

**THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION**

**Improvement to Sharp Bend of Keung Shan Road
near Shek Pik Reservoir Service Access Road**

Project Profile

**Prepared in accordance with Environmental Impact Assessment Ordinance
(Cap. 499)**

May 2016

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1. BASIC INFORMATION

1.1 Project Profile and Project Title

This project profile is prepared in accordance with EIAO and the Technical Memorandum on Environmental Impact Assessment Process (“TM”) to cover a project entitled “Improvement to Sharp Bend of Keung Shan Road near Shek Pik Reservoir Service Access Road” (which is hereinafter referred to as “the Project”). The Project constitutes a designated project in accordance with item Q.1 in Part I of Schedule 2 of EIAO.

1.2 Purpose and Nature of Project

Keung Shan Road was constructed on Keung Shan, its road alignment and width are significantly controlled by the hilly topography. Buses and coaches turning at the existing sharp bend of the Project would need to take the space of opposite lane at low speed and sufficient visibility to the on-coming traffic. Improvement works are therefore necessary for it.

The Project is situated in the vicinity of Shek Pik Reservoir service access road with minimum width of only about 6.4m, for which road widening works are requested by TD to increase its turning radius and visibility for vehicles, so as to improve traffic safety.

As shown on Plan No. HWDIS073A-SK0034 in **Annex A**, the section of Keung Shan Road along this sharp bend will be widened to about 10.2 m width carriageway with 1 m verge as a result of this project.

1.3 Name of Project Proponent

The Project Proponent is Works Division of Highways Department, the Government of Hong Kong Special Administrative Region.

1.4 Location and Scale of Project and History of Project Site

The Project Site is a sharp bend near Shek Pik Reservoir service access road along Keung Shan Road and occupies an area as circumscribed by the site boundary on Plan No. HWDIS073A-SK0034 in **Annex A**, with location completely falling into the ambit of Lantau South Country Park. It can be accessed only via Keung Shan Road.

The scope of the Project comprises:

- a) cutting part of the existing slope along the sharp bend of about 70 m long for widening of about 4.8 m (with proposed verge of 1 m and proposed carriageway widening of 3.8 m);
- b) installation of soil nails to stabilize the modified slope;
- c) associated geotechnical, drainage and roadworks; and

d) landscape/hydroseeding works

The total area of Project Site is about 2770 m² whilst areas for slope upgrading works and road widening works are about 450 m² and 170 m² respectively. The total amount of excavated materials is estimated to be 3000 m³.

1.5 Number and Type of Designated Projects to be Covered by Project Profile

1.5.1 The works area within the limit of works site falls within the Lantau South Country Park. In accordance with item Q.1 in Part I of Schedule 2 of EIAO, the Project is classified as a Designated Project (DP) and an EP is required prior to commencement of the construction works.

1.6 Contact Person

All enquiries regarding the Project can be addressed to:

Mr. LIU Yip Kan Alex	Senior Engineer/Hong Kong 2 Works Division Highways Department Tel. No.: 3903 6790 Fax No.: 3188 3418
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Mr. CHUNG Mann Kun Terry	Engineer/Hong Kong 2-3 Works Division Highways Department Tel. No.: 3903 6805 Fax No.: 3188 3418
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2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

The Project Proponent will engage in-house resources to undertake the investigation, design (with assistance from Geotechnical Engineering Office) and supervision of construction of the Project. Works order will be issued to the contractor under the current maintenance contract for carrying out the works.

2.2 Project Timetable

The tentative implementation programme is as follows:

Investigation and Preliminary Design	mid 2015	-	end 2015
Carrying out Ecological Appraisal and Application for Environmental Permit	end 2015	-	mid 2016
Detailed Design	early 2016	-	mid 2016
Construction	mid 2016	-	end 2017

2.3 Interaction with Other Projects

There are currently no undergoing nor planned projects having interaction / interfaces with the Project.

3 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

3.1 General

3.1.1 The Project Site comprises mainly existing slopes and fall completely within Lantau South Country Park. There are no residential developments within or in close proximity to the Project Site. The Project Site is a sharp bend near Shek Pik Reservoir service access road along Keung Shan Road and occupies an area as circumscribed by the site boundary on Plan No. HWDIS073A-SK0034 in **Annex A**.

3.2 Air Quality

3.2.1 Keung Shan Road is adjacent to the Project Site, and road traffic emission is the key air mission source in the surroundings of the Project Site. Keung Shan Road, however, is only a rural road.

3.2.2 The air sensitive receivers (ASRs) identified in the vicinity of the Project Site are listed in Table 3.1 and a dotted line with a radius of 500 m from the centre of the Project Site to show the locations of representative air sensitive receivers is presented in **Annex B**. There is no ASR within 500m from the Project Site.

Table 3.1 Representative ASRs

SR ID	Description	Landuse	Closest Distance from Project Site (m)
ASR1	Temple	Place of Worship	1300
ASR2	Shek Pik Prison	Institutional	1600

3.3 Noise

3.3.1 Representative noise sensitive receivers (NSRs) identified in the vicinity of the proposed Project Site are listed in Table 3.2 below and presented in **Annex B** (A plan with a 300 m radius dotted line from the centre of the Project Site)

Table 3.2 Representative NSRs

SR ID	Description	Landuse	Closest Distance from Project Site (m)
NSR1	Temple	Place of Worship	1300
NSR2	Shek Pik Prison	Institutional	1600

Note: The site is within Lantau South Country Park, however, no noise-sensitive uses are identified within 300m from the Project Site.

3.4 Water Quality

Water Quality Sensitive Receivers

3.4.1 No gullies are found within the Project Site. All surface runoff from the slopes are collected by U-channels and step channels on both sides of slopes and diverted to U-channels in lower berm outside the Project Site. Water quality sensitive receivers (WQSR) identified in the vicinity of the proposed Project Site are listed in Table 3.3 below and presented in **Annex B** (A plan with a 300 m radius dotted line from the centre of the Project Site)

Table 3.3 Representative WQSRs

SR ID	Description	Landuse	Closest Distance from Project Site (m)
WQSR1	Water Gathering Grounds	Country Park	Project Site falls within its boundary
WQSR2	Shek Pik Reservoir	Service Reservoir	860

3.5 Ecology

3.5.1 Ecological Survey

The Project Site is within country park. To provide full ecological profile for adjacent habitats and to appraise the potential ecological impact of the Project, ecological survey was conducted in November 2015 for the areas within 300m distance from the Project Site (“Study Area”) and the findings were submitted to Agriculture, Fisheries and Conservation Department (AFCD). The key findings are summarized in Section 3.5.2 and Section 4.5.

3.5.2 Key Ecological Elements

The areas within and adjacent to the Project Site consist of two habitats: “developed area” and “plantation woodland” (habitat map as presented in **Annex C** with representative photos). The “developed area” includes Keung Shan Road along the north, east and south side of the Project Site, and the shotcreted artificial slope within the Project Site. The “plantation woodland” includes part of the slope within the Project Site and the slope uphill of the Project Site. The ecological value of the Project Site is considered as low according to the ecological survey; no rare species were found and the plantation woodland is dominated by *Fraxinus chinesnsis*, *Lophostemon confertus* and with some exotic young trees. For the plantation woodland adjacent to the Project Site, there is low abundance of wildlife.

3.6 Landscape and Visual

3.6.1 The Project is not visually sensitive as the Project Site comprises existing slope along Keung Shan Road that is not considered as major tourism spot and has no accommodation of pedestrians. Moreover, it does not comprise any specific landscape features attractable to the public but mainly typical plantation woodland and slopes either vegetated or shotcreted alongside a rural road. Travellers along Keung Shan Road would be the key visual sensitive receivers. Some enhancement measures are proposed in Section 5.

3.7 Cultural Heritage

No declared monuments, proposed monuments, graded historic sites/buildings, heritage resources and Sites of Archaeological Interest are located within or adjacent to the Project Site.

4 POSSIBLE IMPACT ON THE ENVIRONMENT

Potential environmental impacts arising from the construction and operation phases of the Project are identified and summarized in the paragraphs below.

