3. ENVIRONMENTAL LEGISLATION AND STANDARDS

3.1 Introduction

This *Section* describes the regulatory requirements and criteria against which the potential or predicted construction and operational impacts of the EPIWs were evaluated. All of the relevant legislation, criteria or guidelines are those produced, adopted or accepted by the Hong Kong Government. The standards and guidelines set out below are in accordance with the *Environmental Impact Assessment Ordinance* (EIAO) and associated *Technical Memorandum on Environmental Impact Assessment Process* (EIA O TM).

3.2 Noise

3.2.1 Construction Noise Standards

3.2.1.1 General

The principal legislation on the statutory control of construction noise is the *Noise Control Ordinance* (NCO) (Cap 400). Various Technical Memoranda, which stipulate control approaches and criteria, have been issued under the NCO. The following technical memoranda are applicable to the control of noise from construction activities:

- *Technical Memorandum on Noise from Percussive Piling* (PP-TM);
- *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (GW-TM); and
- *Technical Memorandum on Noise from Construction Work in Designated Areas* (DA-TM);

The EIAO and the EIA O TM also provide guidelines for the assessment of noise impacts associated with construction activities.

Despite any description or assessment made in the subsequent paragraphs, the Noise Control Authority will be guided by the Technical Memorandum (Memoranda) in assessing an application, once filed, for a Construction Noise Permit (CNP). He will consider all the factors affecting his decision taking contemporary situations/conditions into account. Nothing in this Report shall bind the Authority in making his decision. There is no guarantee that a CNP will be issued. If a permit is to be issued, the Authority shall include any condition he thinks fit and such conditions are to be followed while the works covered by the permit are being carried out. Failing which will lead to cancellation of the permit and prosecution action under the NCO.

It is anticipated that general construction works during restricted hours are not required, thus no assessment in this Study had been conducted.

3.2.1.2 Percussive Piling

Percussive piling is prohibited at any time on Sundays and public holidays and during the weekday evening and night time hours (1900-0700 hours, Monday through Saturday). A CNP is required for such works during the weekday daytime hours (0700-1900 hours, Monday through Saturday), which needs to be applied from the Noise Control Authority.

When assessing a CNP application for the carrying out of percussive piling, the Noise Control Authority is guided by the PP-TM. The Noise Control Authority will look at the difference between the Acceptable Noise Levels (ANLs), as defined in the PP-TM, and the Corrected Noise Levels (CNLs) that are associated with the proposed piling activities. Depending on the level of noise impact on nearby Noise Sensitive Receivers (NSRs), the Noise Control Authority would determine the time periods for percussive piling operation; *Table 5A* of PP-TM is reproduced in *Table 3.2a* below.

Table 3.2a Permitted Hours of Operation for Percussive Piling (not involving the use of diesel, pneumatic and/or steam hammers)

Amount by which CNL exceeds ANL	Permitted hours of operation on any day not being a holiday
more than 10 dB(A)	0800 to 0900 and 1230 to 1330 and 1700 to 1800
more than 0 dB(A) and less than or equal to 10 dB(A)	0800 to 0930 and 1200 to 1400 and 1630 to 1800
no exceedance	0700 to 1900

For any educational institutions, the ANLs should be adjusted by a -10 dB(A) correction factor in the noise assessment, taking account of the relative noise sensitivity of these uses.

The Government is committed to phasing out the use of diesel, pneumatic and steam hammer pile drivers, which are particularly noisy. Such pile drivers cannot be used after 1 October 1999. In preparation for the incoming legislative control, the Government has already (since July 1997) administratively banned the use of diesel hammers in Government projects.

As the issuance of a CNP by the Noise Control Authority would depend on the application submitted by the Contractor, noise assessment of percussive piling activities has been excluded from this study.

3.2.1.3 General Construction Works

Noise arising from general construction works during normal working hours (i.e. 0700 to 1900 hours on any day not being a Sunday or public holiday) at the openable windows of any noise sensitive buildings is governed by the EIA O TM. The recommended noise standards are presented in *Table 3.2b* below.

