

## **PROJECT PROFILE**

### **1.0 BASIC INFORMATION**

#### **1.1 Project Title**

Contract No. HY/99/19

Castle Peak Road Improvement between Ting Kau and Sham Tseng, Tsuen Wan  
Construction of Reclamation and Associated Seawall at Sham Tseng East.

#### **1.2 Purpose and nature of the project**

Castle Peak Road is at present a two-lane single carriageway, with narrow footways at discrete locations and is generally characterised by sub-standard geometry and frequent entry/egress points offering insufficient visibility. The exception to this is through the centre of Sham Tseng, where the road is already built to a dual two-lane carriageway standard.

In order to enhance the level of service for the increasing number of users, the road needs to be improved to cope with traffic growth predicted by the year 2011. Thus, the Castle Peak Road Improvement works consist of upgrading the existing Castle Peak Road to provide a dual two-lane carriageway of 'Rural Road A' classification between Area 2, Tsuen Wan and Ka Loon Tsuen, and all associated utility, junction and pedestrian facilities.

The Castle Peak Road Improvement project has been divided into three contracts as follows:

- ◆ the west contract HY/99/18 between Sham Tseng and Ka Loon Tsuen, Tsuen Wan;
- ◆ the middle contract HY/99/19 between Ting Kau and Sham Tseng, Tsuen Wan; and
- ◆ the east contract HY/2000/02 between Area 2 and Ting Kau, Tsuen Wan.

An Environmental Impact Assessment (EIA) on the Feasibility Study for the Castle Peak Road Improvements between Ka Loon Tsuen and Yau Kom Tau, hereafter referred to as the Feasibility Study EIA, was completed in December 1996. The Feasibility Study EIA has been approved by all relevant parties, including EPD, and was endorsed by the Advisory Council on the Environment (ACE) in April 1997. Further details on the main findings of the Feasibility Study EIA are presented in Section 5.4 of this Project Profile. However, based upon the 'Rural Road A' classification of the road, the project as a whole is not classified as a designated project under the Environmental Impact Assessment Ordinance and as such does not require an Environmental Permit (EP) for its implementation.

Notwithstanding, three elements of the project, reclamations at Tsing Lung Tau and Sham Tseng West (west contract) and Sham Tseng East (middle contract) are designated works and each will require an EP under the EIAO. This Project Profile is for the Sham Tseng East reclamation, an element of the middle contract HY/99/19.

The proposed reclamation is required to support a small section of improved road, which is at-grade at this location, across a small inlet between the existing reclamation at Sham Tseng to the west and the natural shoreline to the east. The reclamation is the minimum required for the roadworks.

The reclamation cannot be replaced by a viaduct structure, since the bridge deck of such a structure would be too close to sea level, and therefore not practical. Furthermore, the alignment cannot be shifted inland without major cuttings into the existing wooded hillside along the coast. The reclamation option is thus considered the most appropriate solution.

### **1.3 Name of Project Proponent**

Highways Department  
Major Works Project Management Office  
3<sup>rd</sup> Floor, Ho Man Tin Government Offices.  
88 Chung Hau Street,  
Ho Man Tin,  
Kowloon, Hong Kong

### **1.4 Location and scale of project**

The location and layout of the proposed reclamation are shown in Figure 1. The reclamation is about 0.3 ha in area. The length of the reclamation, measured parallel to the road, is about 112 m, and the maximum width, measured from the existing High Water Mark (HWM) to the proposed toe of the scour apron is about 44 m, of which about 26 m is sloping revetment.

### **1.5 Number and types of designated projects to be covered by the project profile**

In accordance with category C.12 (a) (iii) of Part 1, Schedule 2 of the Environmental Impact Assessment Ordinance, this project shall be regarded as a Designated Project as the proposed reclamation works comprises dredging work within 300m of Gemini Beach which is a gazetted beach. Therefore, an Environmental Permit under the EIA Ordinance must be obtained prior to the commencement of construction. Only one designated project is covered by this project profile.

## **2.0 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **2.1 How will the project be planned and implemented**

The Consultants (Mouchel Halcrow Joint Venture) will design the project. The construction works will be planned and implemented by the Contractor as one of the elements of the Contract No. HY/99/19, the middle contract of three contracts making up the Castle Peak Road Improvement works.

The reclamation will be constructed using land-based plant and small derrick lighters. Excavated material will be removed either by truck or lighter, the latter being offloaded at the Contractor's temporary barging point at Tai Lam Kok (see Figure 1), for reuse as backfill elsewhere on site.

The anticipated construction method of the proposed reclamation is shown in Figure 2. The construction stages are as follows:

- Stage 1 Excavate existing ground down to working platform (+2 mPD high tide level) using backhoe.
- Stage 2 Excavate beach and seabed down to underside of scour apron level using grab from derrick lighter.
- Stage 3 Excavate about 10 m width of working platform (measured along reclamation) using backhoe.
- Stage 4 Place rockfill into excavation by end tipping / backhoe.
- Stage 5 Place armour into excavation for scour apron using grab from derrick lighter.
- Stage 6 Place filter and backfill behind rockfill by end tipping / backhoe.
- Stage 7 Construct about 10 m length of retaining wall.
- Stage 8 Complete armouring in front of retaining wall using crane from shore.
- Stage 9 Complete backfilling behind retaining wall by end tipping / backhoe.
- Stage 10 Move 10 m along reclamation and repeat from Stage 2.

### **2.2 What is the project time table**

The construction period for Contract No. HY/99/19 will be 42 months, with the latest tentative construction programme being July 2001 to January 2005. However, it is anticipated that the construction of the proposed reclamation will only take 14 months, and will take place early on in the overall construction programme.

An outline programme for the construction of the reclamation is presented in Figure 3. As indicated above and shown in Figure 3, there are 9 main stages to the construction process, with stages 2 to 8 being undertaken on a cyclic process, with 7 phases predicted in total. The approximate periods for each phase of stages 2 to 8 and for stages 1 and 9 are as follows:

- Stage 1 5 weeks
- Stage 2 1 week per phase

Stage 3	1 week per phase
Stage 4	1 week per phase
Stage 5	1 week per phase
Stage 6	0.5 weeks per phase
Stage 7	2 weeks per phase
Stage 8	0.5 weeks pre phase
Stage 9	7 weeks

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

The construction of the reclamation forms one element of Contract HY 99/19. The programming of this reclamation in relation to the overall project is described in Section 2.2 above. There is potential, therefore, for cumulative impacts associated with this designated element and the remainder of the road improvement works being implemented concurrently. In addition, the other reclamations required as part of the Castle Peak Road Improvement works as a whole may be constructed during the same period which could lead to cumulative impacts, largely associated with water quality and marine ecology. Other reclamation projects in the general vicinity of this designated project and potentially on-going at the same time include Penny's Bay and CT9 reclamations and thus there is a potential for cumulative water quality and marine ecology impacts in this area of Hong Kong waters. These factors are addressed in this project profile.

### 3.0 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

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

##### Noise

The existing Castle Peak Road provides access to the North-west New Territories and there are numerous residential properties along the road as a whole. However along the section of the proposed reclamation, there are few developments and these are lower rise in nature. The sensitive facades of these properties mostly face seawards and towards the proposed construction works. Only 2 residential buildings have been identified located within about 100m of the proposed works site. The locations of the key noise sensitive receivers (NSRs) are shown on Figure 1 and details of the NSRs are provided in Appendix 1.

The major noise sources in this area is the road traffic from the existing Castle Peak Road and Tuen Mun Road, with marine traffic unlikely to make a significant contribution. A baseline profile of the existing conditions was obtained by monitoring prevailing noise levels in March 1995 for the Feasibility Study EIA<sup>1</sup>. Weekday morning peak hour noise levels were monitored to obtain  $L_{10(1\text{-hour})}$ ,  $L_{eq(1\text{-hour})}$  and  $L_{90(1\text{-hour})}$  noise levels at a car park near Lido Beach facade noise level at podium facing Castle Peak Road). The recorded noise levels at this location were determined to be  $L_{eq}64.2$  dB(A) and  $L_{eq}63.4$  dB(A) between 8:00 to 9:00 am and 9:00 to 10:00 am respectively. In addition, the Route 3 EIA<sup>2</sup> reported a measurement at Pink Villas of  $L_{eq}71$  dB(A).

##### Air Quality

Air quality sensitive receivers are the same as for noise above. The closest baseline levels available, for Total Suspended Particulates (TSP) and Respirable Suspended Particulates (RSP), were obtained at the podium of Sea Crest Villas Phase IV in May 1995 as part of the Feasibility Study EIA. No exceedances of the Air Quality Objectives (AQO) were recorded and the mean of the 24-hour average TSP and RSP levels were below  $60 \text{ :g m}^{-3}$ , which are well within 24-hour average AQOs for TSP ( $260 \text{ :g m}^{-3}$ ) and RSP ( $180 \text{ :g m}^{-3}$ ). These indicate a relatively low background dust level at Sea Crest Villas and it is expected that these levels should also prevail in the study area.