4.1 Air Quality

4.1.1 Construction Phase

During construction, construction dust would be generated from construction activities such as minor earthworks for the removal of existing hard surfacing, soil nailing works, material handling and hauling, demolition, excavation, filling, vehicle movement and wind erosion of unpaved areas and uncovered stockpiles. Besides, operation of construction plants / equipment and construction vehicles would also produce exhaust emissions to the surrounding environment. However, the potential air quality impact is anticipated to be short term and could be well controlled through appropriate design, adequate pollution control measures such as dust suppression measures and good site management practices.

In addition, in view of the nature and small scale of works in addition to the implementation of dust suppression measures, no adverse dust impact is anticipated. Besides, taken into account of considerable separation distance between the localized construction works and the ASRs, as well as only limited number of vehicles and plants employed for the proposed works, exhaust emission from the limited construction plant is anticipated to be insignificant.

4.1.2 Operation Phase

The Project is to improve a local sharp bend at Keung Shan Road and no additional vehicular traffic is involved. Hence, adverse air quality impact during operation of the Project is not anticipated.

4.2 Noise

4.2.1 Construction Phase

4.2.1.1 During construction, the major sources of noise nuisance would primarily come from the use of powered mechanical equipment ("PMEs") on site and the temporary increase in construction traffic on the roads in the proximity. The construction activities would involve the use of PMEs for slope cutting, tree felling, drilling and grouting during installation of nails and land traffic traveling to and from the Project Site. Due to the tree felling works would be carried out, the large crane lorry will be deployed on site. Excavator will be used for breaking shotcreted slope and removal of soil or rock. The noise emission levels of these PMEs shall be complied with the sound power levels published on EPD's website.

4.2.1.2 The construction activities would be carried out only during non-restricted hours i.e. daytime (7 am to 7 pm), Monday to Saturday except Sundays and public holidays. No construction activities would be carried out during the restricted hours (7 pm to 7 am on weekdays and anytime on Sundays and public holidays). The noise impact resulting from such construction activities is however expected to be short term and could be within an acceptable level within the allowable sound level output from the PMEs.

4.2.1.3 Also, since the nearest NSRs are more than 1 km away from the Project Site, the noise impact on the NSRs during construction will not be significant.

4.2.2 Operation Phase

No additional vehicular traffic would be permitted to traverse the improved bend at Keung Shan Road. Hence the Project is not expected to generate any adverse noise impact during the operation phase.

4.3 Water Quality

4.3.1 Construction Phase

The potential impact to water quality would primarily result from construction site runoff and effluent from construction workforce. Such runoff may contain considerable amount of suspended solids and contaminants generated from accumulated solid and liquid waste (such as packaging materials), dust suppression sprays, and stockpiles and spillage of cleaning fluids, lubrication oil, fuel or solvents from vehicles. Such runoff and effluent, if discharged in an uncontrolled manner, would pollute the operating drainage system.

However, with proper control measures and good site management practices implemented, the potential impact to water quality delineated above can be readily abated. Moreover, we would not adopt the natural streams along the slopes for flushing purpose during installation of soil nails and therefore, such natural streams would not be adversely affected.

In addition, we have sought advice and liaised with Water Supplies Department (WSD) for any requirements before construction near water mains and Water Gathering Grounds. WSD advised us to observe and comply with conditions for works in the vicinity of Water Gathering Grounds during construction and had no adverse comments on the Project.

4.3.2 Operation Phase

The surface runoff collected would be discharged in a similar manner as that before improvement works are carried out. Apart from this, the Project would not implement any significant change in the operating drainage system, especially Water Gathering Grounds, within the Project Site. Hence, it is unlikely to result in adverse operational impact to water quality.

4.4 Waste Disposal

4.4.1 Construction Phase

The construction activities involved in the Project would generate different types of wastes, including

- construction and demolition (“C&D”) materials
- chemical waste, and
- general refuse

These types of wastes would be generated from different sources and would require different means of handling and disposal. They are more particularly described below:

- C&D materials (estimated to be about 3000 m³) would arise from excess fill material or excavation works which are mainly soil and broken shotcreted surface (less than 100 m³ of wire mesh). The inert materials generated from excavation works should be properly stored and daily disposal (less than 10 m³ per day). Reuse of inert materials should be properly treated to avoid hazard to the vicinity of the environment. Feasibility plan for reuse any of the materials should be followed. Proper handling, storage, collection and disposal of waste would be carried out. A small quantity of non-inert C&D materials that mainly consist of timber, plastic, and other solid waste (estimated to be about 20 m³). All of the construction waste generated on site would be stored separately for further disposal. The C&D waste would be disposed to designated locations with the disposal permit of construction waste. Inert C&D materials would be disposed at Mui Wo Temporary Public Fill Reception Facility, while non-inert C&D wastes will be disposed at Outlying Islands Transfer Facility-Mui Wo Station or North Lantau Transfer Station;
- Chemical wastes, such as cleaning fluids, solvents, lubrication oil and fuel, etc., may be generated in the maintenance and servicing of construction plants / equipment and vehicles. These wastes should be properly handled, labeled, stored and collected in accordance with the requirements of the Waste Disposal (Chemical Waste) General Regulation;
- General refuse, such as plastic, paper, metals and empty containers should be properly sorted on site for recycling. Other wastes, which are not recyclable such as food scraps and packaging box generated by the site labours, should be disposed to a refuse facility on a daily basis; and
- With proper waste management measures in place (Good Site Practices recommended in Section 5), adverse impact from this Project is very limited.

4.4.2 Operation Phase

During operation, the improved bend at Keung Shan Road is not expected to generate any solid waste except those arising from occasional replacement of damaged / wear parts / components during its service life. The Project is therefore not expected to entail any waste generation.

4.5 Ecology

4.5.1 Construction Phase

4.5.1.1 Cutting part of the existing slope and installation of soil nails on the cut slope are the key construction activities with potential to affect the local ecology.

4.5.1.2 The ecological survey revealed that three numbers of *Aquilaria sinensis* and three numbers of *Brainea insignis* were found in plantation woodland outside the Project Site but within the Study Area (i.e. within 300m distance from the Project Site as shown in **Annex C**). These species would not be impacted by the Project as no works would be allowed outside

the Project Site.

4.5.1.3 Tree felling may cause the loss of terrestrial habitats as provided in Table 4.1 below. There will be altogether 29 number of trees to be removed (as attached in **Annex D**). However, as the Project includes appropriate landscape/hydroseeding works, including planting as attached in **Annex G**, the impact of loss of different habitat as shown in Table 4.1 is not significant.

Table 4.1. Estimated loss of different habitat is summarized in below

Habitat	Project Site (ha)	Permanent Loss (ha)	Temporary Loss (ha)
Developed area	~0.13	~0.017	0
Plantation woodland	~0.15	~0.07	0
Grand Total	~0.28	~0.087	0

4.5.1.4 Moreover, for trees not to be affected by the works, they will be adequately preserved according to the established guidelines and requirements. In accordance with GEO publication no.1/2011, works will be carried out in a way to avoid mechanical damage to the tree trunks. The works contractor will be required to comply with the General Specification for Civil Engineering Works (GS), which includes specifications on Preservation and Protection of Trees. References will also make to Development Bureau Technical Circular (Works) No. 7/2015 on “Tree Preservation”.

4.5.1.5 As the Project Site falls within country park, the Tree Preservation and Removal Proposal and the ecological appraisal were submitted to AFCD for comments in March and April 2016 respectively. AFCD had no comment on either of these documents. Key ecological findings are summarized as follow:-

- Existing slope to be cut: mainly artificial slope with shotcreted, planted vegetation or trees;
- Key fauna habitats in the vicinity of the cut slope (as attached in **Annex E**): no terrestrial mammals (apart from domestic dogs), herpetofauna species and aquatic fauna were recorded; common species of avifauna and insects (including odonatan and butterflies) were recorded; no species of conservation importance;
- Key flora species within the ecological survey area (as attached in **Annex F**): mostly common species; mostly species without conservation importance, in particular, trees mostly of common species; three numbers of *Aquilaria sinensis* and three numbers of *Brainea insignis* found outside the Project Site (as shown on habitat map in **Annex C**);

- Two numbers of *Artocarpus hypargyreus* were recorded in the Project Site. Although *Artocarpus hypargyreus* is listed in China Plant Red Data Book, it is common in Hong Kong and the conservation interest of these two recorded individuals within the Project Site were considered as low. Besides, possibility of transplanting these two individuals has been considered. However, they are located within the edge of a rocky slope surface (locations of these trees no. 230 and 304 as indicated in **Annex D**) and formation of a stable and balanced root ball is impracticable. Also, substantial crown and root pruning would be necessary for their transplanting that would cause irrecoverable form afterwards. Hence, transplantation of these two individuals is considered impracticable. As alternative compensation, appropriate landscape/hydroseeding works including planting was proposed (as attached in **Annex G**) and AFCD had no comments.
- In view of limited scale and localized in nature of the Project, adverse ecological impact is unlikely.