Table 3.2b EIA O TM Daytime Construction Noise Limit ($L_{eq, 30\ min}$ dB(A))

Uses	Noise Standards
Domestic Premises	75
Educational Institutions (normal periods)	70
Educational Institutions (during examination periods)	65

The NCO provides statutory controls on general construction works during the restricted hours (i.e. 1900-0700 hours Monday to Saturday and at any time on Sundays and public holidays). The use of powered mechanical equipment (PME) for the carrying out of construction works during the restricted hours would require a CNP. The Noise Control Authority is guided by the GW-TM when assessing such an application.

When assessing an application for the use of PME, the Noise Control Authority will compare the ANLs, as promulgated in the GW-TM, and the CNLs (after accounting for factors such as barrier effects and reflections) associated with the proposed PME operations. A CNP may be issued if the CNL is equal to or less than the ANL. The ANLs are related to the noise sensitivity of the area in question and different Area Sensitivity Ratings have been drawn up to reflect the background characteristics of different areas. The relevant ANLs are shown in *Table 3.2c*.

Table 3.2c Acceptable Noise Levels (ANL, $L_{eq, 5\ min}$ dB(A))

Time Period	Area Sensitivity Rating		
	A	B	C
All days during the evening (1900-2300 hours) and general holidays (including Sundays) during the day and evening (0700-2300 hours)	60	65	70
All days during the night-time (2300-0700 hours)	45	50	55

In addition to the general controls on the use of PME during the restricted hours, the Noise Control Authority has implemented a more stringent scheme via the DA-TM. The DA-TM regulates the use of five types of Specified Powered Mechanical Equipment (SPME) and three types of Prescribed Construction Work (PCW), which are non-PME activities, in primarily densely populated neighbourhoods called Designated Areas (DAs). The SPME and PCW are:

SPME:

- Hand-held breaker
- Bulldozer
- Concrete lorry mixer
- Dump truck
- Hand-held vibratory poker

PCW:

- Erection or dismantling of formwork or scaffolding
- Loading, unloading or handling or rubble, wooden boards, steel bars, wood or scaffolding material
- Hammering

In the interest of offering additional protection to the population, the carrying out of PCW is generally banned inside a DA. As for the use of SPME, it would be necessary to comply with DA-TM noise level requirements that are 15 dB(A) more stringent than those listed in the GW-TM before a CNP may be issued.

There are some factors affecting the assessment results of a CNP application, such as the assigning of Area Sensitivity Rating, ANLs, etc. The Noise Control Authority would decide these at the time of assessment of such an application based on the contemporary situations/conditions. It should be noted that the situations/conditions around the sites may change from time to time.

3.2.2 Road Traffic Noise Standards

3.2.2.1 Traffic Noise Criteria

The EIA O TM requires that road traffic noise levels outside the façades of any sensitive buildings which rely upon openable windows for ventilation should not exceed the criteria given in *Table 3.2d.*

Table 3.2d EIA O TM Road Traffic Noise Criteria

Sensitive Uses	Road Traffic Noise $L_{10,(1hr)}$ (dB(A))[1]
Domestic Premises	70
Offices	70
Educational Institutions	65

(1) Maximum permissible noise level assessed at 1 m from the external façade.

Any measured or predicted road traffic noise levels which exceed these criteria will be considered to be an adverse environmental impact.

Since the EPIWs are for permanent use, the long term effect is to be assessed by this Study and practicable direct mitigation measures will be recommended, where appropriate and within the terms of the Study Brief, to ensure any adverse impacts are reduced to acceptable levels.

While it is generally accepted that roads are a significant source of ambient noise within the community, it would not be practicable to mitigate all sources of adverse impact within or adjacent to the spatial scope or boundary of the EPIWs. The Study Brief

recognises that only those roads within the boundaries of the EPIWs that are subject to significant variation would be candidates for noise mitigation measures where adverse impacts occur. This effectively limits the extent of mitigation to new highway works but requires the impact assessment to consider the effect of all roads within a spatial scope of 300 m from the boundary of EPIWs. In essence, the intent of the noise criteria is to ensure that new highways will not cause adverse environmental impacts and that existing noise exceedances (i.e. those prevailing before the EPIWs) are reduced as far as practicable to acceptable levels. The project proponent therefore has the opportunity to bring about an environmental improvement, where adverse impacts pre-exist, in the vicinity of the EPIWs.

