土木工程拓展署
Civil Engineering and Development Department

Agreement No. CE 28/2004 (GE)

Landslide Preventive Works at Po Shan, Mid-levels - Design and Construction

(Natural Terrain Risk Mitigation Works)

Project Profile

October 2006

Maunsell Geotechnical Services Ltd

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ISO 9001
FS 92773

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1. BASIC INFORMATION

Project Title

1.1 The title of this project is known as "Agreement No. CE28/2004 (GE) Landslide Preventive Works at Po Shan, Mid-levels – Design and Construction (Natural Terrain Risk Mitigation Works)".

Purpose and Nature of the Project

1.2 The objective of this Project is to carry out detailed design and supervision of landslide preventive works to improve the long-term stability of the Po Shan area against large-scale and deep-seated slope failure. This Environmental Impact Assessment focus on the local repair works on the hillside, which is proposed to minimize slope deterioration and shallow slope instabilities.

1.3 The hillside is susceptible to shallow failure and a shallow landslide had occurred during a rainstorm in June 2005. This project aims to mitigate the natural terrain against shallow instabilities.

Name of Project Proponent

1.4 The Project Proponent is the Planning Division of the Geotechnical Engineering Office, Civil Engineering and Development Department, Government of the Hong Kong Special Administrative Region (HKSAR).

Location and Scale of Project

1.5 The proposed landslide preventive works would be constructed to protect the existing residential developments at the toe of the project site. The location of the project is shown in **Figure 1.1**. **Figure 1.2** shows the general layout of the Project.

1.6 The scope of works includes the installation about 700 numbers of soil nails and about 60 numbers of raking drains on the natural terrain within the concerned area as shown in **Figure 1.4**. The length of the soil nails is about 20m with a spacing of 2m horizontally and 3m vertically; the length of raking drains is about 10m with a spacing of 5m horizontally and 15m vertically.

1.7 Rock slope stabilisation works will be provided for the rock outcrop / boulders at the upper portion of the natural terrain. Measures such as scaling, installation of rock bolts / dowels, construction of concrete buttress and provision of wire mesh protection will be provided where necessary.

1.8 No tree felling will be proposed under this Project.

1.9 The Project will be carried out concurrently with the construction works of drainage adit within the Po Shan area as shown in **Figure 1.1**

History of Site

1.10 The study area can be broadly defined as encompassing the mostly undeveloped hillsides above the residential development at Po Shan Road and adjacent to the trimmed back slope on the site of the catastrophic 1972 Po Shan Road failure. Previous studies had been carried out and results indicated that the natural hillside above Po Shan Road is affected by high groundwater level and unfavourable geology. Sub-surface drainage measures by means of sub-horizontal drains had been installed in 1984-85. These measures have been successful in lowering the main ground water table, thus improving the stability of the slopes such that large-scale failures have not occurred in the last twenty years. However, the hillside is susceptible to shallow failure and a shallow landslide was occurred on hillside during a rainstorm last year.

Number and Types of Designated Project Covered by the Project Profile

1.11 In accordance with Category Q.1 of Part 1, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), the proposed works at Po Shan Road would be partly fall within the boundary of the existing Pok Fu Lam Country Park and Special Area, as such should be regarded as a Designated Project. Therefore an Environmental Permit under the EIA Ordinance must be obtained prior to the commencement of any construction works. Location of Pok Fu Lam Country Park is illustrated in **Figure 1.1**.

Name and Telephone Number of Contact Person(s)

1.12 For details of the project please contact:

Mr. Jerry L. P. Ho
Senior Geotechnical Engineer
Geotechnical Engineering Office
Civil Engineering and Development Department
Tel : 2760 5700
Fax : 2714 0247
Email : lpho@cedd.gov.hk

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

Implementation and Planning of the Proposed Project

2.1 The Agreement was awarded by the Civil Engineering and Development Department (CEDD) to Maunsell Geotechnical Services Ltd. (MGSL) as the engineering consultant in April 2005 for design and supervision of the underground drainage adits. Following a shallow landslide on the hillside in June 2005, the CEDD carried out a natural terrain landslide risk assessment. The assessment concluded that natural terrain risk mitigation works is necessary on the hillside above Po Shan Road. On 28 Nov 2005, CEDD entered into agreement with MGSL for carrying out the design of the natural terrain risk mitigation works.

Tentative Project Timetable

2.2 The proposed works are scheduled to commence in June 2007 with duration of 10 months. The preliminary construction programme for the Project is shown as below:

Activity	Time period
Site clearance and set up	Mid June 2007 to mid July 2007
Soil Nail Installation	Mid July 2007 to mid January 2008
Soil Nail Head Construction	Mid July 2007 to mid January 2008
Rock slope stabilization works	Mid July 2007 to mid January 2008
Raking drain installation	Mid July 2007 to mid January 2008
Landscaping works	Mid February 2008 to mid April 2008
Site clear up	Mid February 2008 to mid April 2008

Interactions with Other Projects

2.3 There are interactions with another designated project “Agreement No. CE28/2004 (GE) Landslide Preventive Works at Po Shan, Mid-levels – Design and Construction” on-going during the same period within the captioned area which will also be carried out by the Project Proponent.

2.4 As advised by Water Supplies Department, improvement to Hong Kong Central Mid Level and High Level Areas Water Supply under Agreement CE13/2005(WS) will commence later this year. With reference to the proposed development at Hatton Road Service Reservoirs, it is noted that such works will be carried out after the completion of the proposed landslide preventive works and away from the site of this project. Apparently, there are no interactions between the two projects.

3. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

Description of Major Elements of the Surrounding Environment

3.1 The environmental assessments covering the areas in the vicinity of the Project site include noise, air quality, water quality, waste management, ecology, landscape and visual resources.

Noise

3.2 The areas surrounding the proposed project construction area are country park, namely Pok Fu Lam Country Park, and man-made slopes, with nearby high-rise residential areas to the north. The proposed works would encroach the boundary of Pok Fu Lam Country Park.

