PROJECT PROFILE

BASIC INFORMATION

Project Title

Relocation of Rock Debris at Hang Mei, Tai O, Lantau Island

Purpose and nature of the Project

The objective of the Project is to relocate debris materials at the river channel at Hang Mei so as to reduce risk of flooding. The works comprise relocating the rock debris at the centre of the river bed to the side of the river while surplus soil will be removed off the stream as shown on the attached 'Typical Sections' showing the sectional views.

The project will also help reinstate the disturbed stream bed since the erosion of the stream embankment in the past few years and then the works under Home Affairs Department's project "Improvement to undermined footpath and damaged railing at Hang Mei, Tai O" in April 2012. The reinstatement works will help enhance the current ecological condition of the disturbed stream.

Name of Project Proponent

Home Affairs Department
Work Section, Headquarters
2/F, North Point Government Office
333 Java Road
North Point, Hong Kong

Location and scale of Project

The location of the site is shown in the attached 'Site Layout Plan'. The rock debris at the centre of the river will be relocated to the side of the river while surplus soil will be removed off site. The construction details are shown on the attached 'Typical Sections' showing the sectional views. The works will be carried out at low tide period during week days and will last for approximately 1 month during dry season. The quantity of rock debris relocated is about 100 m^3 while that of surplus soil removed off the stream is about 50 m^3, which are only of small quantity.

Number and Types of designated projects to be covered by the Project profile

Since the relocation works is in a river channel in the vicinity of a conservation area, this project is classified as a designated project under item I.1(b)(vii) – "river training which discharges into an area less than 300m from the nearest boundary of an existing conservation area" in Part I of schedule 2, Environmental Impact Assessment Ordinance.

Name and telephone number of contact person(s)

Name: AU Ying-kit, Paul
Post: Senior Engineer (Works) (2)
Tel: 2573 4348
Fax: 2572 0281
Address: Room 216, 2/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong

Name: YUEN Yui-tai, Joshua
Post: Engineer (5)
Tel: 2382 5163
Fax: 2572 0281
Address: Room 216, 2/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong

OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

How will the project be planned and implemented

The Works Section, Headquarters, HAD designs the Project. The construction works will be implemented by the Contractor as appointed by HAD.

What is the project time table

Construction is expected to commence in around October 2013. The contract period will be approximately 1 month, and is anticipated to end in November 2013. There will then be a 12-month maintenance period for the contractor to carry out remedial works or rectify defects upon request by HAD. The programme of works is shown on the attached 'Works Methods and Programme'.

All works will be carried out in the dry season. This will be specified in the Contract Documents.

Are there any interactions with broader programme requirements or other projects that shall be considered

No.

MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

Outline existing and planned sensitive receivers and sensitive parts of the natural environment which might be affected by the proposed project

Area Zoning:-

The works site is in a stream situated adjacent to a Green Belt zone, the opposite bank of which is a conservation area. Please refer to the attached 'Outline Zoning Plan' for details.

Noise:-

Noise sensitive receivers (NSRs) include 7 individual houses, all within 100m of the Project site. No houses are within 15m of the site. Sensitive receivers are shown in the attached 'Location Plan of Air and Noise Sensitive Receivers'.

Dust:-

Sensitive receivers same as those in 'Noise' above.

Stream Water Quality:-

The stream is subject to tidal effect and at upstream of Tai O river. The stream may be susceptible to sediments which may enter the stream from the works site.

Ecology:-

The trees/shrubs and mangrove located along the opposite bank of the stream (outside site boundary) are considered to be valuable components of the landscape and important to the local ecosystem. The bank vegetation there-at consists of patches of grass, shrubs, climbing plants, herbs, mangroves and mature trees. No flora with significant ecological value can be found within and adjacent to the works area. No tree, shrubs, the plants, herbs, mangroves will be affected by the works. The stream bed has been disturbed and it is subject to tidal effect. Habitat in the stream near the site also include invertebrates such as Water Skater and fish fauna such as exotic *Oreochromis niloticus* and *Mugil* sp, which are of small fishes with a few centimetres in length and can be commonly found along the tidal stream and near Tai O River.

POSSIBLE IMPACTS ON THE ENVIRONMENT

The key process will involve taking up the rock debris and relocating them to the nearest side of the river. A portion of the boulders at the stream bank will be randomly distributed to the stream bed. The surplus soil will be removed off the site. The details of works are shown on the attached 'Works Methods and Programme'.