##### Marine Water Quality

The study area is within the Western Buffer Water Control Zone. Background marine water quality of the specific project area is not available, however, data is available for a comparable location on the eastern side of Ma Wan<sup>3</sup> (Monitoring Station WM4).

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- 1 Feasibility Study for Castle Peak Road Improvements between Ka Loon Tsuen and Yau Kom Tau EIA Report, dated December 1996
  - 2 Route 3 Country Park Section Preliminary Design Stage 2: TLT & YLA EIA
  - 3 EPD (1998) *Marine Water Quality in Hong Kong*

Depth-averaged Dissolved Oxygen (DO) for 1998 failed the Water Quality Objectives (WQOs) of the Control Zone with approximately 10% of samples found to be below the 4mg/L target DO concentration. Bottom DO on the other hand was within the WQOs. Depth-averaged DO ranged between 2.9mg/L to 8.1mg/L with an average of 5.4mg/L. Bottom DO ranged between 2.2 to 8.1 mg/L with an average of 5.2mg/L. DO levels below 4mg/L generally place respiratory stress on local marine fauna, which are adapted to normal background concentrations of between 4 to 8mg/L.

Suspended solids ranged between 1.2 to 17.4mg/L with an average concentration of 7.6mg/L. The suspended solid loading recorded at WM4 is typical of water from the western side of Hong Kong, which is affected by the silt laden fresh waters of the Pearl River.

Gemini Beach, a designated bathing beach, is within 250m of the project area. It was ranked eighth poorest in Hong Kong by the EPD<sup>4</sup> in 1997 and the number of people visiting the beach daily is very low.

## **Ecology and Fisheries**

### **Ecology**

Occasional outcrops of natural rock are present within the project area. Subtidal sediments are sandy in nature, as shown by the borehole logs provided in Figures 4a to 4b. The rocky outcrops found within the site are likely to be colonised by a typical set of rocky shore fauna that are mainly composed of gastropod snails and barnacles. In the North Western waters of Hong Kong faunal density on rocky shores tends to be low.

It is highly unlikely that hard coral will be found within the project area as the North Western waters are generally unsuitable environments for this group due to low salinity and high background water turbidity.

### **Fisheries**

There are no commercial fish survey records for the project area. However, fish records are available from the Environmental Monitoring and Audit of Pit IV at East of Sha Chau<sup>5</sup>. Demersal trawl survey results from this study indicate that approximately 97 species are found in the area East of Sha Chau. The most common species being *Charybdis* sp., *Metapenaeus affinis*, *Leiognathus brevisrostris*, *Platycephalus indicus*, *Oxyurichthys tentacularis*, *Turritella terebra*, *Murex trapa*, *Polycaulus uranoscopa* and *Oratosquilla oratoria*. It is likely that the same species will be found within the coastal waters of the project area.

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4 EPD (1997) *Bacteriological Water Quality of Bathing Beaches in Hong Kong*

5 ERM (1999) *Environmental Monitoring and Audit for Contaminated Mud Pit IV at East of Sha Chau 8<sup>th</sup> Quarterly report*

### **Landscape and Visual**

The topography of the area comprises steep well vegetated slopes falling away to areas of rocky headland. The shoreline in the study area comprises natural rocky outcrops and shoreline but this is not prominent in the views of the local residents due to their low rise nature and the surrounding steep topography. The natural shoreline will be visible from the sea.

## **4.0 POSSIBLE IMPACTS ON THE ENVIRONMENT**

### **4.1 Outline any processes involved, including process flow diagrams, site plans, storage requirements and information on emissions and discharges**

As described in Section 2.1, the reclamation will be constructed in several different stages with mechanical equipment being used at all stages resulting in a potential for noise during the whole process. However, only stages 2 to 4 have the potential to disturb the seabed which could influence water quality and marine ecology. The existing beach and seabed under the reclamation will require excavating to a maximum depth of about -9.5 mPD, with about 13,900 m<sup>2</sup> of material being removed. It is anticipated that the excavation rate will be less than 200 m<sup>3</sup> of material per day.

The excavated material will be removed either by truck or derrick lighter and subsequent offloading at the Contractor's temporary barging point at Tai Lam Kok (see Figure 1). The material is of high quality and suitable for reuse as backfill elsewhere on site and thus no disposal of any of the excavated material from the proposed works is anticipated.

Handling of material will take place during the initial stages during excavation and during backfilling, processes which have the potential for dust generation.

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

#### 4.2.1 Construction Phase

##### **Noise**

Noise during the construction phase will be generated from powered mechanical equipment (PME) being used during various construction activities. Operations that may generate adverse noise impacts can be broadly divided into the following 9 stages:

- X Stage 1 – Excavation and removal of existing soil;
- X Stage 2 – Excavation of Beach;
- X Stage 3 – Excavation of Platform;
- X Stage 4 – Placing of Rockfill on the Platform;
- X Stage 5 – Placing of Armour;
- X Stage 6 – Placing of Filter and Backfill;
- X Stage 7 – Construction of Concrete Retaining Wall;
- X Stage 8 – Complete Armouring by Placement from Shore;
- X Stage 9 – Final Filling.

The equipment which will be required for the construction operations during each of these stages is listed in Table 1 below:

**Table 1: Predicted Sound Power Levels for Each Construction Activities**

Construction Stage	Equipment	CNP Equipment Code	Number of Equipment	Sound Power Level (SWL) in dB(A)*	Total SWL During Operation
Stage 1	Excavator (Backhoe)	CNP 081	1	112	115.0
	Lorry	CNP 141	1	112	
Stage 2	Barge Mounted Crane	CNP 048	1	112	112.0
Stage 3	Excavator	CNP 081	1	112	115.0
	Lorry	CNP 141	1	112	
Stage 4	Excavator	CNP 081	1	112	115.4
	Lorry	CNP 141	1	112	
	Vibrator/ Compactor	CNP 050	1	105	
Stage 5	Barge Mounted Crane	CNP 048	1	112	112.0
Stage 6	Excavator	CNP 081	1	112	115.4
	Lorry	CNP 141	1	112	
	Vibrator/ Compactor	CNP 050	1	105	
Stage 7	Concrete Lorry	CNP 044	1	109	112.0
	Concrete Pump	CNP 047	1	109	
Stage 8	Mobile Crane	CNP 048	1	112	115.0
	Lorry	CNP 141	1	112	
Stage 9	Excavator	CNP 081	1	112	115.4
	Lorry	CNP 141	1	112	
	Vibrator/ Compactor	CNP 050	1	105	

\* SWL are obtained from the Technical Memorandum on Noise from Construction Work Other than Percussive Piling

The construction noise at the designated NSRs has been assessed in accordance with the methodology specified in the *Technical Memorandum on Noise from Construction Work Other than Percussive Piling*. The details of the predicted noise levels at the representative NSRs during the seawalls and retaining wall construction is shown in Appendix 2A. Noise calculations have been based on the assumption that all the identified NSRs are 1 storey in height.

The results indicate that maximum noise levels will not exceed the daytime noise criteria of 75dB(A). Based upon these results, no noise mitigation measures will be necessary at this location to reduce the noise to acceptable levels.

No cumulative impacts associated with works on-going for the other reclamations highlighted in Section 1.2 are predicted due to the distance between the works, with approximately 1km between each of the three designated reclamations. However, due to the progress of the remaining works of the Castle Peak Road Improvement contract

HY/99/19, it is possible that there could be some cumulative construction activities occurring. As the existing road will be in use until after the reclamation is complete, the key activity that could occur will be bored piling for the foundations for the adjacent viaduct to the east. The Feasibility Study EIA assumes that 1 large diameter bored piling rig, either oscillating or grab-and-chisel, would be used during this process. The equipment would have a sound power level (SWL) of 115 dB(A), based upon the CNP 164 or 165 of the Technical Memorandum on Noise from Construction Work Other than Percussive Piling.

The Feasibility Study EIA has predicted that a portable noise barrier with an attenuation of 10 dB(A) would be required to reduce the noise levels at the adjacent sensitive receivers to below the 75 dB(A) standard during this operation. In order to determine the cumulative effects of the reclamation equipment and the bored piling rig operating simultaneously, calculations have been undertaken. The predicted noise levels for the bored piling with noise barrier and reclamation equipment without mitigation are shown in Appendix 2B. The results indicate that cumulative impacts in excess of the 75 dB(A) standard will not occur and thus, no mitigation is required.

### **Air Quality**

Material will be excavated at the start of the proposed works and loaded into either a derrick lighter or truck for removal. The excavated material will be wet sand and based upon both its moisture content and particle size is not predicted to generate significant amounts of dust. During backfilling the material used will also be granular and thus not be subject to significant dust blow except in very high winds. The moisture content of the material will be influenced by how long it has been stockpiled and in some situations it may be necessary to dampen the material to reduce any dust during its use. In this regard, the Contractor will be required to comply with the Air Pollution Control (Construction Dust) Regulation in order to ensure that no adverse dust impact on the air sensitive receivers will result.

