

PROJECT PROFILE

1.0 BASIC INFORMATION

1.1 Project Title

Contract No. HY/99/18

Castle Peak Road Improvement between Sham Tseng and Ka Loon Tsuen, Tsuen Wan
Construction of Reclamation and Associated Seawall at Tsing Lung Tau.

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 Tsing

Lung Tau reclamation, an element of the west contract HY/99/18.

The proposed reclamation is required to support a section of improved road, including a roundabout, two footbridges and two noise enclosures, along the sea front at Tsing Lung Tau. 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 is constrained on the inland side by several large property developments (Hong Kong Garden and Lung Tang Court) and Tsing Lung Tau Village itself, and therefore cannot be shifted inland. The reclamation option is thus considered the most appropriate solution.

1.3 Name of Project Proponent

Highways Department
Major Works Project Management Office
3rd 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 1.7 ha in area. The length of the reclamation, measured parallel to the road, is about 754 m, and the maximum width, measured from the existing High Water Mark (HWM) to the proposed toe of the scour apron is about 74 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.2(c) 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 is greater than 1ha and is less than 100m from an existing residential area. 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/99/18, the western most 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.

It is anticipated that two sets of the equipment will be required to work simultaneously to construct the reclamation. However, the equipment will operate at different locations within the reclamation site with the closest distance between them being approximately 85m between chainages 2580 and 2665 where no reclamation works are required.

2.2 What is the project time table

The construction period for Contract No. HY/99/18 will be 42 months, with the latest tentative construction programme being August 2001 to February 2005. However, it is anticipated that the construction of the proposed reclamation will only take 23 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 11 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	4 weeks
Stage 2	1.5 weeks per phase
Stage 3	1 week per phase
Stage 4	1.5 weeks 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	8 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 99/18. 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 which are largely high-rise in nature. The sensitive facades of these properties mostly face seawards and towards the proposed construction works. 37 residential buildings have been identified within 160m of the proposed reclamation works. 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 source 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 EIA¹. Weekday morning peak hour noise levels were monitored to obtain L_{10} (1-hour), L_{eq} (1-hour) and L_{90} (1-hour) noise levels at Hong Kong Gardens (facade noise level at ground floor of commercial building, facing Castle Peak Road). The recorded noise levels at this location were determined to be $L_{eq}69.6$ dB(A) and $L_{eq}69.5$ dB(A) between 8:00 to 9:00 am and 9:00 to 10:00 am respectively.

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 :g m^{-3} , which are well within 24-hour average AQOs for TSP (260 :g m^{-3}) and RSP (180 :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 Wan² (Monitoring Station WM4). 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.

1 Feasibility Study for Castle Peak Road Improvements between Ka Loon Tsuen and Yau Kom Tau EIA Report, December 1996
2 EPD (1998) *Marine Water Quality in Hong Kong*

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.

Ecology and Fisheries

Ecology

A beach environment, revetment and 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 4d. The beach is exposed to wave action and can be considered mobile with wave action constantly reworking and transporting sand particles.

In Hong Kong mobile beaches tend to be colonised by relatively few species due to the turbulent and uncertain nature of the environment. Typically the burrows of the Family Ocypodidae (Ghost Crabs) can often be found along the upper shore. They feed by sifting sand for food particles as well as catching small insects and crustaceans. The bivalve *Donax cuneatus* is encountered usually in large number within the permanently fluid sands below the mid tide mark. They feed by filtering seawater for food particles.

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.

The backshore habitat is very limited consisting of a narrow strip of land bounded by the existing Castle Peak Road to the north and is dominated by coastal grasses, occasional coastal scrub bushes and some mature tress.

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 Chau³. 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*,

3 ERM (1999) *Environmental Monitoring and Audit for Contaminated Mud Pit IV at East of Sha Chau 8th Quarterly report*

Oxyurichthys tentacularis, *Turritella terebra*, *Murex trapa*, *Polychaetus uranoscopa* and *Oratosquilla oratoria*. It is likely that the same species will be found within the coastal waters of the project area.

Landscape and Visual

The topography of the area comprises gently sloping vegetated slopes on both the landward and seaward side of the existing road and small stretches of beach. Mature trees are planted along the seaward verge of the existing road which occasionally also cover some of the foreshore. Residents in this area have uninterrupted views of the sea and views from the sea will be able to see the residential blocks and the vegetated hillside, with a low lying revetment for the existing road running along the coastline.

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 -10 mPD, with about 129,400 m³ of material being removed. It is anticipated that the excavation rate will be less than 400 m³ 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 based upon 1 set of equipment working at any one time. 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 at 12 of the NSRs will exceed the daytime noise criteria of 75dB(A). A summary of unmitigated noise levels in excess of the criteria is provided in Table 2 below. Based upon these results, noise mitigation measures will be necessary in a number of locations to reduce the noise to acceptable levels.

Table 2: Summary of Unmitigated Noise Levels in Excess of the Criteria

Construction Stage	Noise levels above the standard will result if NSRs are located within the following distances (m)	Number of residences which may be subject to noise above the criteria
Stage 1	53	12
Stage 2	38	1
Stage 3	53	12
Stage 4	56	14
Stage 5	38	1
Stage 6	56	14
Stage 7	38	1
Stage 8	53	12
Stage 9	56	14
Total Dwellings affected : 12		

However, as noted in Section 2.1 above, it is likely that two sets of equipment could be working at the same time for all stages of the reclamation works at different locations within the site. The worst case scenario in this respect is that the noisiest equipment will be operating at the same time at their closest point together, 85m apart in front of Hong Kong Gardens, as noted previously. The noisiest stages of the works will be 4, 6 and 9 when an excavator, lorry and compactor will be working. Calculations to determine the cumulative impacts of two sets operating have been undertaken and the results are provided in Appendix 2B.

These results show that the minimum distance between the equipment sets is sufficient to have only a marginal effect on the overall noise levels at the NSRs SR7-1, 7-2, 7-3, 7-4, 7-5, 8-1 and 8-2 which would be affected. However, the increases do not alter the number of NSRs which would be subject to noise levels in excess of the 75 dB(A) standard.

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/99/18, 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 proposed two sections of operational noise barriers and the foot bridge in front of Hong Kong Gardens.

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 worst case situation of two sets of 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 two sets of reclamation equipment without mitigation are shown in Appendix 2C. The results indicate that there could be further exceedances during other construction stages or at additional NSRs. Thus, 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 132: g m^{-3} and 128 : g m^{-3} at Hong Kong Gardens (SR7-1 on Figure 1) and Lung Tang Court (SR8-2) respectively, based upon the mitigation measures highlighted in Section 5.4, which are well within the 24-hour average AQO for TSP of 260 : g m^{-3} . The Feasibility Study EIA predictions included the proposed reclamation in the scope of its assessment and thus, the levels show that 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.

However, a geotechnical borehole survey has shown that the sediment in the area is

granular in nature. A total of 12 boreholes were drilled in the vicinity of the proposed reclamation and all were found to be composed of sandy material, indicating that the areas to be dredged will be composed of similar deposits. Examples of four of these boreholes (B26, B29, B32(M) and B35(M)) are shown in Figures 4a to 4d 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.

