

Sha Lo Tung Development Company Ltd
沙羅洞發展有限公司

Pilot Project for Public - Private
Partnership Conservation Scheme,
Sha Lo Tung Valley, Tai Po
大埔沙羅洞公私營界別合作
自然保育試驗計劃

Project Profile
工作項目簡介

May 2009
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Environmental Resources Management
21/F Lincoln House
Taikoo Place 979 King's Road
Island East Hong Kong
Telephone 2271 3000
Facsimile 2723 5660

www.erm.com

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檔案

For and on behalf of ERM-Hong Kong, Limited 香港環境資源管理顧問有限公司
Approval by 批核: <u>Dr Robin Kennish 簡樂文博士</u>
Signed by 簽署: <u></u>
Position 職位: <u>Director 董事</u>
Date 日期: <u>4th May 2009 二零零九年五月四日</u>

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1 BASIC INFORMATION

1.1 PROJECT TITLE

Pilot Project for Public - Private Partnership Conservation Scheme, Sha Lo Tung Valley, Tai Po (hereafter "the Project").

1.2 PURPOSE AND NATURE OF THE PROJECT

This Project responds directly to the former Environment, Transport and Works (ET&W) (now Environment) Bureau's invitation to submit proposals for areas selected as potential "pilot projects" for "Public-Private partnership" schemes under the Government's New Nature Conservation Policy announced in November 2004. The conservation objectives incorporated in the Project are directed at conservation, ecological enhancement, sustainable use and education. The landowner's commitment to these objectives is achieved through management and funding obligations provided by development concessions located in non-sensitive parts of the statutory plan area (Outline Zoning Plan No. S/NE-SLT/4). With 96% of the private land within the Valley owned by the Sha Lo Tung Development Company Ltd (SLTDC), the commitment of Green Power and co-operation of Government, such a partnership can be established immediately to start early conservation action within the Valley and provide a basis for sustainable management over the long term. The Project identifies three critical reasons for endorsement of a pilot priority project within the Sha Lo Tung Valley under the new conservation policy as detailed below.

1.2.1 *The Valley is Accorded High Priority for Nature Conservation and Management*

In the announcement of the New Nature Conservation Policy on 12 November 2004, the Environment, Transport & Works Bureau (ETWB) (now Environment Bureau) identified that the Sha Lo Tung Valley scored 2.7 out of 3.0 on the Bureau's scoring of ecologically important sites in Hong Kong. This places the Valley as No.2 in the ranking of the twelve most ecologically important sites in Hong Kong. The streamcourse and riparian habitats have been the subject of many local and international specialist studies and the ecological significance of the area is reflected in the Outline Zoning Plan (No. S/NE-SLT/4) which states "the primary planning intention is to conserve the areas of ecological significance, to preserve the natural landscape, to promote conservation and to maintain the rural character of the area". The Project will protect the habitats through active management and hence protect the dragonfly habitats, while preventing anthropogenic threats such as the use of four wheel drive vehicles, wargames and vegetation removal and undesirable natural succession which are unfavourable to the existing wildlife.

1.2.2 *Nature Conservation must be Beneficial to the Biodiversity, Successfully Planned and Sustainable alongside Limited Compatible Development*

The Project sets out the framework for a new partnership known as the Sha Lo Tung Conservation Management Board (SCMB) – a tripartite entity formed between the Government, the SLTDC and Green Power. Within this framework, long term conservation management is the responsibility of Green Power, the NGO, who has provided assurance that this will be carried out in a professional manner and will operate with transparent and auditable processes. Green Power has a proven track record of suitable experience through operation of conservation and education activities at their Guangzhou Green Country Ecological Education Centre.

1.2.3 *Institutional Arrangements and Funding Must Be Realistic and Achievable*

The New Nature Conservation Policy encourages commitment from the landowner (the SLTDC) through encouraging compatible development concessions on less ecologically sensitive land under the pilot project that will fund conservation facilities and operations. The “Public-Private partnership” between Government, the SLTDC and Green Power operating in the form of the Sha Lo Tung Conservation Management Board (SCMB) will oversee start-up operations and administer on-going funding through a new Conservation Trust Fund. The SLTDC will inject upfront seed capital to construct and equip all conservation, educational, recreational and public facilities, and a lumpsum to the Conservation Trust Fund for long term management and conservation, with such capital repaid from income generated by the SLTDC’s Multi-Cultural Education Retreat cum Columbarium development in the Green Belt zone adjoining the Conservation Area. With the Government as an active partner in the pilot project, the Government will facilitate the SLTDC’s submission to fulfil statutory requirements and procedures.

1.3 *NAME OF THE PROJECT PROPONENT*

Sha Lo Tung Development Company Ltd

1.4 *LOCATION AND SCALE OF PROJECT AND HISTORY OF THE SITE*

1.4.1 *Project Location*

The Project includes three components, Ecological Reserve (within Sha Lo Tung Valley), Development Site (at the entrance of Sha Lo Tung Valley) and Sha Lo Tung Road Improvement, and the location of the three components is shown in *Figure 1*. The three components are located north-east of Tai Po. It should be noted that the Project Site does not lie within the Pat Sin Leng Country Park.

The Ecological Reserve is located within Sha Lo Tung Valley and comprises Sha Lo Tung Site of Special Scientific Interest (SSSI), Conservation Area and Green Belt.

