

Environmental Impact Assessment Ordinance (Cap. 499)
Section 5 (7)

Environmental Impact Assessment Study Brief No. ESB-025/1998

Project Title: Deep Bay Link

**Name of Applicant: Major Works Project Management Office, Highways Department,
Hong Kong Special Administrative Region Government**

1. BACKGROUND

- 1.1 An application (No. ESB-025/1998) for an Environmental Impact Assessment (EIA) study brief under section 5(1) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the captioned Applicant on 11 December 1998 with a project profile (No. PP-036/1998).
- 1.2 The Applicant proposes to construct a dual-3 lane expressway about 5.4 km in length linking Ngau Hom Shek to an interchange with the Yuen Long Highway and the proposed Route 10 at Lam Tei. The location of the proposed project is shown in the attached Figure 1. The project covered in the project profile is a designated project under the EIAO by virtue of Section A.1 or Q.1 of Schedule 2 under the Ordinance.
- 1.3 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this Environmental Impact Assessment (EIA) study brief to the Applicant to carry out an EIA study.
- 1.4 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the proposed designated projects and related activities taking place concurrently. This information will contribute to decisions by the Director on:
 - (i) the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the proposed project;
 - (ii) the conditions and requirements for the detailed design, construction and operation of the proposed project to effectively mitigate against adverse environmental consequences wherever practicable; and
 - (iii) the acceptability of residual impacts after the proposed mitigation measures are implemented.

2. OBJECTIVES OF THE EIA STUDY

- 2.1 The objectives of the EIA study are as follows:
 - (i) to describe the proposed project and associated works together with the requirements for carrying out the proposed project;
 - (ii) to identify and describe the elements of the community and environment likely to be affected by the proposed project and/or likely to cause adverse impacts to the proposed project, including both the natural and man-made environment;
 - (iii) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
 - (iv) to identify and quantify any potential losses or damage to flora, fauna and wildlife habitats;
 - (v) to identify any negative impacts on sites of cultural heritage and to propose measures to mitigate these impacts;
 - (vi) to identify and quantify any potential landscape and visual impacts;
 - (vii) to propose the provision of infrastructure or mitigation measures so as to effectively minimize pollution, environmental disturbance and nuisance during construction and operation of the proposed project;

- (viii) to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts and the cumulative effects expected to arise during the construction and operation phases of the proposed project in relation to the sensitive receivers and potential affected uses;
- (ix) to identify, assesses and specify methods, measures and standards, to be included in the detailed design, construction and operation of the proposed project which are necessary to effectively mitigate these environmental impacts and reducing them to acceptable levels;
- (x) to investigate the extent of side-effects of proposed mitigation measures that may lead to other forms of impacts;
- (xi) to identify constraints associated with the mitigation measures recommended in the EIA study;
- (xii) to design and specify the environmental monitoring and audit requirements, to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted.

3. DETAILED REQUIREMENTS OF THE EIA STUDY

3.1 The purpose of this study brief is to set out the scope of the EIA study and the technical requirements and methodologies to supplement those set out in the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (thereafter refer to as the TM). The Applicant has to demonstrate in the EIA report that the assessment criteria in the relevant sections of the TM are fully complied with.

The Scope

- 3.2 The scope of this EIA study covers the proposed project mentioned in section 1.2 above, including:
- (i) a dual-3 lane expressway about 5.4 km in length linking Ngau Hom Shek to an interchange with the Yuen Long Highway and the proposed Route 10 at Lam Tei;
 - (ii) an interchange with the Yuen Long Highway and the proposed Route 10 at Lam Tei;
 - (iii) cross boundary control facilities;
 - (iv) a northbound and a southbound vehicle holding area; and
 - (v) associated civil, structural, geotechnical, landscape, drainage works, street lighting, traffic aids, emergency telephones, closed circuit television cameras and electrical and mechanical works.

Technical Requirements

- 3.3 The Applicant shall conduct the EIA study to address all environmental aspects of the activities as described in the scope as set out above. The technical requirements for the impacts are listed in the following Section 3.4 to 3.14.
- 3.4 The EIA report shall describe clearly and objectively the potential environmental impacts on each of the alignment options, as well as the likely future environmental conditions in the absence of the proposed project. The EIA report shall also describe the reasons for selecting the final preferred alignment(s), and the environmental factors considered in the selection.

3.5 Wherever practicable, cross-referencing shall be avoided in the EIA report and Executive Summary.

3.6 Air Quality Impact

3.6.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing air quality impact as stated in Annexes 4 and 12 of the Technical Memorandum, respectively.

3.6.2 The "Study Area" for the air quality impact assessment shall include all areas within 500m from either side of and along the full stretch of the project boundary of the proposed road alignment(s) and its associated cross-boundary facilities.

3.6.3 The air quality impact assessment shall include the following:

(i) Construction Impacts

The Applicant shall follow the requirements of the Air pollution Control (Construction Dust) Regulation in dust control and shall initiate an audit and monitoring program during construction stage to ensure construction dust impacts are controlled within the relevant standards as stipulated in Annex 4 of the TM.

(ii) Operation Impacts

(a) Analysis of operational activities and its characteristics.