Describe the environmental impacts or issues that arise during the construction, operation or decommissioning of the project, where applicable

During Construction

Conservation Area:-

The works will have no direct impact on the conservation area because the works site is a tidal section at upstream of the river, and the works are to be carried out during low tide period. No adverse impact is anticipated since sediment transport downstream into the stream is anticipated to be insignificant. (See 'Stream Water Quality' below)

Noise:-

During construction, it is expected that an excavator of small to medium size will be used to relocate the rock debris under low tide condition in dry season. The nearest NSR is approximately 17m (in horizontal distance) away from the site boundary. As low tide condition lasts for 1 hour only, the construction noise would be temporary, short, localised, and within an acceptable level. Nevertheless, standard pollution control measures would still be adopted. (See 'Noise' part in 'Describe measures to minimise environmental impacts' under section

"Environmental Protection Measures to be Incorporated" below, and the attached "Construction Noise Calculation")

Dust:-

The stream is subject to daily tidal effect and thus the rock debris and soil at the stream bed are wet (but not submerged in water) even in low tide condition. Therefore, there is no construction dust impact.

Stream Water Quality:-

As the works will be carried out in dry season at low tide level, only a little suspended solids may be generated in the water at the site. As the bed sediments are mostly composed of coarse materials (gravels and sands), these will settle rapidly from the water column and, therefore, only travel a short distance even if they are flowing out of the site. Water quality impact on the downstream Tai O river is unlikely. Standard pollution control measures will also be implemented to safeguard against any potential impact. (See 'Stream Water Quality' part in 'Describe measures to minimise environmental impacts' under section "Environmental Protection Measures to be Incorporated" below)

Ecology:-

Trees and shrubs are not anticipated to be affected by the works. No materials will be relocated to the adjacent Conservation Area zone and Green Belt zone. Therefore there is no disturbance to the environment. Rock debris is relocated to the artificial stream bank where no vegetation can be found. Overall, the ecological impact on vegetation is not anticipated.

The low diversity of stream fauna (see ecology part in the above 'Major Elements of the Surrounding Environment') that were observed during the site inspection should well adapt to any short term disturbance created by the construction works since they are found along the stream and can freely move into and out of the stream during high tide condition. As the stretch of stream to be improved is relatively small, impacts on the habitats are considered to be of low-medium significance. Actually, the works are beneficial to the habitat. (See 'Ecology' part in 'Describe measures to minimise environmental impacts' under section "Environmental Protection Measures to be Incorporated" below)

Others:-

No chemical waste will be produced. Approximately $50m^3$ of surplus soil will be transported to designated public fill for dumping, which is of small amount, and the rock debris will be reused on site. Also, there is no visual and landscape impact for the relocation works, given that small amount of rock debris originally situated at the stream centre will be moved to one side of the stream where there are existing gabion walls and no superstructure will be built. There is no fisheries habitats, fisheries ground and agriculture sites in vicinity of the site. Environmental impacts with respect to all these aspects are unlikely.

Land matter during construction is an important consideration. The area of land used should be kept to a minimum. The Contractor will only be permitted to use land within the site boundary for any works such that there is no occupation of and hence no disturbance to adjacent land.

During Operation

Upon completion of the works, rock debris relocated to the stream bank and some remaining boulders randomly distributed at the stream bed will be subject to flush during rainstorm period and daily tidal effect. Natural deposition of stream sediment will take place over time and the stream bed will gradually become a more favourable habitat under natural effects, which can actually improve the ecological condition as compared with the current situation. Thus, a beneficial impact is anticipated in this phase in terms of ecology. The project will not involve any environmental impact on all other environmental aspects during the operation phase.

ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED

Describe measures to minimise environmental impacts

Standard pollution control measure will be implemented during the works. Reference for standard pollution control measures will also be made to "Recommended Pollution Control Clauses for Construction Contracts" as published by EPD and included into the Contract Documents where appropriate. Moreover, the works can facilitate the environment to naturally develop into a better habitat, hence will ultimately increase the ecological value of the site.

Noise:-

Standard noise control measures, such as maintaining the excavator used on site in good operating condition and turning-off of the excavator when it is not in use, will be implemented. These measures will be included in the Contract Documents.

Dust:-

No dust will be generated. However, as further preventive measure, exposed areas of soil and stockpiling areas (if any) will be covered by tarpaulin. Contractor will be required to implement effective dust suppression methods as specified in the Contract Documents.

Stream Water Quality:-

Works on the stream bed will be carried out in dry season and under low tide condition. Also, the "Works Methods and Programme" adopted in the Project has been in such a way to minimise the amount of extracted materials accidentally entering the water course. This requirement will be included in the Contract Documents. While it is anticipated that only little mud will be generated and washed away under the proposed construction method, silt curtain will still be installed around the work site to safeguard the environment against any potential impact.

Ecology:

Care will be taken to avoid causing disturbance to areas that do not require any work. No tree was observed inside the works area.

All works will be confined to the area as shown on the attached 'Works Methods and Programme'. Boulders at the stream bed will be relocated to the stream bank, except that a portion will be left and will be randomly distributed there-at. Surplus soil/silt will be removed off the site. The stream bed and stream bank will then be subject to flush during rainstorm period and daily tidal effect. With the new stream bed profile, the natural flushing will help provide habitats for benthos and promote recolonisation of riparian vegetation.