3.3 No major noise source was identified in the vicinity of the Study Area apart from the traffic along Po Shan Road. The ambient noise level is expected to be moderate.

Air Quality

3.4 The existing air quality near the proposed project site would be mainly contributed by emissions from vehicular traffic on nearby road networks. In the absence of in-situ monitoring data, reference is made to the annual average concentrations of major air pollutants measured at EPD's nearest monitoring stations (i.e. Central/Western Station) for the last 5 years. The 5-year annual average TSP levels at Central/Western station is 71μgm^{-3} according to *Air Quality 1999-2003.*

Water Quality

3.5 A drainage culvert lies within the works area of the landslide preventive works on the hillslope between Po Shan Mansion and Hamilton Court. There is one temporary stream outside the site boundary to the east.

Ecology

3.6 The works area for the landslide preventive works would fall partially within a recognised site of conservation importance: Pok Fu Lam Country Park. A habitat map is shown in **Figure 3.1**

3.7 Secondary woodland habitat dominated the works area, supported a moderate diversity of plants, with commonly encountered species including the trees *Acronychia pedunculata*, *Machilus chekiangensis* and *Schefflera heptaphylla*.

3.8 One small stream was recorded to the east of the site boundary of the Study Area.

3.9 Other habitats within the Study Area included engineered cut slopes, residential developments and landscaped amenity areas. Plant diversity in these habitats was low, with typical species recorded including trees such as *Acacia confusa*, shrubs including *Lagerstroemia speciosa*.

Landscape & Visual

3.10 The existing slope area of the proposed construction works is mostly woodland with mostly wildgrass and occasional trees of common species, *Celtis sinensis, Acacia confusa, Schefflera heptaphylla, Mallotus paniculatus, Cinnamomum camphora, Ficus microcarpa, Rhus succedanea, Leucaena leucocephala* and *Macaranga tanarius* etc. Both are of fair quality and of fair amenity value.

Existing and Planned Sensitive Receivers

Noise

3.11 Based on the criteria set out in the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM), representative noise sensitive receivers (NSRs) have been identified close to the Project site. **Table 3.1** presents descriptions of these selected NSRs. Locations of representative NSRs and the proposed works areas are illustrated in **Figure 3.2**.

3.12 As shown in **Figure 3.2**, Pok Fu Lam Country Park lies to the south of the Project site and would be regarded as NSRs according to the EIAO-TM. Visitors to the country park would potentially be impacted by the proposed construction works.

Table 3.1 Representative Noise Sensitive Receivers

NSR	Location	Horizontal Separation from Site Boundary (m)	Use
N1	Po Shan Mansion	7	Residential
N2	Po Shan Mansion	20	Residential
N3	Hamilton Court	45	Residential
N4	Piccadilly Mansion	15	Residential
N5	No 21 Po Shan Road	40	Residential
N6	No 53 Conduit Road	45	Residential
N7	Pok Fu Lam Country Park	-(1)	Country Park

Note: (1) The proposed works areas fall partially within the Pok Fu Lam Country Park

Air Quality

3.13 Based on the criteria set out in *Annex 12* of the EIAO-TM, representative air sensitive receivers (ASRs) have been identified close to the Project site. A brief description of the representative ASRs is summarized in **Table 3.2** and the ASR locations are shown on **Figure 3.3**.

Table 3.2 Representative Air Sensitive Receivers

ASR	Location	Horizontal Separation from Site Boundary (m)	Use
A1	Po Shan Mansion	7	Residential
A2	Hamilton Court	45	Residential
A3	Piccadilly Mansion	15	Residential
A4	Ching Yuen Garden	110	Residential
A5	No 21 Po Shan Road	40	Residential
A6	No 53 Conduit Road	45	Residential
A7	Pok Fu Lam Country Park	-(1)	Country Park

Note: (1) The proposed works areas fall partially within the Pok Fu Lam Country Park

Water Quality

3.14 Water sensitive receivers have been identified and included a drainage culvert which lies within the works area of the site boundary of the concurrent landslide preventive works on the hillslope between Po Shan Mansion and Hamilton Court.

Ecology

3.15 Secondary woodland habitat in the Study Area is relatively mature, moderately diverse, and supports a number of floral and faunal species of conservation importance.

3.16 One stream in the Study Area retain many natural characteristics and small in size.

Landscape & Visual

3.17 Existing landscape and visual sensitive receivers are mostly residents of adjacent high-rises, especially Po Shan Mansion, users of the existing rest garden and road users of Po Shan Road. Their sensitivities do not change after the completion of the works.

4. POSSIBLE IMPACTS ON THE ENVIRONMENT

Outline of Processes Involved

Construction of the Project

4.1 Soil nails are proposed as the mitigation works for the potential shallow instabilities in the hazard zone as shown. The soil nails are arranged in a 2m by 3m grid pattern and applied to the hazard zone. The soil nail heads are recessed type entirely embedded into soil. The completed slope surface will be hydroseeded and covered with erosion control mat.

4.2 In order to avoid high perched water table building up at the interface of colluvium and saprolite, raking drains are proposed to be installed at the natural terrain as prescriptive measures. These prescriptive raking drains are about 10m in length with 5m centre-to-centre horizontal spacing.

4.3 Rock slope stabilisation works will be provided for the rock outcrop / boulders at the upper portion of the natural terrain. Measures such as scaling, installation of rock bolts / dowels, construction of concrete buttress and provision of wire mesh protection will be provided where necessary.

Construction Works Plan

4.4 It is envisaged that no construction works will be conducted during restricted hours (i.e. time between 1900 and 0700 hours and any time on a general holiday, including Sunday) according to the preliminary construction programme. In case of any construction works planned during restricted hours, it is the responsibility of the Contractor to ensure compliance with the *Noise Control Ordinance* (NCO) and the relevant TM. The Contractor will be required to submit Construction Noise Permit (CNP) application to the Noise Control Authority and abide by any conditions stated in the CNP, should one be issued. To minimise noise disturbance to the sensitive receivers in the vicinity, it is also intended that mobilisation of heavy machinery would be avoided as far as practicable from 0700 to 0900 hours and from 1800 to 1900 hours unless appropriate noise mitigation measures are in place.