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/99/18, 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 of the reclamation, which could lead to high suspended solids site runoff, could be undertaken concurrently with the excavation for the reclamation. However, the proposed reclamation was included in the scope of works assessed by the Feasibility Study EIA which 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.

The EIA report also stated that the reclamation works are minor and not expected to result in substantial impacts based upon the works preferably being conducted behind a sealed seawall and the method of fill placement managed. The proposed method of construction concurs with this recommendation and 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, 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/99/18 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 – 4d, 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 some 725m of upper to mid beach habitat which is colonised by Ghost Crabs and Bivalves. Rocky outcrops and existing revetment 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 sections of the revetment that are within the tidal range 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.

There will be a net loss in beach area to the reclamation with the upper to mid beach being permanently removed. The planned reclamation is mostly limited to the upper shore along the western and middle sections of the reclamation but also occupies the mid shore at the eastern end of the reclamation. The upper shore is the main habitat of the Ghost Crab and its habitat will be lost. The mid to lower shore is the main habitat of bivalves. The Ghost Crab habitat along the beach is predicted to be permanently lost while only a small portion of the bivalve habitat is expected to be lost.

The reclamation will be constructed in a sectional format with only a small part of the beach being worked on at any one time. Construction of the initial section will require the remove of sand from the beach but subsequent sections will have the excavated sand moved to replace the beach extracted during construction of the previous section. Thus overall losses of sand shall be minimal.

Wave action will reform the mid to lower beach area to a natural state once construction is complete. It is not expected that any scour will occur as a result of the construction and the beach that remains should stay in place. Given this, the bivalve community will most likely recolonise the disturbed areas of beach within 2-3 years after construction.

The removal of some vegetation will occur to the landward side of the reclamation, but the coastal grasses and bushes are of low ecological value and 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, 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 beach will be replaced by revetment rocky shore.

Cumulatively, the Feasibility Study EIA predicts impacts on the rocky shore, beach areas and intertidal areas. The proposed reclamation was included in the scope of works assessed by the Feasibility Study EIA and all impacts on marine habitats and aquatic fauna 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 course 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. The proposed reclamation was included in the scope of works assessed by the Feasibility Study EIA and 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 and effectively just extends the existing road platform out to sea, being at the same elevation. Thus, from the landward side, the existing sea views will not be obstructed in any way, although construction equipment will be visible to some residents in the higher floors of the adjacent blocks for the short term. However, this will not be significant in the context of the improvement works to be undertaken in this area. The beach at the west end of the reclamation is not prominent in current views due to its low lying and narrow nature and thus its loss will not be significant to the majority of residents. From the sea, the low lying reclamation will not be prominent in the views and the vegetated hill slopes and residential blocks will still dominate the views.

Some trees will be lost during the construction phase, but extensive planting along the new promenade, together with further planting along the new road verges will compensate and provide a greener outlook. 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 in shown in Drawings 90612/T/LD/1000, 90612/T/LD/1006, 90612/T/LD/1007 and 90612/T/LD/1008.

In respect of cumulative impacts, the Feasibility Study EIA has included the proposed reclamation in the scope of its assessment and has concluded that the elements presenting the most significant visual impacts relate largely to the infrastructure to be constructed on and in the vicinity of the reclamation as opposed to the reclamation itself. The loss of mature trees as a result of the reclamation does increase the landscape impacts of the road improvement works as a whole, however, but residual cumulative impacts are considered to be suitably mitigated by the implementation of the landscape proposals as detailed above.

4.2.2 Operational Phase

No adverse impacts are expected during the operational phase. The Feasibility Study EIA predicted that this designated reclamation and the reclamation at Sham Tseng West would unlikely have any measurable impacts on marine flows and water quality during the operational phase due to the shallow water and narrow nature of the reclamations which do not extend far from the existing coastline.

5.0 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED

5.1 Describe measures to minimise environmental impacts

Noise

The results in Appendix 2A and 2B have highlighted 12 NSRs which may experience adverse noise impacts during the various stages of construction and thus these will require mitigation. The mitigation measures detailed in Table 3 below can provide a maximum of 10 dB(A) attenuation.

Table 3: Recommended Mitigation Measures for the Noisy Equipment

Plant	Source of Noise	Mitigation Measures	Maximum Reduction in dB(A)
- Excavator - Crane - Compactor - Loader - Grader - Scraper	Engine	i) Fit more efficient exhaust sound reduction equipment. ii) Manufacturers' enclosure panels should be kept closed.	10
Materials Handling	Impact of Material	Do not drop material from excessive heights.	up to 15

Reference: Noise and vibration control on construction and open sites, BS5228:Part 1:1997,p15-16

For the purposes of this assessment, a 5dB(A) attenuation of the listed equipment has been assumed and a complete set of mitigated noise results is shown in Appendix 3A, with the maximum attenuation calculation being based on A Noise and Vibration Control on Construction and Open Sites BSI 1997. After the adoption of the mitigation measures, the noise level at all the sensitive receivers do not exceed the statutory requirement during construction and no residual impacts will occur. The mitigation measures are also sufficient to take in account the marginal increases experienced during the worst case situation for two sets of equipment operating, as shown by the results in Appendix 3B and also during any cumulative construction activities associated with two sets of equipment and a bored piling rig as shown in Appendix 3C.

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, the fact that the beach will return after a period of time, the landscaping to compensate for tree loss and the overall insignificant impacts, no further mitigation measures are considered necessary.

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 minimise 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 and short-term visual impacts of the reclamation no further mitigation measures are required.

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

Adverse noise impacts will not occur after the application of the full set of recommended mitigation measures. With the application of the pollution control clauses, no significant air or water quality impacts are expected. In respect of ecology and fisheries, while significant impacts are not predicted, the construction of a granite block revetment, the potential for the beach to return and the planting of compensatory trees are 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 included in the scope of works assessed by the Feasibility Study EIA, which thus effectively represents a cumulative assessment of the impacts associated with the road works and the reclamation. However, the specific relevance of these to the designated project is described below and 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 the reclamation at Tsing Lung Tau and Sham Tseng West being predicted not to result in significant impacts. The EIA does recommend that the works are preferably conducted behind a sealed seawall and the method of fill placement managed. The report states that the adoption of these and other standard mitigation measures, including the treatment of site runoff through sediment traps should result in low residual impacts. In addition, the Feasibility Study EIA predicted that this designated reclamation and the reclamation at Tsing Lung Tau would unlikely have any measurable impacts on marine flows and water quality during the operational phase due to the shallow water and narrow nature of the reclamations.

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 the water quality and marine benthic communities in the area. The Feasibility Study EIA predicts that ecological impacts from the reclamation will be minor.