In accordance with the Study Brief, the definition of a significant variation of a road is where:

- the Project would result in a 25% increase in lanes; or
- substantial alterations in alignment or traffic character such as an increase in vehicle speed restriction.

Where a significant variation occurs, the road (or section to be varied) will be classified as "new". Roads that will remain either completely unchanged or will undergo only very minor alterations such that the above conditions would not be triggered will be classified as "unaltered".

3.2.2.2 Criterion for Indirect Technical Remedies

Indirect remedies (i.e. noise insulation of a sensitive property's windows and provision of air conditioning) will be provided according to the *ExCo Directive, Equitable Redress for Persons Exposed to Increased Noise Resulting From The Use of New Roads*. These remedies will be provided by the Proponent where practicable direct mitigation measures would not be feasible in terms of traffic or engineering constraints or would not be wholly effective: the residual impacts at NSRs after direct mitigation would be assessed according to the *ExCo Directive* criteria to consider if, as a very last resort, the affected noise sensitive receivers would qualify for noise insulation.

The *ExCo Directive* criteria would have to be exceeded (when rounded to the nearest 0.1 dB(A)) for the NSRs to qualify for insulation. The criteria follow the conditions, as embodied in the *ExCo Directive* are:

- the predicted overall noise level from the "new" road together with other traffic in the vicinity must be above a specified noise level (e.g. 70 dB(A) $L_{10.(1\ hr)}$ for domestic premises);
- the predicted overall noise level is at least 1.0 dB(A) more than the prevailing traffic noise level, i.e. the total traffic noise level existing before the works to construct or improve the road were commenced; and
- the contribution to the increase in the predicted overall noise level from the "new" road must be at least 1.0 dB(A).

Within the context of this EIA Study, the objective is to identify the approximate extent of properties being eligible for indirect technical remedies. The detailed scheduling and specification of noise insulation works would be undertaken by the Proponent after the EIA and in accordance with EPD's specification requirements incorporating Annex 5 of the EIA O TM. The noise insulation would be installed prior to the completion of the EPIWs.

3.3 Air Quality

The principal legislation for the management of air quality is the *Air Pollution Control Ordinance* (APCO) (Cap 311). The whole of the Hong Kong SAR is covered by the *Hong Kong Air Quality Objectives* (AQOs) which stipulate the statutory limits of some typical air pollutants and the maximum allowable numbers of exceedance over specific periods. In addition, the EIA O TM stipulates an hourly TSP limit of 500μg m^{-3} measured at 298K (25°C) and 101.325 kPa (1 atm) for construction dust impact assessment. Mitigation measures required to reduce the impact of dust from construction sites have also been specified in the *Air Pollution Control (Construction Dust) Regulation.*

The AQOs are shown in *Table 3.*3a and, under *Annex 4* of the EIA O TM, are to be met during the construction and operational phases of the EPIWs.

Table 3.3a Hong Kong Air Quality Objectives (μg m^{-3})

Pollutant	Averaging Time			
	1 Hour [2]	8 Hours [3]	24 Hours [3]	1 Year [4]
Total Suspended Particulates (TSP)	-	-	260	80
Respirable Suspended Particulates [5] (RSP)	-	-	180	55
Nitrogen Dioxide (NO_2)	300	-	150	80
Sulphur Dioxide (SO_2)	800	-	350	80
Carbon Monoxide (CO)	30,000	10,000	-	-

Notes:

(1) All the pollutant concentrations in μg m^{-3} should be measured at 298K (25 C) and 101.325 kPa (one atmosphere).

(2) Not to be exceeded more than three times per year.

(3) Not to be exceeded more than once per year.

(4) Arithmetic means.

(5) Respirable suspended particulates are defined as particles suspended in the air with a nominal aerodynamic diameter of 10 m and smaller.