Construction works will progress from upstream to downstream as shown in the 'Site Layout Plan'. This is to allow natural deposition of stream sediment and may result in a more normal bed substrate composition for recolonisation. This requirement on the works stages will be included in the Contract Documents.

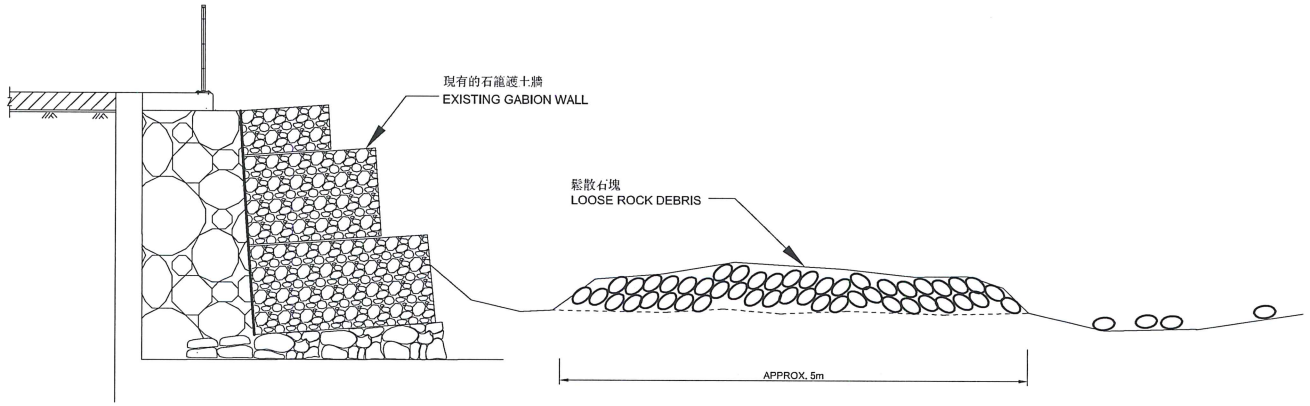
To indicate the above ecological effect of the works, a post-construction survey programme on re-colonisation of native fishes and stream invertebrates will be implemented. An ecological specialist will be employed to survey and report on these organisms in the site area every two months for a period of six months.

Comment on the possible severity, distribution and duration of environmental effects

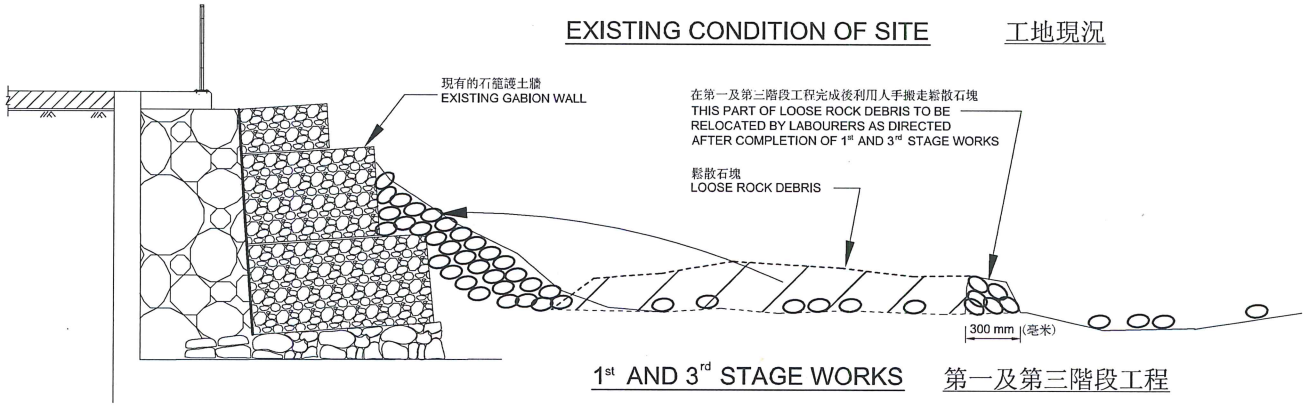
With proper site practices, adverse environmental impact due to the relocation works is not anticipated. Upon completion of the works, the stream bed will gradually become a more favourable habitat under natural effects, which can actually improve the ecological condition there-at.

Comment on any further implications

The proposed works will help reduce the flooding risk at Hang Mei and at the same time facilitate an improvement of the stream bed ecological condition. No further implication is anticipated.