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. The Feasibility Study EIA concludes that the reclamation would cause the loss of mature trees at the road boundary. 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. Mitigation in the form of extensive planting for all vegetation loss, including that associated with the reclamation, sensitive hardworks 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 minimise 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^BC) and pressure (1.0 bar) averaged over one hour, and 0.26 milligrams per cubic metre, at standard temperature (25^BC) 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

Receiver Reference	Sensitive Receiver Identification	Slant Distance from the Construction Work (m)	Description
SR1-1	Hong Kong Garden	124	Residential Building
SR1-2		115	
SR1-3		101	
SR1-4		99	
SR2		55	
SR3		55	
SR4		65	
SR5-1		129	
SR5-2		127	
SR5-3		125	
SR5-4		123	
SR5-5		121	
SR5-6		119	
SR6-1		115	
SR6-2		109	
SR7-1		53	
SR7-2		51	
SR7-3		51	
SR7-3		51	
SR7-5		114	
SR8-1	Lung Tang Court	66	Residential Building
SR8-2		77	
SR9-1	Tsing Lung Tau Village	56	Residential Building
SR9-2		46	
SR9-3		48	
SR9-4		48	
SR9-5		49	
SR9-6		50	
SR9-7		51	
SR9-8		60	
SR9-9		61	
SR9-10		60	
SR9-11		62	
SR9-12		60	
SR10	Dragon Villa	36	Residential Building
SR11	Villa Alfa Vista	38	Residential Building
SR12	Victoria Valerie's Court	162	Residential Building

Appendix 2C - Maximum Noise Level at Sensitive Receivers - Mitigation Measures Applied on Bored Piling*

Receivers Reference	Distance From Sensitive Receivers			Noise Level, dB(A)								
	Reclamation Site 1	Reclamation Site 2	Bored Piling	Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8	Stage9
SR1-1	124	#	110	69	66	69	69	66	69	66	69	69
SR1-2	115	#	90	69	67	69	70	67	70	67	69	70
SR1-3	101	#	80	71	68	71	71	68	71	68	71	71
SR1-4	99	#	73	71	68	71	71	68	71	68	71	71
SR2	55	320	28	77	75	77	77	75	77	75	77	77
SR3	55	290	28	77	75	77	77	75	77	75	77	77
SR4	65	264	38	75	73	75	75	73	75	73	75	75
SR5-1	129	274	108	69	67	69	70	67	70	67	69	70
SR5-2	127	260	102	69	67	69	70	67	70	67	69	70
SR5-3	125	244	102	70	67	70	70	67	70	67	70	70
SR5-4	123	222	102	70	67	70	70	67	70	67	70	70
SR5-5	121	220	102	70	67	70	70	67	70	67	70	70
SR5-6	119	206	104	70	68	70	71	68	71	68	70	71
SR6-1	115	162	104	71	68	71	71	68	71	68	71	71
SR6-2	109	134	86	72	69	72	72	69	72	69	72	72
SR7-1	61	86	26	77	75	77	78	75	78	75	77	78
SR7-2	79	64	26	77	75	77	78	75	78	75	77	78
SR7-3	122	51	26	78	76	78	78	76	78	76	78	78
SR7-4	142	51	26	78	76	78	78	76	78	76	78	78
SR7-5	188	114	84	71	68	71	71	68	71	68	71	71
SR8-1	194	66	42	75	73	75	75	73	75	73	75	75
SR8-2	230	77	62	73	71	73	74	71	74	71	73	74
SR9-1	260	56	80	75	73	75	76	73	76	73	75	76
SR9-2	264	46	88	77	74	77	77	74	77	74	77	77
SR9-3	276	48	100	77	74	77	77	74	77	74	77	77
SR9-4	280	48	103	77	74	77	77	74	77	74	77	77
SR9-5	284	49	108	76	73	76	77	73	77	73	76	77
SR9-6	286	50	112	76	73	76	77	73	77	73	76	77
SR9-7	290	51	116	76	73	76	76	73	76	73	76	76
SR9-8	300	60	128	75	72	75	75	72	75	72	75	75
SR9-9	305	61	130	75	72	75	75	72	75	72	75	75
SR9-10	310	60	138	75	72	75	75	72	75	72	75	75
SR9-11	330	62	160	74	71	74	75	71	75	71	74	75
SR9-12	350	60	180	75	72	75	75	72	75	72	75	75
SR10	396	38	240	78	75	78	79	75	78	75	78	79
SR11	444	40	300	78	75	78	78	75	78	75	78	78
SR12	564	162	380	66	63	66	67	63	67	63	66	67

76 NSR exceeding noise standard criteria 75dB(A)
 * Assume Noise Barrier is Applied on Piling Activities [10 dB(A) Reduced]
 # Receiver is totally Shield By the other Building

Appendix 3C - Maximum Noise Level at Sensitive Receivers - Mitigation Measures Applied on Reclamation and Bored Piling*

Receivers Reference	Distance From Sensitive Receivers			Noise Level, dB(A)								
	Reclamation Site 1	Reclamation Site 2	Bored Piling	Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8	Stage9
SR1-1	124	#	110	65	63	65	65	63	65	63	65	65
SR1-2	115	#	90	66	64	66	66	64	66	64	66	66
SR1-3	101	#	80	67	65	67	67	65	67	65	67	67
SR1-4	99	#	73	67	65	67	67	65	67	65	67	67
SR2	55	320	28	74	73	74	74	73	74	73	74	74
SR3	55	290	28	74	73	74	74	73	74	73	74	74
SR4	65	264	38	72	70	72	72	70	72	70	72	72
SR5-1	129	274	108	65	63	65	65	63	65	63	65	65
SR5-2	127	260	102	65	63	65	66	63	66	63	65	66
SR5-3	125	244	102	65	64	65	66	64	66	64	65	66
SR5-4	123	222	102	66	64	66	66	64	66	64	66	66
SR5-5	121	220	102	66	64	66	66	64	66	64	66	66
SR5-6	119	206	104	66	64	66	66	64	66	64	66	66
SR6-1	115	162	104	67	64	67	67	64	67	64	67	67
SR6-2	109	134	86	68	66	68	68	66	68	66	68	68
SR7-1	61	86	26	74	73	74	75	73	75	73	74	75
SR7-2	79	64	26	74	73	74	75	73	75	73	74	75
SR7-3	122	51	26	75	73	75	75	73	75	73	75	75
SR7-4	142	51	26	75	73	75	75	73	75	73	75	75
SR7-5	188	114	84	67	65	67	67	65	67	65	67	67
SR8-1	194	66	42	71	70	71	72	70	72	70	71	72
SR8-2	230	77	62	69	67	69	70	67	70	67	69	70
SR9-1	260	56	80	71	68	71	71	68	71	68	71	71
SR9-2	264	46	88	72	70	72	73	70	73	70	72	73
SR9-3	276	48	100	72	69	72	72	69	72	69	72	72
SR9-4	280	48	103	72	69	72	72	69	72	69	72	72
SR9-5	284	49	108	72	69	72	72	69	72	69	72	72
SR9-6	286	50	112	71	69	71	72	69	72	69	71	72
SR9-7	290	51	116	71	68	71	72	68	72	68	71	72
SR9-8	300	60	128	70	67	70	70	67	70	67	70	70
SR9-9	305	61	130	70	67	70	70	67	70	67	70	70
SR9-10	310	60	138	70	67	70	70	67	70	67	70	70
SR9-11	330	62	160	69	67	69	70	67	70	67	69	70
SR9-12	350	60	180	70	67	70	70	67	70	67	70	70
SR10	396	38	240	73	71	73	74	71	74	71	73	74
SR11	444	40	300	73	70	73	73	70	73	70	73	73
SR12	564	162	380	61	59	61	62	59	62	59	61	62

