

# **CONSTRUCTION OF A TEMPORARY HELIPAD AT YUNG SHUE WAN, NORTH LAMMA**

## **PROJECT PROFILE (FINAL)**

**August 2003**

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## 1 BASIC INFORMATION

### 1.1 Project Title

1.1.1 ‘Construction of a Temporary Helipad at Yung Shue Wan, North Lamma’.

### 1.2 Purpose and Nature of the Project

#### *Purpose*

- 1.2.1 The proposed temporary helipad is required mainly for transporting residents in areas of North Lamma to urban areas for medical treatment in emergency situations, pending the development of a permanent helipad to serve the local community.
- 1.2.2 The previous Yung Shue Wan helipad – located on a soccer pitch outside the North Lamma Clinic – ceased operation in May 1998 when the Government Flying Service (GFS) classified the Site to a Category 1 Landing Site.<sup>†</sup>
- 1.2.3 Since this time there has been no permanent, dedicated helipad serving the local community. The community presently must use the helipad at The Hongkong Electric Co. (HEC) Ltd’s Lamma Power Station – a distance of 2.75 km and a typical trip time of around 20 minutes by mini-ambulance from the North Lamma Clinic.\* The local community has raised its concerns over this current situation.
- 1.2.4 In the first six months of 2003 (1<sup>st</sup> January to 30<sup>th</sup> June) there have been 76 ‘casevac’ (casualty evacuation) flights flown by GFS using the HEC Lamma Power Station helipad.
- 1.2.5 Public consultation was held in early 2003 to consider the location and construction method of a permanent helipad at Yung Shue Wan. Given the urgency for an easily accessible helipad, and with public support, the Administration decided to investigate the feasibility of constructing and operating a temporary helipad as an interim measures before the permanent helipad site becomes available.

#### *Nature*

- 1.2.6 This Project involves the construction of a helipad for emergency use on existing reclaimed land at Yung Shue Wan, North Lamma.
- 1.2.7 The construction of the temporary helipad and associated access road requires only minor modifications to the existing formed site. No dredging or other marine works are required for the construction of the Project.

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<sup>†</sup> Landing Site Categorization: Category 1 – “Sites that tend to be located in an urban or congested area and which have no clear approach and departure paths. A helicopter landing at these sites places both 3<sup>rd</sup> parties on the ground and the helicopter and its occupants at risk, if the helicopter were to suffer a major mechanical or engine failure during the approach or departure phase of flight.”

\* Travel time provided by Department of Health official in telecon on 13<sup>th</sup> January 2003.

- 1.2.8 The helipad footprint will have a diameter of 25 metres, and will be surrounded by a concrete perimeter apron up to 7.5 metres wide. A 2.5 metres wide by 50 metres long concrete access road will link the helipad with the existing surfaced road. Further details are provided in *Section 1.4*.

### 1.3 Name of Project Proponent

- 1.3.1 Islands District Office, Home Affairs Department of the HKSAR Government.

### 1.4 Location of Project, Scale of Project and History of Site

#### *Location and Site History*

- 1.4.1 The proposed temporary helipad is to be located on reclaimed land at Kam Lo Hom (North), Yung Shue Wan, North Lamma, as shown by *Figures 1a* and *1b*.

#### *Scale of Project*

- 1.4.2 The construction of the temporary helipad and access road requires only minor modifications to the existing formed site. The works and equipment to be used is as follows:

#### Helipad footprint

- (i) Surface excavation of 625m<sup>2</sup> (25m x 25m) of the existing formed site to a depth of 425 mm.
- (ii) Placement of 225 mm deep of granular fill material (sub-base).
- (iii) Placement of 200 mm thick concrete cast *in-situ*, with mesh reinforcement.
- (iv) Paint touchdown markings to GFS specifications to guide helicopter landing.

#### Access road footprint

- (i) Surface excavation of 125m<sup>2</sup> (2.5m x 50m) of the existing formed site to a depth of 425 mm.
- (ii) Placement of 225 mm deep of granular fill material (sub-base).
- (iii) Placement of 200 mm thick concrete cast *in-situ*, with mesh reinforcement.

#### Helipad perimeter

- (i) Surface excavation of approximately 717m<sup>2</sup> of the existing formed site to a depth of 75 mm.
- (ii) Placement of cast *in-situ* concrete up to 7.5 metres wide around the helipad footprint.

#### Construction Equipment

- (i) Mini lorry (construction materials and equipment delivery).