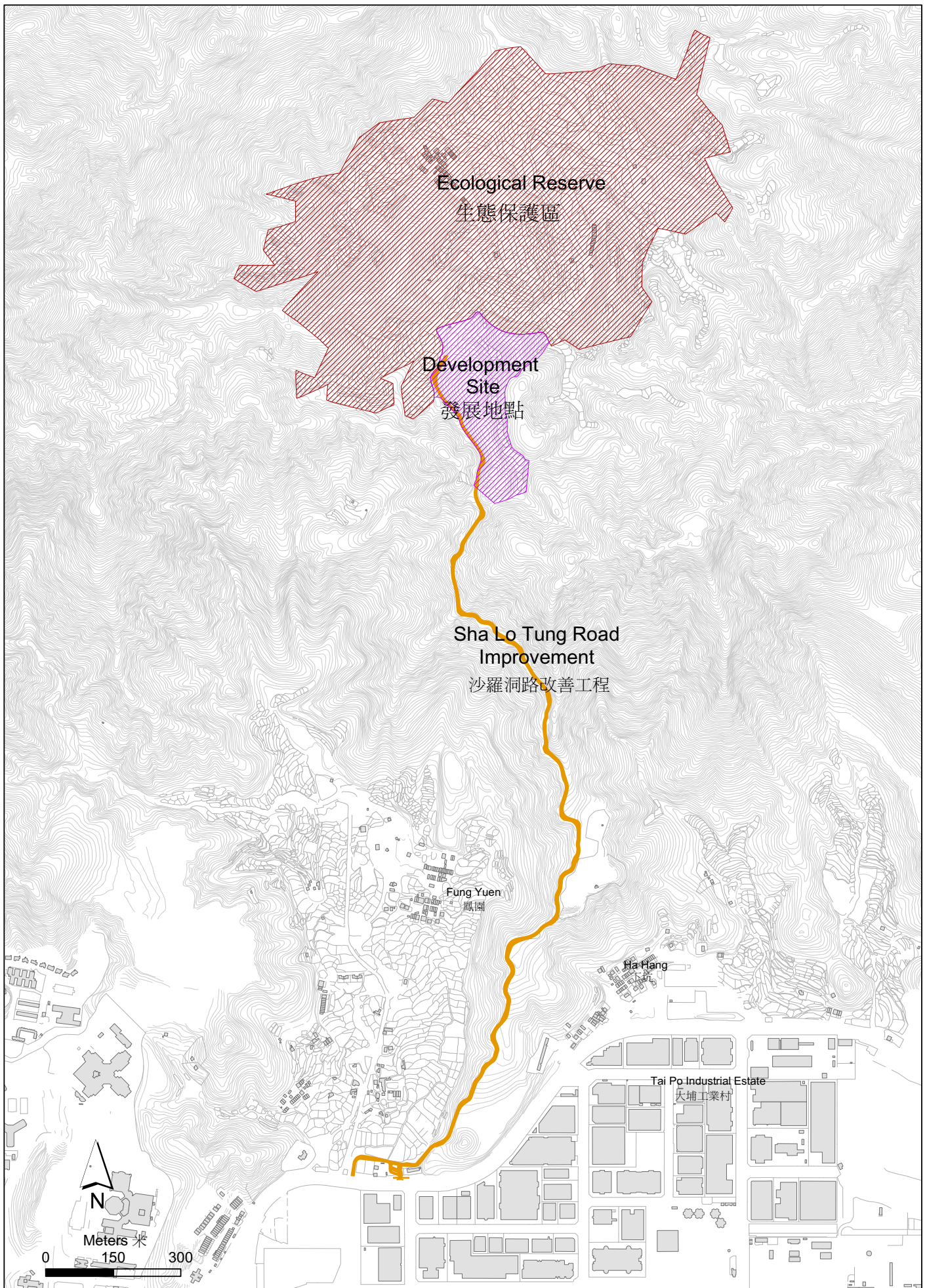


Figure 圖 1

Three Components of the Project: Ecological Reserve,
Development Site and Sha Lo Tung Road Improvement

本工程項目的三個部份：
生態保護區、發展地點及沙羅洞路改善工程

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The Development Site, which is a knoll zoned “Green Belt” located in the upland area of Sha Lo Tung Valley and at the northern end of the Sha Lo Tung Road, avoids the SSSI, natural streams and important dragonfly habitats. This area is mainly covered by grassland shrubland mosaic. *Figures 2 and 3* show the existing conditions of the Development Site. It contains a number of graves and urns, which make the site susceptible to hill fire. Although not a formally designated burial ground, the knoll has been used for over 70 years by local villagers for this purpose. The Development Site is accessible by Sha Lo Tung Road via Ting Kok Road.



Figure 2 *Aerial Photograph of the Development Site located at the entrance of Sha Lo Tung Valley, which avoids any natural streams and important dragonfly habitats.*



Figure 3 *The Development Site scattered with a number of graves and urns and dominated by grassland.*

1.4.2

History of the Site

In 1989 a comprehensive development proposal including residential development and clubhouse facilities supporting an 18 hole golf course was put forward for the Sha Lo Tung site. A limited scope of environmental assessment was carried out in line with requirements prevailing at that time.

In line with increasingly stringent (at the time non-statutory) government requirements for the coverage of environmental issues, several detailed environmental assessment studies that included extensive ecological field surveys for the development proposal have been conducted since 1993.

An outcome of the ecological surveys, was that the ecological significance of Sha Lo Tung Valley, in particular the streamcourses and dragonfly communities, has been recognised. In early 1997 a Development Permission Area (DPA) plan was produced that defined an SSSI, including a 30 metre area on either side of the streams. The Outline Zoning Plan covering Sha Lo Tung Valley was gazetted in 2002 (shown in *Figure 4*).

In order to conserve Sha Lo Tung Valley, the golf course and residential development proposal was not pursued and the SLTDC proposes, instead, to set up an Ecological Reserve within Sha Lo Tung Valley under the proposed Pilot Project.

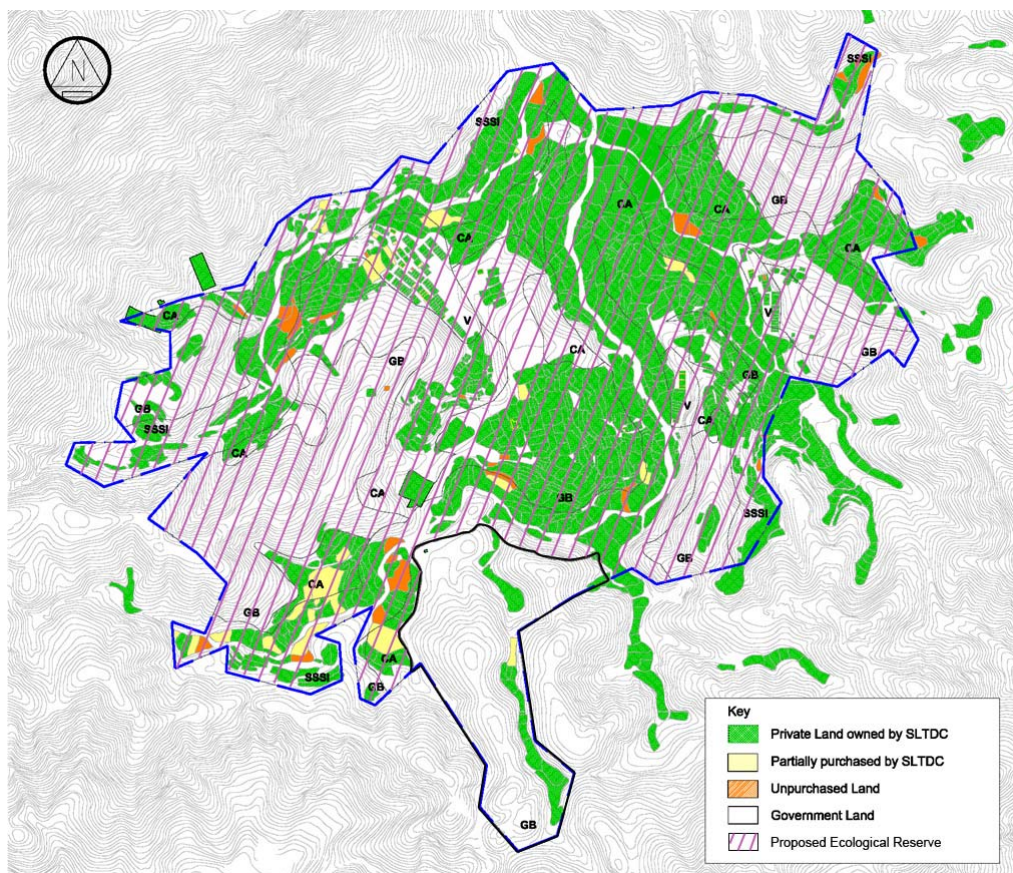


Figure 4 Sha Lo Tung Valley - Land Use Zonings (Extracted from Sha Lo Tung OZP)
SSSI = Site of Special Scientific Interest; CA = Conservation Area; GB = Green Belt; V = Village