4.5 The construction plant inventory for all construction activities and planned works areas relevant to this Project are given in **Table 4.1**.

Table 4.1 Proposed Construction Plant Inventory

PME	Number	To be used in activity	Works Area (1)
Dump truck	1	Site clearance and set up	B
Air compressor	4	Soil nail installation, soil nail head construction, rock slope stabilization and raking drain installation	2 in A and 2 in F
Drill rig	6		C, D and E
Grouting machine	3		1 in A and 2 in F
Generator	2		1 in A and 1 in F
Concrete mixer	3		1 in A and 2 in F

Note: (1) Refer to Figure 3.2

Potential Environmental Impacts

4.6 Potential environmental impacts associated with the construction and operation of the project have been identified based on the preliminary project design information, as presented below.

Air Quality

Construction Phase

Potential Sources of Impacts

4.7 Potential impacts arising from the construction of the proposed works would include dust nuisance and gaseous emissions from the construction plant and vehicles. The major construction activities for the Project would be potential sources of construction dust in the Study Area include earthworks and tunnel formation. It is anticipated that dust would be generated from excavation, material handling and wind erosion from the site.

4.8 The construction of the Project would induce additional traffic to the existing Po Shan Road. Based on the preliminary construction programme, it is envisaged that only about 2 construction vehicles per day (on average) would be induced by the proposed Project. Air quality impact due to project-induced traffic emissions would be expected to be minor.

Operation Phase

4.9 No operational phase air quality impact is expected.

Noise

Construction Phase

Construction Noise

4.10 The use of powered mechanical equipment (PME) for various construction activities would be the main source of noise impact during the construction phase of the Project.

4.11 Construction activities proposed for the Project would include: site clearance, soil nail installation, soil nail head construction, rock slope stabilization and raking drain installation.

4.12 Based on the proposed plant inventory as shown in **Table 4.1**, construction noise impacts from various construction activities were estimated. Exceedance of day time construction noise criteria at NSRs N1and N2 are anticipated as the receivers are in close proximity to the proposed works areas. Mitigation measures such as adopting quieter PME and insulating fabric for drill rigs have to be implemented during the works period in order to comply with the stipulated noise criteria.

4.13 Cumulative noise impact would be expected as the Project works will be carried out concurrently with the works of the drainage adit nearby. Assuming that mitigation measures proposed for the drainage adit works have been implemented, the estimated cumulative construction noise impact at all NSRs shall comply with the stipulated noise criteria. A more detailed assessment on the construction noise impact and any necessary mitigation measures would be carried out in the later EIA study stage.

Project-induced Traffic Noise

4.14 The construction of the Project would induce additional traffic to the existing Po Shan Road. However, as described above, it is envisaged that only about 2 construction vehicles per day (on average) would be induced by the proposed Project. No insurmountable noise impact due to project-induced traffic during construction phase would be expected.

Operation Phase

4.15 No insurmountable operational phase noise impact is expected.

Water Quality

Construction Phase

4.16 Water-bodies potentially affected by the proposed landslide preventive works include a drainage culvert within the works area. Site runoff and drainage from the works area, if uncontrolled, could enter the drainage culvert.

4.17 During site clearance, runoff and drainage from the works area would be the main sources of potential water quality impacts to the nearby water bodies. Site runoff and drainage may contain increased loads of suspended solids and contaminants. Potential sources of pollution from site drainage include: runoff and erosion from exposed soil surfaces and stockpiles; release of grouting and cement materials with rain wash; wash water from dust suppression sprays; and fuel and lubricants from maintenance of construction vehicles and mechanical equipment. Sewage arising from the on-site construction workforce would also have the potential to cause water pollution if it is discharged directly into the nearby water bodies without any appropriate treatment.

Operation Phase

4.18 No adverse water quality impact would be expected during the operation phase of the proposed landslide preventive works. The proposed soil nailing and rock slope stabilization works will be carried out to stabilize the superficial soil layer and outcrops at the upper portion of the natural hillside respectively. In addition, raking drain will be inserted on the hillside prescriptively to reduce the risk of the perched water build-up.

Waste Management

Construction Phase

4.19 Construction and demolition (C&D) material would be generated from site clearance, soil nail installation, soil nail head construction, rock slope stabilization and raking drain installation.

4.20 Estimated volumes of the C&D material are summarized in **Table 4.2** below. Provided that these waste materials are handled, transported and disposed of using the recommended methods in Section 5 and that good site practices are adhered to, no adverse environmental impacts and nuisance would be expected.

Table 4.2 Estimated Quantities of Waste Material Arisings

Construction works	Soil, m^3	Rock, m^3	Total, m^3
Site Clearance and Set up	100	-	100
Soil Nail Installation	250	-	250
Soil Nail Head Construction	500	-	500
Raking Drain Installation	10	-	10
Scaling	50	50	100
Rock bolts / dowels	10	10	20
Landscape Works	10	5	15
			995

Operation Phase

4.21 No adverse impact would be expected during the operation phase of the proposed landslide preventive works.

Ecology

4.22 Several potential ecological impacts resulting from construction and operation phase activities have been identified. These would include:

- Limited impact to approximately 6500m^2 secondary woodland habitat due to soil nailing and raking drain construction. Impacts to the woodland habitat are considered limited as no tree-felling would be required.
- Indirect disturbance to habitats and associated fauna adjacent to works areas resulting from increased human activity and noise-generating construction plant.
- Indirect disturbance to habitats resulting from storage or dumping of construction material.

Landscape and Visual

Construction Phase

4.23 Landscape and visual impacts during the construction phase would be moderate. The existing Mid-levels neighbourhood is pleasant and densely vegetated in comparison with other districts in Hong Kong. Due to the site clearance, there will be an immediate but temporary loss of greenery, affecting users from adjacent high-rises. There would be no tree felling within the soil nailing area and no transplanting of trees would be required.