- (ii) Mini excavator (shallow surface excavation).
- (iii) Concrete mixer and Vibratory poker (surfacing works).
- (iv) Mechanical saw (reinforcement material cutting).

1.4.3 There will be no site lighting to guide helicopter landing (i.e., the helicopter will use its own lights).

## **1.5 Name and Telephone Number of Contact Persons**

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Tel.: 2852 4316; Fax: 2815 2291  
E-mail: dois@had.gov.hk

## **1.6 Number and Types of Designated Projects covered by the Project Profile**

1.6.1 The Project is ‘Designated’ under Item B.2, Schedule 2 of the EIA Ordinance by virtue of: “A helipad within 300m of existing or planned residential development”.

## **1.7 Estimated Cost**

1.7.1 The estimated cost for construction would be HK\$ 0.8M.

## **2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

2.1.1 The planning and implementation programme for the Project is as follows:

- Planning / Approvals and Design                      June to September 2003
- Construction    October to November 2003
- Helipad Operation    November 2003 to October 2004

2.1.2 The temporary helipad would cease operation when the construction works for the permanent helipad commence. Operation of the temporary helipad beyond commencement of the construction of the permanent helipad is not possible due to flight safety concerns posed by tall construction plant / equipment. The permanent helipad will be located approximately 50 metres north of the proposed temporary helipad site.

## **3 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT**

### **3.1 General Environs**

3.1.1 The proposed temporary helipad site is located at Kam Lo Hom north, at the southwest of Yung Shue Wan, North Lamma.

3.1.2 The site is located approximately 190 metres due south of the Yung Shue Wan ferry pier. The nearest occupied building within direct line of sight to the temporary helipad is village housing approximately

300 metres to the northeast. Further details are provided in *Section 4.1*.

- 3.1.3 The nearest building to the proposed site is the Refuse Transfer Station (RTS) that is located approximately 100 metres to the northeast. The North Lamma Clinic is located approximately 350 metres (by ground travel) to the southeast of the proposed site [*Figure 2* refers].

### **3.2 Immediate Environs**

- 3.2.1 The proposed site is at the foot of a steep-sided vegetated valley. Geotechnical Engineering Office of the Civil Engineering Department (CED) has advised that no natural terrain hazard mitigation measures immediately behind the site are required for the purposes of temporary helipad operation. There are several derelict residences on the slope, but no residents in the immediate vicinity.\* Ruins are also located south of the site.
- 3.2.2 As confirmed by the latest approved Outline Zoning Plan (OZP), there is no planning intention for residential use in the immediate vicinity of the Project.
- 3.2.3 At the foot of the valley behind the site there is a stormwater drainage channel, as displayed by *Figure 1a*. Care will be taken to ensure no excavated material is transported into this channel.
- 3.2.4 The land at the site is flat and at an elevation of around 4.9 mPD. There is a sloping seawall approximately 200 metres long fronting the reclamation area, with a landscaped planter wall around 0.75 metres high that provides a solid barrier between the site and the sloping seawall. The planter wall will not be affected by the construction of the temporary helipad.

## **4 POSSIBLE IMPACTS ON THE ENVIRONMENT**

### **4.1 Noise**

- 4.1.1 Baseline Conditions: Lamma Island is one of the HKSAR's outlying islands with no major road network. Therefore there are no major road traffic related noise issues. However, it is observed from site visits that there are motorized carts travelling on access routes within the Yung Shue Wan area that may generate potential noise impacts affecting the residences living along the routes. Yung Shue Wan is a popular tourist attraction and the noise environment is dominated by general human activities and regular ferry activities at Yung Shue Wan Ferry Pier. In general, human activities are likely more during daytime and become less towards nighttime.
- 4.1.2 The majority of the developments along the coast of Yung Shue Wan are residential type village houses, varying from single to 3 storeys high. Some of these buildings are used for commercial purposes on the ground floor, e.g., grocery store and restaurant, and are used as residences on the floors above. The first tier buildings, i.e., those with a direct line of sight to the proposed helipad, will likely be most affected by noise originating from the helipad site, but they provide shielding to the second tier buildings. The natural topography at Kam Lo Hom provides shielding to the buildings located around the existing football field, and completely blocks the line of sight to the buildings located south of the football field, which are laterally closest to the helipad site.

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\* Derelict status confirmed by DO memo ref. (45) in IS 80/8/02, dated 17<sup>th</sup> December 1997.