General

The Project includes three components: Ecological Reserve, Development Site and Sha Lo Tung Road Improvement (*Figure 1*). Sha Lo Tung Development Company (SLTDC) and Green Power (GP) propose to set up an Ecological Reserve (approximately 52 ha, accounting for more than 90% of the entire Valley) in Sha Lo Tung (SLT) Valley, through surrendering private housing lots (approximately 0.8 ha) and private agricultural lots (approximately 26 ha) in the Valley and agricultural lots in the adjacent Country Park (approximately 2 ha) to Government. The proposed Development Site and Sha Lo Tung Road Improvement are outside of the Country Park and Conservation Area. The Ecological Reserve will maintain, protect, restore and enhance the ecological resources of the SLT Valley. This will be achieved by preventing unauthorised incompatible activities, managing and restoring habitats at the “optimal” succession state, and by enhancing grassland and woodland habitat. An additional benefit will be the provision of nature education activities which will promote awareness, appreciation and understanding of the ecological value of the area. The scheme is enabled by allowing the development of a Nature Interpretation Centre, and a Multi-Cultural Education Retreat cum Columbarium (with a footprint of approximately 1.4 ha) within the Development Site (of approximately 5.5 ha, which comprises less than 10% of the SLT Valley area) in a lower ecological value area at the entrance to the Valley. The initial set up and long term operation funding of the Ecological Reserve will come primarily from the sale of niches in the Columbarium. The existing Sha Lo Tung Road (approximately 2.3 km) will be upgraded to Single Track standard with minimum required number of passing bays to meet the requirements of the Buildings Department and Fire Services Department at SLTDC’s own cost.

Ecological Reserve

The Ecological Reserve, of approximately 52 ha, provides an opportunity to enhance Sha Lo Tung Valley’s environment for the benefit of the community and boost its ecological value. Biodiversity conservation is the core focus of the Public Private Partnership (PPP) programme where value-added activities such as conservation education, will be integrated into the management strategy of Sha Lo Tung Valley, when appropriate. It is expected that this can be achieved by adopting a Conservation Management Plan (CMP), which prescribes management to safeguard the ecological value of the area in perpetuity for the people of Hong Kong. A summary of the CMP is presented in the following sections.

Conservation Management Plan and Ecological Enhancement

The CMP will serve as a guideline for action covering the first 5-year period and will evolve as time passes and experience is gained. The key objectives (but not include cultural heritage element) are:

- Objective 1: Conserve and Enhance Dragonfly Biodiversity
- Objective 2: Enhance Upland Habitats by Removal of Exotic Vegetation
- Objective 3: Enhance Quality and Area of Secondary Woodland Habitat
- Objective 4: Restore Abandoned Farmlands to Butterfly Garden and Marsh Habitats
- Objective 5: Sustainably Manage Visitors
- Objective 6: Conserve Target Species
- Objective 7: Enhance Conservation Education Opportunities

The plan will be monitored by a Sha Lo Tung Conservation Management Board (SCMB) which will include three major stakeholders, including the Project Proponent (SLTDC), the management contractor (Green Power) and the HKSAR Government, which may include representatives from other green groups and academic representatives.

Ecological Benefit

The Development Site is located in an area of less ecological concern (mainly shrubland grassland mosaic) and avoids all of the ecologically sensitive areas, including Country Park, SSSIs and Sha Lo Tung streams. No unacceptable ecological impacts during the construction and operational phases of the proposed development at the Development Site and Sha Lo Tung Road are predicted.

With the implementation of the Conservation Management Plan, human disturbance will be largely reduced/ controlled. Disturbance due to hillfire, visitors and vandalism would be controlled by pro-active management, including patrolling and conservation education. Under the Sha Lo Tung pilot project, an aggressive fire-suppression programme will be implemented to prevent the occurrence of hill fires (regularly recorded within Sha Lo Tung Valley). Rubbish and illegal traps would also be constantly removed by site managers.

The PPP pilot scheme will not only avoid and reduce ecological impacts where practicable but will enhance the conservation value of Sha Lo Tung Valley through the following actions:

- Reaching an agreement with indigenous villagers to avoid large scale village expansion which is a threat to the ecological integrity and conservation value of the valley; and,
- The protection of the area by controlling site access and enhancing the ecological value of habitats through active management.

Other Works within Ecological Reserve

There are three villages within the Sha Lo Tung Ecological Reserve: Cheung Uk, Lei Uk and Lo Wai zoned under "Village Typed Development", most of which are under the ownership of the project proponent (*Figure 4*). Cheung Uk and Lei Uk were constructed in about 1700 and are presently classified as Grade II historical buildings

(<http://www.lcsd.gov.hk/ce/Museum/Monument/form/historical.pdf>). According to the CMP, these abandoned village houses will be retained but not managed in any way other than to remove exotic/invasive vegetation. However, recent site investigation showed that some of the broken village houses of remaining structures in Cheung Uk and Lei Uk are unstable with a safety concern. It should be noted that most of the village houses in Lei Uk were collapsed. The existing footpath and concrete footbridge from the northern end of Sha Lo Tung Road to Cheung Uk are in good condition, allowing easy access for removal work (see below). However, access to Lei Uk is restricted, and a proper stream crossing across Sha Lo Tung Stream SSSI is lacking. It is considered necessary to build a temporary footbridge (which will be demolished after the removal works) to Lei Uk to minimise disturbance to the ecological sensitive area including the SSSI during the maintenance work.

The proposed work would include the following elements:

- detailed investigation of the existing structural condition of the broken/collapsed village houses and structures at Cheung Uk and Lei Uk to identify potential public safety risk;
- removal of broken/collapsed remaining structures (ie broken wall) of the village houses, particularly at Lei Uk, to ground level for public safety reason. All of the works will be undertaken by hand tools;
- construction of a temporary footbridge of approximately 3m long and 1.5m wide across the stream within the Sha Lo Tung Stream SSSI (*Figure 5*). It is expected that the footbridge would be made mainly of wooden materials and spanned over the streambed to minimise the impacts to the stream. Prefabricated timber sections will be assembled on site. All of the works would be implemented using hand tools during dry seasons (October to March) only.
- minor improvement of the existing new footpath to Lei Uk. The width of the existing new footpath is 1-2m, which is considered sufficient for the access of workers and material and hand tools transportation, but minor improvement such as vegetation removal in certain section of the footpath may be required (to be determined on site). To facilitate the transportation of the construction materials, temporary access in the form of metal scaffolding may be formed on the areas near both sides of the existing stream where there is level difference. The extent of the temporary metal scaffolding will be confirmed on site. No vehicles except buggies for transportation of materials would be allowed within the valley.