(b) Presentation of background air quality in the study area for the purpose of evaluating the cumulative air quality impact of the operational activities.

(c) Identification and description of representative existing air sensitive receivers (ASRs) and planned/committed air sensitive uses that would likely be affected by the air emissions of the operational activities. The locations shall be agreed with the Director and a map showing the location of every identified ASRs shall also be given.

(d) Identification of emission inventory of the air pollution sources and the respective emission characteristics

(e) Description of the assessment method and the associated assumptions, validity of the method and limits of application. The methodology used shall be agreed with the Director before commencement of study.

(f) Assessment and evaluation of the net and cumulative air quality impacts of the air emissions at the identified ASRs.

(g) Presentation of the predicted residual air quality impacts (both unmitigated and mitigated) in the form of summary tables and pollution contours, for comparison with relevant air quality standards and the examination of the land use implications of these impacts.

(h) Proposals of effective mitigation measures to reduce the net and cumulative air quality impacts to established standards.

(i) If there are any direct technical noise remedies recommended in the study, the air quality implication due to these remedies shall be assessed. For instance, if barriers are proposed, the implications of such remedies on air quality impact shall be assessed. If enclosure is proposed, then both "tunnel" portal emissions and air quality inside the "tunnel" shall also be addressed.

- (j) All input and output file(s) of the model run(s) in electronic format shall form part of the EIA report.

3.7 Noise Impact

3.7.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing noise impact as stated in Annexes 5 and 13 of the TM, respectively.

3.7.2 The "Study Area" for the noise impact assessment shall include all areas within 300m from either side of and along the full stretch of the project boundary of the proposed road alignment(s) and its associated cross-boundary facilities. The study area can be reduced accordingly if the first layer of the noise sensitive receivers (NSRs), closer than 300m from the road, can provide acoustic shielding to those receivers at further distance behind subject to the agreement with the Director.

3.7.3 The noise impact assessment shall include the following:

(i) Identification of Noise Sensitive Receivers

(a) The Applicant shall refer to Annex 13 of the TM when identifying the noise sensitive receivers (NSRs). The NSRs shall include all existing NSRs and all planned/committed noise sensitive developments, including those uses earmarked on the relevant Outline Zoning Plans, Outline Development Plans, Layout Plans and other published plans in relation to the Planning and Development Study on North West New Territories. For planned noise sensitive uses without committed site layouts, the Applicant should work out site layouts for operational noise assessment purpose base on relevant planning parameters.

(b) The Applicant shall select assessment points to represent all identified NSRs for carrying out quantitative noise assessment described below. The assessment points shall be agreed with the Director prior to the quantitative noise assessment. A map showing the location and description such as name of building, use, and floors of each and every selected assessment point shall be given.

(ii) Provision of an Emission Inventory of the Noise Sources

The Applicant shall provide an inventory of noise sources. The inventory shall include construction equipment (for construction noise assessment) and, operation characteristics of the associated cross boundary facilities, and the road traffic data (for operational noise assessment). Confirmation of the validity of the inventory shall be obtained from the relevant government departments/authorities.

(iii) Construction Noise Assessment

(a) The Applicant shall carry out assessment of noise impact from construction (excluding percussive piling) of the proposed project during day time, i.e. 7 a.m. to 7 p.m., on weekdays other than general holidays in accordance with the methodology stipulated in paragraphs 5.3. and 5.4 of Annex 13 of the TM. The criteria in Table 1B of Annex 5 of the TM shall be adopted in the assessment.

(b) To minimize the construction noise impact, alternative construction methods to replace percussive piling shall be proposed .

(c) The Applicant shall propose practicable direct mitigation measures (including but not limited to movable barriers, enclosures, quieter alternative methods, re-scheduling and restricting hours of operation of noisy task) to effectively minimize the impact. If the mitigated noise levels still exceed the relevant criteria, the duration of the noise exceedance shall be given.