4.5.2 Operation Phase

The Project is to improve a local sharp bend of the existing rural road, and no additional vehicular traffic is involved. The Project does not include any further works during operation phase, and hence ecological impact during operation is not anticipated.

4.6 Landscape and Visual

4.6.1 Construction Phase

There are altogether 29 number of trees to be removed (**Annex D**). During tree felling, removable barrier would be installed in the proximity of the removal zone. Estimated loss of plantation woodland including groundcover will be about 0.07 (ha). The removable barrier or temporary installations on the slope during construction may have slight visual impact to the visitors/drivers on Keung Shan Road but the effect is short term and transient. The impact is considered insignificant.

4.6.2 Operation Phase

The existing slope is mainly shotcreted. The project will involve appropriate landscape/hydroseeding works (reference photos as attached in **Annex G**). The visual and landscape aspect of the slope will actually be enhanced with the Project.

4.7 Cultural Heritage

No site of cultural heritage could be identified within and in the proximity of the Project Site. Cultural heritage impact is not anticipated.

5 ENVIRONMENTAL PROTECTION MEASURES AND FURTHER ENVIRONMENTAL IMPLICATIONS

Appropriate environmental protection measures would be devised to ensure that the Project would be environmentally acceptable with reference to the relevant legislations and other requirements.

5.1 Environmental Protection Measures/Good Site Practices

5.1.1 Air Quality

The control measures, set out in the Air Pollution Control (Construction Dust) Regulation, would be implemented, where applicable and practicable, to suppress the dust emission from the Project. These control measures may cover:

- the site would be frequently wetted and cleaned to reduce dust emission;
- earthmoving activities, including transportation to and from the site would be carefully planned;
- stockpiles of dusty materials on site would be properly covered and frequently water sprayed;
- the speed of construction traffic on public roads would be reduced; and
- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.

5.1.2 Noise

Noise Control measures would be implemented, where applicable and practicable, to suppress the construction noise arising from the Project. These control measures may cover:

- properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds / shields, acoustic machinery enclosures, etc. would be applied to noise sources;
- material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities;
- plants with low noise emission levels would be used;
- noise emitting plants would be located away from NSRs;
- noisy construction activities would be properly scheduled to minimize exposure of NSRs to construction noise;
- construction noise thresholds / requirements would be devised in contracts
- site plants / equipment would be regularly maintained; and
- construction traffic on public roads would be properly routed to minimize construction noise impact to noise sensitive receivers.

5.1.3 Water Quality

Water pollution arisen from construction activities can be controlled by adopting site practices, where applicable and practicable, in ProPECC PN 1194 “Construction Site

Highways Department May 2016

Drainage” and “Recommended Pollution Control Clauses for Construction Contracts” issued by Environmental Protection Department (“EPD”), and the procedures in the ETWB TCW No. 5/2005 “Protection of Natural Stream / Rivers from Adverse Impact Arising from Construction Works”. The measures relevant to this Project include:

- Following “Conditions for Working near Water Gathering Grounds” published by Water Supplies Department;
- surface run-off would be discharged to storm drains via silt trap and oil interceptor after proper treatment for removal of oil, lubricants, grease, silt, grit and debris from the wastewater;
- silt trap, oil interceptor and wastewater collection and treatment facilities would be cleaned and maintained regularly
- temporarily exposed slope surfaces and stockpiles of construction materials would be properly covered by tarpaulin or impermeable sheets;
- drilling fluid for boring and / or drilling would be re-circulated and re-used after sedimentation; and
- works involving excavation would be minimized, where possible, during wet season.

5.1.4 Waste Disposal

Proper waste management would be implemented to reduce and minimize generation of C&D materials in the execution of the construction works. The waste management would, where applicable and practicable, cover the following items:

- any inert and non-inert C&D construction materials would be properly sorted and plan stringently for feasible use of inert materials generated from excavation works; any C&D waste (concrete waste, and rock debris) will be disposal on a daily basis; surplus of C&D materials shall be handled properly by segregation inside a designated area within site boundary;
- metal, paper, plastic, aluminum and other recyclable materials would be segregated from the construction wastes for recycling;
- reusable non-timber formwork and falsework system would be deployed as far as practicable to reduce the amount of C&D materials;
- no C&D materials or general refuse would be disposed or temporarily stored in the vicinity of Lantau Island South Country Park;
- inert C&D materials would be disposed at Mui Wo Temporary Public Fill Reception Facility, while non-inert C&D wastes will be disposed at Outlying Islands Transfer Facility-Mui Wo Station or North Lantau Transfer Station;
- control trip ticket system shall be implemented by the Contractor and monitored as a standard item in the relevant technical audit, in accordance with the requirement specified in DEVB TC(W) No. 6/2010 Trip Ticket System for Disposal of C&D materials;

- proper measures and site management practices would be taken to prevent illegal dumping of non-inert C&D waste and to plan and record the waste management and disposal activities;
- form briefing to the site staff of the practice of handling, storage and disposal of waste with reference to Waste Disposal Ordinance to be followed; and
- chemical wastes generated from construction activities, vehicle and / or plant maintenance and oil interceptors would be properly segregated, treated and disposed of in strict compliance with relevant ordinances and regulations.

5.1.5 Ecology

The following measures would be taken, where applicable and practicable, to minimize the potential disturbance on the local ecology:

- the duration, amount and extent of unavoidable disturbances to the nearby natural habitat would be minimized as far as practicable by the use of appropriate temporary works, foundation type / layout, construction plants and construction methods;
- temporary access to the works site would be arranged and located to minimize disturbance to natural vegetation by construction plants;
- no works would be allowed outside the works boundary;
- trunk of trees in close vicinity would be wrapped in hessian as a form of protective wrapping;
- the Contractor would be required to comply the provisions of tree preservation with General Specification for Civil Engineering Works during construction phase;
- Soil erosion prevention measures, wherever necessary and appropriate, such as, earth bunding, erection of temporary fences, installation of silt traps, covering of exposed soil and application of erosion control mats.
- DEVB TC(W) No. 7/2015 on “Tree Preservation” would be complied for the implementation of the Project. In particular, as for tree felling, appropriate landscape/hydroseeding works (with grass, shrubs, groundcovers and climbers) would be provided as alternative compensatory planting (as shown in **Annex G** with reference photos); and
- formal briefing to the site staff identifying the location of any identified species within and adjacent to the Project Site would be held prior to works commencement

5.1.6 Landscape and Visual

The following control or enhancement measures would be taken, where applicable and practicable:

- litter control would be properly implemented within and in the proximity of the Project Site;
- the extent works areas would be minimized;
- construction period would be minimized;
- site and works areas would be screened off from the sensitive users by installation of

- hoarding or other suitable methods;
- appropriate landscape/hydroseeding works as well as compensatory planting (with grass, shrubs, groundcovers and climbers) would be provided (as shown in **Annex G** with reference photos);
- construction plants / equipment and construction materials would be stored in such a way that would not render them visually intrusive;
- trunk of trees in close vicinity would be wrapped in hessian as a form of protective wrapping, other vegetation not affected will be fenced off; and
- formal briefing to the site staff identifying the location of any identified species within and adjacent to the Project Site would be held prior to works commencement.

5.2 Environmental Monitoring and Audit

In view of the small scale of works, with the provisions of the standard control measures, the Project is unlikely to have adverse impact. An environmental monitoring and audit programme would not be required.