Operation Phase

4.24 After the completion of all construction works, landscaping works would be carried out to reinstate the slope area to match the existing conditions.

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

5.1 Broad mitigation measures for the project to minimise potential environmental impacts are indicated below, subject to further detailed assessment in the EIA study.

Environmental Protection Measures

Construction Phase

Air Quality

- Implement dust suppression measures set out in the Air Pollution Control (Construction Dust) Regulation, such as provision of wheel-washing facilities and watering of exposed ground.

Noise

- Implementation of good site practices to limit noise emissions at source.
- Use of quieter PME.
- Use of quieter alternative construction method.
- Use of movable noise barrier / enclosure.

Water Quality

- Implement site practices as recommended in ProPECC PN1/94 “Construction Site Drainage”.
- Install appropriate drainage facilities to control site runoff.
- Provide adequate treatment facilities to treat process water from construction activities prior to discharge.
- Provide proper toilet facilities.

Waste Management

- Implement waste management practices to minimize waste generation and maximize waste recovery and recycling.
- Sort and segregate waste for reuse and disposal.
- Dispose waste to landfills only as a last resort.

Ecology

- Avoid and minimise disturbance to any flora/fauna and habitats of conservation interest.
- Mitigate unavoidable impacts, e.g. transplantation and provision of compensatory habitats.
- Minimize indirect construction disturbance, e.g. fence off work areas.

Landscape and Visual

- Avoid and minimize disturbance to significant landscape resources, e.g. minimise work areas.
- Mitigate unavoidable landscape impacts through compensatory planting or transplantation.

Operation Phase

Landscape and Visual

- Landscape planting for the project and reinstatement of planted areas.

Possible Severity, Distribution and Duration of Environmental Effects

5.2 The construction work is expected to last for about 10 months from June 2007 to April 2008. The severity and distribution of potential environmental impacts are described in Sections 3 and 4. In particular, noise and ecological impacts from the proposed works would be expected to be the key environmental issues during the construction phase. No unacceptable environmental impacts would be expected during operation.

5.3 A review of the potential environmental impacts during the construction and operation of the Project found that there are no insurmountable impacts. The Project Proponent is committed to the full integration of environmental issues within the project design and construction, and will ensure adoption of suitable environmental protection measures for full compliance with environmental legislation and standards.

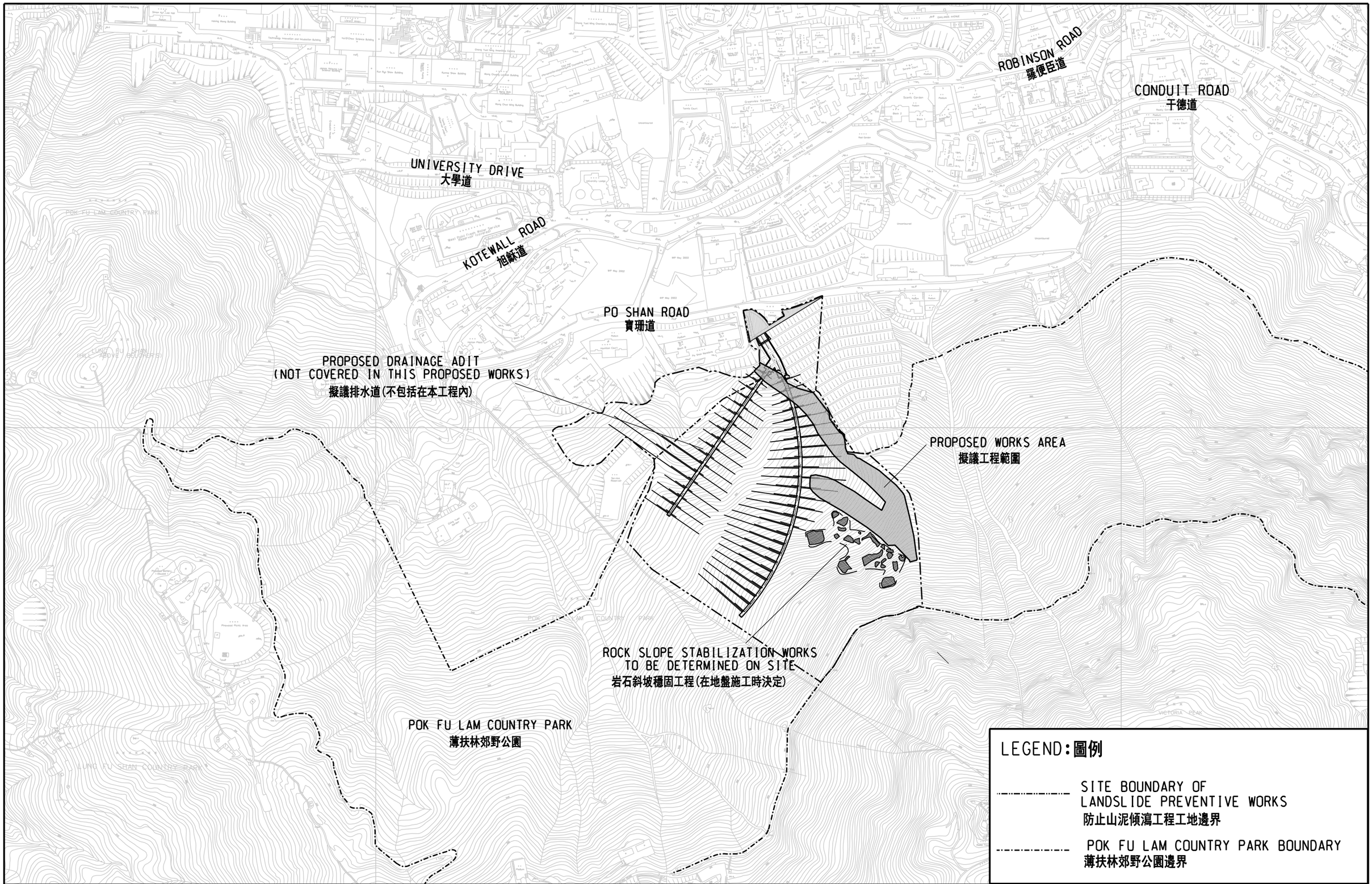
Further Implications

5.4 Public consultation through the Joint Action Group (JAG) of Po Shan Area, District Council, and internet posting had been conducted since May 2005 for the proposed drainage tunnel works. In principle agreement has been sought from all parties. Regarding these additional surface works, further public consultation will be carried out in this year.

6. USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1 No previously approved EIA reports were referenced for this project.

FIGURES



LEGEND:圖例

- SITE BOUNDARY OF LANDSLIDE PREVENTIVE WORKS
  防止山泥傾瀉工程工地邊界
- POK FU LAM COUNTRY PARK BOUNDARY
  薄扶林郊野公園邊界

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS
半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

LOCATION PLAN FOR THE PROJECT
工程項目位置圖

SCALE	A3 1:3500	DATE	OCT 06
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N

N 815800

N 815600

N 815400

E 832400

E 832600

E 832800

PROPOSED WORKS AREA
擬議工程範圍

ROCK SLOPE STABILIZATION WORKS
TO BE DETERMINED ON SITE
岩石斜坡穩固工程(在地盤施工時決定)

POK FU LAM COUNTRY PARK
薄扶林郊野公園

A

B

C

LEGEND:圖例

SITE BOUNDARY OF
LANDSLIDE PREVENTIVE WORKS
防止山泥傾瀉工程工地邊界

POK FU LAM COUNTRY PARK BOUNDARY
薄扶林郊野公園邊界

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS
半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

GENERAL LAYOUT PLAN
整體平面圖

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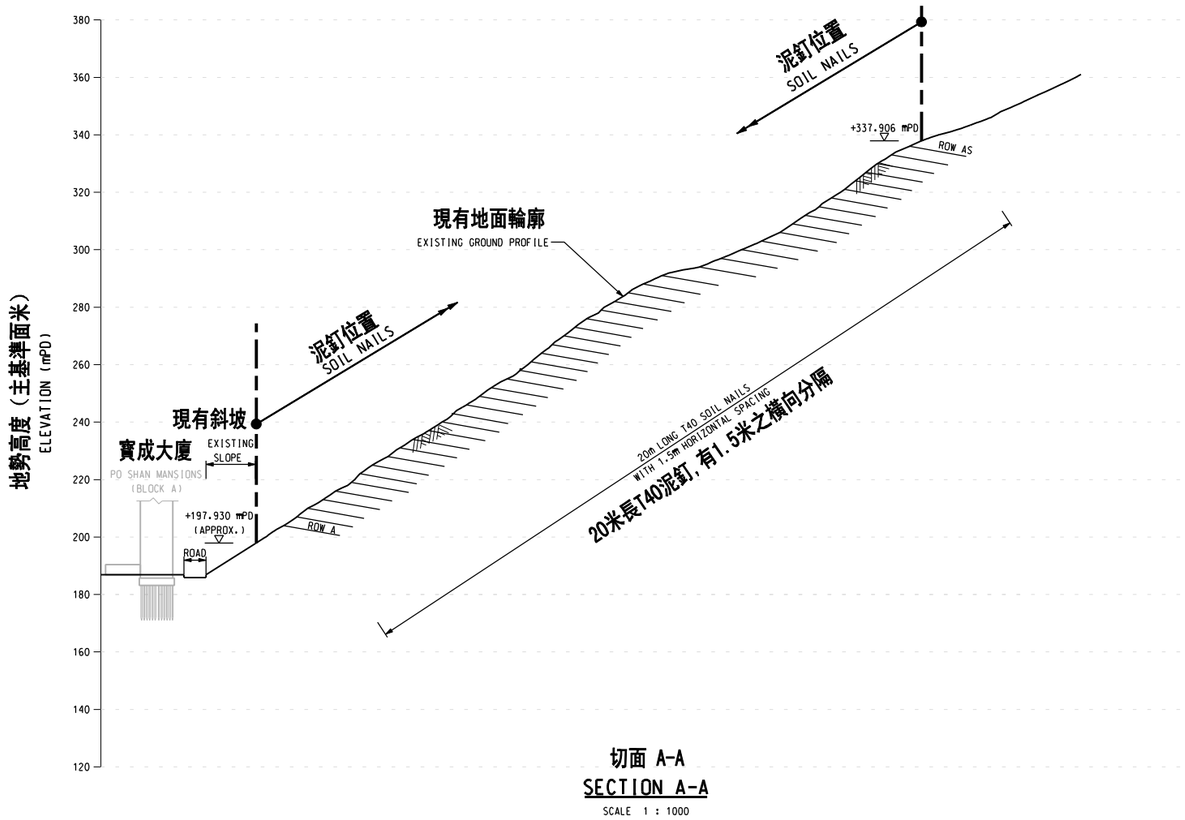

