# 6. Ecology and Cultural Heritage

## 6.1 Ecology

### 6.1.1 Introduction

6.1.1.1 In the EIA Report, although there is no special requirement about EM&A program for the ecological impact of this project, predicted the substantial impact on the ecosystem in the vicinity, site inspection is required to ensure the mitigation measures are fully implemented.

### 6.1.2 Mitigation Measures

6.1.2.1 For the loss of the 3ha of secondary woodland, it is recommended that the extent of cut slope along Butterfly Valley to be investigated further at the following Design and Construct stage to explore further options to minimise the loss of secondary woodland and stream habitat. There is approximately 3 ha cut/fill slope area within the boundary of cut slope and alignment in Butterfly Valley available as shown in *Figure 7.7a* and *Figure 9.9a* of the EIA Report, and has been recommended for compensatory tree planting. Tree species used for planting should take reference of the species in the surrounding and, using native species as far as possible.

6.1.2.2 Woodland loss and corresponding compensation due to the section from West Kowloon to Sha Tin of Route 16 has been stated in the previous EIA report. However, it has been confirmed with Highways Department that more area is identified available for compensatory replanting in Ching Cheung Road Interchange and Pak Shek area. For completeness, the entire Route 16 alignment is considered and the total woodland loss and compensation is summarised in *Table 6.1a.* Their locations are shown in *Figure 7.7b* and *7.7c* respectively in the EIA report.

***Table 6.1a Summary on Woodland Loss and Compensation for the Entire Route 16 Alignment***

| Location of woodland loss | Area of loss (ha) | Location of compensatory replanting | Area of compensation (ha) |
|---|---|---|---|
| Butterfly Valley | 3 | Cut/fill slopes at Butterfly Valley | 3 |
| Ventilation Building & Toll Plaza in Shatin | 5.6 | Ching Cheung Road Interchange | 2.5 |
| | | Wai Man Tsuen | 1 |
| | | Pak Shek area | 5 |
| Total | 8.6 | | 11.5 |

6.1.2.3 To compensate for the permanent stream habitat loss, approximately 450 m long of future drainage channel is recommended to be designed and constructed to mimic natural stream habitats (see *Figure 7.7d* in the EIA report for location). The created stream course should have natural substrate so as to provide suitable habitats for the colonization of stream invertebrates. The stream habitat will be restored partly by natural silting due to flow from upper stream. Selected substratum should resemble the existing stream conditions and large granite boulders may be placed at the upstream section so that these boulders will be weathered naturally to smaller pebbles and finer particles, forming natural stream substrate. In addition, stream fauna from upper stream will colonise lower stream naturally after stream re-creation. The habitat creation aims to provide and maintain high quality stream habitat, in particular with the removal of village areas which are sources of pollution. A schematic

cross-section of the re-created stream is shown in *Figure 7.7e* in the EIA report. Details of the natural drainage channel design to provide stream habitats will be developed in the following Design and Construct Stage.

6.1.2.4 Stream sedimentation during construction should be prevented by erection of sediment barriers and operation of stilling ponds in the streams within the project limit.

6.1.2.5 A tree survey should be conducted during the subsequent detailed design stage, in accordance with the technical requirements of the *Works Branch Technical Circular* (WBTC) No. 24/94 & *Planning Environment and Lands Branch Technical Circular* (PELBTC) No. 3/94 on *Tree Preservation*, for the Tree Felling Application, which will also form the basis for the compensation planting recommended above.

6.1.2.6 Given the proximity of the secondary woodland to the boundary of the proposed alignment, it is also recommended that the following good practice be adopted during the construction phase to avoid any unnecessary impact due to uncontrolled construction activities:

- the woodland area to be encroached upon by the development should be well-defined and minimised;
- fences should be erected along the boundary of construction sites before the commencement of works to prevent tipping, vehicle movements, and encroachment of personnel into adjacent wooded areas, particularly near the two rare/protected plant species (location see *Figure 7.4a*);
- regular checks should be made to ensure that the work site boundaries are not exceeded and that no damage caused to the surrounding areas;
- if there is any loss of the adjacent woodland because of the temporary landtake during the construction phase, the area should be returned to the original status immediately after completion of the road construction by on-site tree replanting, using tree species recommended as above; and
- wild and uncontrolled open fires should be strictly prohibited within the work site boundary, and appropriate fire control measures should be provided for preventing potential fire damage to the woodland area.