76 NSR exceeding noise standard criteria 75dB(A)
 * Assume Noise Barrier is Applied on Bored Piling Activities [10 dB(A) Reduced];
 Silenced Equipments are Applied on Reclamation Activities [5 dB(A) Reduced]
 # Receiver is totally Shield By the other Building

Appendix 2B Maximum Noise Level [dB(A)] at the Noise Sensitive Receivers Without Mitigation Measures (Two Sets of Equipment at Minimum Distance)

Receivers Reference	Slant Distance of site 1	Slant Distance of site 1	Noise Level without Mitigation, dB(A)								
			Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8	Stage9
SR7-1	61	86	76	73	76	76	73	76	73	76	76
SR7-2	79	64	76	73	76	76	73	76	73	76	76
SR7-3	122	51	77	74	77	77	74	77	74	77	77
SR7-4	142	51	76	73	76	77	73	77	73	76	77
SR7-5	188	114	70	67	70	71	67	71	67	70	71
SR8-1	194	66	74	71	74	75	71	75	71	74	75
SR8-2	230	77	73	70	73	73	70	73	70	73	73

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

Appendix 3B Maximum Noise Level [dB(A)] at the Noise Sensitive Receivers With Mitigation Meas (Two Sets of Equipment at Mininium Distance)

Receivers Reference	Start Distance of site 1	Start Distance of site 1	Noise Level without Mitigation, dB(A)								
			Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8	Stage9
SR7-1	61	86	71	*73	71	71	*73	71	*73	71	71
SR7-2	79	64	71	*73	71	71	*73	71	*73	71	71
SR7-3	122	51	72	*74	72	72	*74	72	*74	72	72
SR7-4	142	51	71	*73	71	72	*73	72	*73	71	72
SR7-5	188	114	*70	*67	*70	*71	*67	*71	*67	*70	*71
SR8-1	194	66	*74	*71	*74	*75	*71	*75	*71	*74	*75
SR8-2	230	77	*73	*70	*73	*73	*70	*73	*70	*73	*73

*73 Noise level below standard criteria before mitigation

Appendix 3A Maximum Noise Levels [dB(A)] at the Noise Sensitive Receivers with Mitigation Measures (One Set of Equipment)

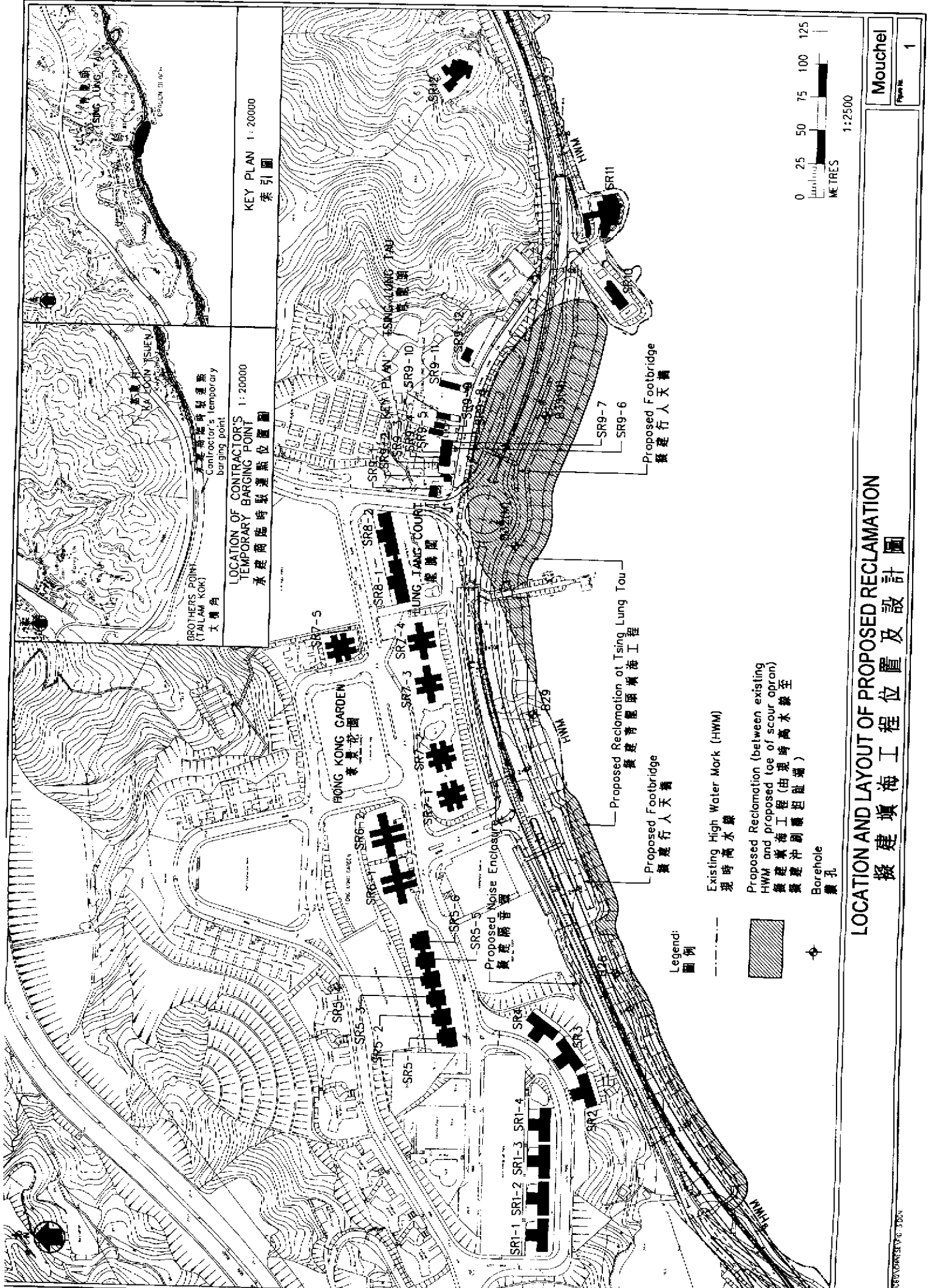
Receivers Reference	Slant Distance	Noise Level with Mitigation, dB(A)								
		Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8	Stage9
SR1-1	124	*68	*65	*68	*69	*65	*69	*65	*68	*69
SR1-2	115	*69	*66	*69	*69	*66	*69	*66	*69	*69
SR1-3	101	*70	*67	*70	*70	*67	*70	*67	*70	*70
SR1-4	99	*70	*67	*70	*71	*67	*71	*67	*70	*71
SR2	55	*75	*72	*75	70	*72	71	*72	*75	71
SR3	55	*75	*72	*75	70	*72	71	*72	*75	71
SR4	65	*74	*71	*74	*74	*71	*74	*71	*74	*74
SR5-1	129	*68	*65	*68	*68	*65	*68	*65	*68	*68
SR5-2	127	*68	*65	*68	*68	*65	*68	*65	*68	*68
SR5-3	125	*68	*65	*68	*68	*65	*68	*65	*68	*68
SR5-4	123	*68	*65	*68	*69	*65	*69	*65	*68	*69
SR5-5	121	*68	*65	*68	*69	*65	*69	*65	*68	*69
SR5-6	119	*68	*65	*68	*69	*65	*69	*65	*68	*69
SR6-1	115	*69	*66	*69	*69	*66	*69	*66	*69	*69
SR6-2	109	*69	*66	*69	*70	*66	*70	*66	*69	*70
SR7-1	53	71	*73	71	71	*73	72	*73	71	72
SR7-2	51	71	*73	71	71	*73	72	*73	71	72
SR7-3	51	71	*73	71	71	*73	72	*73	71	72
SR7-3	51	71	*73	71	71	*73	72	*73	71	72
SR7-5	114	*69	*66	*69	*69	*66	*69	*66	*69	*69
SR8-1	66	*74	*71	*74	*74	*71	*74	*71	*74	*74
SR8-2	77	*72	*69	*72	*73	*69	*73	*69	*72	*73
SR9-1	56	*75	*72	*75	*75	*72	*75	*72	*75	*75
SR9-2	46	72	*74	72	72	*74	73	*74	72	73
SR9-3	48	71	*73	71	71	*73	72	*73	71	72
SR9-4	48	71	*73	71	71	*73	72	*73	71	72
SR9-5	49	71	*73	71	71	*73	72	*73	71	72
SR9-6	50	71	*73	71	71	*73	72	*73	71	72
SR9-7	51	71	*73	71	71	*73	72	*73	71	72
SR9-8	60	*74	*71	*74	*75	*71	*75	*71	*74	*75
SR9-9	61	*74	*71	*74	*75	*71	*75	*71	*74	*75
SR9-10	60	*74	*71	*74	*75	*71	*75	*71	*74	*75
SR9-11	62	*74	*71	*74	*75	*71	*75	*71	*74	*75
SR9-12	60	*74	*71	*74	*75	*71	*75	*71	*74	*75
SR10	36	74	71	74	74	71	75	74	74	75
SR11	38	73	*75	73	73	*75	74	*75	73	74
SR12	162	*66	*63	*66	*66	*63	*66	*63	*66	*66

