

**Landscape Proposal**  
**For Route 9 – Sha Tin Heights Tunnel and Approaches**

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## **Landscape Proposal**

### **For Route 9 – Sha Tin Heights Tunnel and Approaches**

#### **1. Background**

An Environmental Permit for the Contract No. ST89/02 in respect of the construction and operation of Route 9 between Cheung Sha Wan and Sha Tin-Entrusted Portion was issued on 4 October 2001 and placed in the EIA Ordinance Register, based on the following approved EIA documents

- (1) *Route 16 Investigation Assignment*
  - *Environmental Impact Assessment Final Assessment Report (January 1998) (Register No. EIA-135/BC) [Hereinafter referred to as the “1998 EIA Report”]*
  - *Environmental Monitoring & Audit Manual (January 1998) [Hereinafter referred to as the “1998 EM&A Manual”]*
- (2) *Route 16 Investigation Assignment*
  - *Alternative Alignment Environmental Impact Assessment Final Assessment Report (August 1999)(Register No. AEIAR-022/1999)[Hereinafter referred to as the “1999 EIA Report”]*
  - *Environmental Monitoring & Audit Manual (August 1999)[Hereinafter referred to as the “1999 EM&A Manual”]*
- (3) *The Director’s letter of approval of the 1999 EIA Report dated 5 November 1999 ref (25) in Ax(1) to EP2/N1/A/24 Pt.3*
- (4) *Environmental permit application documents for the Main Portion, including all attachments submitted by Highways Department on 20 August 2001 (Application No. AEP-103/2001).*
- (5) *Environmental Permit issued on 17 September 2001 for the Main Portion (Permit No. EP-103/2001).*
- (6) *Environmental permit application documents for the Entrusted Portion including attachments, submitted by the Permit Holder on 6 September 2001 (Application No. AEP-104/2001) [Hereinafter referred to as the “the Application”].*

## Conditions of Environmental Permit

Clause 1.7 of the Part C (Permit Conditions) of the Permit requires ....

*The Permit Holder shall ensure that the Project is designed, constructed and operated in accordance with the information and all recommendations described in the 1998 EIA Report (Register No. EIA-135/BC), the 1999 EIA Report (Register No. AEIAR-022/1999), the 1998 EM&A Manual, the 1999 EM&A Manual, and the Application (Application No. AEP-104/2001); or mitigation measures described in this Permit, or mitigation measures to be recommended in submissions that shall be deposited with or approved by the Director as a result of permit conditions contained in this Permit, or mitigation measures to be recommended under on going surveillance and monitoring activities during all stages of the Project. Where recommendations referred to in the documents of the Register are not expressly referred to in this Permit, such recommendations are nevertheless to be implemented unless expressly excluded or impliedly amended in this Permit.*

Clause 2.4 of the Part C (Permit Conditions) of the Permit requires ....

*The Permit Holder shall, at least 8 weeks before commencement of any construction work causing any loss of woodland, submit to the Director for approval 3 sets of landscape proposals as recommended in Section 8.6.5 and the implementation schedule of the Environmental Review Report dated September 2001 attached to the Application. The landscape proposals shall include plans of scale 1 to 1000 or other appropriate scale as agreed by the Director. With a view to further minimizing ecological impacts, the proposals shall show the compensatory replanting areas for permanent woodland loss and reinstated areas for temporary woodland loss (with the size of compensation area clearly stated in hectares), and shall include a design document for the toll plaza illustrating efforts to further minimize ecological impacts. The proposals shall also include an implementation programme for these works, with clear identification of the responsibility for implementation, management and maintenance of landscape mitigation measures for these works. All measures recommended in the approved proposal(s) shall be fully implemented in accordance with the details and time schedule set out in the submission. No construction work causing any loss of woodland shall commence without the approval of the proposals.*

The Planting Plans have been commented and approved by the following Government Departments.

