Civil Engineering Department

ROAD P1 ADVANCE WORKS AT YAM O ON LANTAU ISLAND

PROJECT PROFILE

August 2002

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1. BASIC INFORMATION

Project Title

1.1 The title of the proposed project is "Road P1 Advance Works at Yam O on Lantau Island" (hereafter referred to as the Project).

Purpose and Nature of the Project

1.2 In early 2002, the Civil Engineering Department (CED) carried out a study on the implication of the deferment of the construction of Route 10 Lantau East Coastal Section and the Pa Tau Kwu Section of Chok Ko Wan Link Road (CKWLR) to beyond 2016 on the proposed Penny's Bay development including Hong Kong Disneyland Development. The Final Study Report recommended that it would be necessary to advance the construction of a part of the Road P1 works at Yam O to ensure that a second entrance/exit is provided to and from the proposed theme park and other developments in Penny's Bay for relieving large number of park visitors during emergency situation, such as blockage of the any of the existing slip roads of the Yam O Interchange due to car accident.

1.3 The proposed Road P1 is a primary distributor extending from the Airport to Yam O, providing a parallel route to North Lantau Highway (NLH). It provides a regional access to North Lantau New Town and the airport, and also a local access to Yam O and Penny's Bay. Two slip roads at Yam O will be provided for efficient access to the Lantau Link and the proposed Yam O development. The alignment of Road P1 from Sham Shui Kok to Yam O was developed under the Northshore Lantau Development Feasibility Study (NLDFS). A Preliminary Project Feasibility Study (PPFS) Report for Road P1 between Sham Shui Kok and Yam O (hereinafter called "PPFS report") was completed in October 2001.

Name of Project Proponent

1.4 The Project Proponent is the Civil Engineering Department, Government of the Hong Kong Special Administrative Region (HKSAR).

Location and Scale of Project and History of Site

1.5 The location of the proposed Project site is shown in Figure 1. The majority part of the Project will be undertaken on reclaimed land which is located to the north of the existing North Lantau Highway. Its remaining part will be on a viaduct structure above the existing North Lantau Highway and Mass Transit Railway Corporation Ltd. (MTRC) Airport Express Line.

1.6 The scope of the Project includes the following:

(i) construction of elevated Slip Roads 5 and 6 of 2-lane carriageway with hard shoulders of about 800 metre connecting NLH to an at-grade Road P1 Roundabout at the proposed Yam O Reclamation;

(ii) construction of at-grade local distributor connections from the at-grade Road P1 Roundabout to Road P2 Roundabout north of the proposed Yam O Public Transport Interchange to be constructed under the Main Assignment;

(iii) reclamation of approximate area of 3 ha and construction of seawall for forming road embankment for (i) and (ii) above;

(iv) realignment of the existing maintenance track along the edge of existing seawall;

(v) construction of associated civil, structural, geotechnical, drainage and landscape works and associated facilities including street lighting, signage, traffic aids, traffic control and surveillance system (TCSS) including closed-circuit television (CCTV) facilities, electrical & mechanical installation and water mains/fire hydrants in connection with the roads; and

(vi) provision of environmental mitigation measures during construction and operation stages, including but not limited to landscape and visual remedies to be recommended in the Environmental Impact Assessment (EIA) study.

Number and Types of Designated Projects Covered by the Project Profile

1.7 The Project involves the construction and operation of a primary distributor, and is classified as a Designated Project under item A.1 of Part I of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499).

1.8 The Project will also involve reclamation and dredging works less than 500m from the Luk Keng Conservation Area and the proposed Lantau North (Extension) Country Park (LNECP). Such work elements are also classified as Designated Projects under items C.2 and C.12 of Part I of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) respectively.

Name and Telephone Number of Contact Person(s)

1.9 All queries regarding the project can be addressed to:

Mr. H C Tam **Senior Engineer/Project Management Branch**
Civil Engineering Department
Tel No.: 2762 5649

2. OUTLINE OF PLANNING AND IMPLEMENTATION

Responsibilities of Parties

2.1 CED is the Project Proponent with overall responsibility for the planning, design and construction of the Project. The Project Proponent has commissioned a Consultant to undertake the engineering design work and to conduct an Environmental Impact Assessment (EIA) Study for this Project. The Project will be implemented by Contractor(s) to be appointed by the Project Proponent at the subsequent stage.