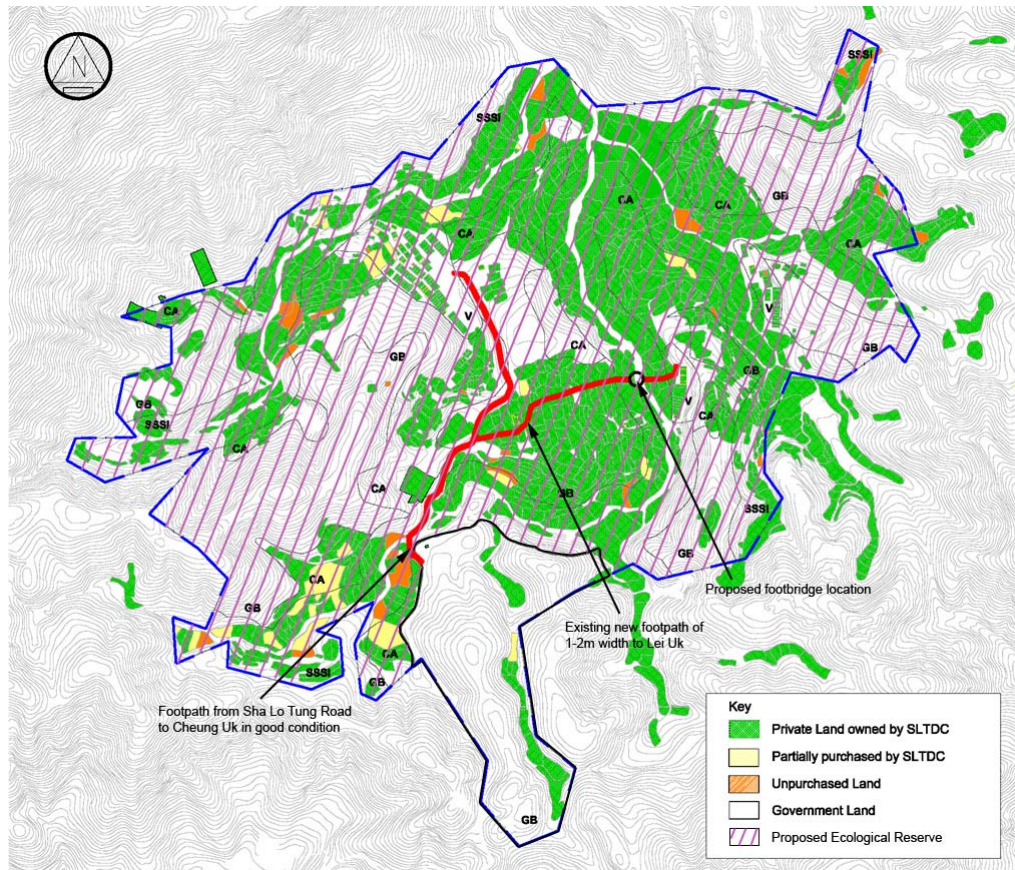


Figure 5 Locations of the footpaths and proposed footbridge within Sha Lo Tung Ecological Reserve

Development Site

Due to the sensitivity of the Sha Lo Tung Valley and the potential construction impacts to the Sha Lo Tung Stream, the design of the Master Plan of the Development Site has adopted the following considerations, in order to avoid potential impacts to the existing trees and Sha Lo Tung Stream.

- Provision of a minimum additional 20 m wide non-building buffer from the Sha Lo Tung SSSI;
- Maximising the utilisation of the existing profile and natural topography;
- Locating buildings away from the Sha Lo Tung SSSI and stream; and,
- Preservation of existing trees.

With the adoption of the above considerations, the Master Plan as presented in Figure 6 can avoid or minimise potential water quality and ecological impacts to the stream and SSSI, as well as impacts to woodland and trees.

The preliminary Master Plan and the concept of the Nature Interpretation Centre, and a Multi-Cultural Education Retreat cum Columbarium is presented in Figure 6. The proposed development comprises the following:

- Nature Interpretation Centre;

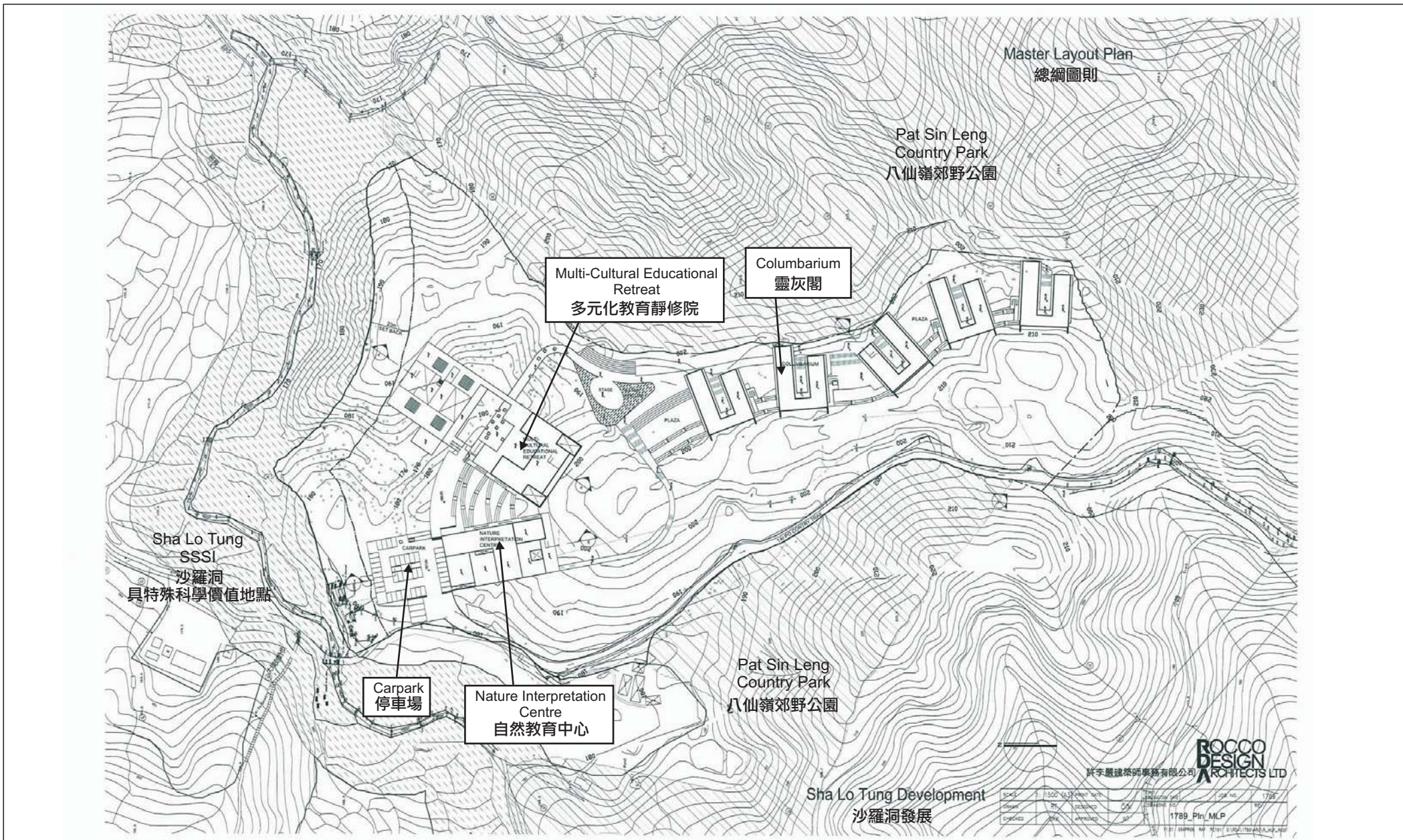


Figure 6
圖六

Preliminary Master Layout Plan
初步總綱圖則

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- Open landscaped areas;
- Open car park;
- Path;
- Multi-Cultural Education Retreat including Confucius Halls & Multi-purpose Hall and Security/ Staff Quarters; and
- Columbarium to accommodate maximum 60,000 niches.