*73 Noise level below standard criteria before mitigation

Appendix 2A Maximum Noise Levels [dB(A)] at the Noise Sensitive Receivers without Mitigation Measures (One Set of Equipment)

Receivers Reference	Slant Distance	Noise Level without Mitigation, dB(A)								
		Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8	Stage9
SR1-1	124	68	65	68	69	65	69	65	68	69
SR1-2	115	69	66	69	69	66	69	66	69	69
SR1-3	101	70	67	70	70	67	70	67	70	70
SR1-4	99	70	67	70	71	67	71	67	70	71
SR2	55	75	72	75	76	72	76	72	75	76
SR3	55	75	72	75	76	72	76	72	75	76
SR4	65	74	71	74	74	71	74	71	74	74
SR5-1	129	68	65	68	68	65	68	65	68	68
SR5-2	127	68	65	68	68	65	68	65	68	68
SR5-3	125	68	65	68	68	65	68	65	68	68
SR5-4	123	68	65	68	69	65	69	65	68	69
SR5-5	121	68	65	68	69	65	69	65	68	69
SR5-6	119	68	65	68	69	65	69	65	68	69
SR6-1	115	69	66	69	69	66	69	66	69	69
SR6-2	109	69	66	69	70	66	70	66	69	70
SR7-1	53	76	73	76	76	73	76	73	76	76
SR7-2	51	76	73	76	76	73	76	73	76	76
SR7-3	51	76	73	76	76	73	76	73	76	76
SR7-3	51	76	73	76	76	73	76	73	76	76
SR7-5	114	69	66	69	69	66	69	66	69	69
SR8-1	66	74	71	74	74	71	74	71	74	74
SR8-2	77	72	69	72	73	69	73	69	72	73
SR9-1	56	75	72	75	75	72	75	72	75	75
SR9-2	46	77	74	77	77	74	77	74	77	77
SR9-3	48	76	73	76	77	73	77	73	76	77
SR9-4	48	76	73	76	77	73	77	73	76	77
SR9-5	49	76	73	76	77	73	77	73	76	77
SR9-6	50	76	73	76	76	73	76	73	76	76
SR9-7	51	76	73	76	76	73	76	73	76	76
SR9-8	60	74	71	74	75	71	75	71	74	75
SR9-9	61	74	71	74	75	71	75	71	74	75
SR9-10	60	74	71	74	75	71	75	71	74	75
SR9-11	62	74	71	74	75	71	75	71	74	75
SR9-12	60	74	71	74	75	71	75	71	74	75
SR10	36	79	76	79	79	76	79	76	79	79
SR11	38	78	75	78	79	75	79	75	78	79
SR12	162	66	63	66	66	63	66	63	66	66

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



KEY PLAN 1:20000
索引圖

LOCATION OF CONTRACTOR'S TEMPORARY BARGING POINT
承建商臨時駁運點位置圖

BROTHERS POINT (TAILAM KOK)
大馬角

Contractor's temporary barging point

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坦趾端)

Barehole
鑽孔

Proposed Reclamation at Tsing Lung Tou
擬建青龍頭填海工程

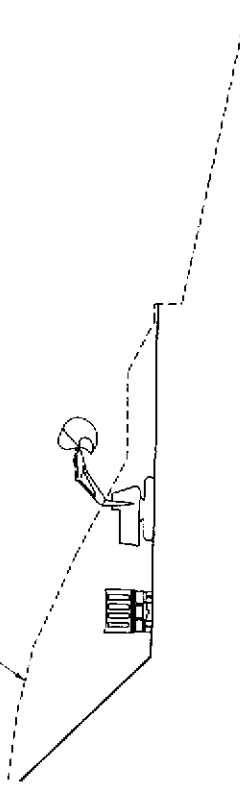
Proposed Footbridge
擬建行人天橋

Proposed Footbridge
擬建行人天橋



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

現時的土壤橫剖面
EXISTING SOIL PROFILE



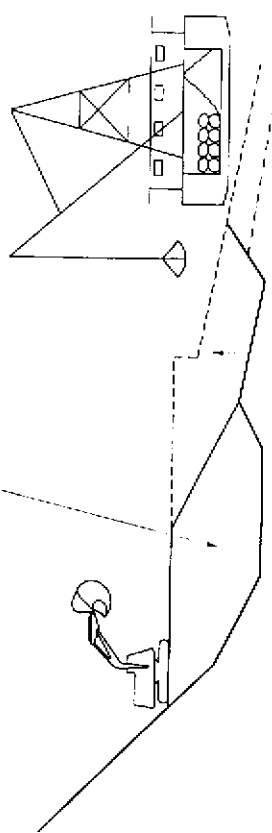
STAGE 1 - EXCAVATE EXISTING GROUND DOWN TO WORKING PLATFORM (+2mPD HIGH TIDE LEVEL) USING BACKHOE.