(iv) Operational Noise Assessment

- (a) The Applicant shall analyse the scope of the proposed road alignment(s) to identify appropriate new and existing road sections for the purpose of traffic noise impact assessment. When an existing road section undergoes major modification which will directly result in 25% increase in lanes or substantial changes in alignment or characters (e.g. change to a high speed road) of the existing road, it shall be regarded as a new road for the purpose of this noise impact assessment.
- (b) The Applicant shall calculate the expected road traffic noise using methods described in the TM. The Applicant shall calculate the traffic noise levels in respect of each road section and the overall noise levels from the combined road sections (both new and existing) at the NSRs.
- (c) The Applicant shall present the prevailing and future traffic noise levels in $L_{10}(1 \text{ hr})$ at the NSRs at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (d) Quantitative assessment at the NSRs for the proposed road alignment(s) shall be carried out and compared against the criteria set out in Table 1A of Annex 5 in the Technical Memorandum. The potential noise impact of the proposed road alignment(s) shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive elements that will be exposed to noise levels exceeding the criteria set in Table 1A of Annex 5 in the Technical Memorandum.
- (e) After rounding of the predicted noise levels according to the U.K. Department of Transport's "Calculation of Road Traffic Noise" (1988), the Applicant shall propose direct technical remedies in all situations where the predicted traffic noise level is 1 dB(A) in excess of the criteria set in Table 1A of Annex 5 in the TM. Specific reasons for not adopting certain direct technical remedies in the design to reduce the traffic noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs should be clearly quantified and laid down. The total number of dwellings, classrooms and other noise sensitive element that will be benefited by the provision of direct technical remedies shall be provided.
- (f) The total number of dwellings, classrooms and other noise sensitive elements that will still be exposed to noise levels above the criteria set in Table 1A of Annex 5 in the TM with the implementation of all the recommended direct technical remedies shall be quantified.
- (g) In case where a number of the NSRs cannot all be protected by the recommended direct technical remedies, the Applicant shall identify and estimate the total number of existing dwellings, classrooms and other noise sensitive elements which may qualify for indirect technical remedies under the ExCo directive "Equitable Redress for Persons Exposed to Increased Noise Resulting from the Use of New Roads", the associated costs and any implications for such implementation. For the purpose of determining the eligibility of the affected premises for indirect technical remedies, reference shall be made to the set of the following three criteria:
- (g1) the predicted overall noise level from the new road together with other traffic noise in the vicinity must be above a specified noise level (e.g. 70 dB(A) for domestic premises and 65 dB(A) for education institutions, all in $L_{10}(1 \text{ hr})$);
- (g2) 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 the road were commenced; and

(g3) the contribution to the increase in the predicted overall noise level from the new road must be at least 1.0 dB(A).

(v) Assessment of Side Effects and Constraints

(a) The Applicant shall identify, assess and propose means to minimize any side effects and to resolve any potential constraints due to the inclusion of any recommended direct technical remedies. For instance, when decking over of roadways is identified to be necessary, the air quality and the increase in noise levels below the deck and at the portals shall be addressed.

(b) If noise barriers/enclosures are proposed, specific attention and precautionary measures should be taken into consideration so as not to cause any obstruction to the emergency vehicular access for existing and planned buildings as well as fire hydrants installed within/in the vicinity of the proposed road.

(vi) Evaluation of Constraints on Planned Noise Sensitive Developments/Land Uses

(a) For planned noise sensitive uses which will still be affected even with all practicable direct technical remedies in place, the Applicant shall propose, evaluate and confirm the practicality of additional measures within the planned noise sensitive uses and shall make recommendations on how these noise sensitive uses will be designed for the information of relevant parties.

(b) The Applicant shall take into account the agreed environmental requirements/constraints identified by this EIA to assess the development potential of the concerned sites which shall be made known to the relevant parties.

3.8 Water Pollution

3.8.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing water pollution as stated in Annexes 6 and 14 of the TM, respectively.

3.8.2 The "Study Area" for the water quality impact assessment shall include all areas within 300m from either side of and along the full stretch of the project boundary of the proposed road alignment(s) and its associated cross-boundary facilities, plus any stream courses and the associated water system in the vicinity that may be affected by the development.

3.8.3 The Applicant shall identify and analyse in the assessment all physical, chemical and biological disruptions of marine, estuarine, and fresh water systems arising from construction and operation of the proposed project.

3.8.4 The Applicant shall include the following in the water quality impact assessment:

(i) collection and review of background information on the existing water systems and their respective catchment(s), and sensitive receivers which might be potentially affected by the proposed project both during construction and operation;

(ii) based on collected information, characterization of water and sediment quality on the surrounding water system(s) and sensitive receivers which might be potentially affected by the proposed project both during construction and operation;

(iii) identification of pertinent water quality objectives, criteria and standards for the water systems and all the sensitive receivers identified in (i) above;

- (iv) identification of any alteration of any water courses, natural streams/ponds, wetlands, change of shoreline or bathymetry, change of flow regimes, change of ground water levels, change of catchment types or areas;
- (v) identification, analysis and quantification of all existing and future water and sediment pollution sources, including point discharges and non-point sources to surface water runoff, and establishment and provision of an emission inventory on the quantities and characteristics including degree of possible contamination of all these pollution sources. Field investigation and laboratory tests shall be conducted as appropriate;
- (vi) prediction and quantification, by technique subject to agreement of the Director, of impacts on the water systems and the sensitive receivers due to those changes, alterations and activities identified in (iv) above and the pollution sources identified in (v) above. Possible impacts include changes in hydrology, flow regime, sediment deposition, water and sediment quality and the effects on aquatic organism due to such changes. The prediction shall take into account and include possible different construction stages or sequences, and different operations stages. Cumulative impacts due to other projects, activities or pollution sources around the Study Area, subject to the agreement of the Director, shall also be predicted and quantified;
- (vii) assessment and quantification of all future waste water generation activities and analysis on the adequacy of existing and future sewerage infrastructure;
- (viii) identification, assessment and evaluation of any potential stormwater impacts on identified systems and sensitive receivers during both construction and operation stages. Best Management Practices (BMPs) shall be recommended to effectively reduce potential impacts to within standards, objectives and criteria identified in (iii) above;
- (ix) assessment and evaluation of any potential water quality impacts on the identified water systems and sensitive receivers due to sewerage arising from on-site construction workforce. Any effluent generated will require appropriate treatment and disposal; and
- (x) appropriate mitigation measures shall be recommended to alleviate all potential impacts identified above and residual or mitigated impacts shall be predicted and in compliance with all established objectives, criteria and standards identified in (iii) above both during construction and operation of the proposed project.