5.3 Severity, Distribution and Duration of Environmental Effects

The construction period of approximately 18 months. In view of the nature and limit scale of the Project, the environmental effect would be very localized.

With respect to discussions as stated in Sections 3-5, it is anticipated that the environmental impact arising in relation to air, noise, water quality, ecology, landscape and visual and cultural heritage is unlikely to be adverse with the implementation of the appropriate pollution control measures and good site practices as described above in Section 5.

5.4 Further Environmental Implications

No further environmental implications are anticipated.

6 CONCLUSION

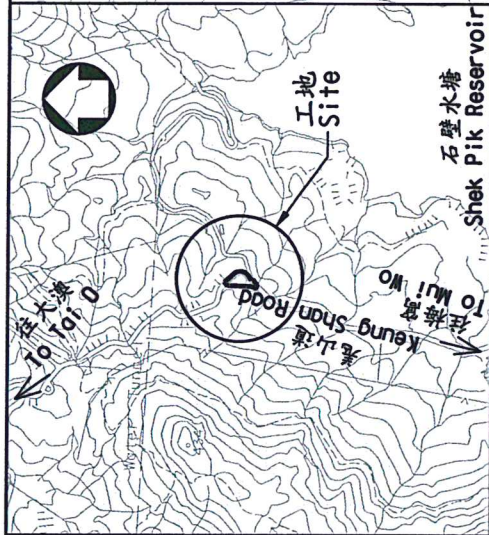
Potential environmental issues, including air quality, noise, water quality, ecology, landscape and visual, cultural heritage and waste management, have been addressed in Project Profile.

The conclusion is that, with proper implementation of the standard environmental protection and good site practices, the Project is unlikely to cause adverse environmental impact during the construction and operation phases of the Project. With the implementation of the landscaping works in the Project, slight positive impact in terms of landscape resources is predicted in the long term.

7 USE OF PREVIOUSLY APPROVED EIA REPORTS

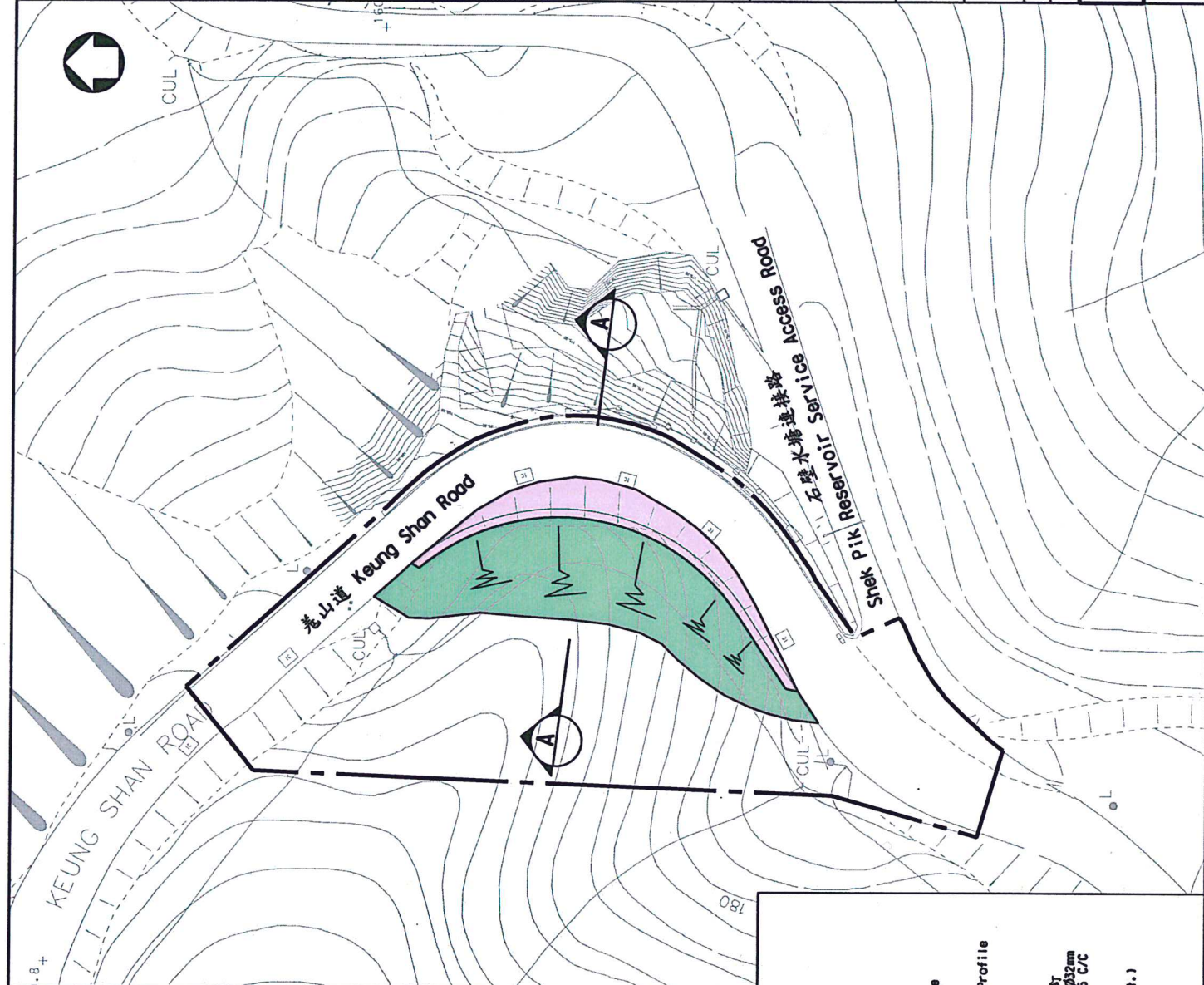
No previously approved EIA reports are referred to in the preparation of this project profile.

Annex A



位置圖 Location Plan

比例 Scale 1 : 15000



註 NOTES :

圖例 Legend :

施工區界限
Limit of Works Site

擬建斜坡改善工程
Proposed Slope Upgrading Works

擬建擴闊道路工程
Proposed Road Widening Works

ADVANCE COPY
DATE 10 MAY 2016

工程名稱 project title
虎山道急彎改善工程 -
近石壁水塘連接路
Improvement To Sharp
Bend Of Keung Shan Road
Near Shek Pik Reservoir
Service Access Road