The Feasibility Study EIA predicted maximum construction dust levels of  $122 \text{ g m}^{-3}$  at Pink Villa (SR2-1 on Figure 1), based upon the mitigation measures highlighted in Section 5.4, which is well within the 24-hour average AQO for TSP of  $260 \text{ g m}^{-3}$ . Given the low level predicted for the road works by the Feasibility Study EIA and the assessment of potential dust levels from the reclamation above, cumulative impacts from the reclamation and the remainder of the road works being conducted concurrently would not give rise to adverse cumulative effects. In addition, no cumulative impacts from works on the other reclamations being constructed concurrently are predicted due to the distance between the works.

### **Marine Water Quality**

The greatest potential impact to marine water quality is likely to occur during Stages 2 and 3 of the reclamation construction process, with Stage 4 having less potential to cause impacts. During Stages 2 and 3, tidal and subtidal sediment deposits will be excavated

to form the base for the reclamation's foundations. Excavation activities will result in the suspension of sediment particles in the water column.

A geotechnical borehole survey has shown that the sediment in the area is granular in nature. A total of 4 boreholes were drilled in the vicinity of the proposed reclamation and all indicated the same sand material. Examples of two of these boreholes (B68E(M) and B68D(M)) are shown in Figures 4a and 4b with the borehole locations provided on Figure 1. Sediments put into suspension during excavation will, therefore, settle out rapidly and are unlikely to travel far from the works area. Water quality impacts in terms of suspended solid concentrations are expected to be minimal. In addition, the sediment particles are too granular to constitute mud and thus impacts associated with contaminated excavation material on water quality are, therefore, not expected.

Gemini beach is 250m to the east of the project area. Given the coarsenature of the sediments to be dredged from the project area, it is unlikely that any suspended solids will be transported as far as the beach. In addition, very few people use this beach and the magnitude of any impact on beach use can be considered small. Construction impacts on the beach are, therefore, predicted to be insignificant.

Water quality impacts during the remaining stages of construction are not expected to have any great affect on water quality, as there will be no sediment removal.

In addition, due to the progress of the remaining works of the Castle Peak Road Improvement contract HY/99/19, it is possible that there could be some cumulative construction activities occurring. The key issue in respect of marine water quality is any increase in suspended solids in the water column and it is possible that major slope works associated with the road improvements in the vicinity, which could lead to high suspended solids site runoff, could be undertaken concurrently with the excavation for the reclamation. However, the Feasibility Study EIA report did not specifically mention the reclamation at Sham Tseng East, but did state that other reclamation works at Tsing Lung Tau, which is 4 times the size, were minor and not expected to result in substantial impacts.. In addition, the assessment stated that impacts associated with suspended solids from all activities would be low based upon the runoff from all active working areas being passed through a sediment removal facility. Based upon this and the assessment provided above that any water quality impacts would be very localised and small, cumulative impacts from this reclamation and other works associated with the road improvement, including the other reclamations highlighted in Section 1.2, being conducted concurrently are not predicted to be significant.

Other reclamation projects in this area of Hong Kong waters, namely Penny's Bay and CT9, could be on-going at the same time as this designated project, providing the potential for cumulative impacts. However, as the impacts of this designated project are considered to be localised and based upon the large distance between these projects, the strong tidal flows separating the areas and the mitigation being applied during all these works, cumulative impacts associated with these works being conducted concurrently are considered to be negligible.

## **Waste Management**

Due to the close proximity of residences to the construction site, improper waste management on site could cause visual and dust impacts on nearby sensitive receivers. However, as all excavated material will be loaded directly onto either the derrick lighter or a truck for removal and reuse at an alternative location on site. No dumping of the material is required as it is of high quality and suitable for reuse. This approach is consistent with that to be applied for the other elements of Contract HY/99/19 for the remainder of the road improvement works based upon the recommendations of the Feasibility Study EIA, which stated that excavated material should be reused on site as far as possible to minimise off-site disposal. In addition, as detailed in the boreholes in Figures 4a and 4b, the material does not constitute mud and therefore cannot be contaminated and thus, no special handling is required. Therefore, significant issues associated with waste management are not anticipated.

## **Ecology and Fisheries**

### **Ecology**

Construction of the reclamation will initially result in the loss of rocky outcrop habitats of the gastropods and barnacles will also be lost.

However, the sea front of the reclamation will be constructed of stonework revetment, which will effectively increase the area of rocky shore within the project area. Once complete it is expected that the revetment will be colonised by a range of rocky shore fauna similar to that presently occurring within the project area. Recolonisation is expected to take 2-3 years to complete.

The removal of some vegetation in the form of trees will occur, but the mature trees to be felled will be replaced as part of the landscape proposal, which is discussed in more detail below.

Overall short-term ecological impacts of construction will not be significant, as the habitats are common in Hong Kong and the area lost is relatively small when compared to the length of natural coastline still present in Hong Kong. Species affected are likely to be common and it is unlikely that any rare or endangered species will be lost. Long term ecological impacts on balance will be insignificant, as the loss of the rock outcrop will be replaced by revetment rocky shore.

Cumulatively, the Feasibility Study EIA predicts impacts on the rocky shore, beach areas and intertidal areas. The Feasibility Study EIA stated that all impacts on marine habitats and aquatic fauna from the road improvement works as a whole were predicted to be small and insignificant. Based upon this and the assessment provided above, cumulative impacts from the reclamation and other works associated with the road improvement, including the other reclamations highlighted in Section 1.2, are not predicted to be

significant.

Cumulative loss of marine habitats and impacts on marine ecology associated with other major reclamation projects on-going concurrently are considered to be minor as this designated project would result in only a negligible loss of habitat and not result in significant water quality impacts as noted above.

### **Fisheries**

Construction of the reclamation will result in the generation of suspended solids but due to the coarse nature of the sediments and low current velocities expected in the project area, dispersal of suspended solids will be minimal. Impacts will be highly localised and the impact on the North Western waters fishery resource will be insignificant.

Permanent loss of subtidal habitat is not expected as the subtidal beach area is predicted to return on completion of the construction works. Long-term impacts on fisheries are, therefore, insignificant.

In addition, the Feasibility Study EIA has recommended mitigation in the form of runoff from all active working areas being passed through a sediment removal facility and based upon this does not predict any significant impacts on water quality or marine fauna. Based upon this and the assessment provided above, cumulative impacts on the fisheries resource of the North Western Waters from the reclamation and other works associated with the road improvement, including the other reclamations highlighted in Section 1.2, being conducted concurrently are not predicted to be significant. Also, as noted for water quality above, due to the only localised impacts at worst, cumulative impacts with other reclamation projects such as Penny's Bay and CT9 are considered to be negligible.

### **Landscape and Visual Impact**

The proposed reclamation is of a relatively small scale but a small stretch of natural rocky shoreline will be replaced by granite revetment. While partially altering the landscape character of the area, the revetment will not be visible for the low rise properties to the east on the hillside which face in a slightly different direction and have views directly out to sea as opposed to onto the shoreline. Views from the sea may be slightly changed but the revetment and reclamation will not be prominent due to the low lying nature and the dominance of the steep vegetated hillside as the backdrop.

Some trees will be lost during the construction phase, but extensive planting along the top of the rocky outcrop to the east and along the other side of the road will compensate for the loss. A tree survey report has been prepared for the improvement works as a whole as part of the tree felling application to be submitted to the relevant authorities for approval in accordance with WBTC No.24/94. Associated with this, is the Landscape Proposal, and the proposed landscaping for the study area is shown in Drawings 90612/T/LD/2000 and 90612/T/LD/2003.

In respect of cumulative impacts, the Feasibility Study EIA concludes that as a whole the road improvement works, which includes the other reclamations highlighted in Section

1.2, will have impacts on the landscape character of the area associated with the loss of vegetation from cut slopes and the alignment and effects on the natural coastline. Moderate visual impacts from the whole project are predicted on the few sensitive receivers in the area of this designated project by the Feasibility Study EIA but as the designated reclamation forms a small element of the road improvement works only and thus, cumulative impacts are considered to be limited.

#### **4.2.2 Operational Phase**

No adverse impacts are expected during the operational phase. The Feasibility Study EIA predicted that the reclamations at Tsing Lung Tau and Sham Tseng West would unlikely have any measureable impacts on marine flows and water quality during the operational phase due to the shallow water and narrow nature of the reclamations. As the reclamation at Sham Tseng East is similar in nature and also to be constructed in shallow water, the same conclusion is considered to apply.

## **5.0 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED**

### **5.1 Describe measures to minimise environmental impacts**

#### **Noise**

The results in Appendix 2A have shown that no noise mitigation measures are required if the reclamation works are not undertaken while other contract works are on-going. In addition, as shown in Appendix 2B, the cumulative noise levels are also below the 75 dB(A) standard and no mitigation is required in this case.