- 4.1.3 Based on site visits and desktop study findings, the closest noise sensitive receiver (NSR) with a direct line of sight to the helipad footprint is No. 67 Yung Shue Wan Main Street (NSR6), which is an existing village house located about 300 metres from the helipad site. This is considered as the worst-case NSR as it is not shielded and will thus be directly affected by helicopter noise generated at the helipad.
- 4.1.4 A village house to the north of NSR6, namely, No. 54 Yung Shue Wan Main Street (NSR5), has also been assessed. There are village houses located south of NSR6 that are laterally closer to the helipad, but which are screened / partially screened by the topography of Kam Lo Hom. These include North Lamma Clinic (NSR3) and No. 108 Yung Shue Wan Main Street (NSR4), which is a residential house.
- 4.1.5 The cluster of buildings near the ferry pier also has a direct line of sight to the helipad, of which the North Lamma Public Library (NSR2) is the closest to the helipad footprint at about 330 m. The North Lamma Public Library is also closest to the possible helicopter flight path to / from the helipad. In addition, a village house at O Tsai (NSR1) has been selected as a representative residential type NSR.
- 4.1.6 The selected representative NSRs are summarised in Table 4.1. *Figure 2* illustrates the locations of representative NSRs around Yung Shue Wan. The horizontal distances between the site and NSRs are presented under each of the noise sub-section headings.

**Table 4.1 Location of NSR Assessment Points in Yung Shue Wan**

NSR Assessment Point	NSR Location	Number of storeys	Ground Level (mPD)	Land Use
NSR1	Village House at O Tsai	3	20.0	Residential
NSR2	North Lamma Public Library	1	4.0	Library
NSR3	North Lamma Clinic	1	3.3	Clinic
NSR4	No. 108 Yung Shue Wan Main Street	3	3.2	Residential
NSR5	No. 54 Yung Shue Wan Main Street	3	4.3	Residential
NSR6	No. 67 Yung Shue Wan Main Street	1	3.2	Residential

#### *Construction Noise*

- 4.1.7 Construction Phase: During the construction phase of the helipad, Powered Mechanical Equipment (PME) used for the helipad construction will generate potential noise impacts upon the nearby NSRs. There will not be any construction activities during restricted hours.
- 4.1.8 Noise arising from construction for designated projects during the non-restricted periods, i.e., between 07:00-19:00 hours of any days not being a Sunday or general holiday, is assessed with reference to the noise criteria listed in Table 1B of Annex 5 of the EIA-TM, which are summarized in *Table 4.2*. These criteria shall be met as far as practicable according to Annex 5 of the EIA-TM.

**Table 4.2 Recommended Construction Noise Levels (Non-restricted Hours)**

Noise Sensitive Receiver Uses	Noise Levels $L_{eq(30\text{ min})}$ dB(A)
All domestic premises including temporary housing accommodation, hotels and hostels	75
Schools	70 (normal school hours) 65 (during examination periods)

4.1.9 Based on the equipment inventory as described in *Section 1.4* of this Project Profile, as confirmed by the project proponent, the likely PME to be used for construction and their corresponding sound power levels are summarised in *Table 4.3*.

**Table 4.3 Powered Mechanical Equipment used for Construction of Helipad**

ID Code*	Description	Sound Power Level, dB(A)	No. PME
CNP141	Lorry	112	1
CNP081	Excavator	112	1
CNP045	Concrete Mixer (electric)	96	1
CNP170	Poker, vibratory, hand-held	113	1
CNP203	Saw / groover, concrete (petrol)	115	1
<b>Total Sound Power Level</b>		<b>119</b>	<b>-</b>

Note: \* PME code from TM on Noise From Construction Work Other than Percussive Piling

4.1.10 The predicted construction noise levels are summarised in *Table 4.4*.

**Table 4.4 Construction Noise Levels at NSRs**

NSR ID	Horizontal distance separation to NSP, m	Sound Pressure Level with Distance Correction @ NSR dB(A)	Topography Correction dB(A)	Façade Correction dB(A)	Predicted Noise Level @ NSR dB(A)
NSR1	324	61	0	3	64
NSR2	278	62	0	3	65
NSR3	205	63	0	3	68
NSR4	169	67	0	3	70
NSR5	263	63	0	3	66
NSR6	239	64	0	3	67

Note: NSP – Notional Source Position

4.1.11 The predicted construction noise levels arising from the construction of helipad upon the nearby NSRs are lower than or equal to 70 dB(A) which comply with the relevant criteria under the EIAO-TM. Therefore, no construction noise mitigation is required.