3.4 Water Quality

The regulatory requirements and standards to protect water quality include the *Water Pollution Control Ordinance* (WPCO), its subsidiary technical memoranda, and various technical circulars issued by the Works Branch and the EPD as described below. Whilst

the technical circulars are non-statutory, they are generally accepted as best practice guidelines in Hong Kong and have been adopted as relevant for this assessment.

3.4.1 Water Pollution Control Ordinance (WPCO)

Under the WPCO, Hong Kong waters are divided into 10 Water Control Zones (WCZs). Each WCZ has a designated set of statutory Water Quality Objectives (WQO). The standards to be met in each WCZ depend on the classification of the receiving waters (e.g. inland, inshore, marine or foul sewer). The standards are applied to effluents through licences issued by the EPD under Sections 15, 16 and 20 of the WPCO. The relevant standards are set out in the *Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.*

3.4.2 Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

This TM issued under Section 21 of the WPCO defines acceptable discharge limits to different types of receiving waters.

Effluents discharged into the inshore and marine waters of the Victoria Harbour WCZ are subject to standards stipulated in Tables 9a and 9b of the TM. The standards in Tables 10a and 10b of the TM apply to effluents discharged into the inshore and marine waters respectively of the North Western and Western Buffer WCZs. For the Deep Bay WCZ, the standards in Table 8 of the TM apply, although reference should also be made to *Section 3.4.3* below.

Relevant criteria for effluents discharged to inland waters depend on the classification of beneficial uses downstream. The majority of inland water bodies potentially affected by West Rail are used for agriculture (defined in the TM as Group B inland waters) and freshwater fish culture (Group C inland waters). Discharge standards for Group B and Group C inland waters are listed in Tables 4 and 5 of the TM respectively.

Discharges of effluents into the foul sewerage system need to comply with the standards listed in Tables 1 and 2 of the TM.

For cooling water discharges, in addition to the TM requirements (which only apply to discharges of up to 6,000 m^3 per day), the EPD has required that discharges of between 6,000 and 1,000,000 m^3 per day have a temperature of not more than 35 °C and not more than 10 °C above influent temperature, and contain not more than 0.2 mg/l of total residual chlorine.

3.4.3 The Deep Bay "Zero Discharge Policy"

In addition to Table 8 of the TM, this policy aims to limit the decline of water quality in Deep Bay and its catchments. It requires that major developments within Deep Bay catchments and all new developments in sensitive areas of the catchment, where a connection to public sewer system is not feasible, do not increase existing pollution loads.

3.4.4 Construction Site Drainage Guidelines

The *Practical Note for Professional Persons on Construction Site Drainage* (PN1/94) issued by the EPD provides basic environmental guidelines for the handling and disposal of construction site discharges to minimise impacts on water quality.

3.5 Landscape and Visual Impact

The assessment of the landscape and visual impacts of the proposed development has been carried out in accordance with the Technical Memorandum of the Environmental Impact Assessment (EIA) issued under the EIA Ordinance. Particular reference has been made to *Annexes 1, 2, 3, 10, 11,18 and 20* of the *Technical Memorandum.*

Government restrictions on the preservation and felling of trees in Hong Kong are detailed in *"Government General Regulation 740", WBTC 24/94 and PELB 3/94 Tree Preservation.*

3.6 Waste

The following legislation relates to the handling, treatment and disposal of wastes in Hong Kong, and will be considered in assessing potential impacts and their avoidance or mitigation:

- *The Waste Disposal Ordinance (Cap 354);*
- *The Waste Disposal (Chemical Waste) (General) Regulation (Cap 354);*
- The *Crown Land Ordinance (Cap 28);*
- The *Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-laws;* and
- *Dumping At Sea Ordinance (Cap 466).*

The *Waste Disposal Ordinance* (WDO) prohibits the unauthorised disposal of wastes. Construction waste is not directly defined in the WDO but is considered to fall within the category of "trade waste". Under the WDO, wastes can only be disposed of at sites licensed by the EPD.

Under the *Waste Disposal (Chemical Waste) (General) Regulation* all producers of chemical wastes (including asbestos) must register with the EPD and treat their wastes, either utilising on-site plant licensed by the EPD, or arranging for a licensed collector to take the wastes to a licensed facility. The regulation also prescribes the storage facilities to be provided on site, including labelling and warning signs, and requires the preparation of written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.