Tentative Project Time Table

2.2 The proposed programme for the Project is scheduled as follows:

(a)	Detailed Design Phase	August 2002	-	October 2003
(b)	Tender Phase	November 2003	-	February 2004
(c)	Construction Phase	March 2004	-	November 2005

Interactions with Other Projects

2.3 The Project may have interaction with other projects, including but not limited to the following:

(a) Penny's Bay Reclamation, Stage 2 by Civil Engineering Department;

(b) Infrastructure for Penny's Bay Development by Civil Engineering Department;

(c) Chok Ko Wan Link Road (Penny's Bay Section) by Civil Engineering Department;

(d) Water Mains and Sewerage Works from Siu Ho Wan to Yam O by Civil Engineering Department;

(e) Yam O Tuk Fresh Water Service Reservoir by Water Supplies Department;

(f) Fire Station, Ambulance Depot and Police Post in Penny's Bay by Architectural Services Department;

(g) The Southern Section of Route 10 (North Lantau to Tsing Lung Tau Section) by Highway Department;

(h) Theme Park Development by Hongkong International Theme Parks Ltd and;

(i) Penny's Bay Rail Link by MTRC.

3. POSSIBLE IMPACT ON THE ENVIRONMENT

General

3.1 The potential environmental impacts that may arise from the construction and operation of the Project are discussed below.

Construction Phase

Air Quality

3.2 The main potential air quality impact during construction of the Project would be dust arising from construction activities including material handling, wind erosion of open sites and stockpiling areas and truck haulage on unpaved roads. Since the dredged marine mud would contain high moisture content, dust emission from dredging would be limited.

3.3 The air quality impact due to the construction of the Northshore Lantau Development was quantitatively assessed in the "NLDFS EIA Report for the Northshore Lantau Development Feasibility Study" (hereinafter called "NLDFS EIA"). The NLDFS EIA report concluded that the dust criteria would be satisfied at all air sensitive receivers with the implementation of dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulation.

Noise

3.4 Potential construction noise sources would be activities related to the use of powered mechanical equipment (PME) for the reclamation, excavation and infrastructure works. The NLDFS EIA report identified that the nearest noise sensitive receiver (NSR) would be Luk Keng Tsuen. With the recommended mitigation measures (including the use of quiet plant, the erection of noise barriers and the reduction on the number of PME usage) in place, noise levels at all NSRs would meet the daytime construction noise criteria. With the avoidance of evening works and re-scheduling of certain construction activities, noise levels at Luk Keng Tsuen were predicted to be within the evening criteria.

Water Quality

3.5 The potential water quality impact caused by the construction of the project would be related to the spreading of sediment plumes during dredging and reclamation works, and their effect on water sensitive receivers. It is expected the dredged mud would be disposed of at two potential marine disposal areas: South of Cheung Chau and East of Ninepins, which are distant from the proposed Project site. These two areas are allocated by the Marine Fill Committee for disposal of dredged material from Yam O Reclamation. The on-going Yam O Reclamation is scheduled for completion in December 2003 whereas, the proposed reclamation under this Project would commence in March 2004. Therefore, cumulative water quality impacts due to overlapping of these two projects would be therefore not anticipated.

3.6 The key issues pertinent to water pollution that would arise during the construction phase of the Northshore Lantau Development were assessed under the NLDFS EIA. The EIA reported that there would be no adverse impacts to water quality with the implementation of suitable mitigation measures. Similarly, the potential water quality impacts from land based construction activities could be readily controlled through a series of "best practice" methods to control wastewater discharges from the construction sites. The mitigation measures shall be reassessed under the EIA for this Project. Appropriate mitigation measures shall be recommended where necessary.

Waste

3.7 The management and disposal of the dredged material would follow the procedures and requirements specified in the Works Bureau Technical Circular (WBTC) No. 3/2000 Management of Dredged/Excavated Sediment, and a Marine Dumping Permit would be obtained. The amount of other construction wastes such as land excavated material and general refuse would be limited and normal waste management practices would be implemented.

Terrestrial Ecology

3.8 The potential impacts on the habitats as well as the flora and fauna in the study area of this Project were assessed under the NLDFS EIA.

3.9 Part of the proposed Road P1 advance works would be undertaken on reclaimed land. Based on the findings of the NLDFS EIA, direct loss of terrestrial habitat of high ecological value as a result of this Project would not be anticipated. Two habitats of conservation interest were recorded at Luk Keng in the NSLDFS EIA Report, including a small patch of secondary woodland of moderate species diversity which supported the restricted plant species *Vitis balanceana* and *Thespesia populnea*; and a small mangrove (about 0.5ha) at the entrance to Yam O Bay. These habitats are of low ecological value due to the previous disturbance.