3.9 Waste Management Implications

3.9.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing waste management implications as stated in Annexes 7 and 15 of the TM, respectively.

3.9.2 The assessment of waste management implications shall cover the following :

(i) Analysis of Activities and Waste Generation

The Applicant shall identify the quantity, quality and timing of the waste arising as a result of the construction and operation activities, based on the sequence and duration of these activities. If excavation and disposal of pond sediment/mud is required, field investigation, sampling and laboratory tests to characterise the sediment/mud shall be conducted as appropriate.

(ii) **Proposal for Waste Management**

- (a) Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation shall be fully evaluated.
- (b) Having taken into account all the opportunities for reducing waste generation, the types and quantities of the wastes required to be disposed of as a consequence shall be estimated and the disposal options for each type of waste described in details. The disposal method recommended for each type of wastes shall take into account the result of the assessment in (c) below.
- (c) The impact caused by handling (including labeling, packaging & storage), collection, and disposal of wastes shall be addressed in details. This assessment shall cover the following areas:
 - (c1) potential hazard;
 - (c2) air and odour emissions;
 - (c3) noise;
 - (c4) wastewater discharge; and
 - (c5) public transport.

3.10 Land Contamination Impact

- 3.10.1 A land contamination impact assessment is required if potentially contaminated land uses are identified within the works area of the proposed project. Examples of such uses are stated in Section 3.1, Annex 19 of the TM. If such uses are identified, the Applicant shall follow the guidelines for assessing potential contaminated land as stated in Annex 19 of the TM.
- 3.10.2 The "Study Area" for the land contamination impact assessment shall include all work areas of the proposed project.
- 3.10.3 The Applicant shall provide a clear and detailed account of the present use of the land or project site together with a location map of the site, including the following information:
 - (i) description of the activities,
 - (ii) inventory of chemicals and hazardous substances handled;
 - (iii) storage location of these substances; and
 - (iv) the relevant past history of the land/site in relation to possible land contamination (e.g., accident records, change of land use, etc.).
- 3.10.4 During the course of the EIA study, the Applicant shall submit a contamination assessment plan (CAP) to the Director for endorsement prior to conducting an actual contamination impact assessment of the site. The CAP shall include proposals on sampling and analysis required and shall aim at determining the nature and extent of the contamination of the site.
- 3.10.5 Based on the endorsed CAP, the Applicant shall conduct a land contamination impact assessment. If land contamination is confirmed, a remedial action plan shall be prepared to formulate necessary remedial measures.

3.11 Ecological Impact (Both Aquatic and Terrestrial)

- 3.11.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing ecological impact as stated in Annexes 8 and 16 of the TM, respectively.
- 3.11.2 The "Study Area" for the ecological impact assessment shall include all areas within 500m from either side of and along the full stretch of the project boundary of the proposed road alignment(s) and the associated cross-boundary facilities.
- 3.11.3 In the ecological impact assessment, the Applicant shall examine the flora (including Pitcher plant, *Nepenthes mirabilis*), fauna and other components of the ecological habitats within the assessment area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the proposed project shall avoid impacts on recognized sites of conservation importance and other ecological sensitive areas. The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the proposed project.
- 3.11.4 The Applicant shall include the following in the ecological impact assessment:
- (i) review findings of relevant studies and collate all the available information regarding the ecological characters of the assessment area;
 - (ii) evaluate the information collected and identify any information gap relating to the assessment of potential ecological impacts to the terrestrial and aquatic environment;
 - (iii) carry out necessary field surveys (the duration of which shall be at least 6 months and cover both the wet and dry seasons) and investigations to verify the information collected, fill the information gaps identified and fulfill the objectives of the EIA study;
 - (iv) establish the general ecological profile and describe the characteristics of each habitat found; information to be provided shall include :
 - (a) description of the physical environment;
 - (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats in the assessment area;
 - (c) ecological characteristics of each habitat type such as size, vegetation type, species present, dominant species found, species diversity and abundance, community structure, seasonal patterns, inter-dependence of the habitats and species, and presence of any features of ecological importance;
 - (d) representative colour photos of each habitat type and any important ecological features identified;
 - (e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife/habitats or red data books;
 - (v) investigate and describe the existing wildlife uses of various habitats with special attention to those wildlife groups and habitats identified as having special conservation interests including:
 - (a) woodland;
 - (b) inter-tidal mudflats;
 - (c) freshwater marshes;
 - (d) birds (including Savanna Nightjar *Caprimulgus affinis* and Eurasian Eagle Owl *Bubo Bubo*); and