6.1.3 Site Inspection

6.1.3.1 Site inspection checklist should be developed to check the performance of the Contractor.

## 6.2 Cultural Heritage

6.2.1 Introduction

6.2.1.1 Although there is no direct impact identified at the historic buildings within the study boundary of this project, the Contractor is responsible for ensuring the structural integrity of the historic buildings in Tin Sam Village and within Lai Chi Kok Hospital would not be affected by the construction of the Route 16. As discussed in Section 3.4, construction noise monitoring will be carried out at Lai Chi Kok Hospital to ensure that the noise level of construction works complies with the criteria of the NCO and other adopted noise criteria.

6.2.2 Mitigation Measures

6.2.2.1 No direct air impacts to the LCK Hospital are expected. However, environmental control and mitigation measures stipulated in *Air Pollution Control (Construction Dust) Regulation*, are

required to limit the dust emission from the site. Mitigation measures are summarised in Table 6.2a below.

6.2.2.2 With the use of appropriate mitigation measures, no construction noise impact on the LCK Hospital is expected. As discussed in section 3.15, the combination of 3m to 5 m noise barriers have been proposed which would ensure the new Route 16 alignment does not further deteriorate the future noise environment on the LCK Hospital. The proposed mitigation measures are summarised in Table 6.2a below.

***Table 6.2a Summary of Mitigation Measures for LCK Hospital***

| Issues | Mitigation Measures |
|---|---|
| Construction dust | • any excavated dusty materials or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet;<br>• a stockpile of dusty materials should not extend beyond the pedestrian barriers, fencing or traffic cones;<br>• vehicle washing facilities should be provided at every exit point;<br>• the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;<br>• where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit;<br>• every main haul road should be sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet;<br>• the portion of any road leading only to a construction site that is within 30 m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials;<br>• any stockpile of dusty materials should be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet;<br>• all dusty materials should be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;<br>• every vehicle should be washed to remove any dusty materials from its body and wheels immediately before leaving a construction site; and<br>• the working area of any excavation should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet. |
| Construction Noise | • use of quiet PME;<br>• reducing the number of each type of PME to one ; and<br>• use of low vibration piling methods such as bored piling |
| Operational Noise | • 5m high roadside noise barrier located on the western side of the northbound carriageway of LCKV (opposite LCK Reception Centre Staff Quarters);<br>• 3m high roadside noise barrier located on the western side of the southbound carriageway of the LCKV (opposite LCK Reception Centre Staff Quarters);<br>• 3m high roadside noise barrier located on the southern side of Slip D; and |

| Issues | Mitigation Measures |
|---|---|
| | • 3m to 3.5m high roadside noise barrier located on the southern side of Slip E. |
| | • |

6.2.2.3 To ensure the structural integrity of the historic buildings within Lai Chi Kok Hospitals and Tin Sam Village, visual inspection and structural survey are recommended prior to the commencement of the construction works. A piezometer would also be installed in Butterfly Valley to monitor any change in ground water table during construction.

6.2.3 Inspection Survey And Ground Water Table Monitoring

6.2.3.1 Visual inspection of the 5 historic buildings in Tin Sam Village and the historic buildings within Lai Chi Kok Hospital shall be conducted prior to the commencement of the construction. All structural defects that could be identified during the visual inspection shall be recorded. In addition, structural inspection survey for the above historic buildings shall be made in quarterly interval. Critical structural members, such as main beams and columns shall also be included in the quarterly inspection. Future inspection record will be copied to AMO for record. Measurement of vibration would also be carried out on a need basis during the piling work.

6.2.3.2 A piezometer shall also be installed in Butterfly Valley to monitor any change in ground water table during construction. The measurement shall be made twice a month during construction. Records of monitoring will be copied to AMO for record.