#### *Helicopter Noise*

4.1.12 Operation Phase: The proposed temporary helipad at Yung Shue Wan shall be designated for ‘casevac’ (casualty evacuation) operations flown by the Government Flying Service (GFS). Helicopter noise will be generated when the helicopter is approaching and departing the helipad, and when it is manoeuvring

on and over the helipad (i.e., hovering over the helipad; touchdown on the helipad; idling on the ground; and lift-off from the helipad surface to achieve a hover).

- 4.1.13 As the helipad at the HEC Lamma Power Station is approximately 700 metres southwest of the proposed temporary helipad, and as the HEC helipad is infrequently used, cumulative helicopter noise impacts are not anticipated.
- 4.1.14 According to Table 1A, Annex 5 of the EIAO TM, helicopter noise impacts shall be assessed in terms of the  $L_{max}$  level – the maximum instantaneous sound pressure level at the noise sensitive receiver. The stipulated noise standard of helicopter noise (between 07:00 and 19:00 hours) for different uses are summarised in *Table 4.5*.

**Table 4.5 Helicopter Noise Standards for Planning Purposes**

Uses	Helicopter Noise $L_{max}$ dB(A) 07:00 to 19:00 hours
<ul style="list-style-type: none"> <li>- All domestic premises including temporary housing accommodation;</li> <li>- Hotels and hostels</li> <li>- Educational institutions including kindergartens, nurseries and all others where unaided voice communication is required</li> <li>- Place of public worship and courts of law</li> <li>- Hospitals, clinics, convalescences and home for the aged, diagnostic rooms, wards</li> </ul>	85
<ul style="list-style-type: none"> <li>- Offices</li> </ul>	90

Notes: (1) The above standards apply to uses that rely on opened windows for ventilation.

(2) The above standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

- 4.1.15 Since all the identified NSRs are distant from the helipad, helicopter noise can be considered as a ‘point’ source. Therefore, the sound pressure level at NSRs can be evaluated based on standard acoustic principles of a point source, i.e., the sound pressure level in any direction (in the open) will decrease at a rate of 6 dB per doubling of distance away from the source. In another words, the difference in noise levels at two different distances,  $r_1$  and  $r_2$ , can be calculated using the following formula:

$$20 \log_{10} \left( \frac{r_2}{r_1} \right)$$

- 4.1.16 It is expected that GFS would use the ‘EC155B1’ helicopter model for ‘casevac’ operations at Yung Shue Wan. Noise source terms, i.e., the  $L_{max}$  at a given distance, of each operation mode of this helicopter model have been provided by GFS. On-site noise measurements were also conducted to supplement the noise source terms data.
- 4.1.17 The International Civil Aviation Organization (ICAO) has stipulated noise standards for helicopters for different flying modes, including ‘approach’, ‘take-off’ and ‘flyover’ (i.e., the maximum noise level [in EPNdB] used as the noise certification standards adopted by the Council of ICAO). These are summarized in *Table 4.6*, with test noise measurement points for each flying mode illustrated in *Appendix 4.1*. *Table 4.6* also presents the Demonstrated Noise Level data for the ‘EC155 B1’ as tested by the helicopter manufacturer (i.e., the noise level for that helicopter type measured by the manufacturer in accordance with standard technical procedures in the ICAO noise certification).

**Table 4.6 Helicopter Noise Data for EC155 B1**

Reference Measurement Configurations	ICAO Maximum Noise Level EPNdB	Demonstrated Noise Level EPNdB
Approach	97.9 (84.9)	95.7 (82.7)
Take-off	96.9 (83.9)	92.2 (79.2)
Flyover	95.9 (82.9)	88.9 (75.9)

Notes: Data provided by GFS.

Figures in brackets are the  $L_{max}$  values.

$L_{max} = EPNdB - 13$ , with reference to "Transportation Noise Reference Book, Butterworths, 1987"