- (e) any other wildlife groups and habitats identified as having special conservation interests by this study.
- (vi) describe all recognized sites of conservation importance and ecological sensitive areas in the proposed development site and its vicinity and assess whether these sites will be affected by the proposed development or not;
- (vii) using well-referenced methodology to identify and quantify any direct, indirect, on-site, primary, secondary and cumulative ecological impacts such as destruction of habitats, reduction of species abundance/diversity, loss of feeding grounds, reduction of ecological carrying capacity and habitat fragmentation and, in particular, the habitat loss and disturbance to wildlife during construction stage;
- (viii) evaluate the significance and acceptability of the ecological impacts identified using criteria as stated in Annex 8 of the TM;
- (ix) recommend all possible alternatives (such as modifications of layout and design) and practicable mitigation measures to effectively avoid, minimize and/or compensate for the adverse ecological impacts identified;
- (x) evaluate the feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, subsequent management and maintenance of such measures;
- (xi) determine and quantify the residual ecological impacts after implementation of the proposed mitigation measures;
- (xii) evaluate the severity and acceptability of the residual ecological impacts using criteria as stated in Annex 8 of the TM. If off-site mitigation measures are considered necessary to mitigate the residual impacts, the guidelines and requirements laid down in the PELB Technical Circular No. 1/97 shall be followed; and
- (xiii) review the need for and recommend any ecological monitoring programme required.

3.12 Fisheries Impact

- 3.12.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing fisheries impact as stated in Annexes 9 and 17 of the TM, respectively.
- 3.12.2 The fisheries impact assessment shall cover any potential impact of the proposed project on nearby pond fisheries and oyster farms during both the construction and operational phases.
- 3.12.3 The fisheries impact assessment shall include the followings:
 - (i) description of the physical environmental background;
 - (ii) description and quantification of existing fisheries activities (e.g. pond fisheries, shellfish farming/collection, etc.);
 - (iii) description and quantification of existing fisheries resources (e.g. major fisheries products and stocks);
 - (iv) identification of parameters (e.g. water quality parameters) and areas (e.g. breeding grounds, nursery grounds, reefs) that are important to fisheries;
 - (v) identification and quantification any direct/indirect impacts to fisheries (e.g. permanent loss/temporarily occupation of fish ponds, silting of oyster farms, loss of breeding grounds, reduction of catch/productivity);

- (vi) evaluation of impacts and make proposals for effective mitigation measures with details on justification, description of scope and programme, feasibility as well as staff and financial implications including those related to subsequent management and maintenance requirements of the proposals; and
- (vii) review the need for monitoring and, if necessary, propose a monitoring and audit programme.

3.13 Impact on Cultural Heritage

3.13.1 There are a number of historical buildings and structures within the alignment limit in Figure 1 such as Tseung Kong Wai (its shrine and gate tower), Kau Lee Uk Tsuen and the Luk Yun Shu Shat within the village, Sam San Tsuen, Nai Wai Walled Village, Sun Fung Wai Walled Village and Ling To Monastery (a Grade 2 historic building). The alignment limit also encroach upon the following archaeological sites:

- (i) Ngau Hom Shek Archaeological Site
- (ii) Tseung Kong Wai So Kwun Tsai Archaeological Site
- (iii) Tuen Mun San Tsuen Archaeological Site
- (iv) Lam Tei Archaeological Site
- (v) Shun Fung Wai Archaeological Site
- (vi) Nai Wai Archaeological Site
- (vii) Chung Uk Tsuen Archaeological Site
- (viii) Tsing Chuen Wai Archaeological Site

For items (i) and (ii) above, relics dated to Late Neolithic have been found. For items (iii) to (viii) above, cultural remains dated to Sung, Yuen, Ming and Qing dynasties are located. Moreover, other areas within the alignment limit also have high archaeological potential due to close proximity to the above archaeological sites. As such, a heritage impact assessment shall be conducted so as to assess the impact of the proposed project on all the known and unknown archaeological sites and historic structures.

3.13.2 The Applicant shall follow the criteria and guidelines for evaluating and assessing impact on cultural heritage as stated in Annexes 10 and 19 of the TM, respectively, as well as the "Guidance Notes on Assessment of Impact of Sites of Cultural Heritage in EIA Studies".

3.13.3 The heritage impact assessment shall cover all areas within 30m from the boundary of the works area of the proposed project and shall include 3 components: a baseline study, an impact assessment and mitigation measures.

3.13.4 Baseline Study

- (i) A baseline study shall be conducted to compile a comprehensive inventory of archaeological sites, historic buildings and structures within the proposed project area, which include:
 - (a) sites of archaeological interest (including marine archaeological sites);
 - (b) pre-1950 buildings and structures of high architectural and historical significance and interest; and
 - (c) landscape features include sites of historical events or providing a significant historical record or a setting for buildings or monuments of architectural or archaeological importance, historic field patterns, tracks and fish ponds and cultural element such as flint shut woodlands and clan grave.
- (ii) The baseline study shall identify the direct and indirect impacts on the site of cultural heritage at the planning stage in order to avoid causing any negative effects. The impacts include the direct loss, destruction or disturbance of an element of cultural

heritage, impact in its settings causing impinge on its character through inappropriate sitting or design, potential damage to the physical fabric of archaeological remains, historic buildings or historic landscapes through air pollution, change of water-table, vibration, recreation pressure and ecological damage by the development. The baseline study shall include a desk-top literature study and a field survey.