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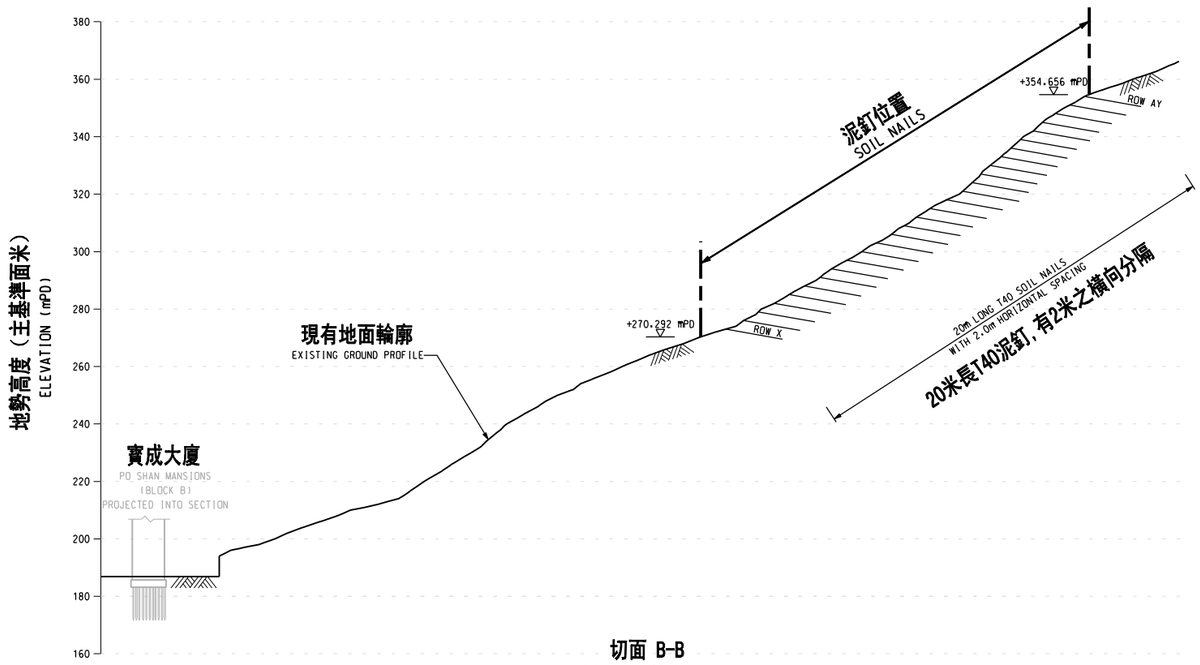

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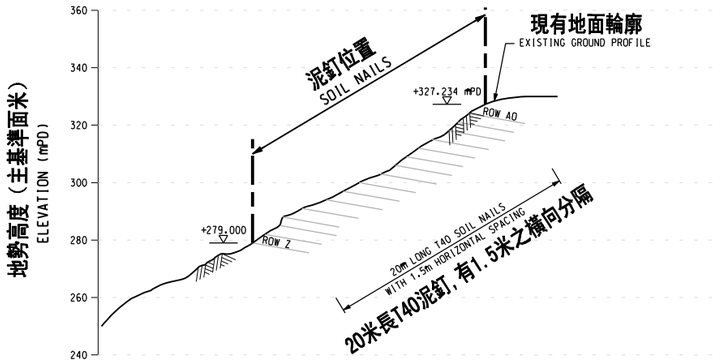

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS
半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

SOIL NAILING SECTIONS
泥釘工程切面圖

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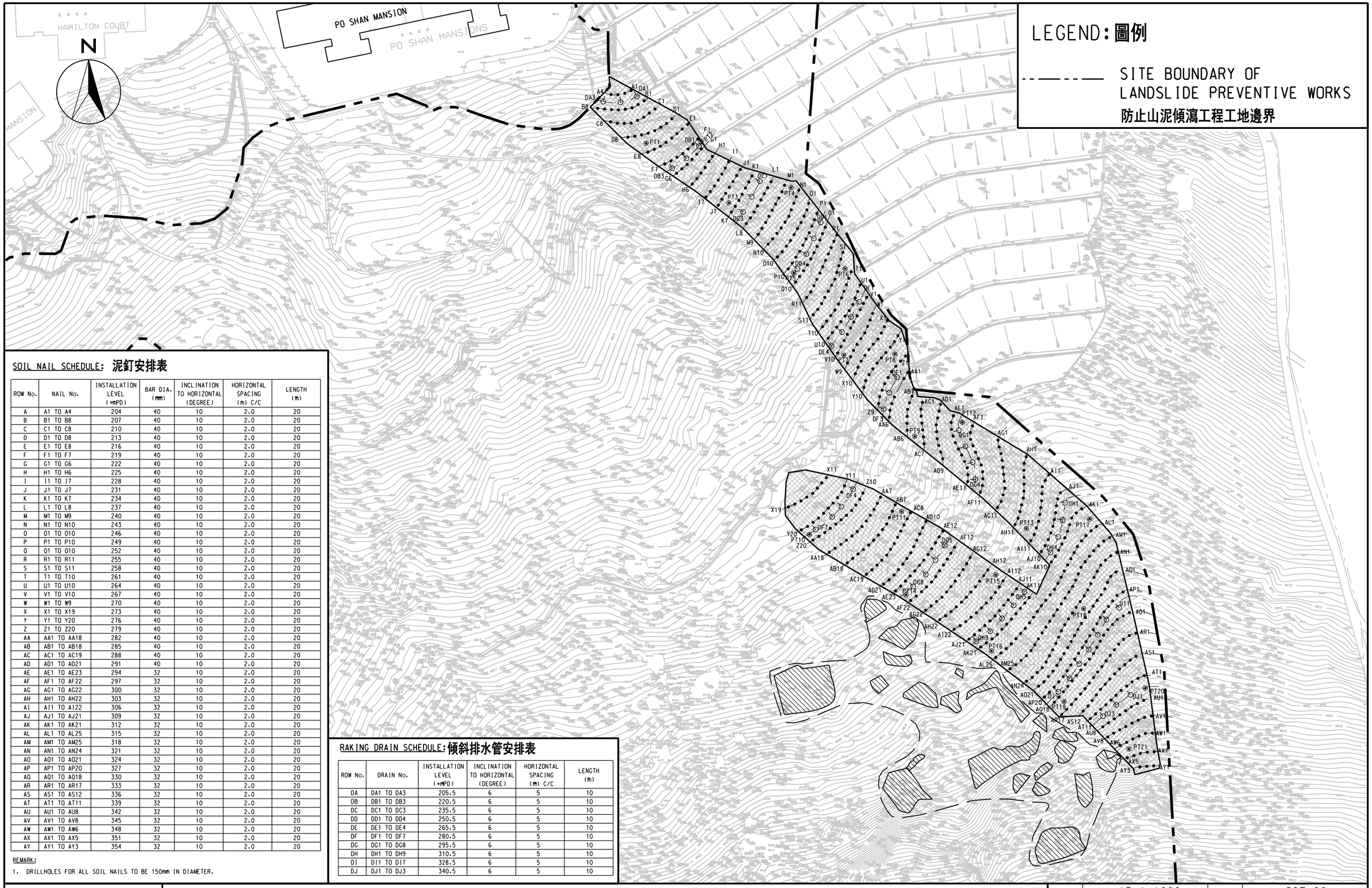