#### **Air Quality**

It may be necessary to dampen the backfilling material prior to its use. However, with the adoption of this measure if required and the relevant pollution control clauses in the Construction Contract as detailed in Attachment 1, environmental nuisance can be kept to a minimum.

#### **Water Quality**

Impacts on water quality are predicted to be insignificant given the limited amount of excavation required, the granular and uncontaminated nature of the material and the short length of the works. Thus, based upon the specification of the Pollution Control Clauses in the Construction Contract as detailed in Attachment 1, no further mitigation measures are recommended.

#### **Ecology and Fisheries**

The revetment wall will be constructed of stonework blocks of granite, the type of rock currently found within the project area. These blocks will form cracks and crannies in which rocky shore fauna such as gastropods can shelter during low tide. The surface of the blocks will provide a suitable habitat for algae to grow and gastropods to graze. In more exposed areas, barnacles are expected to attach to the granite blocks.

Based upon this, and the overall insignificant impacts, no further mitigation measures are considered to be required.

#### **Waste Management**

Based upon the process of the removal of all excavated waste from the site as it is excavated and the reuse of the material during the overall construction works, no mitigation is required. Notwithstanding, relevant pollution control clauses will be included in the Construction Contract, as detailed in Attachment 1, so as to minimize the environmental nuisance to the nearby sensitive receivers.

## **Landscape and Visual**

The boundary or works area has been defined by the detailed design layout. Every effort has been taken to avoid the works impacting mature trees within the works area during the detailed design process. However, in order to quantify the tree loss, a tree survey report has been prepared and the associated Landscape Proposal provides the details of the compensatory planting proposed. The proposals are considered sufficient to mitigate the loss of vegetation and in light of the low visual impacts of the reclamation and the retention of the adjacent rocky outcrop, no further mitigation measures are considered to be required.

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

No adverse noise, air and water quality impacts are predicted and with the application of the pollution control clauses, any impacts will be reduced to a minimum. In respect of ecology and fisheries, while significant impacts are not predicted, the construction of a granite block revetment is considered sufficient to compensate for any impacts.

The duration of the works is short term, will affect a localised area only and no significant impacts have been predicted. In addition, any cumulative impacts associated the construction of the reclamation and elements of the remainder of the road improvement works are not predicted to be significant based upon the implementation of mitigation measures recommended by this Project Profile and in the Feasibility Study EIA.

### **5.3 Comment on any further implications**

None

### **5.4 Use of previous approved EIA**

Reference has been made to the Feasibility Study for Castle Peak Road Improvements between Ka Loon Tsuen and Yau Kom Tau EIA Report, dated December 1996. The Feasibility Study EIA addressed six major environmental parameters during the construction and operational phase of the road improvement works as follows:

- ◆ noise;
- ◆ air quality;
- ◆ water quality;
- ◆ ecology;
- ◆ solid waste; and
- ◆ landscape and visual.

The construction phase of the road works is relevant to this Project Profile as such the key findings and recommendations of the Feasibility Study EIA construction phase assessment are summarised below. The proposed reclamation was not specifically

included in the scope of works assessed by the Feasibility Study EIA. However, the specific relevance of these to the designated project are described in the main text of this Project Profile.

**Noise** – because of the close proximity of sensitive receivers, exceedances of the 75 dB(A) criteria was predicted during the construction phase along the length of the road and extensive mitigation measures were recommended. The measures included incorporating clauses into the construction contract, quietened equipment and temporary noise barriers. The construction impacts of the reclamation were not specifically covered by the Feasibility Study EIA

**Air Quality** – modelling was undertaken based upon the implementation of standard dust suppression measures including pre-watering of dropping surfaces and twice daily watering of excavated surfaces and dusty roads. With the adoption of these measures, the assessment predicted that there would be no exceedances of the criteria at any of the selected air quality sensitive receivers. Mitigation measures specific to fill/reclamation areas included twice daily watering of bulldozed material and unpaved site roads and formed areas.

**Water Quality** - the key water quality issue concerned suspended solids contained in site runoff, especially cut slopes, entering the water bodies, with other reclamations at Tsing Lung Tau and Sham Tseng West being predicted not to result in significant impacts. The report states that the adoption of standard mitigation measures, including the treatment of site runoff through sediment traps should result in low residual impacts.

**Ecology** – the report stated that the entire study area was extensively disturbed by human activities with no protected flora or fauna present. The road widening will result in the loss of different types of habitats including woodland, shrubland, rocky and sandy shore and intertidal area. Only the loss of woodland is of significance but this is mitigated by extensive compensatory planting. Some seabed will be permanently lost but this is not considered significant due to the degraded nature of both the water quality and marine benthic communities in the area.

**Solid Waste** – the report concluded that there would be a balance of surplus spoil which would require disposal off site. However, in order to minimise the off-site fill requirements and disposal of surplus spoil, it was recommended that the Contractor should make use of excavated material as much as possible. In addition, different categories of waste should be segregated, stored, transported and disposed of separately in accordance with the required procedures.

**Landscape and Visual** – it was predicted that the road improvement works would generate severe impacts on the existing landscape character based upon the cutting of slopes and rock faces and encroachment of construction works onto beach areas causing the loss of vegetation. Loss of areas of woodland was also considered a key issue. Visually, due to the high number of sensitive receivers, there will be a high disruption to the existing views during the construction phase associated with extensive engineering works, cut slopes, the removal of existing vegetation and encroachment into the coastline areas.

The Feasibility Study EIA concludes that the reclamation would affect the natural coastline as the carriageway is moved seaward. Mitigation in the form of extensive planting and sensitive hardworks, for the road works as a whole and the alignment on the reclamation, and the restoration of the disturbed hillside was recommended.

## **ATTACHMENT 1**

### **RECOMMENDED POLLUTION CONTROL CLAUSES FOR CONSTRUCTION CONTRACTS**

#### **AVOIDANCE OF NUISANCE**

- (i) All works are to be carried out in such a manner as to cause as little inconvenience as possible to nearby residents, property and to the public in general, and the Contractor shall be held responsible for any claims which may arise from such inconvenience.
- (ii) The Contractor shall be responsible for the adequate maintenance and clearance of channels, gullies etc. and shall also provide and maintain such pedestrian and vehicular access as shall be directed within the works site.
- (iii) Water shall be used to prevent dust rising and the Contractor shall take every precaution to prevent the excavated materials from entering into the public drainage system.
- (iv) The Contractor shall carry out the Works in such a manner as to minimize adverse impacts on the environment during execution of the Works.

#### **NOISE POLLUTION CONTROL**

##### **General Requirements**

- (i) The Contractor shall comply with and observe the Noise Control Ordinance and its subsidiary regulations in force in Hong Kong.
- (ii) The Contractor shall provide an approved integrating sound level meter to IEC 651: 1979 (Type 1) and 804 : 1985 (Type 1) and the manufacturer's recommended sound level calibrator for the exclusive use of the Engineer at all times. The Contractor shall maintain the equipment in proper working order and provide a substitute when the equipment are out of order or otherwise not available.
- (iii) The sound level meter including the sound level calibrator shall be verified by the manufacturers every two years to ensure they perform the same levels of accuracies as stated in the manufacturer's specifications. That is to say at the time of measurements, the equipment shall have been verified within the last two years.
- (iv) In addition to the requirements imposed by the Noise Control Ordinance, to control noise generated from equipment and activities for the purpose of carrying out any construction work other than percussive piling during the time period from 0700 to 1900 hours on any day not being a general holiday (including Sundays), the following requirements shall also be complied with : -

- (a) The noise level measured at 1m from the most affected external facade of any nearby noise sensitive receivers from the construction work alone during any 30 minute period shall not exceed an equivalent sound level (Leq) of 75 dB(A).
- (b) The noise level measured at 1m from the most affected external facade of any nearby schools from the construction work along during any 30 minute period shall not exceed an equivalent sound level (Leq) of 70dB(A) [65dB(A) during school examination periods].

The contractor shall liaise with the schools and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the Contract.

- (c) Should the limits stated in the above sub-clauses (a) and (b) be exceeded, the construction shall stop and shall not recommence until appropriate measures acceptable to the Engineer that are necessary for compliance have been implemented.

Any stoppage or reduction in output resulting from compliance with this clause shall not entitle the Contractor to any extension of time for completion or to any additional costs whatsoever.

- (v) Before the commencement of any work, the Engineer may require the methods of working, equipment and sound-reducing measures intended to be used on the Site to be made available for inspection and approval to ensure that they are suitable for the project.
- (vi) The Contractor shall devise, arrange methods of working and carry out the Works in such a manner so as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.
- (vii) The Contractor shall ensure that all plant and equipment to be used on Site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings or shields, acoustic sheds or screens or other means to avoid disturbance to any nearby noise sensitive receivers.
- (viii) Notwithstanding the requirements and limitations set out in clause (iv) above and subject to compliance with clauses (vi) and (vii) above, the Engineer may upon application in writing by the Contractor, allow the use of any equipment and the carrying out of any construction activities for any duration provided that he is satisfied with the application which, in his opinion, to be of absolute necessity and adequate noise insulation has been provided to the educational institutions to be affected, or of emergency nature, and not in contravention with the Noise Control Ordinance in any respect.
- (ix) No excavator-mounted breaker shall be used within 125m from any nearby noise sensitive

receivers. The Contractor shall use hydraulic concrete crusher whenever applicable.