- (iii) The field survey shall include the followings:
- (a) The potential value of the development site with regard to the cultural heritage could be established where the site is well-documented. However, it does not mean that the site is devoid of interest if it lacks information. In these instances, a site visit combined with discussions with appropriate organisations should be conducted by those with expertise in the area of cultural heritage to clarify the position.
 - (b) Historic buildings and structures survey, which includes:
 - (b1) Field scan of all the historic buildings and structures within the project area.
 - (b2) Photographic recording of each historic building or structure including The exterior (The elevations of all faces of the building premises, the roof, close up for the special architectural details) and the interior (special architectural details), if possible, as well as the surroundings of each historic building or structure.
 - (b3) Interview with locals and other informants on the local historical, architectural, anthropological and other cultural information related to the historic buildings and structures.
 - (b4) Architectural appraisal of the historic buildings and structures.
 - (c) Archaeological Survey: Appropriate methods of field evaluation should be applied to assess the archaeological potential of the project area, which include the followings:
 - (c1) Definition of areas of natural land undisturbed in the recent past.
 - (c2) Field scan of the natural land undisturbed in the recent past in detail with special attention paid to areas of exposed soil which were searched for artifacts.
 - (c3) Conduct systematic auger survey/shovel testing to establish the horizontal spread of cultural materials deposits.
 - (c4) Excavation of test pits, if necessary, to establish The vertical sequence of cultural materials. The hand digging of 1 x 1 m or 1.5 x 1.5 m test pits to determine the presence or absence of deeper archaeological deposits and their cultural history.
 - (d) If the field evaluation identifies any additional sites of cultural heritage within the study area which are of potential historic or archaeological importance and not recorded by AMO, the office should be reported as soon as possible. The historic and archaeological value of the items will be further assessed by the AMO.
- (iv) The Applicant shall prepare an inventory of the sites of cultural heritage supported by:
- (a) A description containing detailed geographical, historical, archaeological, architectural, anthropological, ethnographic and other cultural data supplemented with illustrations, and photographic/cartographic records.

- (b) A map in 1:1000 scale showing the boundary of each historic building or structure.
- (c) Detailed record of each historic building or structure including its construction year, previous and present uses, architectural characteristics, as well as legends, historic persons and events, and cultural activities associated with The structure.
- (d) A map showing the boundary of each archaeological site as supported and delineated by field walking, augering and test-pitting; and
- (e) Drawing of stratigraphic section of test-pits excavated which shows the cultural sequence of a site.

3.13.5 Impact Assessment

- (i) The Applicant shall identify the impacts on the sites of cultural heritage which will be affected by the proposed project subject to the result of desktop research and field evaluation. During the assessment, both the direct impacts such as loss or damage of important features as well as the indirect impacts such as change of water table levels which may affect the preservation of the archaeological and built heritage in situ should be stated. A detailed description and plans should be provided to elaborate to what extent the site of cultural heritage will be affected.
- (ii) Preservation in totality must be taken as the first priority. Criteria and guidelines for assessment shall be referred to Section 4.3.1(c), item 2 of Annex 10 and items 2.6 to 2.9 of Annex 19 and other relevant parts of the TM.

3.13.6 Mitigation Measures

- (i) It is always a good practice to recognise the sites of cultural heritage early in the planning stage and site selection process in order to minimize or to avoid any adverse impacts on the sites (i.e. preserve it in-situ, or leaving a buffer zone around the site). Built heritage, sites and landscapes are to be in favour of preservation unless it can be shown that there is a need for a particular development which is of paramount importance and outweighs the significance of the heritage feature.
- (ii) If avoidance of the cultural heritage is not possible, amelioration can be achieved by reduction of the potential impacts and the preservation of heritage features, such as physically relocating it. Measures like amendments of the siting, screening and revision of the detailed design of the development are required to lessen its degree of exposure if it causes visual intrusion to the cultural heritage and affecting its character.
- (iii) Paragraph 4.3.1(d) of the TM, items 2.10 to 2.14 of Annex 19 of the TM and other relevant parts of the TM shall be referred to in considering mitigation proposals. The mitigation proposals shall be accompanied with a master layout plan together with all detailed treatment, elevations, and landscape plan. If a rescue programme is required, it shall involve preservation of the historic building or structure together with the relics inside, and its historic environment through relocation, detailed cartographic and photographic survey or preservation of an archaeological site "by record", i.e. through excavation to extract the maximum data as the very last resort. A comprehensive plan and programme for the protection and conservation of the partially preserved site of cultural heritage during the construction stage of the proposed project must be detailed. It is important that the mitigation proposals and the rescue programme shall be effective and practicable.