Sha Lo Tung Road Improvement

The existing Sha Lo Tung Road between Ting Kok Road and Sha Lo Tung Valley (approximately 2.3 km) is the only vehicular access to Sha Lo Tung Valley and the Development Site. The reason for the proposed improvements is to upgrade the existing roadway to the minimum requirement of a safe Single Track Access Road that would also enable emergency access for fire engines and also stabilise the slopes on both sides to resolve the frequent landslide in wet season. In the absence of the road improvements, delivery of emergency services would not be practicable. In order to meet the traffic demand during construction and facilitate the transportation of construction plants or raw materials to/from the Development Site, it is proposed to complete the road improvement works with drainage and sewerage systems prior to commencement of site formation works.

The principles of the design for the road improvement works are: -

- Minimize disturbance to the existing landscape and trees;
- Preserve woodlands of ecological value;
- Provide a safe access road; and
- Enable emergency vehicle access to the Ecological Reserve, Nature Interpretation Centre, Multi-Cultural Education Retreat cum Columbarium.

Following the principles of the improvement works, the impacts arising from the upgrading of Sha Lo Tung Road will be kept to a minimum, and the improved road will be able to provide emergency service access, serve the conservation facilities, Pat Sin Leng Country Park and Water Services Department (WSD) Service Reservoirs etc. In light of the low volume of traffic forecast, the access road shall remain a single track access road with basic improvements to satisfy the Transport and Planning Design Manual (TPDM) requirements. These include:

- Widening the existing access road to a minimum width of 4.5 m, which according to TPDM is suitable for use of emergency vehicles;

- Providing additional inter-visible passing places at maximum spacing 60 m for 2-way traffic;
- Appropriate local widening at bends of up to 6 m wide to cater for travel of emergency vehicles from Ting Kok Road to the proposed conservation facilities;
- The access road shall follow the existing road alignment and profile to minimise earthworks and impacts to the existing environment. Nevertheless, the road shall be re-profiled to ensure a maximum gradient less than 16% because a gradient more than 16% is not suitable for use of emergency vehicles;
- The road will be widened towards the eastern side by cutting the uphill slopes to avoid disturbing the woodland dominating on the western side;
- Soil nailing, if required, to stabilise slopes particularly downhill, can be implemented carefully to avoid damage to trees and the slope surface can be planted to maintain a green landscape after the improvement works are finished;
- Provision of a vehicle turning area at the entrance of Sha Lo Tung Valley suitable for use by fire engines;
- Provision of drainage system with additional verges and sewer along the route;
- No encroachment in to the Conservation Area or Pat Sin Leng Country Park; and
- Appropriate landscape design along the access road.

1.5 NUMBER AND TYPES OF DESIGNATED PROJECTS

The Project involves earthworks (building a footbridge crossing stream at Ecological Reserve) within an existing Site of Special Scientific Interest, and therefore is classified as a designated project under Schedule 2, Part I, Category Q, Item Q.1 of the *Environmental Impact Assessment Ordinance* (Cap. 499).

1.6 NAME AND TELEPHONE NUMBER OF CONTACT PERSONS

Ms Pinky LUK Sau Fong
 Sha Lo Tung Development Company Ltd
 Tel: (852) 2525 6071
 Fax: (852) 2868 5474

2 *OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME*

2.1 *PROJECT PLANNING AND IMPLEMENTATION*

The Project will be planned, designed and implemented by the Sha Lo Tung Development Company Ltd together with external consultants and contractors.

2.2 *PROJECT PROGRAMME*

The works programme is tentatively scheduled to commence in end-2011 and to be completed by mid-2014. The works programme and the work sequence of the Project will be undertaken as follows:

- Ecological Reserve - The enhancement work will be undertaken immediately once the commencement of the Project is confirmed in order to provide the greatest conservation and ecological benefit. The minor improvement of footpath, construction and installation of the footbridge and removal of broken village houses and structures (particularly at Lei Uk) will be completed within 3 months (during dry season).
- Sha Lo Tung Road Improvement - The road improvement works will be divided into three phases. Each phase of the road works will be constructed in sequence and each will take approximately 6 to 7 months.
- Development Site - The site formation works will be carried out in three stages after Sha Lo Tung Road Improvement: Stage 1 (approximately 7 months), Stage 2 (approximately 6 months) and Stage 3 (approximately 6 months). The duration of each of the three stages will overlap at certain periods of time so that the earthworks (soil and excavation and filling works) will only be undertaken during the dry season (November through March inclusive).

2.3 *PROJECT INTERFACE*

There are no committed major projects interfacing with the Project.

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3.1 INTRODUCTION

Table 3.1 identifies the potential environmental impacts that may arise from the construction and operation of the Project. The key potential impacts are ecology, water quality, construction dust and noise, waste management and landscape and visual.

Table 3.1 Potential Sources of Environmental Impacts

Potential Impact	Construction	Operation
• Gaseous Emissions	✓	✗
• Dust	✓	✗
• Odour	✗	✗
• Noise	✓	✓
• Night-time Operations	✗	✗
• Liquid Effluents, Discharges or Polluted Runoff	✓	✓
• Generation of Waste or By-products	✓	✓
• Manufacturing, Storage, Use, Handling, Transport, or disposal of Dangerous Goods, Hazardous Materials or Wastes	✗	✗
• Hazard to Life	✗	✗
• Landfill Gas Hazard	✗	✗
• Disposal of Spoil	✓	✗
• Disruption of Water Movement or Bottom Sediment	✗	✗
• Unsightly Visual Appearance	✓	✓
• Cultural Heritage	✗	✗
• Terrestrial Ecology	✓	✗
• Marine Ecology	✗	✗
• Cumulative Impacts	✗	✗

Note:
 ✓ = Possible ✗ = Not Expected

3.2 EXISTING ENVIRONMENTAL CONDITIONS

The Site is located in a rural area in Tai Po and is surrounded by a number of ecological sensitive areas including Conservation Area, Sha Lo Tung SSSI, Fung Yuen Valley SSSI and Pat Sin Leng Country Park.