- 4.1.18 Based on the given noise data in *Table 4.6*, the ‘approach’ mode (when the helicopter is airborne with lateral movements) generates the highest noise level. Accordingly, the helicopter noise assessment makes reference to the ICAO standard for the approach mode that represents the worst-case scenario.
- 4.1.19 According to GFS Helipad Specification Guidelines, the helicopter approach and departure trajectory will be projected at an 8% slope within 245 metres from the edge of the helipad. Beyond 245 metres the slope increases to 12.5%. GFS has advised that the approach and departure angle is within the sector of 270-340 degrees from the centre of the helipad, as illustrated by *Figure 2*. Accordingly, the closest distance between the airborne helicopter and the identified NSR (on the top floor) can be measured and used for evaluating the noise levels.
- 4.1.20 The ICAO standards do not include standards for helicopter manoeuvring on and over the helipad, i.e., hovering, touchdown, idling (with rotors on) and lift-off. As such, on-site noise survey of the ‘EC155 B1’ helicopter model was conducted to simulate manoeuvring on and over a helipad. The  $L_{max}$  noise level was measured, and measurements were made at the far-field region. Details of the noise survey are given in *Appendix 4.2*. The  $L_{max}$  noise level measured has been used to assess the worst-case scenario.
- 4.1.21 It was found that the  $L_{max}$  noise level is less when the helicopter is idling (with rotors on) on ground and the  $L_{max}$  noise level is the greatest when the helicopter is ascending vertically in the air without lateral movements. *Table 4.7* displays the measured  $L_{max}$  noise levels.

**Table 4.7 Measured  $L_{max}$  Noise Levels at Chek Lap Kok**

Measurement Configurations (Reference distance: 150m)	EC155 B1
Helicopter on ground, Idling	80.0
Helicopter in the air, lift-off mode	87.7

- 4.1.22 The evaluation of the helicopter noise during manoeuvring is thus based on the maximum  $L_{max}$  noise level of the helicopter over the helipad and the horizontal distance separation between the helipad and identified NSRs.
- 4.1.23 *Table 4.8* summarises the calculated  $L_{max}$  noise levels at the identified NSRs. Details of the calculation, including terrain cross-sections relevant for noise level calculations for NSR3 and NSR4 are provided in *Appendix 4.3*.

**Table 4.8 Helicopter Noise Levels at NSRs due to Helicopter Manoeuvring at the Helipad**

NSR ID	Horizontal distance separation to centre of Helipad (metres)	$L_{max}$ @ NSR * dB(A)	Topography Correction # dB(A)	Façade Correction dB(A)	Corrected $L_{max}$ @ NSR dB(A)
NSR1	375	80	0	3	83
NSR2	330	81	0	3	84
NSR3	247	83	-10	3	76
NSR4	214	85	-10	3	78
NSR5	325	81	0	3	84
NSR6	299	82	0	3	85

Note:

\* Calculated with reference to measured  $L_{max}$  at reference distance of 150m (Appendix 4.2 refers).

# By standard acoustic principles, if the noise source is totally screened such that none will be visible when viewed from any façade of the NSR, a negative topography correction of 10 dB(A) shall be applied.

- 4.1.24 Regarding helicopter approach mode, the projected worst-case trajectory of the approach path (i.e., closest to the NSR), is at the bearing of 340 degrees to the centre of the proposed temporary helipad. NSR1, NSR2 and NSR3 will be most affected during helicopter approach.
- 4.1.25 Table 4.9 displays the calculated  $L_{max}$  noise levels based upon the closest slant distance between the helicopter and the NSR (on the top floor), with calculations based on the ICAO maximum noise level of  $L_{max}$  84.9dB(A) (i.e., the worst-case scenario). Details of the calculations are provided in Appendix 4.3.

**Table 4.9 Helicopter Noise Levels at NSRs due to Helicopter Approaching to the Helipad**

NSR ID	Slant distance between helicopter & NSR (metres)	$L_{max}$ @ NSR dB(A)	Façade Correction dB(A)	Corrected $L_{max}$ @ NSR dB(A)
NSR1	224	80	3	83
NSR2	211	80	3	83
NSR3	247	80	3	82
NSR4	214	76	3	83
NSR5	330	76	3	79
NSR6	299	77	3	80

\* Calculated with reference to ICAO maximum noise level at reference distance of 120m.

- 4.1.26 The evaluation results in Table 4.8 and Table 4.9 show that the worst-case  $L_{max}$  noise levels during helicopter manoeuvre over the helipad and during approach, respectively, comply with the 85 dB(A) limit.

## 4.2 Waste Management

- 4.2.1 Baseline Conditions: The proposed site comprises reclaimed land and is generally flat. There is no existing development at the site and only minor debris present. There has been no fly tipping on the site.
- 4.2.2 Construction Phase: Construction will require minor surface excavation. With reference to the design

details presented in *Section 1.4*, the approximate volume of excavated soil will be 373m<sup>3</sup>.