- AFCD – letter ref (53) in AFGR DVL 14/47/4 dated 16 April 2002
- LCSD – letter ref. (3) in LCS 1/HQ 752/77(5)X dated 17 April 2002
- DLO/ST – letter ref. (13) in LND/ST/152 Pt. 20 dated 25 April 2002
- HyD/Landscape Unit – letter ref. ( ) in HyDT/12/13/49 dated 16 May 2002

The Tree Survey Report has been approved by the following Government Departments.

- DLO/ST – letter ref. (43) in L/M(3) to LNT 309/2RN/59 dated 22 May 2002
- AFCD – letter ref (54) in AFGR DVL 14/47/4 dated 16 April 2002
- LCSD – letter ref (65) in L/M(8) in LCS 5/HQ 429/60 dated 15 May 2002

## 2. **Landscape Proposal**

### 2.1 Landscape Design

This document summarises the design efforts to minimise ecological impact. As identified in the Environmental Review Report (September 2001), the Sha Tin section of the route alignment is of relatively low ecological value, the potential ecological impact caused very limited. No country park or other designed areas for conservation will be influenced by this section of Route 9.

The ecological impact related to the construction of the Toll Plaza is primarily associated with the loss of secondary woodlands and natural stream courses, in turn, affecting wildlife habitat directly and indirectly in the Project area. The existing woodland covering the work areas of the Toll Plaza would mostly be affected during the construction phase. Therefore, considerable ecological impact arising from the woodland within the Project boundary was identified. On the other hand, the impacts to stream habitats were not substantial as the ecological value of stream courses within Toll Plaza and Pak Shek areas were limited.

### 2.2 Technical Circulars and Guidelines

The landscape proposal was designed based on the following technical circulars and guidelines:

- WBTC No. 25/93 – Control of Visual Impact of Slope;
- WBTC No. 18/98 – The Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS);
- WBTC No. 7/2002 – Tree Planting in Public Works;
- WBTC No. 14/2002 – Management and Maintenance of Natural Vegetation and Landscape Works and Tree Preservation;
- HyDTC No. 10/2001 – Visibility of Directional Signs;
- GEO Publication 1/2000 – Technical Guidelines on Landscape Treatment; and Bio-engineering for Man-made Slopes and Retaining Walls.
- WBTC No. 17/2000 – Improvement to the Appearance of Slopes.
- EIAO Guidance Notes 8/2002 – Preparation of Landscape and Visual Impact.

### 2.3 Designed Mitigation Measures

The engineering designs have focussed on the impact minimisation in the detailed design of the Route 9 project with a view to minimising the impacts on the terrestrial ecology in accordance with para. 3.4.4.3 of the 1998 EIA Report and Table 8-6-1 of the Environmental Review Report dated September 2001 (ERR) as highlighted below:

- (i) The detailed design of the toll plaza and ancillary facilities has achieved a smaller land intake with the following design modifications:
  - a reduction of 2 toll lanes (from 20 to 18) as indicated in the attached Drg. no. 94099/ENT/01028.
  - a revised layout of administration building, car park and ancillary facilities on a reduced footprint.
- (ii) Haul routes are aligned to avoid disturbance to streamcourses by providing a temporary bridge.
- (iii) Temporary woodland loss during construction will be reinstated in the new formed slope formation.

In addition, mitigation measures have been stipulated in the construction works for compliance by the Contractor during the construction phase. In summary the mitigation measures for impact minimisation are summarised as follows:

(i) During Construction Phase:

- Erection of decorative screen hoarding particularly in areas adjacent to existing developments.
- Preservation wherever possible of existing trees and transplanting wherever practical of trees affected by the Works.
- Avoidance of human interference to woodland trees and streams beyond the works area by providing temporary fence at Toll Plaza as illustrated on Fig 1.
- Erection of sediment barrier to minimise stream sedimentation at downstream of the project boundary of the Toll Plaza as illustrated on Fig. 1.
- Regular checks will be carried out to ensure that the work site boundaries are not transgressed, hoarding is properly maintained and that no damage is being caused to the surrounding areas.
- Storage of materials and plant will be limited to areas less visible to receivers.
- Control of night-time lighting.
- Stripping, storing and re-use of topsoil.