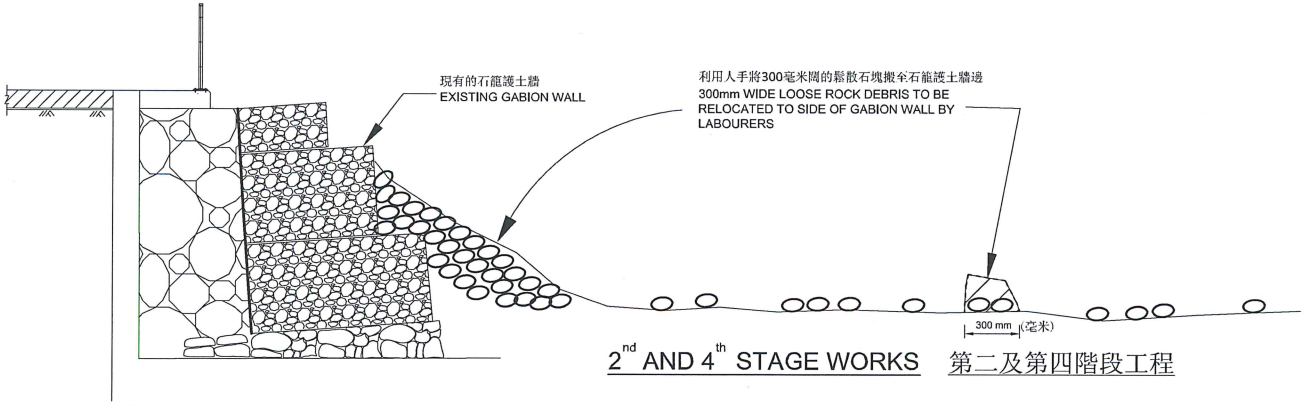


EXISTING CONDITION OF SITE　工地現況



1st AND 3rd STAGE WORKS　第一及第三階段工程

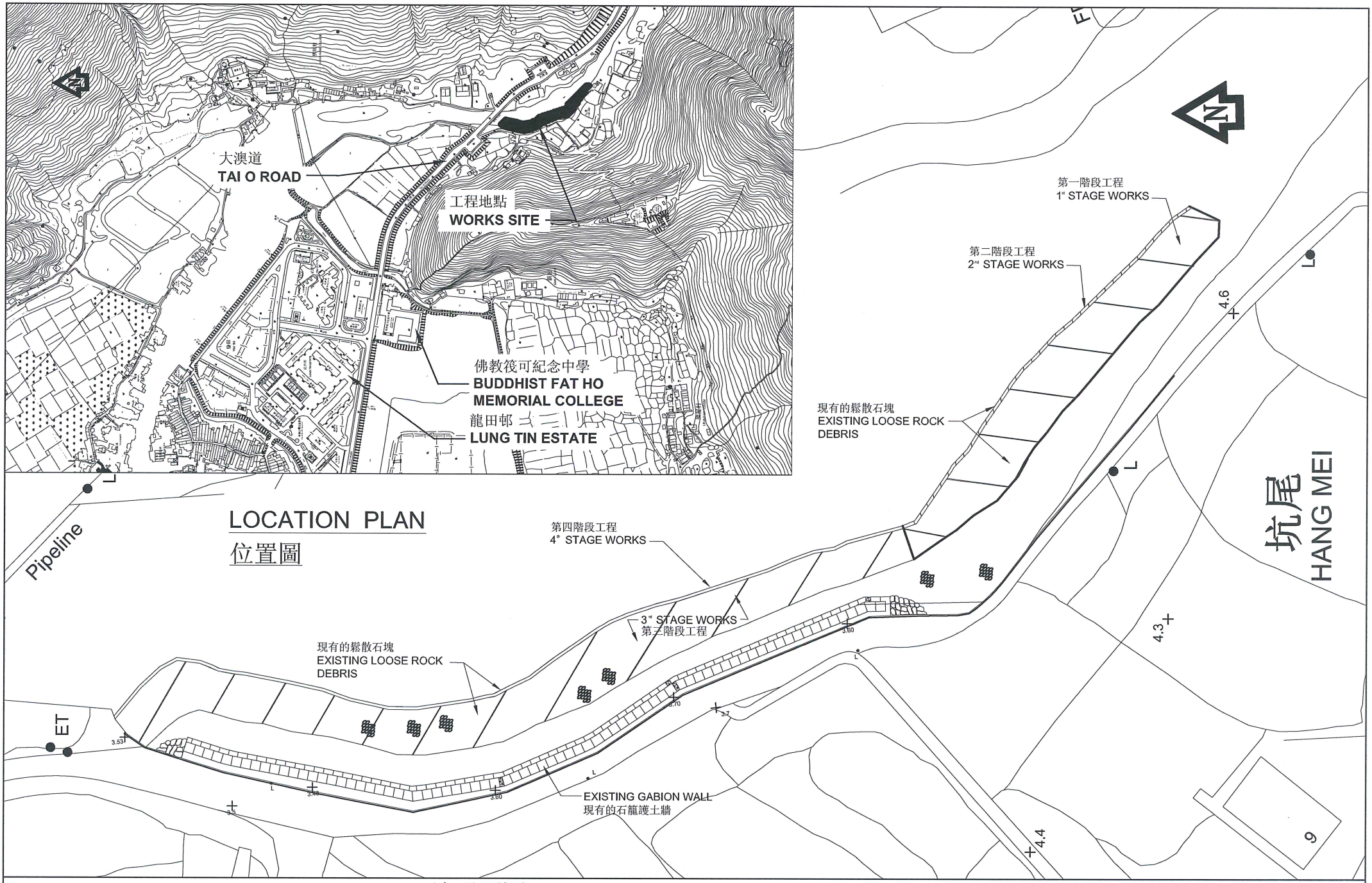
- RELOCATE SHADED PART OF LOOSE ROCK DEBRIS TO SIDE OF GABION WALL BY MECHANICAL MEANS UNDER DRY CONDITION, SOME BOULDERS TO BE RETAINED AND RANDOMLY DISTRIBUTED ON THE STREAM BED, SURPLUS SOIL TO BE REMOVED OFF SITE
- 在乾旱的情況下, 利用機器把現場鬆散的石塊(影線部份)遷移至石籠護土牆邊. 部份大石將會予以保留及隨機分散置於溪床, 而多餘的泥土將會從工地中移除.