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 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)



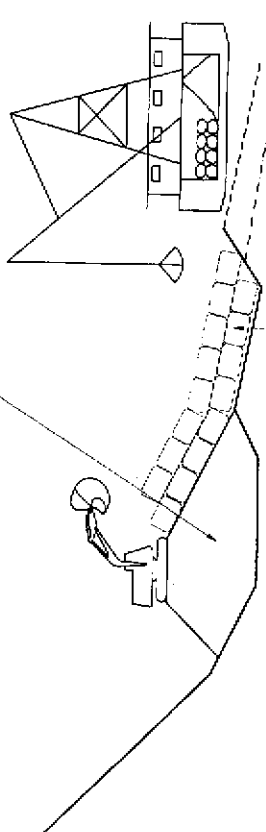
STAGE 2 - EXCAVATE BEACH AND SEARFD DOWN TO UNDERSIDE OF SCOUR APRON LEVEL USING GRAB FROM DERRICK LIGHTER.

第二階段 - 利用吊臂裝設船上的抓斗，將海邊及海床挖至裝卸平台的底層水平

STAGE 2 & 3
第二及第三階段

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



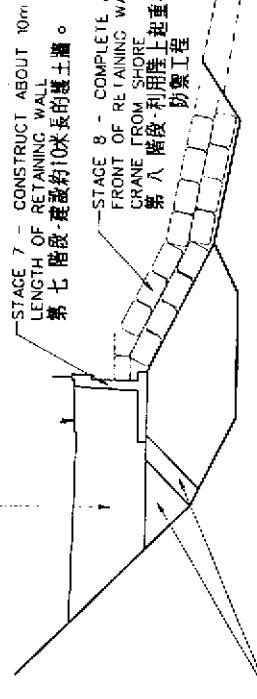
STAGE 5 - PLACE ARMOUR INTO EXCAVATION FOR SCOUR APRON USING GRAB FROM DERRICK LIGHTER

第五階段 - 利用吊臂裝設船上的抓斗，將防禦物卸入裝卸平台的挖土範圍

STAGE 4 & 5
第四及第五階段

STAGE 6 - COMPLETE BACKFILLING BEHIND RETAINING WALL BY END TIPPING/BACKHOE

第六階段 - 利用末端裝卸式泥頭車/反鏟挖土機，完成護土牆後方的填土工程



STAGE 7 - CONSTRUCT ABOUT 10m LENGTH OF RETAINING WALL

第七階段 - 建造約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 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/99/18
 Castle Peak Road Improvement between Sham Tseng and Ka Loon Tsuen, Tsuen Wan
 Programme for Construction of Reclamation and Associated Seawall at Tsing Lung Tau**

Task Name	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	
Stage 1 - Excavate existing ground	█																							
Stage 2 - Excavate beach and seabed	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 3 - Excavate working platform	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 4 - Place rockfill	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 5 - Place armour	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 6 - Place filter and backfill	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 7 - Construct retaining wall	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 8 - Complete armouring	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Stage 9 - Complete backfilling	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█



DRILLHOLE RECORD

HOLE NO. **B26**

CONTRACT NO. HY/97/11

SHEET **1** of **3**

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

METHOD	IP + RO + RC	CO-ORDINATES	W.O. NO. W611	
MACHINE & No.	D2K72	E 822400.14 N 824603.38	DATE	15/07/98 to 20/07/98
FLUSHING MEDIUM	WATER	ORIENTATION Vertical	GROUND LEVEL	3.06 mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RQD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
15/07/98	PX	DRY 07:30								0.00			Medium dense, dark brown (10YR 3/3), medium to coarse SAND with some angular, fine gravel of quartz. (BEACH DEPOSIT)
1										0.40			
2			100				B = 16 (3, 3, 4, 4, 5, 6) N = 19			1.40			
3							B = 25 (4, 5, 5, 6, 6, 6) N = 25			1.50			
4		DRY 19:30	100				B = 42 (3, 5, 4, 9, 16, 16) N = 45			1.85			
5		DRY 07:30								1.95			
6			100				(5, 8, 10, 14, 25, 151) 45mm 200/ 270mm			2.35			
7										2.40			
8										2.75			
9										2.85			
10										3.25			
16/07/98										3.30			Extremely weak, reddish brown (5YR 5/3), completely decomposed BASALT. (Firm to stiff, sandy SILT with much angular, fine to coarse gravel and cobbles of basalt)
11										3.65			
12										3.76			
13										4.15			Weak to moderately strong, brown, highly to moderately decomposed BASALT. (CORESTONE)
14										4.20			
15										5.20			7.98 - 8.10m: No recovery assumed to be completely decomposed basalt.
16										5.30			
17										5.67			Weak to moderately weak, grey, highly to moderately decomposed BASALT. Highly fractured. (CORESTONES)
18										5.72			
19			79	39	0	N.A.				6.72			Weak to moderately strong, brown, highly to moderately decomposed BASALT. (CORESTONE)
20			83	49	39					6.82			
21										6.87			7.98 - 8.10m: No recovery assumed to be completely decomposed basalt.
22										6.92			
23										6.97			Weak to moderately weak, grey, highly to moderately decomposed BASALT. Highly fractured. (CORESTONES)
24										7.02			
25										7.40			7.98 - 8.10m: No recovery assumed to be completely decomposed basalt.
26										7.40			
27										7.98			Weak to moderately weak, grey, highly to moderately decomposed BASALT. Highly fractured. (CORESTONES)
28										7.98			
29										8.10			7.98 - 8.10m: No recovery assumed to be completely decomposed basalt.
30										8.10			
31										8.70			Weak to moderately weak, grey, highly to moderately decomposed BASALT. Highly fractured. (CORESTONES)
32										8.70			
33										9.15			7.98 - 8.10m: No recovery assumed to be completely decomposed basalt.
34										9.15			
35										9.70			Weak to moderately weak, grey, highly to moderately decomposed BASALT. Highly fractured. (CORESTONES)
36										9.70			
17/07/98													REMARKS An inspection pit was excavated from 0.00m to 1.50m.
18/07/98													

<ul style="list-style-type: none"> 111 DISTURBED SAMPLE PISTON SAMPLE U75 UNDISTURBED SAMPLE U100 UNDISTURBED SAMPLE MAZIER SAMPLE SPT LINER SAMPLE WATER SAMPLE 	<ul style="list-style-type: none"> STANDARD PENETRATION TEST IN SITU VANE SHEAR TEST PERMEABILITY TEST IMPRESSION PACKER TEST PACKER TEST PIEZOMETER TIP STANDPIPE TIP 	LOGGED <u>R.T.WU</u> DATE <u>23/07/1998</u> CHECKED <u>M.DAVIDSON</u> DATE <u>24/07/1998</u>
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Figure 4a