- (x) The only equipment that shall be allowed on the site for rock drilling works will be quiet drilling rigs with a sound power level not exceeding 110dB(A). Conventional pneumatically driven drilling rigs are specifically prohibited.
- (xi) For the purposes of the above clauses, any domestic premises, hotel, hostel, temporary housing accommodation, hospital, medical clinic, educational institution, place of public worship, library, court of law, or performing arts centre or office building shall be considered a noise sensitive receiver.
- (xii) The Contractor shall, when necessary, apply as soon as possible for a construction noise permit in accordance with the Noise Control (General) Regulations, display the permit as required and copy to the Engineer.

#### **DUST SUPPRESSION MEASURES**

- (i) The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. The air pollution control system installed shall be operated whenever the plant is in operation.
- (ii) The Contractor shall at his own cost, and to the satisfaction of the Engineer, install effective dust suppression equipment and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver the concentration of air-borne dust shall not exceed 0.5 milligrams per cubic meter, at standard temperature (25<sup>B</sup>C) and pressure (1.0 bar) averaged over one hour, and 0.26 milligrams per cubic metre, at standard temperature (25<sup>B</sup>C) and pressure (1.0 bar) averaged over 24 hours.
- (iii) In the process of material handling, any material which has the potential to create dust shall be treated with water or sprayed with wetting agent.
- (iv) Where dusty materials are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust should be provided for this enclosure and vented to a fabric filter system.
- (v) Any vehicle with an open load carrying area used for moving materials which have the potential to create dust shall have properly fitting side and tail boards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.
- (vi) Any stockpile of dusty material shall be either:
  - (a) covered entirely by impervious sheeting;
  - (b) placed in an area sheltered on the top and three sides; or

- (c) sprayed with water or dust suppression chemical so as to maintain the entire surface wet.
- (vii) Implementation of mitigation measures under the Air Pollution Control (Construction Dust) Regulation where appropriate.
- (viii) The Contractor shall frequently clean and water the site to minimize the fugitive dust emissions.
- (ix) The Contractor shall restrict all motorized vehicles to a maximum speed of 8km per hour and confine haulage and delivery vehicles to designated roadways inside the site. Areas of roadway longer than 100m where movement of motorized vehicles exceeds 100 vehicular movements/day or as directed by the Engineer shall be furnished with a flexible pavement surfacing.
- (x) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel washing facility shall be usable prior to any earthworks excavation activity on the Site. The Contractor shall also provide a hard-surfaced road between washing facility and the public road.
- (xi) Conveyor belts shall be fitted with windboards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize emission of dust. All conveyors carrying materials which have the potential to create dust shall be totally enclosed and fitted with belt cleaners.

## **WATER POLLUTION CONTROL**

### **Discharge into Sewers and Drains**

- (i) The Contractor shall not discharge directly or indirectly (by runoff) or cause or permit or suffer to be discharged into any public sewer, storm-water drain, channel, stream-course or sea, any effluent or foul or contaminated water or cooling or hot water without the prior consent of the relevant Authority who may require the Contractor to provide, operate and maintain at the Contractor=s own expense, within the premises or otherwise, suitable works for the treatment and disposal of such effluent or foul or contaminated or cooling or hot water.
- (ii) If any office, site canteen or toilet facilities is erected, foul water effluent shall, subject to paragraph (I) above, be directed to a foul sewer or to a sewage treatment facility.
- (iii) The Contractor=s attention is drawn to the Building Ordinance, the Water Pollution Control Ordinance and the Technical Memorandum >Standard for Effluent Discharged

into Drainage and Sewerage Systems, Inland and Coastal Waters. = and ProPECC PN 1/94 A Construction Site Drainage.

## **WASTE MANAGEMENT**

### **General**

- (i) The Contractor is responsible for waste control within the Site, removal of waste materials produced from the Works and to implement any mitigation measures to minimise waste or to redress problems from waste arising from the Works. The waste may include any sewage, waste water or effluent containing sand, cement, silt of any other suspended solid or dissolved material to flow from the Works onto any adjoining land, storm water or foul water sewer, or any waste matter or surplus material or refuse to be deposited outside the Site or to be deposited permanently anywhere within the Works. The illegal 'fly-tipping' of any wastes or surpluses which may arise from the Works is strictly prohibited.
- (ii) The overall waste management strategy to be adopted involves minimisation of the waste generation, coupled with the maximum reuse and recycling of waste, where practicable, in accordance with the general principles of the waste management hierarchy.
- (iii) Unless otherwise stated in the Contract, all Construction and Demolition (C&D) Material arising from or in connection with the Works shall become the property of the Contractor. The Contractor shall promptly remove all sorted and processed materials not suitable for inclusion in the Works.
- (iv) The Contractor shall comply with the Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance and any other relevant legislation that may be brought into force when undertaking waste management.
- (v) The Contractor shall be responsible for obtaining the relevant license / permit, such as the effluent discharge licence, the chemical waste producer registration etc.

### **Removal of Waste Material**

- (i) The Contractor shall not permit any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the Site onto any adjoining land or allow any waste matter or refuse to be deposited anywhere within the Site or onto any adjoining land and shall have all such matter removed from the Site.
- (ii) The Contractor shall be liable for any damages caused to adjoining land through his failure to comply with sub-clause (i).
- (iii) The Contractor shall be responsible for temporary training; diverting or conducting of open streams or drains intercepted by any works and for reinstating these to their original courses

on completion of the Works.

- (iv) The Contractor shall be responsible for adequately maintaining any existing site drainage system at all times including removal of solids in sand traps, manholes and stream beds.
- (v) Any proposed stream course and nullah temporary diversions shall be submitted to the Engineer for agreement one month prior to such diversion works being commenced. Diversions shall be constructed to allow the water flow to discharge without overflow, erosion or washout. The area through which the temporary diversion runs is to be reinstated to its original condition or as agreed by the Engineer after the permanent drainage system has been completed.
- (vi) The Contractor shall furnish, for the Engineer's information, particulars of the Contractor's arrangements for ensuring that material from any earthworks does not wash into the drainage system. If at any time such arrangements prove to be ineffective, the Contractor shall take such additional measures as the Engineer shall deem necessary and shall remove all silt which may have accumulated in the drainage system whether within the Site or not.
- (vii) The Contractor shall segregate all inert construction waste material suitable for reclamation or land formation and shall dispose of such material at such dumping areas as may be specified from time to time by the Director of Civil Engineering.
- (viii) All non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material shall be disposed of at a public landfill.
- (ix) The Contractor's attention is drawn to the Waste Disposal Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance. It shall be the Contractor's responsibility, at his own cost, to obtain all licences, permits and the like which may be necessary for compliance with the above or other ordinance.

**Appendix 1: Identified Sensitive Receivers**

Receivers Reference	Sensitive Receiver Identification	Slant Distance from the Construction Work (m)	Description
SR1	Golden Villa	115	Residential Building
SR2-1	Pink Villa	94	Residential Building
SR2-2		109	