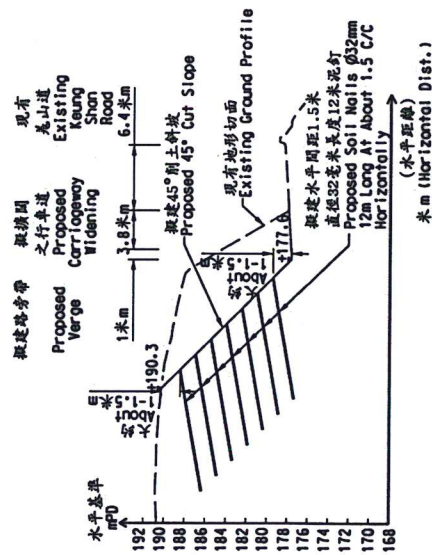
圖則名稱 drawing title
大綱平面圖

圖則編號 drawing no.
HWD IS073A-SK0034

比例 scale 1 : 500
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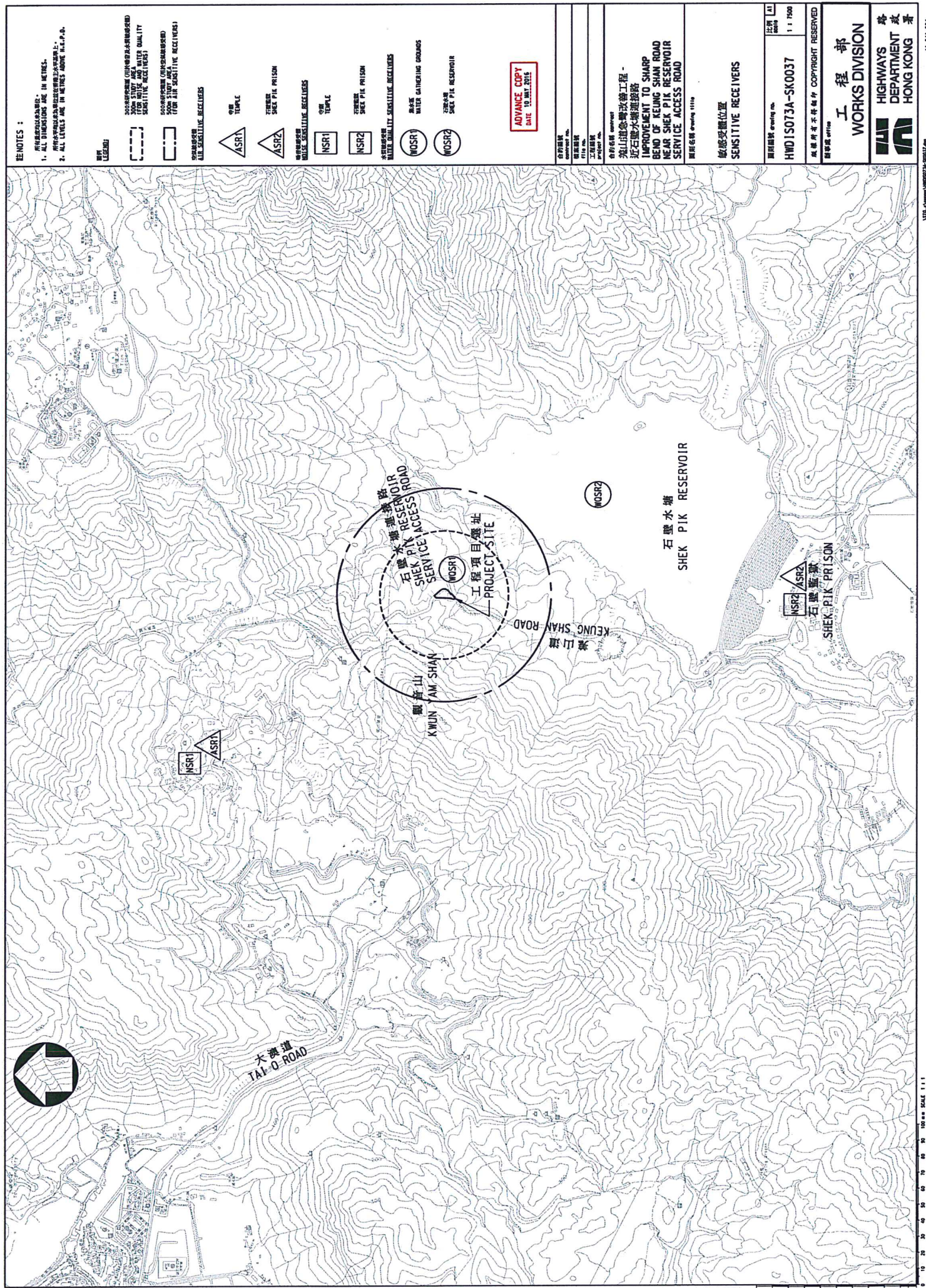