2nd AND 4th STAGE WORKS　第二及第四階段工程

- RELOCATE SHADED PART OF LOOSE ROCK DEBRIS TO SIDE OF GABION WALL BY LABOURERS UNDER DRY CONDITION, SOME BOULDERS TO BE RETAINED AND RANDOMLY DISTRIBUTED ON THE STREAM BED, SURPLUS SOIL TO BE REMOVED OFF SITE
- 在乾旱的情況下, 利用人手將現場約300毫米闊的鬆散石塊搬至石籠護土牆邊. 部份大石將會予以保留及隨機分散置於溪床, 而多餘的泥土將會從工地中移除.

TYPICAL SECTIONS　典型切面圖

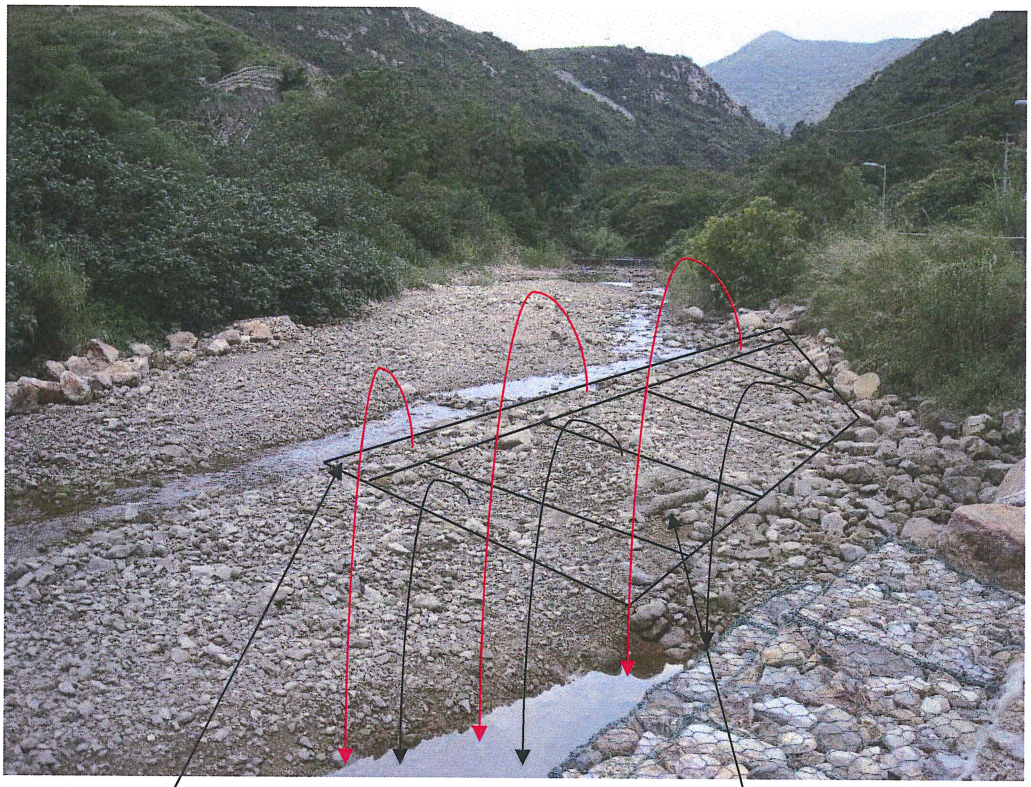


工地平面圖 SITE LAYOUT PLAN 1 : 350

（工地現況） (EXISTING CONDITION OF SITE)