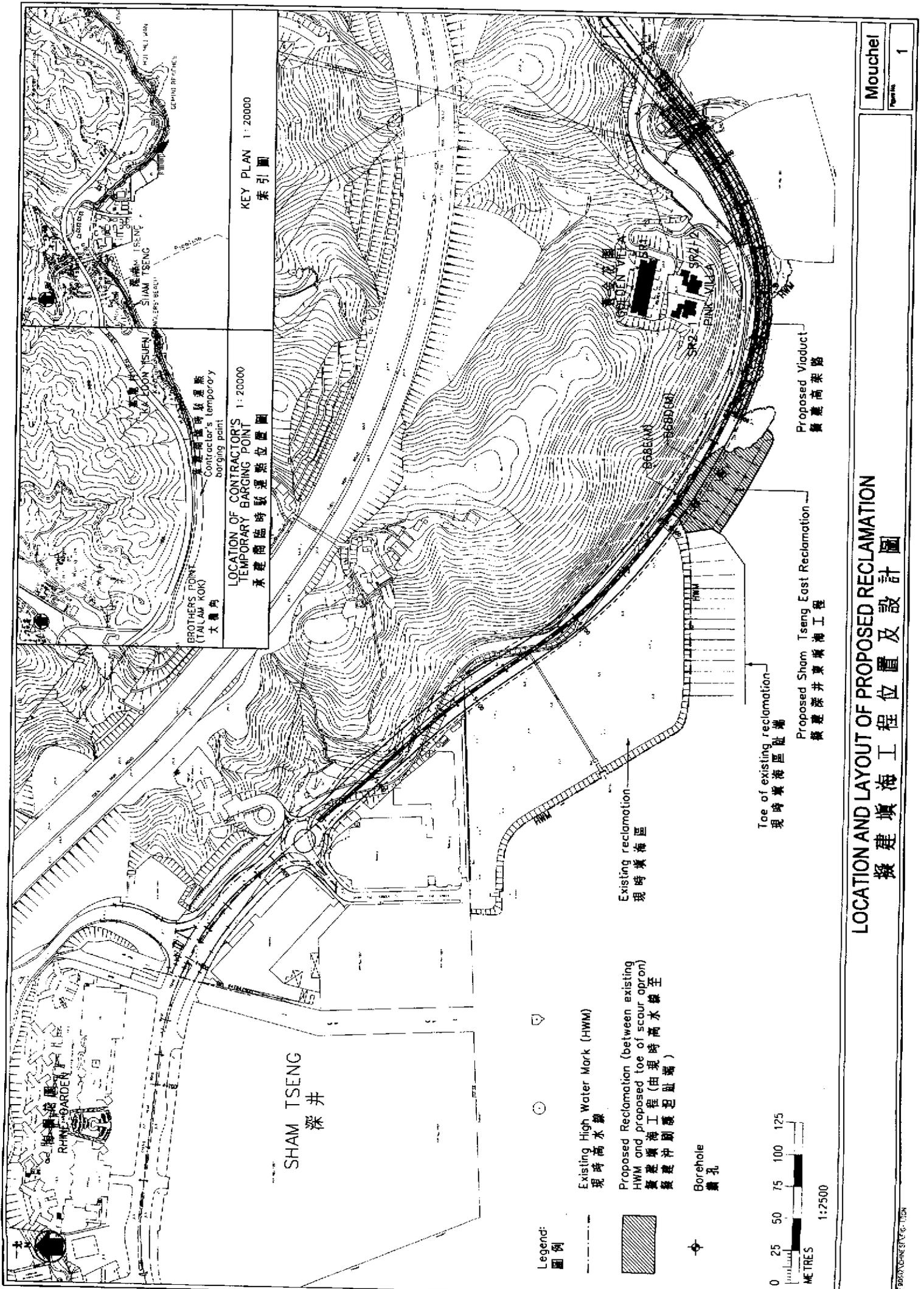
Receivers Reference	Slant Distance	Noise Level with Mitigation, dB(A)								
		<b>Stage1</b>	<b>Stage2</b>	<b>Stage3</b>	<b>Stage4</b>	<b>Stage5</b>	<b>Stage6</b>	<b>Stage7</b>	<b>Stage8</b>	<b>Stage9</b>
SR1	115	*69	*66	*69	*69	*66	*69	*66	*69	*69
SR2-1	94	*71	*68	*71	*71	*68	*71	*68	*71	*71
SR2-2	109	*69	*66	*69	*70	*66	*70	*66	*69	*70

\*73 Noise level below standard criteria before mitigation

**Appendix 2A Maximum Noise Levels [dB(A)] at the Noise Sensitive Receivers without Mitigation Measures**

Receivers Reference	Slant Distance	Noise Level without Mitigation, dB(A)								
		<b>Stage1</b>	<b>Stage2</b>	<b>Stage3</b>	<b>Stage4</b>	<b>Stage5</b>	<b>Stage6</b>	<b>Stage7</b>	<b>Stage8</b>	<b>Stage9</b>
SR1	115	69	66	69	69	66	69	66	69	69
SR2-1	94	71	68	71	71	68	71	68	71	71
SR2-2	109	69	66	69	70	66	70	66	69	70

76 NSR exceeding 75dB(A) will require the application of mitigation measures



KEY PLAN 1:20000  
索引圖

LOCATION OF CONTRACTOR'S  
TEMPORARY BARCING POINT  
承建商臨時裝運點位置圖

BROTHERS POINT  
(TALAM KOK)  
大龍角

Contractor's temporary  
barcging point  
承建商臨時裝運點

SIAM TSENG  
SUKHUMVIT ROAD  
SUKHUMVIT BEACH  
SUKHUMVIT VILLA  
SUKHUMVIT VILLA  
SRG-1  
SRG-2  
SRG-12  
SRG-13  
SRG-14  
SRG-15  
SRG-16  
SRG-17  
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SRG-98  
SRG-99  
SRG-100

SHAM TSENG  
深井

Legend:  
圖例

Existing High Water Mark (HWM)  
現時高水線

Proposed Reclamation (between existing  
HWM and proposed toe of scour apron)  
擬建填海工程 (由現時高水線至  
擬建沖刷護堤趾端)

Borehole  
鑽孔



Existing reclamation  
現時填海區

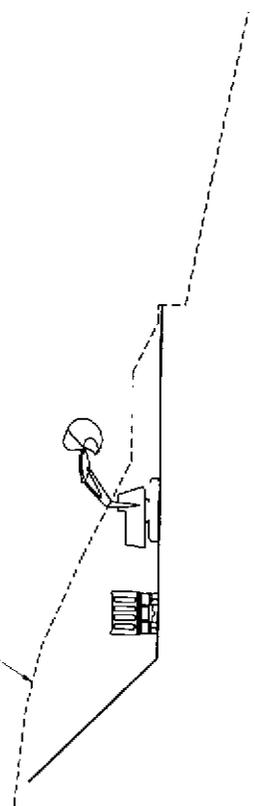
Toe of existing reclamation  
現時填海區趾端

Proposed Sham Tseng East Reclamation  
擬建深井東填海工程

Proposed Viaduct  
擬建高架路

LOCATION AND LAYOUT OF PROPOSED RECLAMATION  
擬建填海工程位置及設計圖

現時的土壤橫斷面  
EXISTING SOIL PROFILE



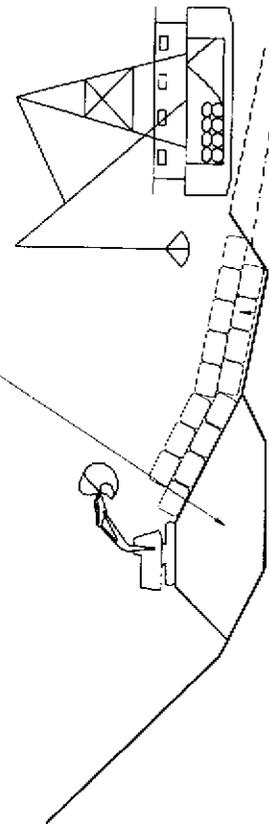
STAGE 1 - EXCAVATE EXISTING GROUND DOWN TO WORKING PLATFORM (+2mPD HIGH TIDE LEVEL) USING BACKHOE.