3.2.1 Ecology

The Ecological Reserve will cover the Sha Lo Tung Valley, including Conservation Area, Green Belt, Sha Lo Tung SSSI and stream, which are recognised as ecologically significant areas. The Development Site is located at the entrance of Sha Lo Tung Valley and surrounded by Conservation Area (located to the west), Sha Lo Tung SSSI (located to the north) and Pat Sin Leng

Country Park (located to the east and west). The majority of the Development Site is located in uphill areas covered by grassland-shrubland mosaic with a number of graves while secondary woodlands were found in the valley of the site. A natural stream runs through the secondary woodland to the north of the Development Site. Sha Lo Tung Road is the only road access link between Ting Kok Road and Sha Lo Tung Valley, and Fung Yuen Valley SSSI is found located to the west of the road. It should be noted that the Construction Works Boundary of the Development Site and Sha Lo Tung Road Improvement avoids encroachment upon Conservation Area, Sha Lo Tung SSSI, Fung Yuen Valley SSSI and Pat Sin Leng Country Park.

3.2.2 *Water Quality*

Sha Lo Tung Valley comprises water quality sensitive receivers including Sha Lo Tung SSSI and stream, which are also considered of ecological and conservation significance. It has been identified that the water quality sensitive receivers (WSRs) of the Development Site and Sha Lo Tung Road Improvement include Sha Lo Tung SSSI, Fung Yuen Valley SSSI and streams.

3.2.3 *Air Quality*

According to Annex 12 of the EIAO-TM, village houses of Fung Yuen Lo Tsuen, Mak Uk, Fung Yuen, Tin Sam and Ha Hang are identified as Air Sensitive Receivers (ASRs). They may be affected by the construction and operation of the Development Site and the road improvement works. The shortest distance from the ASRs to the construction works boundary is about 105m. No major air polluting sources are identified in the vicinity of the Project Site.

3.2.4 *Noise*

The villages at Cheung Uk, Lei Uk and Lo Wai were found to be abandoned and surrounded by woodland and abandoned farmlands. Background noise is generally low and no major noise source was identified. The loud chirps of cicadas may however change the noise climate significantly during Spring and Summer. The village houses at Tin Sam and Mak Uk, which are considered as Noise Sensitive Receivers and located to the south of the site, are located at approximately 105 m to 210 m from the construction works boundary of the road improvement works.

3.2.5 *Landscape and Visual*

The Site for the proposed development is on an undulating series of grassy knolls, fringed with pockets of secondary woodland. There are a number of grave sites and many visible signs of hill fires. The site has attractive views to the south west down to Tai Po and Tolo Harbour. To the north, east and west, the site is surrounded by elevated peaks.

Construction Phase

The SLTDC team for this Project has conducted detailed reviews of literature on terrestrial ecological resources. SLTDC has also commissioned ecological field surveys for this Project which have been throughout the period conducted between 2004 to 2008 covering wet and dry seasons.

The Ecological Reserve covers areas within Sha Lo Tung Valley and is considered of high ecological significance. Habitats recorded include Fung Shui Woods, secondary woodlands, grassland shrubland mosaic, streams, abandoned agricultural land and developed area (abandoned village). However, the habitat quality within Sha Lo Tung Valley is degrading due to threats such as the use of four wheel drive vehicles, hill fires, wargames and vegetation removal. The Development Site is mainly covered by grassland-shrubland mosaic with a small part of the area occupied by secondary woodland (of moderate to high ecological value). The grassland-shrubland mosaic is frequently disturbed by hill fire and is considered to have low ecological value. The secondary woodland is dominated by climax native tree species such as *Schima superba* with densely vegetated understorey and is considered of moderate to high ecological value. Habitats within the Sha Lo Tung Road Improvement area include secondary woodland, plantation, grassland-shrubland mosaic, abandoned agricultural land, and developed area. Aside from the secondary woodland of moderate to high ecological value, all of the remaining habitats are of low ecological value.

The enhancement works for the establishment of the Ecological Reserve and the implementation of the Conservation Management Plan will enhance the conservation value of Sha Lo Tung Valley. In addition, human disturbance such as hill fire will be largely reduced/ controlled. As a consequence, the proposed Project is expected to bring about long term and sustainable benefits to the ecology of Sha Lo Tung Valley and the habitats and associated wildlife.

Given the small scale of the minor footpath improvement, temporary footbridge installation (within the SSSI) and removal of unsafe broken village houses and structures (particularly at Lei Uk), use of hand tools for the construction and scheduling the works during dry season (October to March), unacceptable impacts to the stream are not anticipated.

Direct habitat loss may result from the land taken for the construction of proposed buildings and facilities as well as the Sha Lo Tung Road improvement works. The majority of the proposed development will be constructed on the grassland-shrubland mosaic and thereby reduce the impacts to the secondary woodland.

With the provision of a 20 m additional building buffer from Sha Lo Tung SSSI, the riparian woodlands as well as associated wildlife are significantly preserved. The potential small-sized habitat loss due to the proposed development is not predicted to cause adverse impacts to the wildlife using

the SLT SSSI and associated habitats. The potential ecological impacts on the larval stage of the dragonfly community in the SSSI due to the water quality impacts from the construction activities are likely to be avoided through water pollution control measures. No adverse residual water quality or associated ecological impacts were predicted to occur due to construction of the Project on the basis that appropriate mitigation measures are properly implemented.

3.3.2 *Operational Phase*

Surface runoff from the Development Site will be diverted and discharged into the newly constructed stormwater drainage system along the improved Sha Lo Tung Road to Tai Po (through a pumping system with a storage tank). Contamination of the nearby watercourses is not expected to be anticipated.

The major lighting sources will be pointed inward and downwards to avoid disturbance to wildlife. Minimal lighting will be expected during the operation of the Multi-Cultural Education Retreat cum Columbarium.

Application of pesticides, insecticides and chemical fertilizers for the landscaping purposes and vegetation maintenance will be prohibited during operation of the Development Site. Ecological and water quality impacts to the downstream wetland habitats of the Development Site are not anticipated.

Accidental hillfire is expected to be minimal as no burning of effigies and paper offerings will be allowed at the Multi-Cultural Education Retreat cum Columbarium.

The direct disturbance to natural habitats and wildlife due to increased human activities of the Multi-Cultural Education Retreat cum Columbarium is expected to be minimal as Sha Lo Tung Valley will be properly managed under the proposed Pilot Project for PPP Scheme to control number of visitors, human activities (ie grave sweeping) will be restricted to within the Development Site, and no burning of effigies and paper offerings will be allowed.

3.4 *WATER QUALITY*

3.4.1 *Construction Phase*

During the construction phase of the Project water quality impacts have the potential to arise from construction runoff, general construction activities and domestic sewage discharge. To avoid ecological risk to the downstream Sha Lo Tung Valley, any discharge of construction runoff from the Development Site is prohibited. Before any construction works are undertaken within the Development Site, the Sha Lo Tung Road will be improved with well designed drainage systems and all of the surface run-off will be collected by a temporary drainage system with sufficient number of sedimentation tanks (with sufficient capacity) and then discharged to the newly constructed stormwater drainage system along the improved Sha Lo Tung Road. It is anticipated that if effective controls, including but not limited to the

construction of peripheral channels and erection of site hoarding (with any gaps to be filled and cemented) in advance of site formation works and earthworks which are only to be undertaken during the dry season, and implementation of general good site practice in accordance with the *Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN1/94)*, are applied, the potential water quality impacts are expected to be minimal.