3.14 Landscape and Visual Impact

- 3.14.1 The Applicant shall follow the criteria and guidelines as stated in Annexes 10 and 18 of the Technical Memorandum, respectively for evaluating and assessing landscape and visual impacts. Both the impacts during construction and operation phases shall be assessed.
- 3.14.2 For the visual impact assessment, all sensitive receivers shall be assessed within the visual envelope outlining the area of land of which there is a view of any part of the proposed road, its structure, or the traffic which will use it.
- 3.14.3 The "Study Area" for the landscape impact assessment shall include all areas within 500m from either side of and along the full stretch of the project boundary of the proposed road alignment(s) and its associated cross-boundary facilities. The assessment area for the visual impact assessment shall be defined by the visual envelope of the proposed project.
- 3.14.4 The Applicant shall describe, appraise and analyse the existing landscape resource and character of the assessment area. The sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. The Applicant shall identify the degree of compatibility of the proposed project with the existing landscape. The landscape impact assessment shall quantify the potential landscape impact so as to illustrate the significance of such impacts arising from the proposed development.
- 3.14.5 The Applicant shall assess the visual impacts of the proposed project. The assessment shall include the following:
- (i) identification and plotting of visibility contours of the proposed project within the assessment area;
 - (ii) identification of the key groups of sensitive receivers within the visibility contours with regard to views from both ground level and elevated vantage points;
 - (iii) description of the visual compatibility of the proposed project with the surrounding, both existing and planned uses, and its obstruction and interference with key views of the adjacent areas;
 - (iv) the severity of visual impacts in terms of distance, nature and number of sensitive receivers shall be identified. The visual impacts of the proposed project with and without mitigation measures shall be assessed; and
 - (v) the visual impact of the proposed link road when interfaces with other existing/proposed roads.
- 3.14.6 The Applicant shall recommend mitigation measures to minimize the adverse effects identified above, including provision of a landscape design. The mitigation measures shall include the preservation of vegetation, transplanting of mature trees, provision of screen planting, re-vegetation of disturbed land, compensatory planting, provisioning/reprovisioning of open spaces and amenity areas, design of structures, provision for finishes to structures, colour scheme and texture of materials used and any measures to mitigate the disturbance of the existing land use. Parties shall be identified for the on-going management and maintenance of any proposed mitigation measures to ensure their effectiveness throughout the operation phase of the proposed project. A practical programme and funding proposal for the implementation of the recommended measures shall also be worked out. For bridge structures and noise barriers: Presentation of photomontage of the proposed road in the existing urban and rural setting illustrating the effectiveness of visual impact mitigation measures shall be included.
- 3.14.7 Perspective drawings, plans and section/elevation diagrams, annotated oblique aerial photographs, photographs taken at vantage points, photographs on scaled physical models,

photo-retouching or computer-generated photo-montage shall be adopted to illustrate the landscape and visual impacts of the proposed project. The Applicant shall record the technical details in preparing the illustration, which may need to be submitted for verification of the accuracy of the illustration.

- 3.15 The EIA report shall contain a summary of the key environmental outcomes arising from the EIA study, including the population and environmentally sensitive areas protected, environmentally friendly designs recommended, key environmental problems avoided, compensation areas included and environmental benefits of environmental protection measures recommended.

4. ENVIRONMENTAL MONITORING & AUDIT (EM&A) REQUIREMENTS

- 4.1 The Applicant shall identify in the EIA study whether there is any need for EM&A activities during the construction and operation phases of the proposed project and, if affirmative, to define the scope of the EM&A requirements for the proposed project in the EIA study.
- 4.2 Subject to the confirmation of the EIA study findings, the Applicant shall comply with the requirements as stipulated in Annex 21 of the TM.
- 4.3 The Applicant shall prepare a project implementation schedule (in the form of a checklist, as shown in Annex A) containing all the EIA study recommendations and mitigation measures with reference to the implementation programme.

5. DURATION OF VALIDITY

- 5.1 This EIA study brief is valid for 24 months after the date of issue. If the EIA study does not commence within this period, the Applicant shall apply to the Director for another EIA study brief afresh before commencement of the EIA study.

6. REPORT REQUIREMENTS

- 6.1 In preparing the EIA report, the Applicant shall refer to Annex 11 of the TM for the contents of an EIA report. The Applicant shall also refer to Annex 20 of the TM, which stipulates the guidelines for the review of an EIA report.
- 6.2 The Applicant shall supply the Director with the following number of copies of the EIA report and the executive summary:
- (i) 40 copies of the EIA report and 50 copies of the executive summary (each bilingual in both English and Chinese) as required under section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report.
 - (ii) when necessary, addendum to the EIA report and the executive summary submitted in (i) above as required under section 7(1) of the EIAO, to be supplied upon advice by the Director for public inspection.
 - (iii) 20 copies of the EIA report and 50 copies of the executive summary (each bilingual in both English and Chinese) with or without Addendum as required under section 7(5) of the EIAO, to be supplied upon advice by the Director for consultation with the Advisory Council on the Environment.
- 6.3 In addition, to facilitate the public inspection of the EIA Report via the EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA Report and the Executive Summary Report prepared in HyperText Markup Language (HTML) (version 4.0 or later) and in DynaDoc Format (version 3.0 or later) [for Chinese documents] and in Portable Document Format (PDF