第一階段 - 利用反鏟挖土機，將現有土地挖成工作平台（主水平基準以上2米的潮高水平台）

STAGE 1  
第一階段

STAGE 4 - PLACE ROCKFILL INTO EXCAVATION BY END TIPPING/BACKHOE

第四階段 - 利用末端裝卸式泥頭車/反鏟挖土機，將石塊卸入挖土範圍



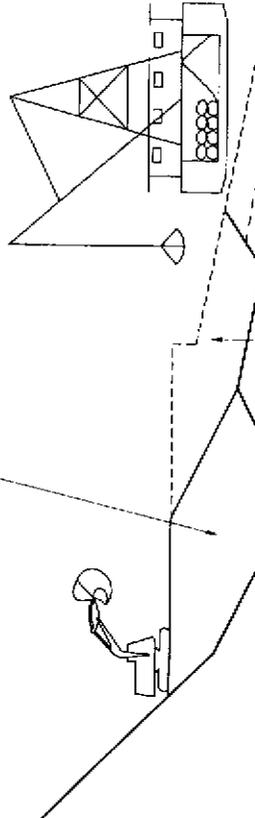
STAGE 5 - PLACE ARMOURING FOR SCOUR APRON USING GRAB FROM DERRICK LIGHTER

第五階段 - 利用吊臂擣船上的抓斗，將防禦物卸入裝卸坪的挖土範圍

STAGE 4 & 5  
第四及第五階段

STAGE 3 - EXCAVATE ABOUT 10m WIDTH OF WORKING PLATFORM (MEASURED ALONG RECLAMATION) USING BACKHOE

第三階段 - 利用反鏟挖土機，將工作平台挖至約10米闊（沿填海區量度）



STAGE 2 - EXCAVATE BEACH AND SCABED DOWN TO UNDERSIDE OF SCOUR APRON LEVEL USING GRAB FROM DERRICK LIGHTER

第二階段 - 利用吊臂擣船上的抓斗及海床挖至裝卸坪的底部水平

STAGE 2 & 3  
第二及第三階段

STAGE 9 - COMPLETE BACKFILLING BEHIND RETAINING WALL BY END TIPPING/BACKHOE

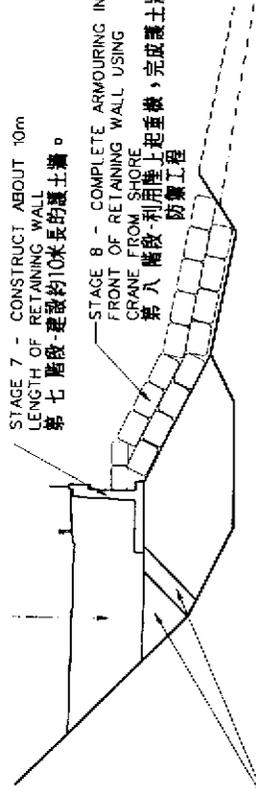
第九階段 - 利用末端裝卸式泥頭車/反鏟挖土機，完成護土牆回填土工程

STAGE 7 - CONSTRUCT ABOUT 10m LENGTH OF RETAINING WALL

第七階段 - 建設約10米長的護土牆。

STAGE 8 - COMPLETE ARMOURING IN FRONT OF RETAINING WALL USING CRANE FROM SHORE

第八階段 - 利用陸上起重機，完成護土牆上的防禦工程



STAGE 6 - PLACE FILTER AND BACKFILL BEHIND ROCKFILL BY END TIPPING/BACKHOE

第六階段 - 利用末端裝卸式泥頭車/反鏟挖土機，將濾水層及填土置於石塊上

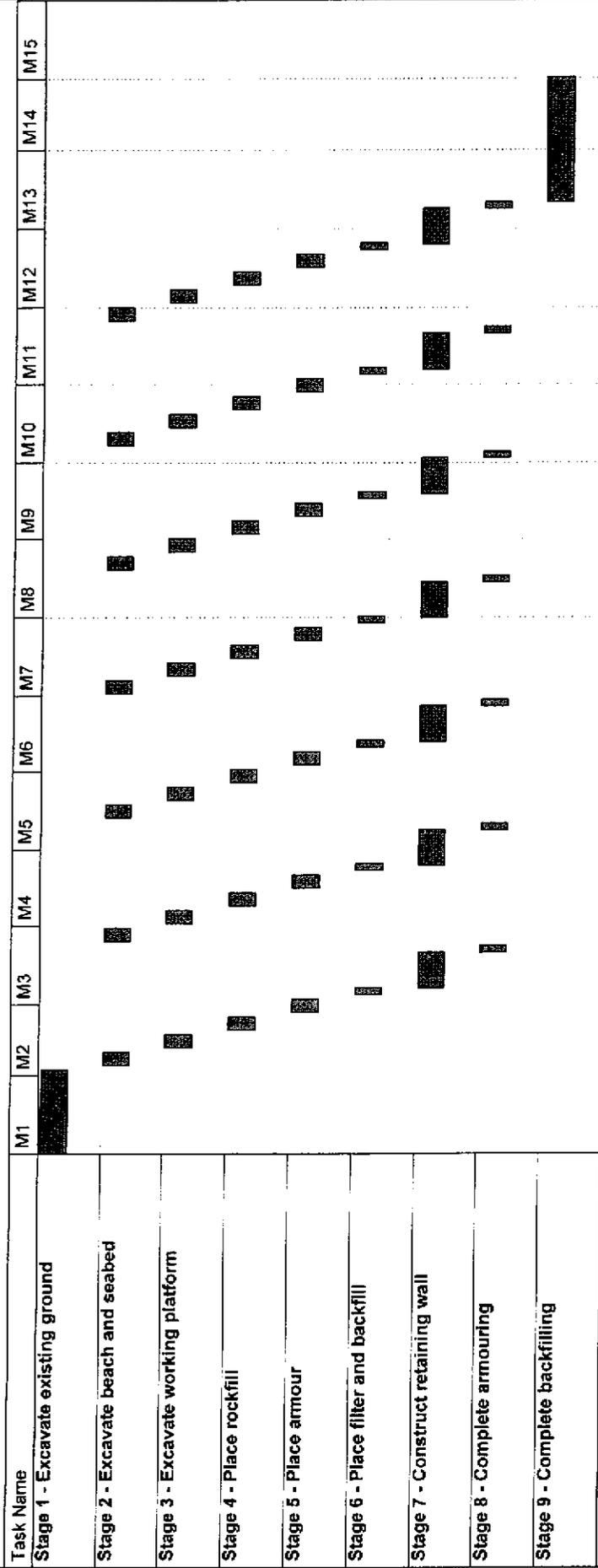
STAGE 6 TO 9  
第六至第九階段

ANTICIPATED CONSTRUCTION METHOD OF PROPOSED RECLAMATION  
建議填海區的預計建設方法

**Contract No. HY/99/19**

**Castle Peak Road Improvement between Ting Kau and Sham Tseng, Tsuen Wan**

**Programme for Construction of Reclamation and Associated Seawall at Sham Tseng East**



REC-1.MPP

Figure 3





DRILLHOLE RECORD

CONTRACT NO. HY/87/11

HOLE NO. B68D(M)

SHEET 2 of 2

PROJECT CASTLE PEAK ROAD IMPROVEMENT BETWEEN AREA 2 AND KA LOON TSUEN TSUEN WAN - SITE INVESTIGATION

METHOD	HO + RC	CO-ORDINATES	W.O. NO.	W611	
MACHINE & No.	CLAIRE	E 824884.86 N 824958.77	DATE	27/07/98 to 27/07/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	-1.90 mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	ROD%	FI	Tests	Sample	Reduced Level	Depth (m)	Legend	Grade	Descriptor
11 27/07/98		2.00m 19:00	100	87	87			T2-101	-12.13	11.23	+		End of drillhole at 1.23m
12													
13													
14													
15													
16													
17													
18													
19													
20													

- SAMPLE DISTURBED SAMPLE
- PISTON SAMPLE
- U78 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZER SAMPLE
- SPT LINER SAMPLE
- WATER SAMPLE
- STANDARD PENETRATION TEST
- IN SITU VANE SHEAR TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- PACKER TEST
- PRESSURE TIP
- STAMPING TIP

LOGGED R.T.WU

DATE 30/07/1998

CHECKED M.DAVIDSON

DATE 04/08/1998

REMARKS

**Figure 4a**



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO.

B58E(M)

SHEET

1 of 1

PROJECT CASTLE PEAK ROAD IMPROVEMENT BETWEEN AREA 2 AND KA LOON TSUEN TSUEN WAN - SITE INVESTIGATION

METHOD	RC	CO-ORDINATES	W.O. NO.	WI 11
MACHINE & No.	CLAIRE	E 824861.16 N 824979.36	DATE	28/07/98 to 30/07/98
FLUSHING MEDIUM	WATER	ORIENTATION Vertical	GROUND LEVEL	-0.81 mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	ADD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
28/07/98	SX	2.10m 07:30	73					T6-131		0.00	[Cross-hatch pattern]	III	Brown (7.5YR 5/4), angular, coarse GRAVEL and COBBLES with a boulder of granite and tuff. (FILL)  0.00 - 0.53m: Boulder.
			82					T6-131		0.85			
29/07/98	SX HX	2.10m 07:30	92	68	68	N.A.		T6-131	-2.16	1.05	[Cross-hatch pattern]	III	Moderately strong, brown, moderately decomposed, medium grained GRANITE. (CORESTONE?)  2.39 - 4.00m: 2.39 - 2.80m and 3.72 - 4.00m: No recovery assumed to be rock fragments washed out by flushing medium.
			70	51	51			T6-131	-2.20	2.39			
29/07/98	HX	2.10m 07:30				N.R.			-2.41	2.60	[Cross-hatch pattern]	V7	
			100	92	80	N.A.		T2-101			3.20	[Cross-hatch pattern]	III
30/07/98	HX	0.80m 19:00	65	29	13	N.R.		T2-101	-4.53	3.72	[Cross-hatch pattern]	V7	
		1.30m 07:30	90	0	0	>20		T2-101	-4.81	4.00	[Cross-hatch pattern]	III	Moderately strong, brown, moderately decomposed, medium grained GRANITE with closely spaced, rough planar and undulating, limonite stained joints, dipping 20° to 30° and subvertical from 4.00m to 4.70m.
30/07/98	HX	1.30m 07:30				3.6		T2-101	-4.66	4.65	[Cross-hatch pattern]	III/II	Moderately strong to strong, brown and pink, moderately to slightly decomposed, medium grained GRANITE with closely to medium spaced, rough planar and stepped, limonite joints, dipping 20° to 30°, 45° and 60°.
			100	100	58			T2-101			5.25	[Cross-hatch pattern]	
30/07/98	HX	1.30m 07:30				6.9		T2-101			6.20	[Cross-hatch pattern]	
			100	100	75			T2-101			6.56	[Cross-hatch pattern]	
30/07/98	HX	1.30m 07:30				7.7		T2-101			7.09	[Cross-hatch pattern]	
			100	82	63			T2-101			7.47	[Cross-hatch pattern]	
30/07/98	HX	1.30m 07:30						T2-101			8.81	[Cross-hatch pattern]	
			89	87	80			T2-101			8.81	[Cross-hatch pattern]	
30/07/98	HX	1.10m 19:00						T2-101			8.84	[Cross-hatch pattern]	
			100	86	80			T2-101			-10.45	8.84	[Cross-hatch pattern]
10												End of drillhole at 8.64m	

<ul style="list-style-type: none"> <li>□ SMALL DISTURBED SAMPLE</li> <li>▣ METON SAMPLE</li> <li>▤ VTD UNDISTURBED SAMPLE</li> <li>▥ VHU UNDISTURBED SAMPLE</li> <li>▧ MAZON SAMPLE</li> <li>▨ 6PT LINER SAMPLE</li> <li>△ WATER SAMPLE</li> </ul>	<ul style="list-style-type: none"> <li>— STANDARD PENETRATION TEST</li> <li>— IN SITU VANE SHEAR TEST</li> <li>— PERMEABILITY TEST</li> <li>— IMPRESSION PACER TEST</li> <li>— PACER TEST</li> <li>— PNEUMETER TIP</li> <li>— STANDPIPE TIP</li> </ul>	LOGGED <u>R.T.WU</u> DATE <u>04/08/1998</u> CHECKED <u>M.DAVIDSON</u> DATE <u>06/08/1998</u>
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REMARKS  
An acoustic borehole televiwer survey was carried out from 5.00m to 8.00m.