SOIL NAIL SCHEDULE: 泥釘安排表

ROW No.	NAIL No.	INSTALLATION LEVEL (+mPD)	BAR DIA. (mm)	INCLINATION TO HORIZONTAL (DEGREE)	HORIZONTAL SPACING (m) C/C	LENGTH (m)
A	A1 TO A4	204	40	10	2.0	20
B	B1 TO B8	207	40	10	2.0	20
C	C1 TO C8	210	40	10	2.0	20
D	D1 TO D8	213	40	10	2.0	20
E	E1 TO E8	216	40	10	2.0	20
F	F1 TO F7	219	40	10	2.0	20
G	G1 TO G6	222	40	10	2.0	20
H	H1 TO H6	225	40	10	2.0	20
I	I1 TO I7	228	40	10	2.0	20
J	J1 TO J7	231	40	10	2.0	20
K	K1 TO K7	234	40	10	2.0	20
L	L1 TO L8	237	40	10	2.0	20
M	M1 TO M9	240	40	10	2.0	20
N	N1 TO N10	243	40	10	2.0	20
O	O1 TO O10	246	40	10	2.0	20
P	P1 TO P10	249	40	10	2.0	20
Q	Q1 TO Q10	252	40	10	2.0	20
R	R1 TO R11	255	40	10	2.0	20
S	S1 TO S11	258	40	10	2.0	20
T	T1 TO T10	261	40	10	2.0	20
U	U1 TO U10	264	40	10	2.0	20
V	V1 TO V10	267	40	10	2.0	20
W	W1 TO W9	270	40	10	2.0	20
X	X1 TO X19	273	40	10	2.0	20
Y	Y1 TO Y20	276	40	10	2.0	20
Z	Z1 TO Z20	279	40	10	2.0	20
AA	AA1 TO AA18	282	40	10	2.0	20
AB	AB1 TO AB18	285	40	10	2.0	20
AC	AC1 TO AC19	288	40	10	2.0	20
AD	AD1 TO AD21	291	40	10	2.0	20
AE	AE1 TO AE23	294	32	10	2.0	20
AF	AF1 TO AF22	297	32	10	2.0	20
AG	AG1 TO AG22	300	32	10	2.0	20
AH	AH1 TO AH22	303	32	10	2.0	20
AI	AI1 TO AI22	306	32	10	2.0	20
AJ	AJ1 TO AJ21	309	32	10	2.0	20
AK	AK1 TO AK21	312	32	10	2.0	20
AL	AL1 TO AL25	315	32	10	2.0	20
AM	AM1 TO AM25	318	32	10	2.0	20
AN	AN1 TO AN24	321	32	10	2.0	20
AO	AO1 TO AO21	324	32	10	2.0	20
AP	AP1 TO AP20	327	32	10	2.0	20
AQ	AQ1 TO AQ18	330	32	10	2.0	20
AR	AR1 TO AR17	333	32	10	2.0	20
AS	AS1 TO AS12	336	32	10	2.0	20
AT	AT1 TO AT11	339	32	10	2.0	20
AU	AU1 TO AU8	342	32	10	2.0	20
AV	AV1 TO AV8	345	32	10	2.0	20
AW	AW1 TO AW6	348	32	10	2.0	20
AX	AX1 TO AX5	351	32	10	2.0	20
AY	AY1 TO AY3	354	32	10	2.0	20

REMARK:

1. DRILLHOLES FOR ALL SOIL NAILS TO BE 150mm IN DIAMETER.

RAKING DRAIN SCHEDULE:傾斜排水管安排表

ROW No.	DRAIN No.	INSTALLATION LEVEL (+mPD)	INCLINATION TO HORIZONTAL (DEGREE)	HORIZONTAL SPACING (m) C/C	LENGTH (m)
DA	DA1 TO DA3	205.5	6	5	10
DB	DB1 TO DB3	220.5	6	5	10
DC	DC1 TO DC3	235.5	6	5	10
DD	DD1 TO DD4	250.5	6	5	10
DE	DE1 TO DE4	265.5	6	5	10
DF	DF1 TO DF7	280.5	6	5	10
DG	DG1 TO DG8	295.5	6	5	10
DH	DH1 TO DH9	310.5	6	5	10
DI	DI1 TO DI7	328.5	6	5	10
DJ	DJ1 TO DJ3	340.5	6	5	10

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS
半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

SOIL NAILS ON NATURAL TERRAIN LAYOUT PLAN & SCHEDULE
泥釘在天然山坡平面圖及安排表

SCALE	A3 1:1000	DATE	OCT 06
CHECK	FKKN	DRAWN	CCCM
JOB No.	A02005(001)	DRAWING No.	1.4
		REV	-

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N

PROPOSED WORKS AREA
擬議工程範圍

POK FU LAM COUNTRY PARK
薄扶林郊野公園

LEGEND: 圖例

- SITE BOUNDARY OF LANDSLIDE PREVENTIVE WORKS 防止山泥傾瀉工程工地邊界
- POK FU LAM COUNTRY PARK BOUNDARY 薄扶林郊野公園邊界
- TEMPORARY STREAM 臨時小溪
- SECONDARY WOODLAND 次生林地
- DEVELOPED AREAS 已開發區
- *Artocarpus hypargyreus* 白桂木
- *Cibotium barometz* 金毛狗
- *Diospyros vaccinioides* 小果柿
- *Neottopteris nidus* 巢蕨
- *Pavetta hongkongensis* 香港大沙葉
- *Pholidota chinensis* 石仙桃
- *Rhododendron spp.* 杜鵑屬植物
- *Nanhaipotamon hongkongense* 香港南海溪蟹