Marine Ecology

3.10 The impact on marine ecology in the North Lantau area was evaluated in the NLDFS EIA. There would be a potential loss of soft bottom benthic habitat, sloping artificial seawalls and mudflat within Yam O Wan as a result of the proposed reclamation works. The NLDFS EIA report concluded that these habitats were considered to be of low ecological value, and the marine ecological impact would be acceptable.

Fisheries

3.11 Potential impact on fisheries resources in relation to direct loss of habitat and /or elevated suspended sediment levels due to reclamation works was assessed in the NLDFS EIA. The EIA report concluded that unacceptable impacts on the capture and culture of fisheries resources from contaminant release during dredging would not be expected. The cumulative water quality impacts on fisheries due to overlapping of this project and the Yam O Reclamation project would not be anticipated as mentioned in Item 3.5.

Cultural Heritage

3.12 A marine geophysical survey of the proposed reclamation area at Yam O was undertaken by CED in 1999. A subsequent detailed diver survey of the proposed reclamation area was conducted by a marine archaeologist in 2000 for further detailed investigation. The surveys confirmed that no significant marine archaeological deposits were identified in the seabed of the Yam O reclamation area. Based on the findings as reported in the NLDFS EIA, adverse cultural heritage impact would not be anticipated.

Landscape and Visual Impact

3.13 The NLDFS EIA report assessed that the landscape impact during construction phase would be indirect as the works is predominantly on reclaimed land and significant visual impact is not expected.

Operation Phase

Air Quality

3.14 The major air pollutants arising from the operation stage of the Project would be vehicle exhaust emissions including nitrogen dioxide (NO_2) and respirable suspended particulates (RSP). The potential impacts of the Project were assessed in the NLDFS EIA which concluded that the Hong Kong Air Quality Objectives (AQO) would be met at all ASRs.

Noise

3.15 Potential operation noise impacts on NSRs were assessed in the NLDFS EIA Report. Traffic noise impacts from the proposed Road P1 and its associated slip roads, together with the existing North Lantau Highway were assessed. Direct mitigation measure in the form of roadside vertical barrier of 5-m noise barrier along waterfront promenade of Yam O Wan were recommended to alleviate the potential noise impact on sensitive receivers. With the implementation of the proposed mitigation measures, adverse noise impact due to the Project would not be expected. The mitigation measures recommended by the NLDFS EIA shall be examined in details, and appropriate control measures shall be recommended for adoption where necessary.

Water Quality

3.16 Potential impacts to the change of hydrodynamic regime and water quality due to the Northshore Lantau Development reclamation were assessed in the NLDFS EIA report using computational modelling. The hydrodynamic modelling predicted that the reclamations for the Northshore Lantau Development would not cause major changes in tidal current patterns. Along the northern shore of Lantau Island it was determined that the current speeds in the vicinity of the remainder of the Yam O bay would be significantly reduced due to the formation of an embayment, which could cause impacts to water quality. The NLDFS EIA also reported that the stormwater system would be designed to mitigate the potential water quality impact by diverting polluted stormwater discharges away from the Yam O bay.

3.17 The area to be reclaimed under this Project would be about 3ha, which would be considered small as compared with the area to be reclaimed under the Northshore Lantau Reclamation project which was estimated to be around 65ha. Given the small size of reclamation area for this advance works for the proposed Road P1, insurmountable water quality impact as a result of this Project would not be expected. The mitigation measures recommended by the NLDFS EIA should be examined in details, and appropriate control measures should be recommended for adoption where necessary.

Ecology

3.18 Operation phase impacts to marine ecological resources may occur through disturbances to water quality due to changes in the hydrodynamic regime of the area or due to polluted discharges into the marine environment. Based on the NLDFS EIA report, it was expected that all discharges would comply with the Water Pollution Control Ordinance (WPCO) discharge standards and consequently marine resources would be protected from impacts. Minor changes in local hydrodynamic regime were predicted although these would not be expected to alter water quality to an extent that marine ecological resources would be affected.

3.19 Potential operational impacts to terrestrial ecology have been assessed under the NLDFS which concluded that the impact would not be insurmountable. No major impacts to the proposed Lantau North (Extension) Country Park or Luk Keng Conservation Area are anticipated.

Fisheries

3.20 The NLDFS EIA report predicted that the reclamation on the northern shore would have minimal effects on tidal discharge through main channel flows. Discharge of stormwater and run-off would satisfy the WPCO requirements and adverse fisheries impact was not predicted.