Works Methods and Programme

施工方法及時間表

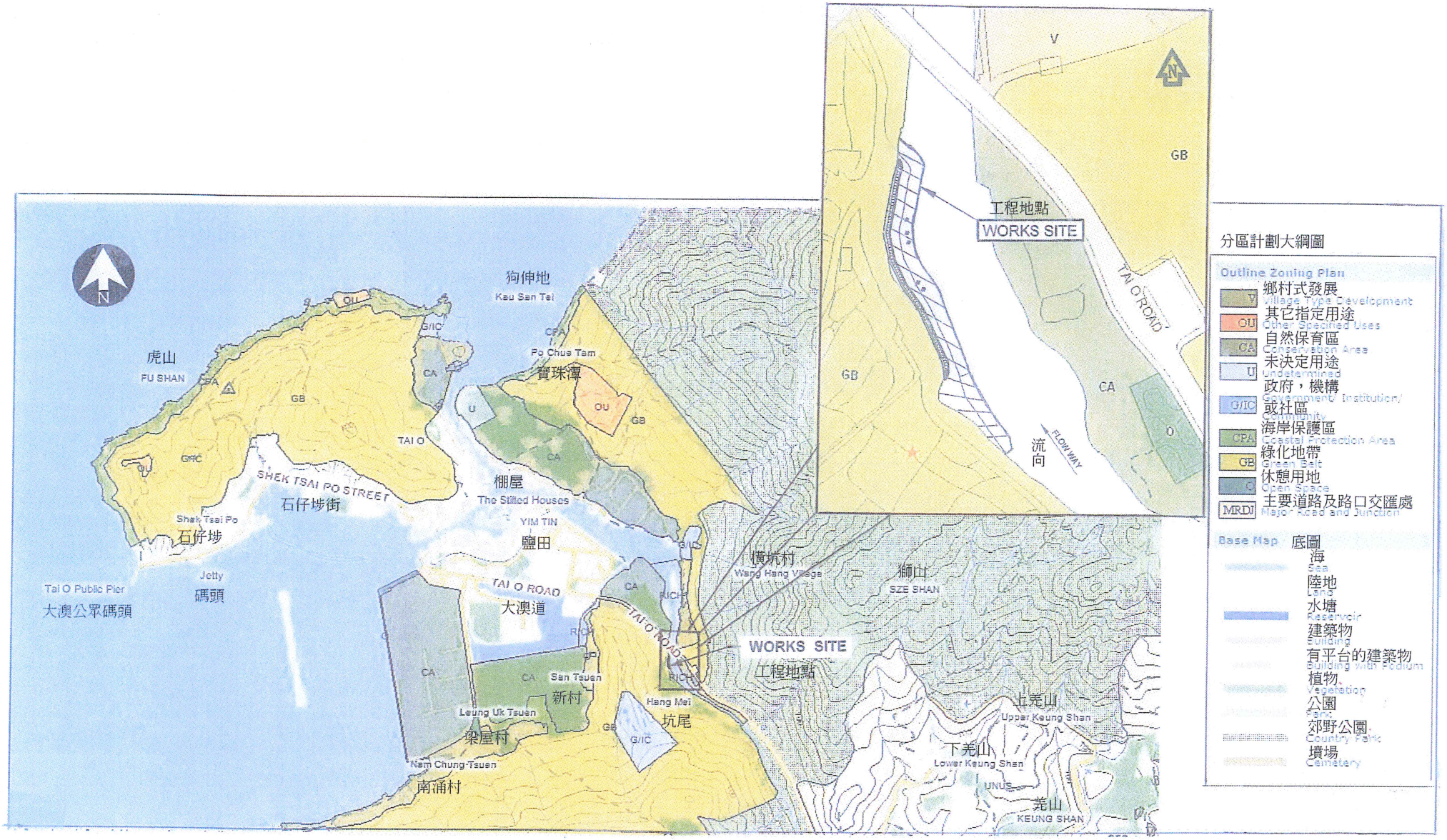


1st Stage of remaining works Relocate existing loose rock debris (shaded part) to side of gabion wall by mechanical means under dry condition. Some boulders to be retained and randomly distributed on the stream bed. Surplus soil to be removed off site. - 1 hour/day (in low tide of day time) - 5 working days for completion of works	**第一階段的餘下工程** 在乾旱的情況下，利用機器現場的鬆散石塊(影線部份)遷移至石籠護土牆邊。 部份大石將會予以保留及隨機分散置於溪床，而多餘的泥土將會從工地中移除。 - 每日一小時（在日間退潮時） - 5 個工作天以完成工作