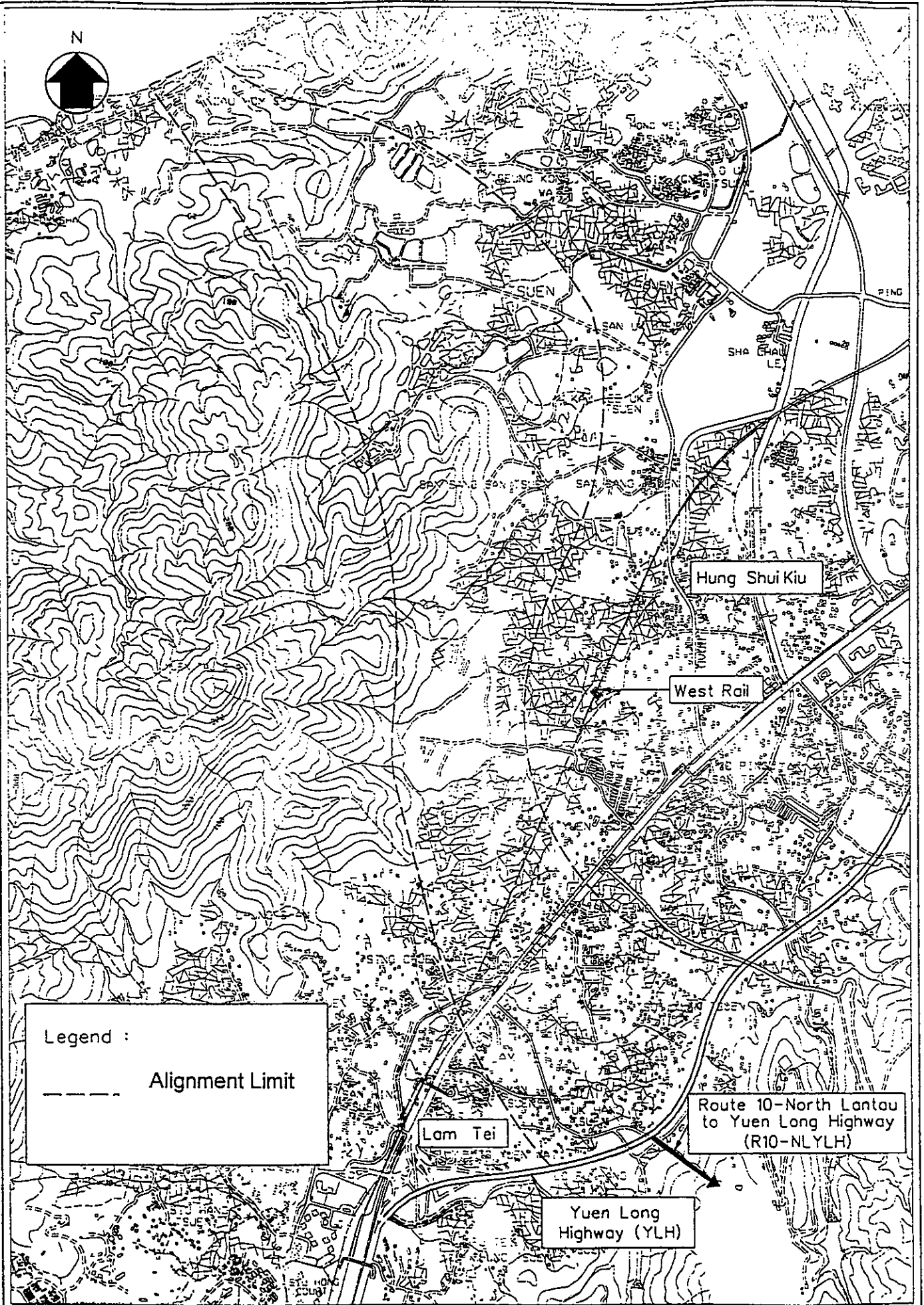
version 3.0 or later) [for English documents], unless otherwise agreed by the Director. For the HTML version, a content page capable of providing hyperlinks to each section and sub-section of the EIA Report and the Executive Summary Report shall be included in the beginning of the document, and all graphics in the report shall be in interlaced GIF format.

- 6.4 The electronic copies of the EIA Report and the Executive Summary shall be submitted to the Director at the time of application for approval of the EIA Report.
- 6.5 When the EIA Report and the Executive Summary are made available for public inspection under Section 7(1) of the EIA Ordinance, the content of the electronic copies of the EIA Report and the Executive Summary must be the same as the hard copies. The Director shall be provided with updated electronic copies.
- 6.6 To promote environmentally friendly and efficient dissemination of information, for future EM&A reports recommended by the EIA study, both hardcopies and electronic copies shall be required and their format shall be agreed by the Director.

7. OTHER PROCEDURAL REQUIREMENTS

- 7.1 During the EIA study, if there is any change in the name of the Applicant for this EIA study brief, the Applicant mentioned in this study brief must notify the Director immediately.
- 7.2 If there is any key change in the scope of the proposed project mentioned in section 3.2 of this EIA study brief and in Project Profile (No. PP-036/1998), the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA study brief can still cover the key changes, and the additional issues, if any, that the EIA study must also address. If the changes to the proposed project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply to the Director for another EIA study brief afresh.

- End -



Deep Bay Link

(Environmental Impact Assessment Study Brief No. ESB-025/1998)

Figure No.

1

IMPLEMENTATION SCHEDULE

EIA* Ref	E/M&A Log Ref	Environmental Protection Measures*	Location/Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					Des	C	O	

** All recommendations and requirements resulted during the course of EIA/EIA Process, including ACE; and/or accepted public comment to the proposed project.
Des=Design, C=Construction, O=Operation, Dec=Decommissioning