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比例 SCALE 1:500

SCALE 1 : 1

Annex B



Annex C

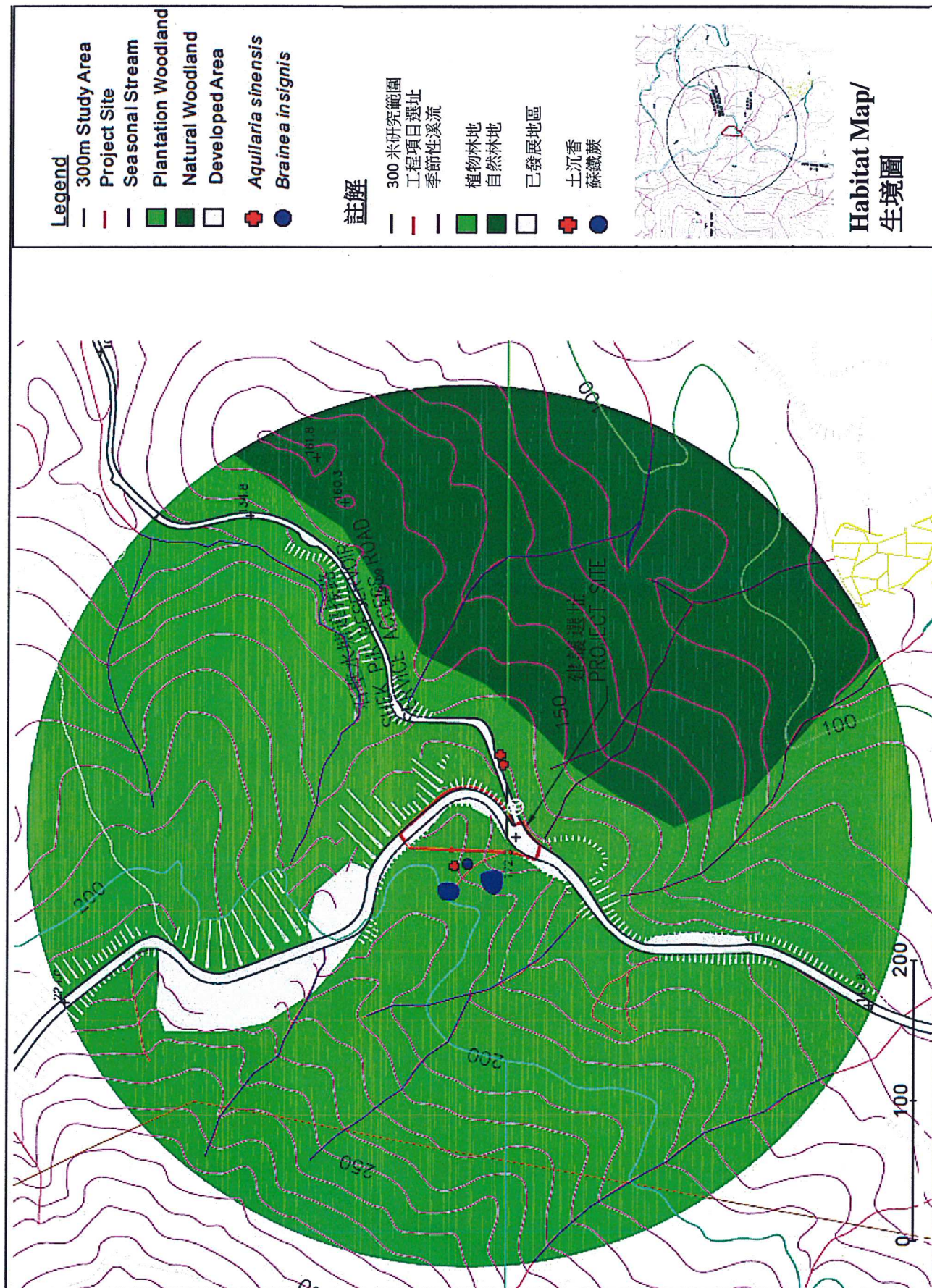




Photo 1. General View of Project Site

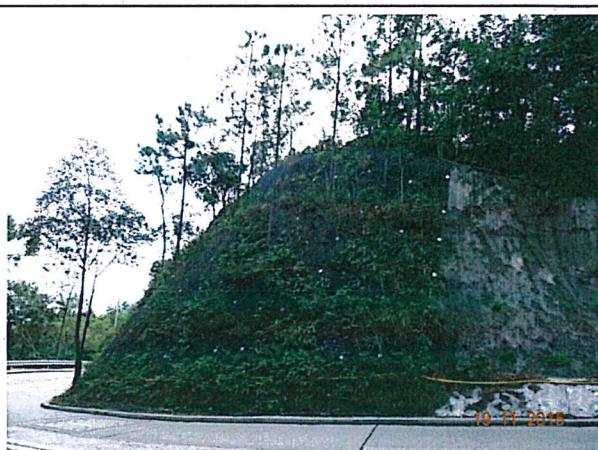


Photo 2. General View of Project Site



Photo 3. General View of Project Site



Photo 4. General View of Project Site



Photo 5. General View of Project Site



Photo 6. General View of Project Site



Photo 7. General View of Project Site



Photo 8. General View of Project Site



Photo 9. General View of Project Site



Photo 10. General View of Plantation Woodland

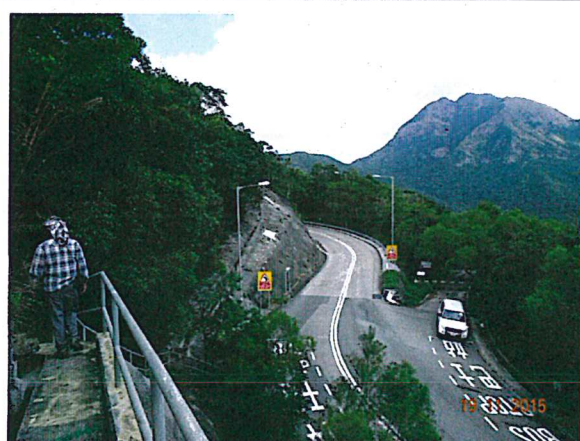


Photo 11. General View of Developed Area



Photo 12. General View of Woodland



Photo 13. General View of Seasonal Stream



Photo 14. Flora species of *Aquilaria sinensis*



Photo 15. Flora species of *Brainea insignis*

Annex D

所有量度均以米為單位。

1. ALL DIMENSIONS ARE IN METRES.

所有水平均以米為單位並在
香港主水平基準上。

2. ALL LEVELS ARE IN METRES ABOVE H.K.P.D.

	工程項目地址 PROJECT SITE
	擬擴闊之行車道 PROPOSED CARRIAGEWAY WIDENING
	擬建設路旁 PROPOSED VERGE
	建議保留的樹木 TREES PROPOSED TO BE RETAINED
	建議移除的樹木 TREES PROPOSED TO BE FELLED

合約編號 contract no.	國家編號 file no.	工程編號 project no.
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美山道急彎改善工程 -
近石壁水塘連接路

樹木保育和移除圖則

圖則編號 drawing no. **HWD1S073A-SK0038**

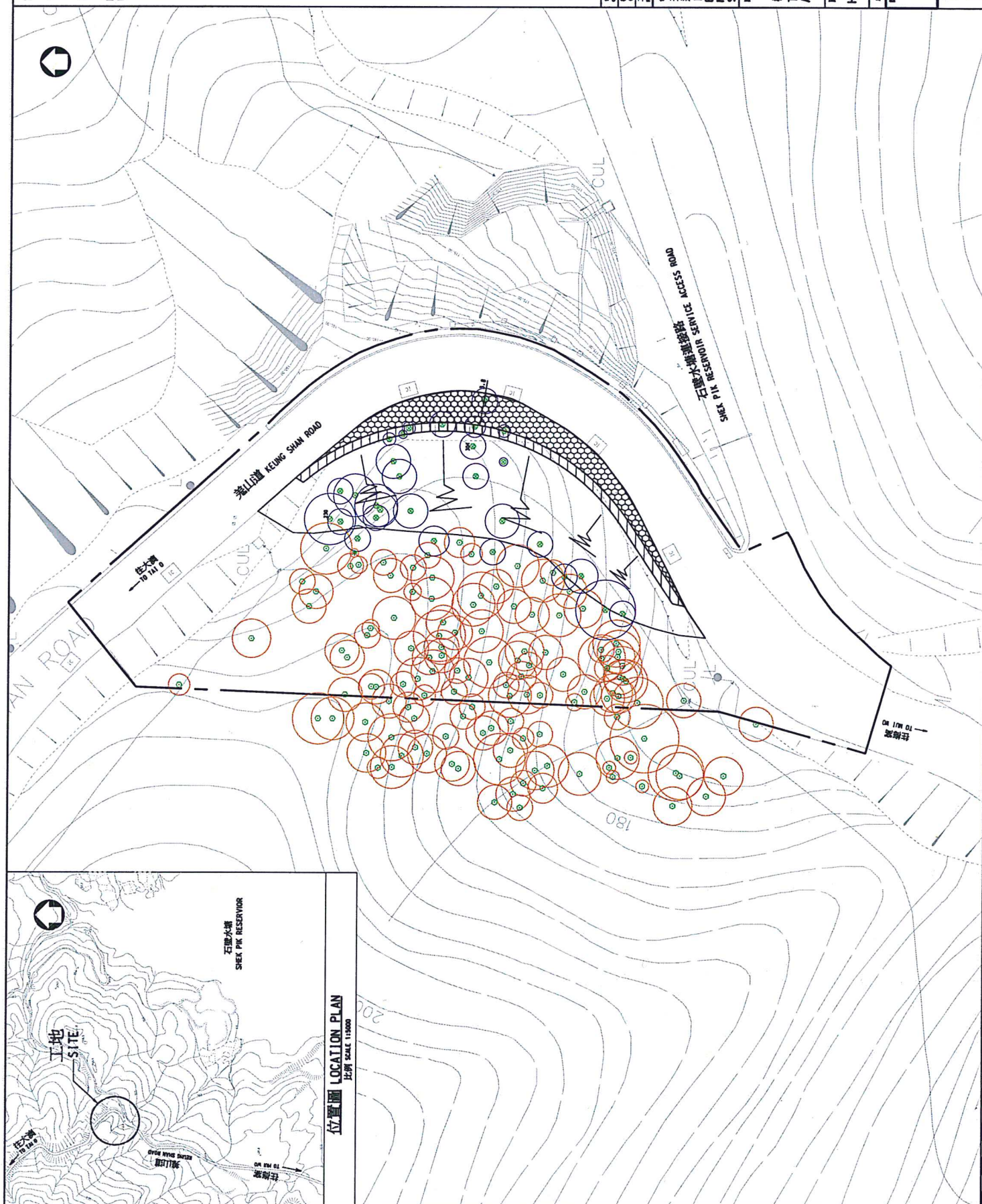
比例 scale	A1 1 : 200
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HIGHWAYS
DEPARTMENT
HONG KONG

570_مكتبة جامعة القاهرة 0734-5000.18.jpg



Annex E

List of dragonfly species recorded and the relative abundance within the Study Area /
已記錄的蜻蜓品種名單及在研究範圍內的相對數量

Common Name	通用名稱	Species Name	品種名稱	Status in Hong Kong/ 香港境內 狀況	Plantation Woodland / 植物林地
Wandering Glider	黃蜻	<i>Pantala flavescens</i>	黃蜻	Abundant / 大量	+

● Note/註解:

+ = occasional / 偶見

++ = common / 常見

+++ = abundant / 大量

List of butterfly species recorded and the relative abundance within the Study Area /
已記錄的蝴蝶品種名單及在研究範圍內的相對數量

Common Name	通用名稱	Species Name	品種名稱	Status in Hong Kong/ 香港境內 狀況	Plantation Woodland / 植物林地	Developed Area/ 已發展地 區	Natural Woodland/ 自然林地	Within Project Site/ 工程項目 選址內
Common mormon	玉帶鳳蝶	<i>Papilio polytes</i>	玉帶鳳蝶	Common	+	+		+
Paris Peacock	巴黎翠鳳蝶	<i>Papilio paris</i>	巴黎翠鳳蝶	Common	+			
Pale grass blue	酢醬灰蝶	<i>Zizeeria maha</i>	酢醬灰蝶	Very common		+		+
Common grass yellow	寬邊黃粉牒	<i>Eurema hecabe</i>	寬邊黃粉牒	Very common	+	+		+
Dark veined Tiger	虎斑蝶	<i>Danaus genutia</i>	虎斑蝶	Common		+	+	
Dark-brand Bush Brown	小眉眼蝶	<i>Mycalesis mineus</i>	小眉眼蝶	Very common	+		+	
Plum Judy	蛇目褐蛺蝶	<i>Abisara echerius</i>	蛇目褐蛺蝶	Very common			+	
Large Faun	串珠環蝶	<i>Faunis eumeus</i>	串珠環蝶	Common			+	

● Note/註解:

+ = occasional / 偶見
 ++ = common / 常見
 +++ = abundant / 大量

List of avifauna species recorded and the relative abundance within the Study Area /