Cultural Heritage

3.21 Cultural heritage impact during operational stage is not expected.

Landscape and Visual Impact

3.22 The NLDFS EIA report indicated that the loss of natural coastline is less significant as the existing coastline is generally man-made by reclamation for the North Lantau (NLH) Corridor. No significant visual impact would be resulted as existing environment of the study area is surrounded by roads and viaducts.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 The project site is situated adjacent to the North Lantau Highway. A theme park is being constructed at Penny's Bay and the associated infrastructure networks including Penny's Bay Rail Link and Chok Ko Wan Link Road (CKWLR) are being constructed to the south of the site. A tourism area gateway, public transport interchange, tourism and recreation related uses are planned in the Yam O Reclamation and Northshore Lantau Reclamation. A sewage pumping station is proposed at the Yam O Interchange.

4.2 Luk Keng Tsuen, located at about 300m from the proposed project site, would be the nearest noise and air sensitive receivers. The development of the Yam O area would introduce future sensitive receivers during the operational phase.

4.3 The project site is within the North Western Water Control Zone.

4.4 The proposed Lantau North Country Park Extension which is mainly covered with grasses and scattered shrubs lies within 500m of the proposed works. The Luk Keng Conservation Area also lies within 500m of the proposed works area. The area has a relatively natural environment including tall shrub/woodland, a small mangrove stand, and natural coastline.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

Air Quality Impact

5.1 The NLDFS EIA report predicted that the criteria for dust would be satisfied at the air sensitive receivers with the implementation of dust control measures stipulated in the *Air Pollution Control (Construction Dust) Regulation*. Specific mitigation measures and environmental monitoring and audit (EM&A) requirement would be required to be identified where necessary in the EIA Report.

5.2 The potential operation phase air quality impacts of the Project were quantitatively assessed in the NLDFS EIA report. The relevant HKAQOs would be satisfied. Further mitigation measures to alleviate traffic emission from the project would be considered not necessary.

Noise Impact

5.3 Construction noise impacts arising from the reclamation and infrastructure works for the North Lantau were assessed in the NLDFS EIA report. The following mitigation measures may be required:

- ? good site practice;
- ? selecting quiet plant;
- ? use of temporary and movable noise barrier;
- ? restriction on the usage of operating PME and;
- ? restriction on evening works.

5.4 Noise impacts arising from the implementation of the Project were quantitatively assessed under the NLDFS EIA report. Direct mitigation measures, such as erecting 5-m noise barrier along Road P1 near the waterfront promenade of Yam O Wan would be required to alleviate the predicted noise impact at the NSR to meet noise standards. With the implementation of mitigation measures, the NLDFS EIA report concluded that the noise impact due to the operation of the proposed Road P1 would not be insurmountable.

5.5 This EIA Study will review the assumptions made in the NLDFS EIA report.

Water Quality Impact

5.6 The NLDFS EIA report concluded that there would be no adverse impact on water sensitive receivers from the reclamation works. Mitigation measures would involve specifying the operational constraints in terms of rates of working, methods of construction and sequence of construction, and implementing 'best practice' working methods.

5.7 According to the NLDFS EIA report, operation phase water quality at the mouth of the bay would be acceptable. Mitigation measures would include the prevention of polluted discharges into the bay by diversion of any polluted stormwater.

Waste Management Implications

5.8 Appropriate measures for handling of dredged/excavated sediment would be implemented, e.g.

- ? minimizing exposure to any contaminated material by the wearing of protective gear, providing adequate hygiene and washing facilities, and prevent eating during dredging/ excavation;
- ? any contaminated sediment dredged should not be allowed to stockpile on the site and should be immediately removed;
- ? all vessels for marine transportation of dredged sediment should be fitted with tight fitting seals to their bottom openings to prevent leakage of materials; and
- ? loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges or hoppers should under no circumstances to be fitted to a level which will cause other overflowing of materials or polluted water during loading or transportation.

5.9 The management and disposal of dredged sediment would be in accordance with the WBTC 3/2000 requirements.

5.10 The exact contamination levels of the dredged material will be determined and exact mitigation measures will be proposed in this EIA report.

Landscape and Visual

5.11 The NLDFS EIA report concluded that the landscape and visual intrusion could be minimised by careful design of highway and road structures, provision of landscape planting, special design/placement of columns and signage and control of lighting. Proper use of hoarding during construction phase would also alleviate the visual impact arised.

6. USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1 Two previously approved EIA reports are relevant to this Projects:

- The Schedule 3 EIA Report for the *Northshore Lantau Development Feasibility Study*, Reference No 040/2000 and approved on 28 April 2000 with conditions (see EIAO Register on EPD web site);
- EIA Report for *Construction of an International Theme Park in Penny's Bay of North Lantau together with its Essential Associated Infrastructure*s, Reference No 041/2000 and approved on 28 April 2000 with conditions (see EIAO Register on EPD web site).