2nd Stage of remaining works Relocate approx. 300mm wide existing loose rock debris to side of gabion wall by labourers under dry condition. Some boulders to be retained and randomly distributed on the stream bed. Surplus soil to be removed off site. - 1 hour/day (in low tide of day time) - 3 working days for completion of works	**第二階段的餘下工程** 在乾旱的情況下，利用人手將現場約 300 毫米闊的鬆散石塊搬至石籠護土牆邊 。部份大石將會予以保留及隨機分散置於溪床，而多餘的泥土將會從工地中移除。 - 每日一小時（在日間退潮時） - 3 個工作天以完成工作

3rd Stage of remaining works Relocate existing loose rock debris (shaded part) to side of gabion wall by mechanical means under dry condition. Some boulders to be retained and randomly distributed on the stream bed. Surplus soil to be removed off site. - 1 hour/day (in low tide of day time) - 5 working days for completion of works	**第三階段的餘下工程** 在乾旱的情況下，利用機器把現場鬆散的石塊(影線部份)遷移至石籠護土牆邊。部份大石將會予以保留及隨機分散置於溪床，而多餘的泥土將會從工地中移除。 - 每日一小時（在日間退潮時） - 5 個工作天以完成工作

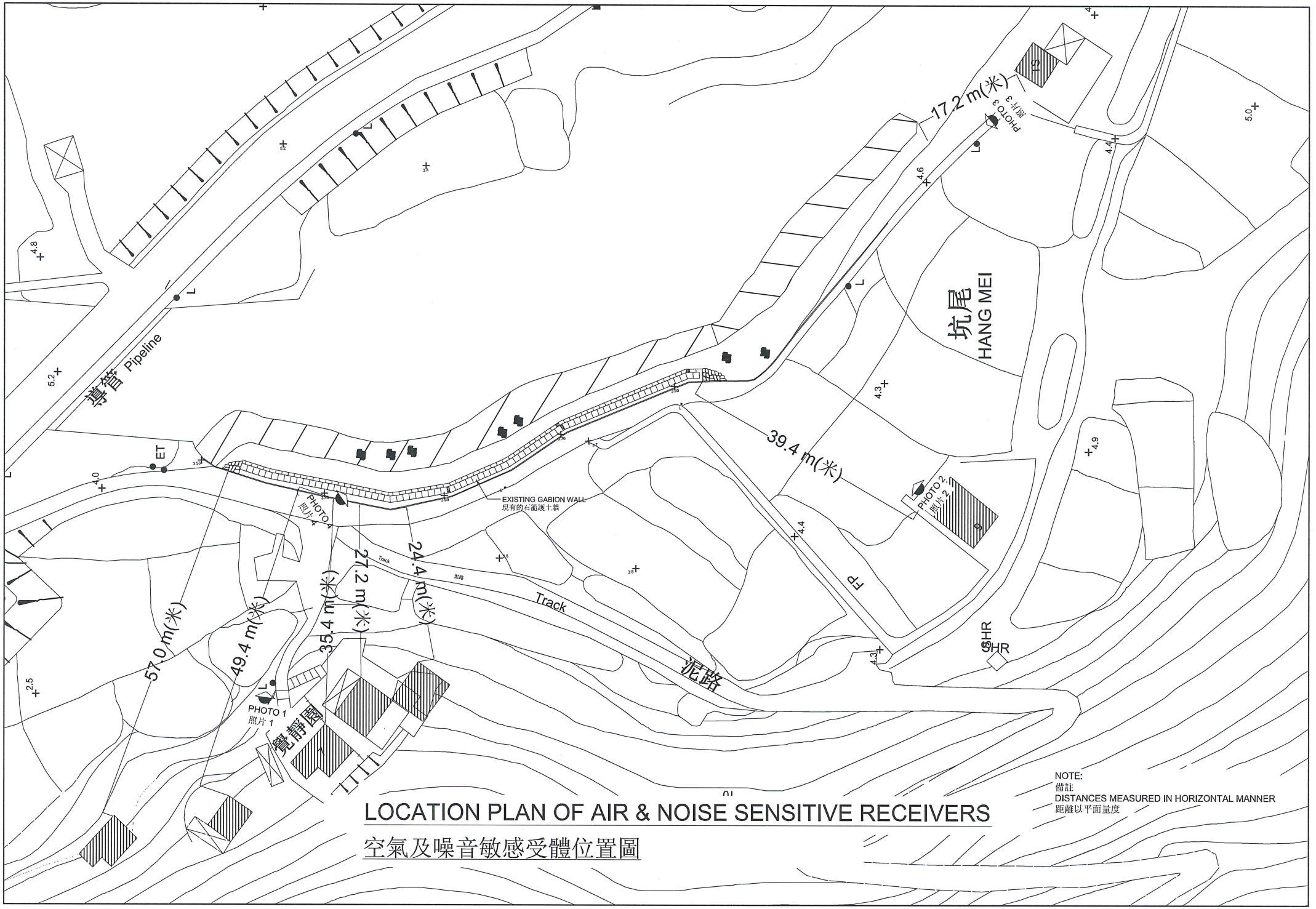
4th Stage of remaining works Relocate approx. 300mm wide existing loose rock debris to side of gabion wall by labourers under dry condition. Some boulders to be retained and randomly distributed on the stream bed. Surplus soil to be removed off site. - 1 hour/day (in low tide of day time) - 3 working days for completion of works	**第四階段的餘下工程** 在乾旱的情況下，利用人手將現場約 300 毫米闊的鬆散石塊搬至石籠護土牆邊。部份大石將會予以保留及隨機分散置於溪床，而多餘的泥土將會從工地中移除。 - 每日一小時（在日間退潮時） - 3 個工作天以完成工作



OUTLINE ZONING PLAN

N.T.S.