已記錄的鳥類品種名單及在研究範圍內的相對數量

Common Name	通用名稱	Species Name	品種名稱	Conservation status in Hong Kong/ 在香港的保育狀況	Within Project Site/ 工程項目選址內	300m range/ 300 米範圍
Oriental Magpie Robin	鵲鴝	<i>Copsychus saularis</i>	鵲鴝	Cap. 170	2	4
Large-billed Crow	大嘴烏鴉	<i>Corvus macrorhynchos</i>	大嘴烏鴉	Cap. 170		2
Masked Laughingthrush	黑臉噪鵲	<i>Garrulax perspicillatus</i>	黑臉噪鵲	Cap. 170		2
Common Tailorbird	長尾縫葉鶯	<i>Orthotomus sutorius</i>	長尾縫葉鶯	Cap. 170		2
Yellow-browed Warbler	黃眉柳鶯	<i>Phylloscopus inornatus</i>	黃眉柳鶯	Cap. 170		2
Pallas's Leaf Warbler	黃腰柳鶯	<i>Phylloscopus proregulus</i>	黃腰柳鶯	Cap. 170		1
Yellow-bellied Prinia	黃腹鷦鶯	<i>Prinia flaviventris</i>	黃腹鷦鶯	Cap. 170		1
Plain Prinia	純色鷦鶯	<i>Prinia inornata</i>	純色鷦鶯	Cap. 170		3
Red-whiskered Bulbul	紅耳鶇	<i>Pycnonotus jocosus</i>	紅耳鶇	Cap. 170	4	6
Chinese Bulbul	白頭鶇	<i>Pycnonotus sinensis</i>	白頭鶇	Cap. 170	2	4
Black-collared Starling	黑領椋鳥	<i>Sturnus nigricollis</i>	黑領椋鳥	Cap. 170		2
				No. of Individuals/ 總數量	8	29
				No. of Species/ 物種數量	3	11

● Note/註解:

Cap. 170 – Wild Animals Protection Ordinance (Cap. 170)

第 170 章《野生動物保護條例》

Annex F

List of flora species recorded and the relative abundance within the Study Area /
已記錄的植物品種名單及其在研究範圍內的相對數量

		Flora Information/植物資料				Study Area/研究範圍			Within Project Site/ 工程項目選址內
Family/科名		Species/品種		Native/ Exotic*/ 土生/ 外來*	Growing Form*/ 生長形態*	Plantation Woodland /植物林地	Developed Area/ 已發展地區	Natural Woodland/ 自然林地	
Adiantaceae	鐵線蕨科	<i>Adiantum flabellulatum</i> L.	扇葉鐵線蕨	N	S	+		+	
Alangiaceae	八角楓科	<i>Alangium chinense</i>	八角楓	N	T/S	+	+		
Amaranthaceae	莧科	<i>Amaranthus viridis</i>	野苋	N	S		+		
Anacardiaceae	漆樹科	<i>Rhus hypoleuca</i>	白背漆	N	S	+		+	
Anacardiaceae	漆樹科	<i>Rhus succedanea</i>	野漆樹	N	T/S	+	+		+
Annonaceae	番荔枝科	<i>Uvaria macrophylla</i>	紫玉盤	N	C	+		+	

Apocynaceae	夾竹桃科	<i>Srophanthus divaricatus</i>	羊角拗	N	S	+			+	
Aquifoliaceae	冬青科	<i>Ilex asprella</i>	梅葉冬青	N	S				+	
Aquifoliaceae	冬青科	<i>Ilex memecylifolia</i>	谷木葉冬青	N	S				+	
Aquifoliaceae	冬青科	<i>Ilex pubescens</i>	毛冬青	N	S	+			+	
Aquifoliaceae	冬青科	<i>Ilex rotunda</i>	鐵冬青	N	T/S	+	+		+	
Araceae	天南星科	<i>Alocasia macrorrhiza</i>	海芋	N	S	+			+	
Araliaceae	五加科	<i>Schefflera heptaphylla</i>	鴨腳木	N	T/S	+	+		+	+
Asclepiadaceae	蘿藦科	<i>Graphistemma pictum</i>	天星藤	N	C	+				+
Asclepiadaceae	蘿藦科	<i>Tylophora ovata</i>	娃兒藤	N	C	+			+	
Asteraceae	菊科	<i>Ageratum conyzoides</i>	勝紅薊	E	S		+			
Asteraceae	菊科	<i>Bidens alba</i>	白花兔耳草	E	S		+			
Asteraceae	菊科	<i>Elephantopus tomentosus</i>	白花地膽草	N	S		+			
Asteraceae	菊科	<i>Emilia sonchifolia</i>	一點紅	N	S		+			

Asteraceae	菊科	<i>Vernonia cinerea</i>	夜香牛	N	S			+		
Asteraceae	菊科	<i>Aster baccharoides</i>	白舌紫苑	N	S	+				+
Asteraceae	菊科	<i>Wedelia chinensis</i>	錦葵菊	N	C	+	+			
Asteraceae	菊科	<i>Youngia japonica</i>	黃鵪菜	N	S	+				+
Asteraceae	菊科	<i>Mikania micrantha</i>	薇甘菊	E	C	+	+	+		+
Blechnaceae	烏毛蕨科	<i>Brainea insignis</i> *1,3	蘇鐵蕨	N	S	+				
Blechnaceae	烏毛蕨科	<i>Blechnum orientale</i>	烏毛蕨	N	S	+			+	+
Caesalpinaceae	蘇木科	<i>Bauhinia sp.</i>	羊蹄甲		T			+		
Caesalpinaceae	蘇木科	<i>Caesalpinia crista</i>	華南雲實	N	C	+				+
Chloranthaceae	金粟蘭科	<i>Sarcandra glabra</i>	草珊瑚	N	S	+			+	
Cyperaceae	莎草科	<i>Cyperus rotundus</i>	香附子	N	S			+		
Cyperaceae	莎草科	<i>Gahnia tristes</i>	黑莎草	N	G	+			+	

Daphniphyllaceae	交讓木科	<i>Daphniphyllum calycinum</i>	牛耳楓	N	S	+				+
Dilleniaceae	第倫桃科 (五 桎 果 科)	<i>Tetracera asiatica</i>	錫葉藤	N	C	+			+	+
Dioscoreaceae	薯蕷科	<i>Dioscorea sp.</i>	薯蕷		C	+			+	+
Ebenaceae	柿科	<i>Diospyros morrisiana</i>	羅浮柿	N	T/S	+				
Euphorbiaceae	大戟科	<i>Aporosa dioica</i>	銀柴	N	T/S				+	
Euphorbiaceae	大戟科	<i>Mallotus paniculatus</i>	白楸	N	T				+	
Euphorbiaceae	大戟科	<i>Glochidion eriocarpum</i>	毛果算盤子	N	T	+			+	
Euphorbiaceae	大戟科	<i>Glochidion lanceolarium</i>	艾膠算盤子	N	S	+				+
Euphorbiaceae	大戟科	<i>Sapium discolor</i>	山烏柏	N	T/S	+			+	
Euphorbiaceae	大戟科	<i>Breynia fruticosa</i>	黑面神	N	S	+	+			+
Euphorbiaceae	大戟科	<i>Bridelia tomentosa</i>	土蜜樹	N	T	+	+		+	
Euphorbiaceae	大戟科	<i>Macaranga tanarius</i>	血桐	N	T	+	+		+	