Figure 4b



**ENGINEER'S LEGEND**

--- DENOTES PRINCIPAL SITTING OUT LINE  
 --- DENOTES FOOTPATH  
 --- DENOTES FACE OF CARBONATORY  
 --- DENOTES NEW SOIL CUT SLOPE  
 --- DENOTES NEW ROCK CUT SLOPE  
 --- DENOTES SLOPE MAINTENANCE STAIRWAY OR ACCESS STAIRWAY TO BEACH  
 --- DENOTES RETAINING WALL  
 --- DENOTES BORED PILE RETAINING WALL  
 --- DENOTES WORKS LIMIT  
 --- DENOTES PROPOSED CARTRIDGEWAY LEVEL (1:100)  
 --- DENOTES ROAD BRIDGE  
 --- DENOTES VIADUCT  
 --- DENOTES NOISE ENCLOSURE  
 --- DENOTES 5m HIGH NOISE BARRIER  
 --- DENOTES 3.5m HIGH NOISE BARRIER  
 --- DENOTES REFERENCE NO. FOR ROAD STORAGE

**WORKS LIMITS**

--- INTERSECTING  
 --- PIT PLANTING WOODLAND MIX  
 --- AMENITY PLANTING  
 --- PAYING UNDER FOOTBRIDGE  
 --- TRAIL GUARD  
 --- HEAVY STANDARD TREE WITH TREE GUARD  
 --- HEAVY STANDARD TREE IN REMOVABLE PLANTER  
 --- EXISTING TREE TO BE RETAINED  
 --- EXISTING TREE GROUP TO BE RETAINED  
 --- CREEPERS  
 --- TREE WALL PLANTER  
 --- PROVISION OF AUTOMATIC IRRIGATION SYSTEM IN CENTRAL RESERVES  
 --- WATER POINT  
 --- VISIBILITY SPLAYS

**ABBREVIATIONS**

--- WOODLAND MIX A  
 --- WOODLAND MIX B  
 --- WOODLAND MIX C  
 --- WOODLAND MIX D  
 --- WOODLAND MIX E  
 --- WOODLAND MIX F  
 --- GRASS INTERSECTING  
 --- LINE INTERSECTING

**LEGEND**

--- WORKS LIMITS  
 --- INTERSECTING  
 --- PIT PLANTING WOODLAND MIX  
 --- AMENITY PLANTING  
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**REVISIONS**

1. EXISTING TERRAZZING: THE CONTRACTOR SHALL PROTECT ALL TREES TO BE RETAINED. THE EXISTING TERRAZZING SHALL BE REINSTALLED BY THE CONTRACTOR.

2. GRASS PROTECTION: GRASS SHALL BE LAYED OUT TO ALL AREAS EXCEPT SLOPE AREAS TO BE PLANTED, AS SPECIFIED.

3. SLOPES: ALL SLOPES SHALL BE PLANTED WITH GRASS. ALL SLOPES SHALL BE PLANTED WITH GRASS. ALL SLOPES SHALL BE PLANTED WITH GRASS.

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**REVISIONS**

11. PLANTING: ALL PLANTING SHALL BE DONE AS SHOWN ON THE LANDSCAPE DETAILS SHEETS.

12. UTILITY CONDUITS: UTILITY CONDUITS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

13. WATER POINTS: WATER POINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

14. WATERING: THE CONTRACTOR SHALL PROVIDE ADEQUATE WATERING FOR ALL PLANTED AREAS AS SPECIFIED.

15. EXISTING TREES: EXISTING TREES SHALL BE PROTECTED AND MAINTAINED THROUGHOUT THE PROJECT.

16. WATER POINTS: WATER POINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

17. AUTOMATIC IRRIGATION SYSTEM: AN AUTOMATIC IRRIGATION SYSTEM SHALL BE PROVIDED FOR ALL PLANTED AREAS AS SPECIFIED.

18. CLIMBERS: CLIMBERS SHALL BE PLANTED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

19. ALL SOIL ANGLES SHALL BE INTERSECTED PRIOR TO CONSTRUCTION WITH THE DEPARTMENT TECHNICAL UNIT.

20. TREE IN REMOVABLE PLANTERS SHALL BE PLANTED AS PER DETAIL ON THE LANDSCAPE DETAILS SHEETS.

21. REMOVABLE PLANTERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT TECHNICAL UNIT.

22. WEATHER STONE FINISHES: WEATHER STONE FINISHES SHALL BE USED FOR ALL EXPOSED CONCRETE.

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**Major Works Project Management Office,**  
**Highways Department,**  
**Hong Kong**

Project No. 6365TH Contract No. HY/99/19

**Moucheil Halcrow JV**  
 Sub-Consultants  
 A.C.I. Asia, MVA Asia Ltd.,  
 Towland Consultants Ltd., Chesterton Pelly Ltd.

Castle Peak Road Improvement  
 Between Ting Kau and Sham Tseng,  
 Tsuen Wan

Drawing Title

**ABBREVIATION AND LEGEND FOR LANDSCAPE DRAWINGS**

Drawn: PFL Checked: [Signature] Approved: [Signature]  
 Scale: CAD File No. 400555a.dwg Date: JAN2000  
 Date Issued: NOV2000 Drawing No. 90612/T/LD/2000 Rvw: B

**PLANT SPECIES**

CODE	SPECIES	TYPE	SIZE	SPACING
01	WATERBURY WILLOW	WIP	15	1000
02	WATERBURY WILLOW	WIP	15	1000
03	WATERBURY WILLOW	WIP	15	1000
04	WATERBURY WILLOW	WIP	15	1000
05	WATERBURY WILLOW	WIP	15	1000
06	WATERBURY WILLOW	WIP	15	1000
07	WATERBURY WILLOW	WIP	15	1000
08	WATERBURY WILLOW	WIP	15	1000
09	WATERBURY WILLOW	WIP	15	1000
10	WATERBURY WILLOW	WIP	15	1000
11	WATERBURY WILLOW	WIP	15	1000
12	WATERBURY WILLOW	WIP	15	1000
13	WATERBURY WILLOW	WIP	15	1000
14	WATERBURY WILLOW	WIP	15	1000
15	WATERBURY WILLOW	WIP	15	1000
16	WATERBURY WILLOW	WIP	15	1000
17	WATERBURY WILLOW	WIP	15	1000
18	WATERBURY WILLOW	WIP	15	1000
19	WATERBURY WILLOW	WIP	15	1000
20	WATERBURY WILLOW	WIP	15	1000
21	WATERBURY WILLOW	WIP	15	1000
22	WATERBURY WILLOW	WIP	15	1000
23	WATERBURY WILLOW	WIP	15	1000
24	WATERBURY WILLOW	WIP	15	1000
25	WATERBURY WILLOW	WIP	15	1000
26	WATERBURY WILLOW	WIP	15	1000
27	WATERBURY WILLOW	WIP	15	1000
28	WATERBURY WILLOW	WIP	15	1000
29	WATERBURY WILLOW	WIP	15	1000
30	WATERBURY WILLOW	WIP	15	1000
31	WATERBURY WILLOW	WIP	15	1000
32	WATERBURY WILLOW	WIP	15	1000
33	WATERBURY WILLOW	WIP	15	1000
34	WATERBURY WILLOW	WIP	15	1000
35	WATERBURY WILLOW	WIP	15	1000
36	WATERBURY WILLOW	WIP	15	1000
37	WATERBURY WILLOW	WIP	15	1000
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39	WATERBURY WILLOW	WIP	15	1000
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41	WATERBURY WILLOW	WIP	15	1000
42	WATERBURY WILLOW	WIP	15	1000
43	WATERBURY WILLOW	WIP	15	1000
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