open sea disposal. With the implementation of the recommended mitigation measures in accordance with the requirements of ETWB TCW No. 34/2002, no adverse residual impact was predicted. Since the dredging activities are marine based activities and negligible dust impacts on nearby air sensitive receivers would be expected. The findings of the noise impact assessment in Section 4 of this report indicated that adverse noise impact would not be expected during the course of the dredging activities.
- 15.6.2 Based on the results of the biological screening, approximately 0.05 Mm³ of highly contaminated sediment from the CBTS would require Type 3 special disposal arrangements. A review of possible disposal arrangements has recommended the use of a geosynthetic container system with negligible loss of material to the marine environment during disposal. It is proposed that the dredged sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. Field trials undertaken during the WDII D&C consultancy using uncontaminated mud established the optimum handling methodology for the proposed special disposal method.
- 15.6.3 Wastes generated by the construction activities will include C&D material (including excavated material and demolition material), general refuse from the workforce and chemical waste from the maintenance of construction plant and equipment. The quantity of C&D materials generated is estimated to be approximately 2.915 Mm³ of which around 1.17 Mm³ will be reused on-site and the remaining surplus of around 1.745 Mm³ will be disposed off-site. By reducing the quantity of C&D material requiring off-site disposal, the potential impacts from the transportation of material by road will be reduced (such as noise impacts, possible congestion due to increased traffic flows, and dust and exhaust emissions from the haul vehicles). 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 of air and odour emissions, noise, potential hazards, wastewater discharge and transport would not be expected during the construction phase.
- 15.6.4 Floating refuse is an existing waste and the Project itself is not designed to generate floating refuse. Owing to the project area in close proximity to or within Victoria Harbour, limited amount of refuse and debris may be unintentionally brought from the site into the harbour during heavy rains or typhoons. Given that the Project would not worsen the shoreline configuration and the implementation of appropriate control measures during construction phase, it is considered that the future quantity of refuse to be found along the shoreline would be similar if not better than the existing situation.
- 15.6.5 With the implementation of the refuse collection system properly within the project area, no insurmountable environmental impact with regard to floating refuse would be anticipated during the construction phase, or after completion of the Project.

15.7 Land Contamination Impact

- 15.7.1 The potential environmental issues associated with land contamination for the WDII Project have been reviewed and any implication for the proposed development has been assessed.
- 15.7.2 Based on the review of the previous WDIICFS EIA Report and investigation on the historical/current land uses, the proposed re-development of A King Marine might pose potential land contamination impacts during the construction phase of the Project. In order to indicate the nature and extent of soil contamination, a Contamination Assessment Plan (CAP) (attached in **Appendix 7.1**) has been prepared under this Study. The CAP discusses the details of the site investigation requirements to be carried out.
- 15.7.3 Site investigation (SI) was subsequently carried out in accordance with the endorsed CAP and a Contamination Assessment Report (CAR), presenting the results and findings of the SI works had been compiled. Based on the analytical results, exceedances in relevant criteria of heavy metals and total petroleum hydrocarbons (TPH) were identified and an estimated 633 m³ of contaminated soil (mainly heavy metals) were required remediation. A Remediation Action Plan (RAP) was thus drawn up to formulate the necessary remedial measures and landfill disposal and cement solidification / stabilisation were proposed as the soil remediation method. The combined CAR / RAP report is attached in **Appendix 7.2**.
- 15.7.4 The land contamination impacts associated with A King Marine would be the handling of contaminated soil by construction works during the remediation works. If the proposed mitigation measures are properly implemented, no adverse land contamination impacts are anticipated.
- 15.7.5 No adverse residual impact in respect of land contamination is expected if the proposed remediation actions are carried out.