分區計劃大綱圖



LOCATION PLAN OF AIR & NOISE SENSITIVE RECEIVERS

空氣及噪音敏感受體位置圖

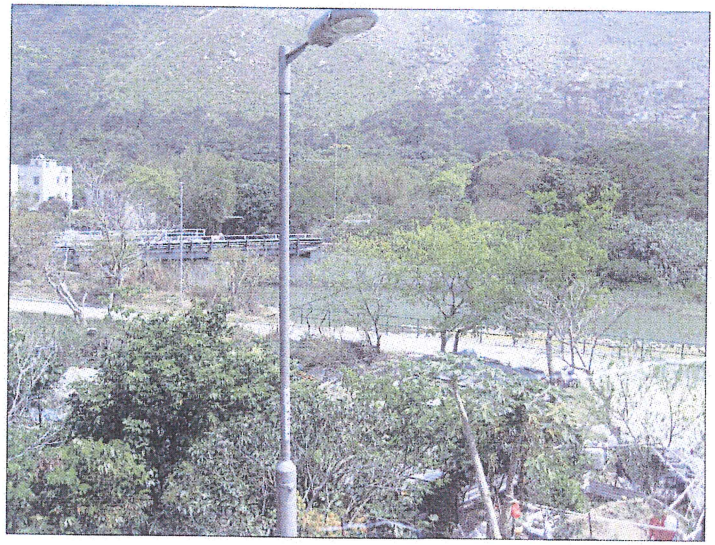


PHOTO 1
照片 1

PHOTO 2
照片 2

PHOTO 3
照片 3

PHOTO 4 (General View of the Site)
照片 4 （工地概況）

LINE OF SIGHT FROM AIR & NOISE SENSITIVE RECEIVERS
空氣及噪音敏感受體的視線

Construction Noise Calculation

Introduction:

This is a simple calculation to demonstrate that the construction noise of this project can fulfill the construction noise criteria even without adopting any noise mitigation measures. Calculation for the nearest NSR (17.2m away from the site boundary) is conducted in this demonstration.

In the calculation, reference is made to the following document:

a. "Technical Memorandum on Noise from Construction Work other than Percussive Piling" published by Environmental Protection Department (NCO-TM)
b. "Technical Memorandum on Environmental Impact Assessment Process" published by Environmental Protection Department (EIAO-TM)
c. "British Standard BS 5228-1:2009 - Code of practice for noise and vibration control on construction and open sites. Noise" published by British Standards Institution (BS)

Calculation:

Reference	Calculation	Output
NCO-TM Section 2.8; BS Table C2 Item 25	1. Sound Power Level for Powered Mechanical Equipment A tracked excavator weighted 14 ton or less will be used for earthworks purpose. Sound power level for 14-ton excavator at 10m = 69 dB(A).	69 dB(A)
NCO-TM Section 2.9 & Table 5	2. Distance Attenuation Correction for Predicted Noise Level (PNL) at source calculated from 10m-distance, sound power level = +28 dB(A)	+28 dB(A)
NCO-TM Table 5	Nearest NSR is at 17.2m from the source (conservatively assuming works be carried out at the nearest site boundary). Correction for PNL at 17-18m distance = -33 dB(A)	-33 dB(A)
NCO-TM Section 2.10	3. Correction for the Effect of Barriers Excavator will be partly screened by river bank. Conservatively, no screening effect is assumed, and no screening correction is adopted.	--
NCO-TM Section 2.11	4. Correction for Acoustic Reflections The nearest NSR is a 1-storey temporary structure without any adjoining buildings. Correction for acoustic reflection = +3 dB(A)	+3 dB(A)
NCO-TM Section 2.12	5. Corrected Noise Level (CNL) at the nearest NSR CNL at the nearest NSR = 69 + (28 -33) +3 dB(A) = 67 dB(A)	**67 dB(A)**
EIAO-TM Annex 5 Table 1B		< 75 dB(A)*(see Note below) => OK!

Note: It is the noise standard (measured as A-weighted equivalent continuous sound power level for a logging interval of 30 minutes) on all domestic premises with regard to construction activities carried out during 0700-1900 hours on any day not being a Sunday or general holiday.