The above mitigation measures shall be implemented by the Contractor under the Contract.

(ii) During the Operational Phase:

- To minimise land-take of toll plaza and approach roads and interference with the existing topography and vegetation.
- Sensitive design of retaining walls (e.g. reinforced earth structures) with shrub planting at their bases and top and climbing plants at their base (OM2, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7203 and 7204.
- Careful grading on man-made slopes to enable extensive woodland planting. In addition to the man-made slopes, woodland planting also provided on undisturbed ground at Pak Shek area (OM3, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7203 and 7204.
- Around tunnel north portal, steep cut slopes with soft landscape treatment (OM4, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7203.
- Retaining structures provided around tunnel south portal so as to minimise land-take and interference with the existing vegetation. For details refer to Drg. No. 60398/7201 and 7202.
- Sensitive architectural treatment of elevated road structures, including parapets, columns and under side of road decks (OM5, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7501 to 7504.
- Sensitive architectural design of noise barriers, with soft landscape screening where appropriate (OM6, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7508 and 7509.
- Screen tree planting and soft landscape treatment along realigned sections of Che Kung Miu Road (OM7, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7205.
- Sensitive architectural treatment of the RC full enclosure, including all associated structures such as escape staircases (OM8, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7204 and 7507.

- Soft landscape treatment to the top and sides of the RC full enclosure on the Approach Road carriageway (OM9, Table 8-6-1 of ERR). For details refer to Drg. no. 60398/7204.
- Additional retaining walls provided along the RC full enclosure to give a softer terraced appearance.

Sensitive architectural treatment of retaining structures, elevated road structures including parapets and columns, noise barriers and RC full enclosure have been discussed and approved by ACABAS on 7 September 2001 via their letter ref. in HYDT 4/1/287(M)VII.

#### 2.4 Planting Plan

The planting plans with maintenance responsibilities are shown in the following drawings:

<u>Drawing No.</u>	<u>Description</u>
60398/7201 to 7205	Planting Plan
63098/7206	Planting Schedule
60398/SK/472 to 476	Maintenance Responsibilities for Planting Plan

### **3. Ecological Mitigation - Woodland Planting**

The requirement for Woodland Compensation is stated under - Ecological Mitigation Table 7.1 of the 2001 Environmental Review Report. A summary table 'Table A' showing the area of woodland loss, area of compensation and reinstated area for temporary woodland loss under the current scheme as compared to the previous EIA, EIA Review and Environmental Review Reports for both portions of Route 9 is attached in Appendix 1. The figures presented in 'Table A' including the compensatory replanting areas for permanent woodland loss and reinstated areas for temporary woodland loss are required under the Permit Conditions. Permanent woodland loss is the loss of woodland due to forming the carriageway, rock slopes, or other permanent structures. Temporary woodland loss is the temporary loss of woodland occurring during construction phase which will be compensated upon completion of works by replanting of woodland species on the affected areas. It should be noted that the areas of woodland loss mentioned in the previous EIA reports include both permanent loss and temporary loss at Butterfly Valley. However at Toll Plaza, temporary woodland loss is not included in the calculation of the area of woodland loss. Drawings (Drg. No. SK46 & SK47) indicating the location of woodland loss area, and area of compensation and reinstatement are also attached in Appendix 1.

#### **3.1 Woodland Loss**

The design approach, as stated in Section 2 of this proposal, has been to minimise the extent of disturbance of existing woodland areas as far as possible. To this end, the footprints of the works including the toll plaza and the slope works have been designed to minimise the overall landtake for the works. As shown in Table A, the woodland loss at Toll Plaza has been reduced from 5.6 ha to 5.32 ha by reduction of two toll lanes and rearranging the car park and ancillary facilities as recommended in the 1998 EIA Report. Although the EIA Report also recommended to integrate the portal building and administration so as to further reduce the landtake for Toll Plaza, it is considered cost ineffective and not efficient for such arrangement. It should be noted that the footprint of the administration building has been designed to be optimum for the operation of the tunnel including siting of the operating staffs, control panel and toll collection system.