- 4.2.3 It is noted that in agreement with Fire Services Department (FSD), the access road to the helipad has been reduced from a standard width of 3.5 metres to 2.5 metres. This has reduced the works area by 50m<sup>2</sup> and has reduced the volume of excavated soil by approximately 21m<sup>3</sup>.
- 4.2.4 The excavated soil will be managed in accordance with requirements for the control of surface run-off as set out in the ProPECC PN 1/94 on ‘Construction Site Drainage’ [*Section 5.2* refers].
- 4.2.5 Small quantities of packaging materials (e.g., plastic wrapping) may be generated during the construction phase. It will be necessary to ensure such waste material is properly removed from the site for reuse/recycling or disposal at landfills, particularly as such materials and any other loose debris could pose a safety hazard during operation of the helipad (i.e., ‘wind-blown’ by the helicopter).
- 4.2.6 The generation of chemical wastes (e.g., oils, fuel and batteries) is not anticipated from construction plant / equipment, or from the helicopter during operation of the helipad. In any case, good site practice measures are proposed in *Section 5.2*.
- 4.2.7 Operation Phase: The proposed temporary helipad is required mainly for transporting residents in areas of North Lamma to urban areas for medical treatment in emergency situations. There will be no personnel permanently stationed at the helipad to maintain the site. Therefore, no significant environmental issues are anticipated.

### 4.3 Air Quality (Dust)

- 4.3.1 Baseline Conditions: The existing site is not surfaced, although the soil is well compacted and there are no existing dust problems.
- 4.3.2 Construction Phase: Given the small scale of the works and the absence of Air Sensitive Receivers (ASRs) in the immediate vicinity of the site, no impacts from wind-blown dust are anticipated. However, good site practice measures should be implemented as referred in *Section 5.3*. Implementation of the control measures by the Contractor for waste management would also control construction dust [*Section 5.2* refers].
- 4.3.3 Operation Phase: Blown dust from the helicopter lift-off and touchdown may cause a localised nuisance to users of the helipad. Measures to address this are provided in *Section 5.3*.

### 4.4 Water Quality

- 4.4.1 Baseline Conditions: EPD’s marine water quality data (year 2001) for the two closest routine monitoring locations to Yung Shue Wan reveals a general compliance with the Water Quality Objectives (WQOs) for bottom and depth-averaged dissolved oxygen and depth-averaged Unionised Ammonia. There has been consistent non-compliance with the WQO for Total Inorganic Nitrogen in the broader area that is indicative of influences from Pearl River discharge rather than any local discharge.\* Despite the effect of the Pearl River discharge upon the nutrient status of the West Lamma Channel, the marine water quality in the broader area is good.

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\* EPD (2001). Marine Water Quality in Hong Kong in 2000. Monitoring Section, Water Policy & Planning Group, EPD. November 2001.

- 4.4.2 The water quality adjacent to the sloping seawall is considered to be good (i.e., well flushed) as indicated by the presence of a hard coral community [*Section 4.6* refers].
- 4.4.3 Construction Phase: Surface excavation during the construction works will generate a volume of approximately 373m<sup>3</sup> soil. Although the works will be undertaken from October 2003 when weather conditions are generally dry and hence most favourable for excavation works, the excavated soil will need to be properly handled to ensure there are no water quality impacts from surface run-off should there be any rainfall.
- 4.4.4 In particular, good practice measures will need to be implemented to ensure there is no siltation in the storm drain at the back (the hill side) of the site from surface run-off. Such measures are presented in *Section 5.2*, with supplementary good practice measures for water pollution control as recommended by EPD provided in *Section 5.4*.
- 4.4.5 There would be no opportunity for direct surface run-off into coastal waters due to the presence of the landscaped planter that separates the site from the sloping boulder seawall.
- 4.4.6 Given the scale and duration of the construction works, there will be no sewerage impacts from the construction workforce (likely to be only a few workers). The generation of liquid chemical waste such as fuel and oil is not anticipated from the works.
- 4.4.7 Operation Phase: No significant environmental issues are anticipated.

## 4.5 Ecology / Fisheries

### *Terrestrial Ecology*

- 4.5.1 Baseline Conditions: The proposed site is not vegetated, being relatively recently reclaimed land. There is however a well vegetated valley leading up the hill at the back of the site. This vegetated area and adjacent inter-tidal habitat were surveyed in March 2003.
- 4.5.2 The terrestrial habitat is largely undisturbed and supports a diverse tree community – part of a continuous habitat up the hill slope. There is evidence of past cultivation, with ornamental plants and a few small banana groves still present. However, most tree species are native. There are also sizable bamboo stands present. Due to its naturalness and size, the wooded area also supports a range of butterflies and birds although no species of conservation note were recorded during survey work, and no bird nesting sites were observed.
- 4.5.3 Construction Phase: There site is barren so there will be no vegetation removal. No significant environmental issues are anticipated.
- 4.5.4 Operation Phase: It is anticipated that birds will temporarily avoid helicopter disturbance when the helipad is in use. Therefore, no significant environmental issues are anticipated.