Construction wastes which are wholly inert may be taken to public dumps. Public dumps usually form part of land reclamation schemes operated by the Civil Engineering

Department (CED). The *Crown Land Ordinance* requires that dumping licences are obtained by individuals or companies who deliver suitable construction wastes to public dumps. The licences are issued by the CED under delegated powers from the Director of Lands.

The *Public Cleansing and Prevention of Nuisances By-Laws* provide further controls on the illegal tipping of wastes on unauthorised (unlicensed) sites.

The following documents and guidelines also relate to waste management and disposal in Hong Kong:

- *Waste Disposal Plan for Hong Kong (December 1989), Planning, Environment and Lands Branch, Hong Kong Government Secretariat;*
- *Environmental Guidelines for Planning In Hong Kong (1990), Hong Kong Planning and Standards Guidelines, Hong Kong Government;*
- *New Disposal Arrangements for Construction Waste (1992), Environmental Protection Department and Civil Engineering Department;*
- *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992), Environmental Protection Department*;
- *Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste, Environmental Protection Department;*
- *Works Branch Technical Circular No 2/93, Public Dumps;*
- *Works Branch Technical Circular No 16/96, Wet Soil in Public Dumps;*
- *Environmental Protection Department Technical Circular No. 1-1-92, Classification of Dredged Sediments for Marine Disposal; and*
- *Technical Circular No. 22/92, Marine Disposal of Dredged Mud, Works Branch.*

3.7 Land Contamination

The assessment of land contamination and the potential impacts arising from the disposal, management and, if appropriate, disposal of contaminated soils are guided by the EPD's guidance document *Professional Persons Environmental Consultative Committee Practice Note 3/94 - Contaminated Land Assessment and Remediation* (ProPECC PN 3/94), and by the provisions of Annex 19 of the *Technical Memorandum on Environmental Impact Assessment Process* (EIA O TM). In accordance with ProPECC PN 3/94, the assessment evaluation should:

- provide a clear and detailed account of the present use of the land in question and the relevant past land use history, in relation to possible land contamination;
- identify those areas of potential contamination and associated impacts, risks or hazards; and

- as required, submit an assessment plan to evaluate the actual contamination conditions for soil and/or groundwater.

Under the ProPECC PN 3/94 note, and in the absence of any formal legislation requiring cleanup of soil and groundwater contamination in Hong Kong, the "*Dutch Ministry of Housing, Planning and Environmental Soil and Groundwater Standards*" (the Dutch List) (1994) are used as reference criteria by the EPD for the classification of contaminated materials.

Under the *EIA Ordinance, Annex 19.3: Guidelines for Assessment of Other Impacts, Potential Contaminated Land Issues,* consideration shall be given to a number of potentially contaminating historical land uses, and, if required, a Contamination Assessment Plan (CAP) shall be developed to determine the extent of any potential contamination.

In May 1999, the EPD produced the new *Guidance Note for Investigation and Remediation of Contaminated Sites* document. Under this document, the assessments of selected contaminating land uses is to be based on a professional approach using a series of nine essential steps, including site appraisal, development of an investigation strategy (the CAP), performing appropriate field work to assess land contamination and interpreting the results in order to develop an appropriate remedial strategy. This new Guidance Note was issued after the technical scope of the current study was established by the formal EIA Study Brief.

The following legislation, documents and guidelines may also cover or have some bearing upon land contamination and the handling, treatment and disposal of contaminated waste in Hong Kong:

- Water Pollution Control Ordinance (WPCO);
- Waste Disposal Ordinance (Cap 354);
- Waste Disposal (Chemical Waste) (General) Regulation (Cap 354); and
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, Environmental Protection Department (1992).

Where appropriate, reference has been made to these additional legislative documents and guidelines.