3.4.2 *Operational Phase*

During the operational phase, the identified water quality impacts will be surface runoff from the paved road and platform (ie car park), and the disposal of domestic sewage. With the installation of grit and oil interceptor for paved areas, and no discharge of sewage to WSRs, no adverse impacts to the WSRs are anticipated.

3.5 *AIR QUALITY*

3.5.1 *Construction Phase*

The scale of the construction works is likely to be small and the rate of excavated soil generation will also be low. With the implementation of the good site practices and dust control measures stipulated in the *Air Pollution Control (Construction Dust) Regulation*, the dust impact is expected to be low and no adverse dust impact is anticipated.

3.5.2 *Operational Phase*

Vehicular emissions from Sha Lo Tung Road are the key air quality concern potentially arising from the operation of the Project. Given that the separation distances between the identified ASRs and the future road kerb (ie about 130 m) will still satisfy the buffer distance recommended in the *Hong Kong Planning Standards and Guidelines (HKPSG)*, ie 10 m, no adverse air quality impact on the ASRs in the vicinity is anticipated

Burning of effigies and paper offerings in the Development Site (including the columbarium, multi-cultural education retreat and open space) will not be allowed, and therefore no adverse impact to air quality is anticipated.

3.6 *NOISE*

3.6.1 *Construction Phase*

In view of the fact that the enhancement works to be carried out in the Ecological Reserve will be relatively minor and will only involve the use of hand tools, the enhancement works are not expected to cause any adverse noise impact to the identified NSRs, which are located at a considerable separation distance from the works area. At the Development Site, construction works will mainly be conducted using small powered mechanical equipment (PME) and no piling works will be required. Given the considerable separation distance and the screening effect provided by the

topography between the Development Site and the representative NSRs, the small scale of the construction activities, limited number of plant items operating along Sha Lo Tung Road at any one time, the construction activities are not expected to cause any adverse construction noise impact to the representative NSRs.

3.6.2 *Operational Phase*

Potential source of noise impacts are identified as the mechanical equipment associated with the operation of the Interpretation Centre, Confucius Hall/ Multi-Cultural Education Centre, fountain, transformer room and pump room.

The nearest NSRs are identified as the proposed staff quarters and the Multi-Cultural Education Retreat located at the north-eastern part of the Development Site. The fixed plant noise emission will be controlled to comply with the daytime and evening time (at least 5 dB(A) lower than Acceptable Noise Levels) noise criteria measured at 1m from the openings of the nearby NSRs in accordance with the *Technical Memorandum on Noise From Places Other than Domestic Premises, Public Places or Construction Sites (IND-TM)*. Other NSRs located along Sha Lo Tung Road are far away from the Development Site. Given that the mechanical equipment will only be operated during daytime and evening time periods (ie 0700 to 2300 hours), it is anticipated that the NSRs located along Sha Lo Tung Road will not be adversely affected by the operation of the Project.

During the operational phase of the Project, the limited induced traffic on Sha Lo Tung Road will not cause any adverse noise impact to the NSRs.

3.7 *WASTE MANAGEMENT*

3.7.1 *Construction Phase*

Construction and demolition materials (C&DM), general refuse and chemical waste will be the key waste arisings during the construction phase of the Project. Efforts will be made to recycle and reuse materials as far as possible. Non-recyclable materials will be disposed of off-site. The handling and disposal of waste will follow strictly the requirements of relevant regulations and code of practices, and therefore no adverse waste management impact is anticipated.

A review of available information regarding site history including historical aerial photographs, historical maps as well as visual site inspection did not identify potential sources of soil and groundwater contamination at the Site. It is therefore not anticipated that there will be contaminated soil or groundwater at the Site which will require treatment or disposal during the construction phase of the Project.

3.7.2 *Operational Phase*

The waste generated during the operational phase of the Project will be those typical of commercial activities, such as general refuse and chemical waste. Provided that the waste are stored and handled properly and disposed off site at regular interval, environmental impacts associated with waste management are not expected during the operational phase of the Project.

3.8 *LANDSCAPE & VISUAL*

3.8.1 *Construction Phase*

During the site formation work, a small amount of excavation will occur into the side slopes of the hills at the entrance of Sha Lo Tung Valley and along Sha Lo Tung Road. Excavation will be required and limited vegetation including shrubby grassland will be lost. The landscape and visual resources of the site will potentially be affected by the construction of the Multi-Cultural Education Retreat cum Columbarium. The landscape and Visual Sensitive Receivers to be potentially affected include the hikers passing by the existing hiking trails. Due to the screening effect of the hills, it is expected that the construction area would not be visible from Tai Po. Mitigation measures including cut-slope finishing, retention of trees and compatible colouring of site hoardings, will be required to reduce the landscape and visual impacts of the Site.

3.8.2 *Operational Phase*

There is to be a high level of landscape treatment associated with the proposed development which will not only mitigate any potential landscape or visual impacts, but will vastly improve the proposed Development Site from the existing condition. The development will be visible at night, however due to the long distances to the Visual Sensitive Receivers, the light impact will be very low intensity and is considered acceptable. The Landscape and Visual Impacts associated with the development site are considered acceptable with mitigation.

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The sensitive receivers that may be affected by the construction and operation of the Project include:

- Sha Lo Tung Valley which supports a considerable diversity of fauna including dragonfly, butterflies, fish, amphibians, reptiles, birds and mammals
- Pat Sin Leng Country Park
- Sha Lo Tung streams which are recognised as ecologically significant areas for dragonfly and other wildlife
- Sha Lo Tung Site of Special Scientific Interest (SSSI)
- Fung Yuen Valley Site of Special Scientific Interest (SSSI)
- Conservation Area and Green Belt within Sha Lo Tung
- Fung shui wood
- Sha Lo Tung Water Gathering Ground

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5.1 *POTENTIAL MEASURES TO MINIMISE ENVIRONMENTAL IMPACTS*

Potential measures are outlined below to minimise environmental impacts. These measures will be further reviewed during the Environmental Impact Assessment (EIA) Study.

5.2 *CONSTRUCTION PHASE*

5.2.1 *Ecology*

The potential ecological impacts on the larval stage of the dragonfly community in the SSSI due to the water quality impacts from the construction activities in Development Site are likely to be avoided through water pollution control measures. Ecological mitigation measures to be implemented will include:

- Adoption of the principle of minimising loss of trees (therefore secondary woodland) for the detailed engineering design;
- completion of the Sha Lo Tung Road improvement (with well designed drainage systems) before any construction works for the Development Site;
- scheduling the earth works in the dry season;
- provision of an additional 20 m non-building buffer between the works area and Sha Lo Tung SSSI;
- adoption of a phased schedule;
- compensatory planting;
- good construction practice;
- a well designed temporary drainage system;
- erection of site hoarding in advance of the commencement of any works; and,
- restricting the workers within the Development Site during construction.