6.2 Potential environmental impacts from the projects including air quality, noise water quality, solid waste management, terrestrial ecology, marine ecology, fisheries impacts, hazard to life, cultural heritage, land contamination were assessed for the North Lantau area as a whole under the previously approved EIA reports.

6.3 Of the two approved EIA reports as mentioned in Item 6.1, only the Schedule 3 EIA Report for the *Northshore Lantau Development Feasibility Study* covered the Project. However, this EIA Study was only a Schedule 3 Study and was considered not in sufficient details for directly applying environmental permit for the Project. Therefore, a Schedule 2 EIA Study is proposed to provide an assessment of the construction and operation phase environmental impacts of this Project, with reference to the above-mentioned approved EIA reports.

7. SUMMARY OF IMPACTS TO BE ASSESSED

7.1 The environmental impacts arising from the construction and operation stages of the Project are summarized in the following tables.

Table 7.1 Summary of Environmental Issues arising from the Construction Phase of the Project

Key Environmental Issues		Remarks
Construction Phase		
Air Quality	? Construction dust	? To be assessed under this EIA.
Noise	? Powered mechanical equipment	? To be assessed under this EIA
Water Quality	? Construction site runoff, possibility of resulting in increased suspended solid levels and turbidity if control measures are not implemented.	? To be assessed under this EIA. ? The impact due to Northshore Lantau development including the proposed works under this Project was previously assessed in NLDFS EIA. Additional water quality modelling will not be necessary.
Waste Management Implications	? Construction and demolition waste ? Workforce waste	? To be assessed under this EIA.
Ecological	? No direct terrestrial ecological impact anticipated. ? Potential loss of soft bottom benthic habitat, sloping artificial seawalls and mudflat within Yam O Wan as a result of the reclamation works	? To be assessed under this EIA.
Fisheries	? No impact anticipated.	? Previously assessed under the NLDFS EIA.
Cultural Heritage	? No impact anticipated.	? Previously assessed under the NLDFS EIA.
Landscape and Visual	? No landscape impact. ? Access of construction vehicles and plants.	? To be assessed under this EIA.

Table 7.2 Summary of Environmental Issues arising from the Operation Phase of the Project

Key Environmental Issues		Remarks
Operation Phase		
Air Quality	? Vehicle emissions	? Previously assessed under the NLDFS EIA
Noise	? Adverse traffic noise not expected.	? Previously assessed under the NLDFS EIA.
Water Quality	? Runoff from road surfaces. ? Water quality within the Yam O Bay after reclamation.	? Previously assessed under the NLDFS EIA. ? Not practicable to conduct a detailed quantitative assessment for the advance works proposed under this Project.
Waste Management Implications	? No impact anticipated	? Previously assessed under the NLDFS EIA.
Ecological	? Potential loss of soft bottom benthic habitat of low ecological value. ? Impact expected to be acceptable.	? To be assessed under this EIA.
Fisheries	? No impact anticipated	? Previously assessed under the NLDFS EIA.
Cultural Heritage	? No impact anticipated	? Previously assessed under the NLDFS EIA.
Landscape and Visual	? Extension of coastline along north of NLH corridor ? Viaducts over existing NLH corridor	? To be assessed under this EIA.

Figures

鹿頸
LUK KENG

陰澳灣
YAM O BAY

P1號公路迴旋處
ROAD P1 ROUNDABOUT

P2號公路迴旋處
P2 ROUNDABOUT

P2號公路
ROAD P2

地區幹路
LOCAL DISTRIBUTOR

北大嶼山公路 NORTH LANTAU HIGHWAY

翔東路 CHEUNG TUNG ROAD

高架連接路五和六
ELEVATED SLIP ROADS 5 & 6

現有之陰澳連接路一至四
EXISTING YAM O SLIP ROADS 1 TO 4

圖例
LEGEND :

P1號公路前濱段的前期工程的工程範圍
SITE BOUNDARY OF ROAD P1 ADVANCE WORKS AT YAM O

擬建填海 (約3公頃)
PROPOSED RECLAMATION (ABOUT 3ha)

CA 保護區
CONSERVATION AREA

土木工程署
Civil Engineering Department

擬建工程地點位置圖
PROJECT SITE LOCATION PLAN

MAUNSELL CONSULTANTS ASIA LTD.

Figure 1 圖一

PRELIMINARY

Maunsell