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS
半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

LOCATIONS OF TREES AND WATER STREAMS
樹木及河流位置圖

SCALE	A3 1:2500	DATE	OCT 06
CHECK	FKKN	DRAWN	CCCM
JOB No.	A02005(001)	DRAWING No.	3.1
		REV	-

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N

N 815800

N 815600

N 815400

E 832400

E 832600

E 832800

N1

N2

N3

N4

N5

N6

N7

WORKS AREA A
工程區A

WORKS AREA B
工程區B

WORKS AREA C
工程區C

WORKS AREA D
工程區D

WORKS AREA E
工程區E

WORKS AREA F
工程區F

薄扶林郊野公園
POK FU LAM COUNTRY PARK

LEGEND: 圖例

- N1 NOISE SENSITIVE RECEIVERS
  噪音敏感受體
- SITE BOUNDARY OF LANDSLIDE PREVENTIVE WORKS
  防止山泥傾瀉工程工地邊界
- POK FU LAM COUNTRY PARK BOUNDARY
  薄扶林郊野公園邊界

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS

半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS

具代表性的噪音敏感受體位置圖

SCALE	A3 1:2000	DATE	OCT 06
CHECK	FKKN	DRAWN	CCCM
JOB No.	A02005(001)	DRAWING No.	3.2
		REV	-

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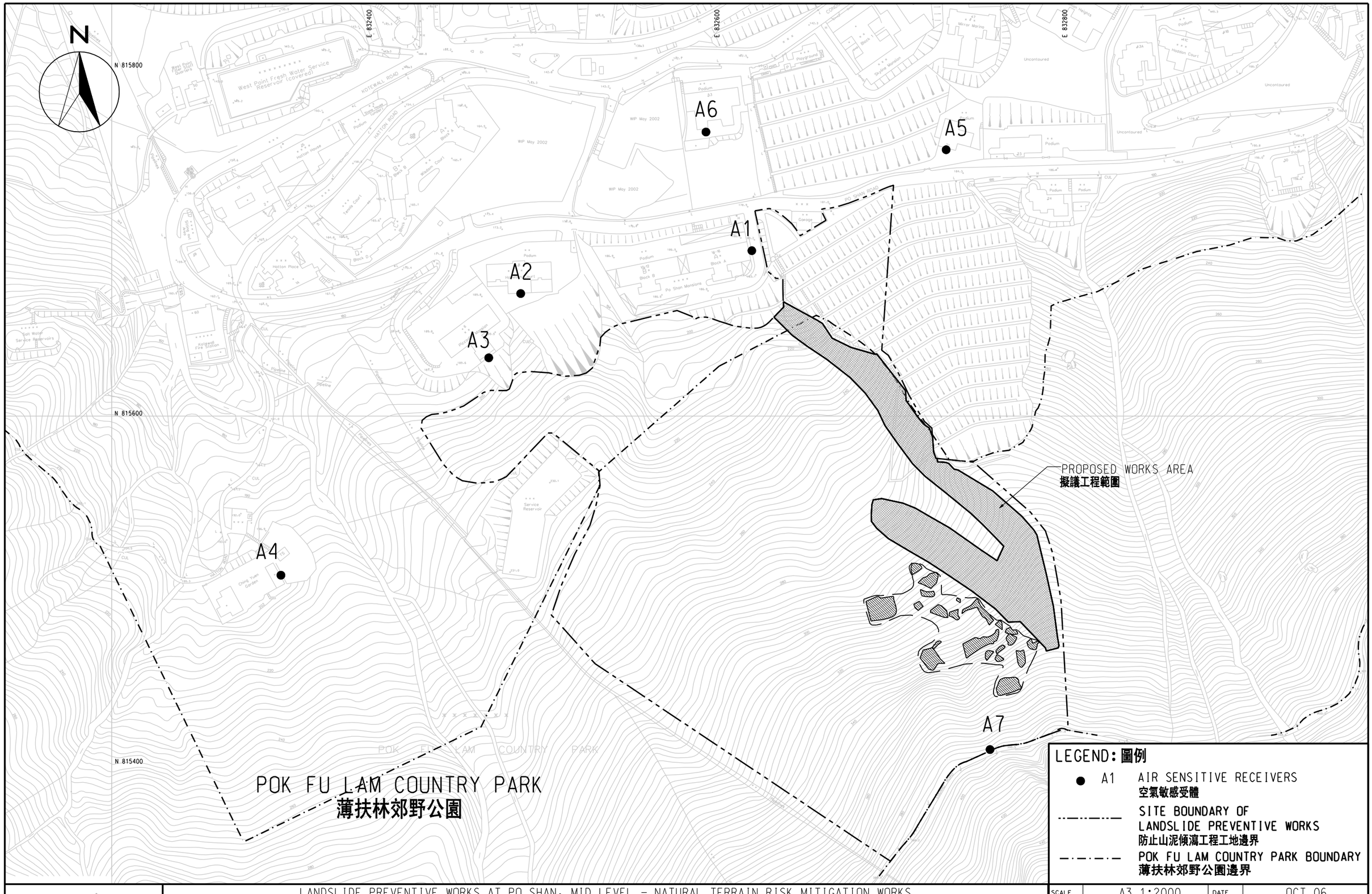

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LANDSLIDE PREVENTIVE WORKS AT PO SHAN, MID LEVEL - NATURAL TERRAIN RISK MITIGATION WORKS

半山區寶珊地段防止山泥傾瀉工程 - 設計及施工(天然山坡滑坡災害緩減工程)

LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS

具代表性的空氣敏感受體位置圖

SCALE	A3 1:2000	DATE	OCT 06
CHECK	FKKN	DRAWN	CCCM
JOB No.	A02005(001)	DRAWING No. 3.3	REV -

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