3.8 Ecology

A range of international and local regulations, legislation and guidelines provides the framework for the protection of species and habitats of ecological importance. Those of relevance to this Study are as follows:

- The Country Parks Ordinance (Cap 208);
- The Forests and Countryside Ordinance (Cap 96);

- The Wild Animals Protection Ordinance (Cap 170);
- The Town Planning Ordinance (Cap 131);
- The Hong Kong Planning Standards and Guidelines Chapter 10 (HKPSG);
- Annexes 8 and 16 of the Technical Memorandum for the Environmental Impact Assessment Ordinance (EIA O TM); and
- The United Nations Convention on Biodiversity (1992).

The Country Parks Ordinance provides for the designation and management of country parks and special areas. Country parks are designated for the purpose of nature conservation, countryside recreation and outdoor education. Special Areas are created mainly for the purpose of nature conservation.

The Forests and Countryside Ordinance prohibits felling, cutting, burning or destroying of trees and growing plants in forests and plantations on Government land. Related subsidiary Regulations prohibit the picking, felling or possession of listed rare and protected plant species. The list of protected species in Hong Kong which comes under the Forestry Regulations was last amended on 11 June 1993 under the *Forestry (Amendment) Regulation 1993* made under Section 3 of the Forests and Countryside Ordinance.

Under *the Wild Animals Protection Ordinance*, designated wild animals are protected from being hunted, whilst their nests and eggs are protected from injury, destruction and removal. All birds and most mammals are protected under this Ordinance. The Second Schedule of the Ordinance which lists all the animals protected was last revised in June 1992.

The recently amended *Town Planning Ordinance* provides for the designation of coastal protection areas, Sites of Special Scientific Interest (SSSIs), Green Belt or other specified uses that promote conservation or protection of the environment, e.g. conservation areas. The authority responsible for administering the Town Planning Ordinance is the Town Planning Board.

Chapter 10 of the HKPSG covers planning considerations relevant to nature conservation. This chapter details the principles of conservation, the conservation of natural landscape and habitats, historic buildings, archaeological sites and other antiquities. It also addresses the issue of enforcement. The appendices list the legislation and administrative controls for conservation, other conservation related measures in Hong Kong and government departments involved in conservation.

Annex 16 of the EIAO TM sets out the general approach and methodology for assessment of ecological impacts arising from a project or proposal, to allow a complete and objective identification, prediction and evaluation of the potential ecological impacts. *Annex 8* recommends the criteria that can be used for evaluating ecological impact.

The Peoples' Republic of China (PRC) is one of the Contracting Parties to the *United Nations Convention on Biological Diversity of 1992*. The Convention requires signatories to make active efforts to protect and manage their biodiversity resources. Hong Kong Government has stated that it will be 'committed to meeting the environmental objectives' of the Convention (PELB 1996).

3.9 Archaeological and Cultural Resources

The *Antiquities and Monuments Ordinance (Cap. 53)*, provides powers for the designation of Antiquities and Monuments Sites or Declared Monuments in Hong Kong. The Ordinance provides statutory protection against the threat of development for gazetted monuments, historic buildings and archaeological sites which have been approved by the Antiquities Authority (AA) to enable rehabilitation and maintenance works and facilitate public visits.

Deemed Monuments have been identified by the Antiquities and Monuments Office (AMO) and agreement reached with the owners of the Monument to provide for specific measures to ensure preservation. Deemed Monuments have the potential to be upgraded to statutory Declared Monuments.

The AMO has also assigned gradings to buildings of historic interest ranging from the most valued buildings at Grade 1 down to Grade 3. This classification is for AMO internal reference and has no statutory protection power.

Although there are no statutory provisions for the protection of Sites of Historical Interest, Deemed Monuments and Graded Buildings in Hong Kong, the Government has administrative procedures which state that consideration must be given to protect listed and locally designated historic buildings and sites of cultural interest. However, the current record of archaeological sites is known to be incomplete as many areas are not yet surveyed. Although *Section 11* (and its relevant sub-sections) of the *Antiquities and Monuments Ordinance* require any person who discovers an antiquity or supposed antiquity to report the discovery to the Antiquities Authority, there is a need to ensure that procedures and mechanisms, which ensure the preservation or formal notification of previously unknown archaeological resources that may be revealed or discovered during project assessment or construction, are identified at an early stage in Project planning.