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO. **B26**

SHEET **2** of **3**

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

METHOD	IP + RD + RC	CO-ORDINATES	W.O. NO. W611	
MACHINE & No.	D2K72	E 822400.14 N 824603.38	DATE	15/07/98 to 20/07/98
FLUSHING MEDIUM	WATER	ORIENTATION Vertical	GROUND LEVEL	3.06 mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RCD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description			
11	PX HX	07:30	96	43	19	N.I.		T2-101		10.40				11.75 - 11.90m: No recovery assumed to be completely decomposed basalt.		
			100	17	0			T2-101		10.70						
			88	18	18			T2-101		11.75						
								N.R.			11.93		V?			
								N.I.					IV/III			
			60	0	0			N.R.			12.69		V			
			100							13.20						Extremely weak, grey (7.5YR 6/1), completely decomposed BASALT. (Coarse SAND with much angular, fine to coarse gravel of basalt)
										13.77						
										13.95						
										14.12					IV/II	
										14.45					V	
12	1.50m 19:30 1.50m 07:30	18/07/98 17/07/98	100						14.85				Extremely weak, greenish grey (5G 5/1), completely decomposed BASALT. (Coarse SAND with much angular, fine to coarse gravel of basalt)			
			100						14.95							
			0						14.96							
									15.03							
									15.08							
									15.23							
									15.38							
									15.68							
									15.88							
									16.18							
									16.35							
13	HX		60	0	0	N.A.		T2-101		15.62		IV/III	15.68 - 17.87m: 15.68 - 15.88m, 16.18 - 16.35m, 16.62 - 17.03m and 17.33 - 17.87m: No recovery assumed to be completely decomposed basalt.			
									15.88							
									16.18							
									16.35							
									16.62							
									16.85							
									17.03							
									17.33							
									17.87							
									18.17							
									18.53							
14	HX		34	0	0	N.A.		T2-101		18.85		V?	Weak to moderately strong, pink and grey, highly to moderately decomposed, medium grained GRANITE with basalt and quartz veins. Highly fractured with very closely spaced, rough planar, limonite stained and chlorite coated joints, dipping 30° to 40° and subvertical from 18.85m to 19.51m.			
									19.51							
									19.51							
									19.51							
									19.51							
									19.51							
									19.51							
									19.51							
									19.51							
									19.51							
									19.51							
15	HX		60	0	0	N.A.		T2-101		18.85		IV/III	Moderately strong, pink, moderately decomposed, medium grained GRANITE with			
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
16	HX		100	22	0			T2-101		18.85		IV/III	Moderately strong, pink, moderately decomposed, medium grained GRANITE with			
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
17	HX		64	0	0	N.A.		T2-101		18.85		IV/III	Moderately strong, pink, moderately decomposed, medium grained GRANITE with			
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
18	HX		40	0	0	N.A.		T2-101		18.85		IV/III	Moderately strong, pink, moderately decomposed, medium grained GRANITE with			
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
19	HX		36	0	0	N.A.		T2-101		18.85		IV/III	Moderately strong, pink, moderately decomposed, medium grained GRANITE with			
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
20	HX		100	33	15	>20		T2-101		18.85		III	Moderately strong, pink, moderately decomposed, medium grained GRANITE with			
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							
									18.85							

STANDARD PENETRATION TEST	LOGGED	R.T.WU
IN SITU VANE SHEAR TEST	DATE	23/07/1998
FERMEABILITY TEST	CHECKED	M.DAVIDSON
IMPRESSION PACKER TEST	DATE	24/07/1998
PACKER TEST		
PEZOMETER TIP		
STANDPIPE TIP		

REMARKS

Figure 4a



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO.

B26

SHEET

3 of 3

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

METHOD IP + RO + RC

CO-ORDINATES

W.O. NO.

W611

MACHINE & No. D2K72

E 822400.14
N 824603.38

DATE

15/07/98

to

20/07/98

FLUSHING MEDIUM WATER

ORIENTATION Vertical

GROUND LEVEL

3.06

mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RQD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
21			97	85	81	8.0		T2-101		20.48	+		quartz veins and closely spaced, rough planar and undulating, limonite stained joints, dipping 10° to 20°, 45° and 55° and subvertical from 22.60m to 23.75m and 23.85m to 24.75m.
			100	100	74			T2-101		21.41	+		
22			100	61	21			T2-101		21.97	+		
23			97	85	79	11.0		T2-101		23.28	+		
24		2.00m 19:30											
		2.00m 07:30	100	90	73			T2-101		24.17	+		
25		2.00m 19:30	100	75	54			T2-101		25.12	+		End of drillhole at 25.12m
26													
27													
28													
29													
30													

- SMALL 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
- PIEZOMETER TIP
- STANOLOPE TIP

LOGGED R.T.WU

DATE 23/07/1998

CHECKED M.DAVIDSON

DATE 24/07/1998

REMARKS

Figure 4a



DRILLHOLE RECORD

HOLE NO. **B29**

CONTRACT NO. HY/97/11

SHEET 1 of 3

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

METHOD	IP + RO - RC	CO-ORDINATES	W.O. NO.	W611	
MACHINE & No.	CMC42	E 822596.40 N 824672.15	DATE	18/06/98 to 20/06/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	3.34 mPD

Drilling Progress	Casing size	Water level (ml Shift start/end)	TCR%	SCR%	ROD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	
18/06/98	SX	DRY 07:30								0.00			Medium dense, yellow (10YR 8/6), medium to coarse SAND (BEACH DEPOSIT)	
1								INSPECTION PIT		0.40				
2			96				G-32 (1, 2, 1, 2, 2, 4, 3) N=1			1.40				
3			91				B=34			1.50				
4	SX PX		91				(1, 2, 3, 2, 4, 4) N=13		0.04	1.85				
5			91				B=47			1.95			Medium dense, light grey (5Y 6/1), medium to coarse SAND with occasional shell fragments (MARINE DEPOSIT)	
6			91				(1, 2, 3, 2, 2, 4) N=11			2.05				
7			91				B=47			2.35				
8			85				(1, 2, 4, 4, 4, 6) N=17		-1.76	2.40				
9			90							2.75			Soft to firm, grey (5Y 6/1), silty, sandy CLAY with occasional shell fragments. (MARINE DEPOSIT)	
10			100				(1, 2, 2, 2, 2, 3) N=5			2.85				
										2.95				
							(1, 0, 1, 1, 2, 2) N=6		-4.66	3.25				
										3.30		V	Extremely weak, red (10R 5/6), mottled white, completely decomposed, medium grained GRANITE (Firm, clayey, very sandy SILT with some angular, fine gravel of quartz)	
										3.65				
							(1, 2, 3, 5, 7, 10) N=25			3.75			V	Extremely weak, brown (10YR 5/3), spotted white, completely decomposed, medium grained GRANITE (Slightly clayey silty fine to coarse SAND with some angular, fine gravel
										4.15				
										4.20				
										4.55				
										4.65				
										4.75				
										5.05				
										5.10				
										5.96				
										6.10				
										6.20				
										6.30				
										6.60				
										6.65				
										7.65				
										7.75				
										7.85				
										8.15				
										8.20				
										9.20				
										9.30				
										9.40				
										9.70				
										9.75				

SMALL DISTURBED SAMPLE	STANDARD PENETRATION TEST	LOGGED	R.T.WU
PISTON SAMPLE	IN SITU VANE SHEAR TEST	DATE	07/07/1998
U75 UNDISTURBED SAMPLE	PERMEABILITY TEST	CHECKED	M.DAVIDSON
U100 UNDISTURBED SAMPLE	IMPRESSION PACKER TEST	DATE	09/07/1998
MAZAR SAMPLE	PACKER TEST		
SPT LINER SAMPLE	PEZOMETER TIP		
WATER SAMPLE	STANDPIPE TIP		

REMARKS
An inspection pit was excavated from 0.00m to 1.50m

Figure 4b



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO.