5.2.2 *Water Quality*

Water quality impact mitigation measures, such as drainage facilities to control site runoff, wheel washing facilities, proper toilet facilities and comprehensive waste management procedures, will be implemented in

accordance with the *Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN 1/94)*.

To avoid ecological risk to the downstream Sha Lo Tung Valley, discharge of construction runoff from the Development Site will be prohibited. The following practices and measures to be proposed are targeted to ensure no discharge of construction runoff to the downstream ecological sensitive areas and Sha Lo Tung Stream:

- Complete the Sha Lo Tung Road improvement (with well designed drainage and sewerage systems) before any construction works are undertaken within the Development Site;
- Restrict earthworks to the dry season;
- Manage the construction sequences, in particular during the wet season;
- Provide temporary drainage channels with sedimentation tanks to divert the site runoff to the sandtrap before discharging it from the site;
- Provide silt removal facilities such as sedimentation tanks and sand traps;
- Provide a separate temporary drainage system to divert the natural runoff away from the site and minimise the site runoff;
- Erect a continuous site hoarding with seal along the northern boundary of the Development Site; and
- Carry out daily inspection.

In addition, the construction of peripheral channels and erection of the site hoarding (with any gaps to be filled and cemented) in advance of site formation works and earthworks which are only to be undertaken during the dry season, will also be applied.

5.2.3 *Air Quality*

Good site practices and appropriate dust control measures set out in *Air Pollution Control (Construction Dust) Regulations* will be implemented to control the dust impacts on the nearby sensitive receivers.

5.2.4 *Noise*

General good site practices including the location of noisy machinery away from sensitive receivers; the use of silencers, mufflers and acoustic shields on plant and equipment; regular maintenance of plant and equipment; and the reduction in number of machines used at any one time, will be adopted as needed to control noise impacts.

5.2.5 *Waste Management*

Good waste management practices to control the environmental impact associated with waste handling will include adoption of good housekeeping practices, sorting and segregation of wastes for reuse and disposal. The Project will aim at maximising the opportunities for re-using and recycling materials. Off-site disposal of waste will be considered as the last resort. Chemical wastes will be stored, handled, transported and disposed of in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation and Code of Practice on Packaging, Labelling and Storage of Chemical Waste*.

5.2.6 *Landscape and Visual*

Landscape and visual impact mitigation measures will include shielding building structures by the natural topography, high level of landscape treatment, good housekeeping and avoiding unnecessary night-time lighting. The trees within the Site will be fenced off to avoid disturbance and damages during construction.

5.3 *OPERATIONAL PHASE*

5.3.1 *Ecology*

Induced human activities (ie grave sweeping) will be restricted to within the Development Site, and no burning of effigies and paper offerings will be allowed. The total number of visitors to the Columbarium during festival days will be controlled through proper administrative arrangement. Sufficient number of Conservation Ambassadors (organised by Green Power), who will serve as reserve guards to control, advise and educate visitors on the regulations in the Ecological Reserve, will be provided during festival days. The Nature Interpretation Centre will also be closed during those days to avoid attracting people to wander within the Ecological Reserve.

Application of pesticides, insecticides and chemical fertilizers for the landscaping purposes and vegetation maintenance will be prohibited during operation of the Development Site.

5.3.2 *Water Quality*

In order to enhance the protection to the Sha Lo Tung SSSI and Sha Lo Tung Stream, the sewage effluent generated from the Development Site will be discharged of at the Tai Po Sewage Treatment Work (STW) and there will be no facility for bypassing and overflowing the sewage effluent to the WSRs. This will also satisfy the TM requirement that no treated sewage effluent is allowed to be discharged within 100 m of the landward boundaries of the Sha Lo Tung SSSI. The sewage generated from the site will be collected and temporarily stored in a storage (equalisation) tank. The sewage storage tank will be located at least 40 m away from Sha Lo Tung Stream. A new sewer will be installed from the Development Site running along Sha Lo Tung Road

to the existing sewerage network at Ting Kok Road. The sewage will finally be discharged from the sewage storage tank to the Tai Po STW.

The drainage in the concrete paved areas will be connected to a storm water channel via a grit and oil interceptor. The details of the oil interceptors will follow those recommended in *ProPECC PN 5/93* and be based on Highways Department's standard drawings H3028 (1 to 10).

5.3.3 *Air Quality*

Burning of effigies and paper offerings in the Development Site (including the columbarium, multi-cultural education retreat and open space) will be prohibited.

5.3.4 *Noise*

Acoustic treatment will be applied to fixed noise sources within the Development Site.

5.3.5 *Waste Management*

Waste management practices will be implemented to minimize waste generation and maximize waste recovery and recycling. Waste will be stored and handled properly and disposed off site at regular interval. Chemical wastes will be stored, handled, transported and disposed of in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation and Code of Practice on Packaging, Labelling and Storage of Chemical Waste*.

5.3.6 *Landscape and Visual*

To the extent practical, structures will utilise appropriate design to complement the surrounding landscape. Materials and finishes will be considered during detailed design.

5.4 *POTENTIAL SEVERITY, DISTRIBUTION AND DURATION OF ENVIRONMENTAL EFFECTS*

5.4.1 *Construction Phase*

The environmental impacts during the construction phase will be transient and confined to the immediate vicinity of the Site. With proven means of good site practices and mitigation measures in place, adverse environmental impacts are not envisaged.

5.4.2 *Operational Phase*

With the implementation of recommended mitigation measures, no unacceptable environmental impacts are envisaged due to the operation of the Project.

An Ecological Reserve (approximately 52 ha) in Sha Lo Tung Valley will be set up by the Sha Lo Tung Development Company (SLTDC) and Green Power (GP), through surrendering of private housing lots (approximately 0.8 ha) and private agricultural lots (approximately 26 ha) in the Valley and agricultural lots in the adjacent Country Park (approximately 2 ha) to the government. The Ecological Reserve is expected to enhance to the ecology of the Sha Lo Tung Valley, through:

- protection against unauthorized and incompatible activities (hill fire, visitors and vandalism);
- management/ restoration of habitats to avoid degradation due to natural succession;
- enhancement to grassland/ woodland for habitat improvement; and
- provision of nature education to promote awareness, appreciation, understanding and supporting action among the public.

The initial set up and long term operation funding of the Ecological Reserve primarily comes from the Conservation Trust Fund with capital injected by SLTDC and to be covered by the sale of niches in the Columbarium.

Under the Sha Lo Tung pilot project, an aggressive fire-suppression programme will be implemented to prevent the occurrence of hill fires. Rubbish and illegal traps would also be constantly removed by site managers. As a consequence, the proposed development is expected to bring about long term ecological benefits to Sha Lo Tung Valley.

The PPP pilot scheme will not only avoid and minimise ecological impacts but will enhance the conservation value of Sha Lo Tung Valley through the following actions:

- Reading an agreement with indigenous villagers to avoid large scale village expansion which is a threat to the ecological integrity and conservation value of the valley; and,
- It protects the area by controlling site access and enhances the ecological value by active management.

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None