Euphorbiaceae	人戟科	<i>Phyllanthus urinaria</i>	葉下珠	N	S	+	+	+	+
Fabaceae	蝶形花科	<i>Millottia nitida</i>	亮葉雞血藤	N	C	+		+	
Flacourtiaceae	大風子科	<i>Homalium cochinchinensis</i>	天料木	N	S	+		+	
Gleicheniaceae	裏白科	<i>Dicranopteris pedata</i>	芒萁	N	S	++		+	+
Grossulariaceae	鼠刺科	<i>Itea chinensis</i>	鼠刺	N	T			+	
Guttiferae	山竹子科	<i>Cratoxylum cochinchinense</i>	黃牛木	N	T	+		+	
Lauraceae	樟科	<i>Litsea cubeba</i>	山蒼樹	N	T/S			+	
Lauraceae	樟科	<i>Litsea glutinosa</i>	潺槁樹	N	T	+			
Lauraceae	樟科	<i>Cassytha filiformis</i>	無根藤	N	C	+			+
Lauraceae	樟科	<i>Machilus chekiangensis</i>	浙江潤楠	N	T	+		++	
Lauraceae	樟科	<i>Machilus velutina</i>	絨毛潤楠	N	T/S	+		+	
Lauraceae	樟科	<i>Litsea rotundifolia</i>	豺皮樟	N	S	+	+	++	+
Liliaceae	百合科	<i>Dianella ensifolia</i>	山菅蘭	N	S	+			+

Liliaceae	百合科	<i>Liriope spicata</i>	麥門冬	N	S	+			+	
Lygodiaceae	海金沙科	<i>Lygodium japonicum</i>	海金沙	N	C	+	+		+	+
Malvaceae	錦葵科	<i>Urena lobata</i>	苘梵天花	N	S		+			
Melastomataceae	野牡丹科	<i>Melastoma sanguineum</i>	毛梔	N	S	+				+
Menispermaceae	野牡丹科	<i>Cyclea hypoglauca</i>	粉葉輪環藤	N	C	+			+	
Mimosaceae	含羞草科	<i>Acacia confusa</i>	台灣相思	E	T	+	+		+	+
Mimosaceae	含羞草科	<i>Leucaena leucocephala</i>	銀合歡	E	T	+	+			
Mimosaceae	含羞草科	<i>Archidendron lucidum</i>	亮葉猴耳環	N	S	+	+		+	
Moraceae	桑科	<i>Artocarpus hypargyreus</i>	白桂木 *2,6	N	T	+				+
Moraceae	桑科	<i>Ficus hispida</i>	對葉榕	N	S	+			+	
Moraceae	桑科	<i>Ficus varitiosa</i>	變葉榕	N	T/S	+				
Moraceae	桑科	<i>Ficus simplicissima</i>	五指毛桃	N	S	+			+	
Moraceae	桑科	<i>Ficus pumila</i>	蔦蘿	N	C	+	+			+
Myrsinaceae	紫金牛科	<i>Embelia laeta</i>	酸藤果	N	C	+				+

Myrtaceae	桃金娘科	<i>Baeckea frutescens</i>	崗松	N	S	+	+	+		
Myrtaceae	桃金娘科	<i>Lophostemon confertus</i>	紅膠木	E	T	+++	+	+	+	++
Myrtaceae	桃金娘科	<i>Rhodomyrtus tomentosa</i>	桃金娘	N	S	+	+	+		+
Nephrolepidaceae	腎蕨科	<i>Nephrolepis auriculata</i>	腎蕨	N	S	+				
Oleaceae	木犀科	<i>Ligustrum sinense</i>	山指甲	E	S	+	+	+	+	+
Oleaceae	木犀科	<i>Fraxinus chinensis</i>	白蠟樹	E	T	+				++
Oxalidaceae	酢漿草科	<i>Oxalis corniculata</i>	酢醬草	N	S		+			
Pentaphylacaceae	五列木科	<i>Pentaphylax euryoides</i>	五列木	N	S/T	+			++	
Pinaceae	松科	<i>Pinus elliotii</i>	濕地松	E	T	+	+			+
Poaceae	禾本科	<i>Cymbopogon tortilis</i>	扭鞘香茅	N	G	+				+
Poaceae	禾本科	<i>Ischaemum aristatum</i> var. <i>glaucum</i>	鴨嘴草	N	G	+	+			

Poaceae	禾本科	<i>Rhynchelytrum repens</i>	紅毛草	E	G			+		+
Pteridaceae	通座蕨科	<i>Pteris semipinnata</i>	半邊旗	N	S	+			+	
Pteridaceae	通座蕨科	<i>Pteris vittata</i> L	蜈蚣草	N	S	+	+	+		+
Rhamnaceae	鼠李科	<i>Berberia floribunda</i>	多花勾兒茶	N	C	+				
Rhizophoraceae	紅樹科	<i>Carallia brachiata</i>	竹節樹	N	T	+				+
Rosaceae	薔薇科	<i>Rhaphirolepis indica</i>	車輪梅	N	S	+		+		+
Rubiaceae	茜草科	<i>Diplospora dubia</i>	狗骨柴	N	S				+	
Rubiaceae	茜草科	<i>Mussaenda pubescens</i>	玉葉金花	N	C	+				
Rubiaceae	茜草科	<i>Hedyotis acutangula</i>	金草	N	S	+				+
Rubiaceae	茜草科	<i>Psychotria asiatica</i>	九節	N	S	+			+	
Rubiaceae	茜草科	<i>Borreria stricta</i>	豐花草	N	S	+		+		+
Rubiaceae	茜草科	<i>Gardenia jasminoides</i>	梔子	N	S	+				

Rubiaceae	茜草科	<i>Canthium dicoccum</i>	魚骨木	N	T	+			+	+
Rubiaceae	茜草科	<i>Paederia scandens</i>	雞矢藤	N	C	+	+		+	
Rutaceae	芸香科	<i>Acronychia pedunculata</i>	降真香	N	S/T	+			+	+
Rutaceae	芸香科	<i>Zanthoxylum avicennae</i>	蒟醬花椒	N	T/S	+			+	+
Smilacaceae	菝葜科	<i>Smilax glabra</i>	土茯苓	N	C	+			+	
Sterculiaceae	梧桐科	<i>Reevesia thyrsoidea</i>	梭羅樹	N	T	+			+	+
Sterculiaceae	梧桐科	<i>Sterculia lanceolata</i>	假蘋婆	N	T/S	+	+		+	+
Theaceae	山茶科	<i>Eurya nitida</i>	細齒葉柃	N	S	+			+	+
Thymelaeaceae	瑞香科	<i>Aquilaria sinensis</i>	土沉香 *2,3,4,5,6	N	S/T	+				
Verbenaceae	馬鞭草科	<i>Callicarpa rubella</i>	紅紫珠	N	S	+				
Verbenaceae	馬鞭草科	<i>Lantana camara</i>	馬纓丹	E	S		+			
Verbenaceae	馬鞭草科	<i>Stachytarpheta jamaicensis</i>	假敗醬	E	S	+	+			

Verbenaceae	馬鞭草科	<i>Vitex negundo</i>	黃荊	N	S		+		+
Verbenaceae	馬鞭草科	<i>Clerodendrum fortunatum</i>	白花燈籠	N	S	+		+	+
Vitaceae	葡萄科	<i>Parthenocissus dalzielii</i>	爬牆虎	E	C		+		

● Note/註解:

Study Area covers Project Site and its surrounding 300 meters/研究範圍包括工程項目選址及其附近 300 米範圍內

"1" – "Vulnerable" in Rare and Precious Plants of Hong Kong (Status in China)/

屬香港稀有及珍貴植物 (中國境內現狀)內的「易危」類

"2" – "Near Threatened" in Rare and Precious Plants of Hong Kong (Status in China)/

屬香港稀有及珍貴植物 (中國境內現狀)內的「近危」類

"3" – Under State protection (Category II)/

屬國家二級保護植物

"4" – Listed as "Vulnerable" in International Union for Conservation of Nature Red List/

在國際自然保護聯盟紅色名錄被列為「易危」類

"5" – Protection of Endangered Species of Animals and Plants Ordinance (Cap 586)/

第 586 章《保護瀕危動植物物種條例》

"6" – Recorded in China Plant Red Data Book/

收錄在中國植物紅皮書

"+" represents species existing within the Study Area/

代表存在於研究範圍內的品種

"++" represents species commonly recorded within Study Area/

代表經常在研究範圍內錄得的品種

“+++” represents recorded species is a dominant species within Study Area/

代表研究範圍內錄得的主要物種

“N” represents native species

代表本土品種

“E” represents exotic species

代表外來品種

“S” represents shrub/

代表灌木

“T” represents tree

代表喬木

“C” represents climber

代表攀緣植物

“G” represents grass

代表草

Annex G



Reference Photos
參考相片