#### **3.2 Woodland Compensatory Planting & Reinstated Temporary Woodland Loss**

Woodland compensatory plantings and reinstated plantings for temporary loss are proposed as shown in Drawing nos. 60398/7201 to 7205. Reinstatement of temporary woodland loss will be established on all newly formed soil cut and embankment slopes. Also areas around the perimeter of newly formed slopes that are anticipated to be undisturbed by the works within which infill planting of woodland trees would be possible.

The EIA Reports (January 98 and August 99) stated there would be 5 ha of woodland compensatory planting at Pak Shek. Referring to Figure 3.4d of EIA Report (January 98), the 5 ha was based on, at the time of writing of EIA Reports, the assumption that compensatory planting is to be achievable by infill planting / replanting the available areas downhill of Tai Po Road at Pak Shek. However, during the detailed design (several years later), the available areas for woodland compensatory are much less than as identified in the EIA Reports because most of the areas are either already filled with trees or slopes too steep for planting.

A joint site visit at Pak Shek Area was conducted by the Landscape Architect, Engineer and the ET on Friday 20th September 2002 to explore further opportunities to maximise the areas available for compensatory tree planting within the site boundary. Two additional areas were identified in which compensatory tree planting is suitable. The sum of additional area is approximately 0.23 ha. The total compensatory woodland planting area can be achieved at Pak Shek is 1.87 ha.

The detailed breakdown of the various forms of compensation planting for both portions of Route 9 that can be achieved is shown in Table B attached in Appendix 1.



#### 4. Compensatory Tree Planting

The numbers of trees to be felled are based on the separate Tree Surveys prepared for the Main and Entrusted Portions, and are shown in Table C attached in the Appendix 1.

The recommendation for Compensation Tree Planting is described in para. 9.8.23 of the 1999 EIA report which states that subject to further studies during the detailed design stage (para. 9.8.15), “existing woodland cleared by construction activity will also be replaced at a ratio of a least twenty trees planted for every tree felled”. According to the latest tree survey results, it was revealed that the existing tree density in the areas where infill planting was originally proposed is very much higher than that expected when the EIA was done in 1999. Hence, the room of infill planting has been reduced.

However, Government Recommended planting density for woodland (Tree Planting and Maintenance in HK - SILTech 1991) is at a rate of between 2,500 and 4445 no. of plants per hectare (2000mm and 1500mm spacing respectively). Current practice accepts up to 10,000 plants per hectare (1000mm spacing).

For the whole Route 9 Project, the available compensatory and reinstated areas of 14.16ha, planted at 1000mm spacing, 141,600 nos of woodland trees can be planted in the available areas.

Based on the total number of trees lost (ref. columns (1) in Table C) of 33,718 for the whole Route 9 Project, the compensation planting represents a compensation ratio of 4.20:1.

Regarding the secondary woodland areas, the estimated number of trees to be felled (ref. column (2) in Table C) is 21,281, the compensation planting represents a compensation ratio of 6.65:1. It should be noted that this ratio represents the maximum practicable replanting ratio.

**5. Implementation Programme**

The proposed landscape mitigation measures will be implemented by Territory Development Department under two separate contracts of namely Contract No. ST 89/02 – Route 9 – Sha Tin Heights Tunnel and Approaches and Contract No. ST 79/02 – Road T3 and Associated Roadworks as shown on Drawing Nos. 60398/7201 – 7206. The contract period for Route 9 from November 2003 to May 2006 and T3 from December 2003 to June 2006. The woodland and amenity planting will be planted as early as possible (with a condition of not affecting or being affected by the construction works) such that there will be a longer period for the establishment of the woodland within the construction period.

The management and maintenance authorities for the landscape works are shown on the **Maintenance Responsibilities for Planting Plan** (Drawing nos.60398/SK/472 to 476).