### *Marine Ecology / Fisheries*

- 4.5.5 Baseline Conditions: The coastal waters immediately adjacent to the proposed site were surveyed in April 2003. The dive survey reported that the substrate off the sloping seawall largely comprises silty marine muds overlain with occasional granite boulders. The benthic community in this area was confined to the boulder habitat, with typical hard community taxa such as bryozoans, encrusting

sponges, mussels and barnacles present.

- 4.5.6 Of some note was the discovery of 15 species of hard coral from four families growing only on the sloping boulder seawall. All the hard coral species recorded in the community are common in the HKSAR, with the dominant family being the Faviidae. The corals were present in numerous isolated sub-massive and encrusting colonies, with most growing on the upper surface of large boulders (i.e., boulders typically with a surface area  $> 1.0\text{m}^2$ ) typically in a depth range of -1.5m to -2.0m CD. The distribution of hard corals was scattered but uniform along the length of the wall.
- 4.5.7 Associated with the seawall coral community were other typical hard community taxa, such as fish, bryozoans, encrusting sponges, mussels and barnacles. All of the species observed are commonly found at hard shore habitats throughout the HKSAR.
- 4.5.8 Construction Phase: As there is no dredging or other marine works involved in the proposed Project, there will be no direct loss of coastal / marine habitat, and no direct impacts on the coral community. As regards potential indirect impacts, there is some potential for impacts on water quality and the marine ecosystem, and particularly corals, from the discharge of silty surface run-off. However, with the implementation of good practice measures for waste management and water quality control as summarised in *Section 5.2* and *Section 5.4* respectively, adverse indirect impacts are not anticipated. The key measures to ensure there will be no impacts on marine ecology are summarised in *Section 5.5*.
- 4.5.9 Operation Phase: No significant environmental issues are anticipated.

## **4.6 Landscape & Visual**

- 4.6.1 Baseline Conditions: The site is already formed, and presently bare and unvegetated. The site is devoid of any features except the landscaped planter wall above the sloping seawall that is to be retained.
- 4.6.2 The site is currently zoned ‘Other Specified Uses’ (‘OU’) on the latest OZP for the area, and all works would be restricted to within this zoning. The vegetated land behind the site is zoned ‘Green Belt’ (‘GB’) and would not be affected by the Project. Public consultations were conducted in early 2003 and no landscape / visual concerns related to the development were raised by the local community.
- 4.6.3 Due to the distance and its location, the site is not easily visible to users of the Yung Shue Wan ferry pier, while ferry passengers can only view the temporary helipad site from a distance. The ground at the site is generally visible only to residents living up on the hill to the northeast of the ferry pier.
- 4.6.4 Construction Phase: There will be no major construction works. It is considered that the proposed surfacing works, that will occupy  $1,470\text{m}^2$  of waterfront area on existing reclaimed land, would only visually improve the site. It is also intended that the remainder of the reclaimed land around the proposed helipad, helipad perimeter and access road shall be hydroseeded for visual enhancement.
- 4.6.5 Operation Phase: It is considered that the proposed surfacing works would only visually improve the site. Furthermore, the helipad will not be lit at night-time, and no glare impact is expected. There will be no tall structures (e.g., light poles, flag poles, etc.) above ground at the site. As such no significant environmental issues are anticipated. As above, the remainder of the reclaimed site that will not be developed under the Project shall be hydroseeded for visual enhancement.

## 4.7 Cultural Heritage

4.7.1 Baseline Conditions: As the proposed site and the access road leading to the site are recently reclaimed land, there are no sites of archaeological or cultural heritage value in the vicinity. The closest archaeological site is 150 metres away and the closest building of cultural heritage value is 200 metres from the site.

4.7.2 Construction Phase: No cultural heritage issues are anticipated.

4.7.3 Operation Phase: No cultural heritage issues are anticipated.

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

### 5.1 Noise

5.1.1 Construction Phase: The worst case noise level generated from the construction of helipad will comply with the  $L_{eq}$  75 dB(A) limit, and no adverse construction noise impact is anticipated

5.1.2 Operation Phase: The worst case noise level generated from the 'EC155 B1' helicopter will comply with the  $L_{max}$  85 dB(A) limit, and no adverse helicopter noise impact is anticipated.