15.8 Marine Ecological Impact

- 15.8.1 Literature reviews of existing information supplemented with the results of recently undertaken field surveys on marine ecological resources indicated that identified marine habitats within the Assessment Area are of low ecological value. There are no ecological sensitive receivers, such as SSSIs, Marine Parks and / or Reserves and other areas of ecological importance or conservation interest, in and within the immediate vicinity of the study area.
- 15.8.2 Direct and indirect ecological impacts arising from the Project during construction phase and operation phase were identified and evaluated. The Project will result in the permanent loss of approximately 12.7 hectares of soft bottom benthic and subtidal habitats. Considering that the benthic, intertidal and subtidal habitats within 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.
- 15.8.3 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 wildlife are considered already well adapted to human disturbance and therefore no adverse indirect impact is expected to occur.
- 15.8.4 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.

15.9 Landscape and Visual Impact

- 15.9.1 The proposed development and associated works follow in principle the planning intentions from the Metroplan, 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 respond to the CFA judgment on the PHO, the extent of reclamation has been reduced to a 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.
- 15.9.2 Approximately 12.7 ha (1.8% of total 700ha harbour area) of Victoria Harbour will be permanently lost under the proposed reclamation (DP3). Causeway Bay Typhoon Shelter 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 (DP4) with mooring area of approximately 4ha will be constructed in Victoria Harbour just outside 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.
- 15.9.3 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 Hong Kong Academy of Performing Arts Extension. Approximate 0.24ha of Victoria Park will be permanently lost for the construction of Slip Road 8 of the Trunk Road. Under the proposed development, approximately 13.8ha 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 but have positive substantial impact to the waterfront from Central to North Point.
- 15.9.4 It is estimated that, approximately 571 trees will be affected by the construction of Road P2, Slip Road 8, the repositioning of the bowling green, the landscape 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 LCSD Champion Trees or Registered Old and Valuable Trees. There are no rare species or endangered species, all trees are common species. All the 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 in accordance with ETWB TCW no. 3/2006. Based on the proposed works, new trees will be planted along roadside amenity areas and new waterfront to compensate for the loss of existing trees.
- 15.9.5 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.

- 15.9.6 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.
- 15.9.7 With implementation of mitigation measures during construction, there will still be some moderate negative visual impact on the VSRs in the front row of high rise buildings along the waterfront from Central to North Point. Residual impacts on VSRs further away the 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 the harbour will be slight or insubstantial.
- 15.9.8 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 to 10 years and **beneficial with mitigation** in the long run after 20 to 30 years.

15.10 Cultural Heritage Impact

- 15.10.1 A Marine Archaeological Investigation has been carried out for the seabed that will be affected by the reclamation required by the Project. The aim of the investigation was to locate and assess underwater archaeological resources which may be damaged by the dredging and reclamation. In accordance with AMO Guidelines, the MAI consisted of a Baseline Review and Geophysical Survey.
- 15.10.2 The results of the MAI in 2001 (Report No. SDA8827) are applicable to the current study since they cover the same seabed area, with the exception of North Point. There have not been any significant changes to the seabed since 2001 which would have affected its archaeological potential. According to the MAI in 2001, it was concluded there were no archaeological resources within the study area of Wan Chai.
- 15.10.3 The baseline review indicates high archaeological potential for the North Point study area. To ensure compliance with AMO Guidelines for MAI, it is therefore necessary to carry out a geophysical survey for this area.

15.10.4 The geophysical survey provided very detailed information about features on the seabed. Within the study area, the seabed is characterised by the presence of dumped materials, trawl marks, scars and other evidence of previous disturbance. The geophysical survey located one significant sonar contact but its intact linear shape indicated it was a shipwreck of modern origin. There were no other sonar contacts which merited further investigation.

15.10.5 It is therefore concluded that there are no marine archaeological resources within the study area. It follows that there are no related constraints on the proposed development. There is no need for any further archaeological investigation or mitigation measures.

15.11 Environmental Monitoring and Audit

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

15.12 Overall Conclusion

15.12.1 The EIA has been conducted based on currently available information and has been adequately addressed the environmental impacts of the Schedule 2 designated projects identified. No outstanding issues were identified and hence further detailed EIA study was considered not necessary. 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.

15.12.2 Overall, the EIA Report for the WDII and CWB has predicted that the Project will generally comply with the environmental standards and legislation after the proposed construction and operational 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.