### 5.2 Waste Management

5.2.1 Construction Phase: Measures to control surface run-off as set out in the ProPECC PN 1/94 on 'Construction Site Drainage' that shall be implemented throughout the works are as follows:

- The works will not be undertaken during the rainy season (April – September).
- As a precaution against surface run-off, sand bags will be placed along the edge of the existing stormwater drain to avoid siltation.
- Excavated areas will be compacted and subsequent surface protection works completed carried out soon after excavation is complete.
- Excavated soil will be stockpiled and covered with a protective tarpaulin or similar if rainfall is anticipated and at the end of each workday.

5.2.2 The waste generated by the construction (including mainly surplus soil and packaging materials) shall be removed by reputable waste collectors for recycling or reuse as far as practicable. If recycling or reuse of waste cannot be identified, packaging materials shall be disposed of at approved Government Landfills.

5.2.3 Operation Phase: No significant environmental issues are anticipated.

### 5.3 Air Quality (Dust)

5.3.1 Construction Phase: The measures outlined in the Air Pollution Control (Construction Dust) Regulation shall be implemented to control dust to an acceptable level.

5.3.2 In addition, and as referred in *Section 5.2* above, all excavated areas will be compacted and subsequent surface protection works completed carried out soon after excavation is complete. Excavated soil will be stockpiled in a designated area and covered, or otherwise transported off-site for proper disposal / re-use.

5.3.3 Operation Phase: In order to control potential environmental impacts and nuisance during the operation of the helipad, the design has specifically included the placement of concrete paving around the helipad perimeter. It is also intended that the remainder of the reclaimed land around the proposed helipad, helipad perimeter and access road be hydroseeded. These measures, combined with the hard surface of the temporary helipad and access road, will ensure there are no dust-related issues of concern during operation of the helipad. The design of this measure is summarised in *Section 1.4* under “Helipad perimeter”.

#### 5.4 Water Quality

5.4.1 Construction Phase: In addition to the surface run-off control measures stipulated in ProPECC PN 1/94 on ‘Construction Site Drainage’ as summarised under *Section 5.2* above, the following clause shall be incorporated into tender and contract documentation for the works:

- The Contractor shall not discharge directly or indirectly or cause or permit or suffer to be discharged into any stormwater drain or sea any trade effluent or foul or contaminated water without the prior written consent of the Engineer in consultation with the Director of Environmental Protection and Director of Water Supplies.

5.4.2 Operation Phase: No significant environmental issues are anticipated.

#### 5.5 Ecology / Fisheries

##### *Terrestrial Ecology*

5.5.1 Construction Phase: No significant environmental issues are anticipated.

5.5.2 Operation Phase: No significant environmental issues are anticipated.

##### *Marine Ecology / Fisheries*

5.5.3 Construction Phase: The waste management and water quality control measures outlined in *Sections 5.2* and *Section 5.4* shall be properly implemented to avoid discharge of silty surface run-off from the works area into coastal waters, and thus avoid potentially adverse impacts on marine sensitive receivers – particularly the hard coral community on the sloping boulder seawall.

5.5.4 In particular, the following points are of note:

- As a precaution against surface run-off, sand bags will be placed along the edge of the existing stormwater drain to avoid siltation.
- There is a solid concrete planter wall between the site and the sloping seawall that offers extra security against direct surface run-off to the coastal waters.

5.5.5 As such, with the implementation of the above measures in conjunction with those measures for waste management and water quality control, no adverse impacts on marine ecology are anticipated.

5.5.6 Operation Phase: No significant environmental issues are anticipated.

## **5.6 Landscape & Visual**

5.6.1 Construction Phase: No significant environmental issues are anticipated. In any event, as good practice, it is intended that the remainder of the reclaimed land around the proposed helipad, helipad perimeter and access road shall be hydroseeded for visual enhancement.

5.6.2 Operation Phase: While no significant environmental issues are anticipated, it is intended that the remainder of the reclaimed land around the proposed helipad, helipad perimeter and access road shall be hydroseeded for visual enhancement.

## **5.7 Cultural Heritage**

5.7.1 Construction Phase: No cultural heritage issues are anticipated.

5.7.2 Operation Phase: No cultural heritage issues are anticipated.

## **6 USE OF PREVIOUSLY APPROVED EIA REPORTS**

6.1.1 There is no previously approved EIA report for the project or for a project of similar nature.