B29

SHEET

2 of 3

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

METHOD	IP + RO + RC	CO-ORDINATES	W.O. NO.
MACHINE & No.	CMC42	E 822596.40 N 824672.15	W611
FLUSHING MEDIUM	WATER	ORIENTATION Vertical	DATE 18/06/98 to 20/06/98
			GROUND LEVEL 3.34 mPD

Drilling Interval	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RCD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description		
11	PX HX	2.85m 19:30 2.50m 07:30	100				(2, 4, 7, 10, 16, 25) N=58	33, 34, 35, 36	10.75, 10.85, 10.95, 11.25, 11.30				of quartz.)		
12			100				(4, 9, 14, 20, 28, 36) N=98	37, 38, 39, 40	12.30, 12.40, 12.50, 12.30, 12.85						
13			80				(3, 6, 11, 19, 24, 47) N=101	41, 42, 43, 44	13.85, 13.95, 14.05, 14.35, 14.40						
14			95				(21, 59, 100) 75mm	45, 46, 47, 48	15.40, 15.50, 15.51, 15.78, 15.83						
15			50		0	0	NA NR	T2-101	49	13.08, 13.33, 16.42, 16.67			IV/III	Weak to moderately weak, red and brown, highly to moderately decomposed, medium grained GRANITE, highly fractured (CORESTONES)	
16			32		18	0	NR	T2-101		13.58, 16.92, 17.22			V?	16.67 - 18.70m: 16.67 - 16.92m, 17.22 - 17.85m, 18.02 - 18.30m and 18.50 - 18.70m: No recovery assumed to be completely decomposed granite.	
17			38		0	0	NA NR	T2-101		14.51, 17.65, 14.88, 18.02			IV/III		
18			50		0	0	NA NR	T2-101		14.98, 18.30, 15.16, 18.50			V?		
19			100		93	74	B.6	T2-101		15.38, 18.70			III	Moderately strong, brown and grey, moderately decomposed, medium grained GRANITE, with closely spaced, rough planar and undulating, limonite stained and kaolin coated joints, dipping 30°, 45° and 65°	
								T2-101		19.24					

ALL DISTURBED SAMPLE	STANDARD PENETRATION TEST	LOGGED	H.T.WU
RESTON SAMPLE	IN SITU VANE SHEAR TEST	DATE	07/07/1998
100% UNDISTURBED SAMPLE	PERMEABILITY TEST	CHECKED	M.DAVIDSON
100 UNDISTURBED SAMPLE	IMPRESSION PACKER TEST	DATE	09/07/1998
AZER SAMPLE	PACKER TEST		
SPT LINER SAMPLE	PEZOMETER TIP		
WATER SAMPLE	STANDPIPE TIP		

REMARKS

Figure 4b



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO. **B29**

SHEET **3** of **3**

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

METHOD	IP + RO + RC	CO-ORDINATES	W.O. NO.
CHINE & No.	CMC42	E 822596.40 N 824672.15	W611
FLUSHING MEDIUM	WATER	ORIENTATION Vertical	DATE 18/06/98 to 20/06/98
		GROUND LEVEL	3.34 mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	
21			95	89	64			T2-101		20.72				<p>21.50 - 22.08m: Highly to moderately decomposed granite.</p> <p>22.08 - 22.22: No recovery assumed to be completely decomposed granite.</p> <p>Weak to moderately strong, brown and grey, highly to moderately decomposed, medium grained GRANITE, with closely spaced, rough planar and undulating, limonite stained and kaolin coated joints, dipping 45° and subvertical from 23.70 - 24.00m and 24.80 - 25.23m</p>
22			91	53	42			T2-101	-18.16	21.50		IV/III		
									-18.74	22.08				
						NF 8.3			-18.68	22.22		V2		
			100	84	55			T2-101		22.73		IV/III		
3			100	89	65			T2-101		22.73				
4	HX	2.85m 19:30								23.85				
25		0.50m 07:30	96	80	74			T2-101						
		0.50m 19:30												
									-21.89	25.23			End of drillhole at 25.23m	

	SMALL DISTURBED SAMPLE		STANDARD PENETRATION TEST
	PISTON SAMPLE		IN SITU VANE SHEAR TEST
	U78 UNDISTURBED SAMPLE		PERMEABILITY TEST
	U100 UNDISTURBED SAMPLE		IMPRESSION PACKER TEST
	MAZZER SAMPLE		PACKER TEST
	SPT LINER SAMPLE		PIEZOMETER TIP
	WATER SAMPLE		STAKOPIE TIP

LOGGED	<u>R.T. WU</u>
DATE	<u>07/07/1998</u>
CHECKED	<u>M. DAVIDSON</u>
DATE	<u>09/07/1998</u>

REMARKS

Figure 4b



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO. **B32(M)**

SHEET 1 of 3

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

METHOD	WB + RC	CO-ORDINATES	W.O. NO.	W611	
MACHINE & No.	CLAIRE	E 822725.35 N 824689.47	DATE	09/05/98 to 11/05/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	-0.25 mPD

Drilling Date/Time	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RQD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	
09/30/98	SX	2.00m 07:30	100				9 = 50 (2, 2, 3, 3, 2, 3) N = 11	1		0.00			Medium dense, grey (N 6/), medium to coarse SAND with some subangular to subrounded, fine gravel of quartz. (DISTURBED BEACH DEPOSIT)	
								2		0.35				
								3		0.50				
								4	-1.60	1.35				
							B = 40 (2, 3, 4, 4, 3, 3) N = 14	5		1.90			Medium dense, brownish yellow (10YR 6/8), coarse SAND with some subangular to subrounded, fine gravel of quartz. (BEACH DEPOSIT)	
								6		2.00				
								7		2.35				
								8		2.50				
10/05/98	SX	1.90m 19:30						9		3.35				
								10	4.15	3.90				
	PX	1.80m 07:30							11		4.00			Loose, grey (N 5/), fine to coarse SAND with some subangular to subrounded, fine gravel of quartz and shell fragments. (MARINE DEPOSIT)
									12		4.90			
								13		5.40				
								14		5.90				
								15		6.00				
								16	-6.70	6.35				
								17		6.90			Medium dense, grey (N 5/), fine to coarse SAND, with some subangular to subrounded, fine gravel of quartz and shell fragments. (MARINE DEPOSIT)	
								18		7.35				
								19		7.90				
								20		8.00				
								21	-6.75	8.35				
								22		8.90				
								23		9.35				
								24		9.90				

<ul style="list-style-type: none"> SMALL DISTURBED SAMPLE PISTON SAMPLE U76 UNDISTURBED SAMPLE U100 UNDISTURBED SAMPLE MAZIER SAMPLE SPT LINER SAMPLE WATER SAMPLE 	<ul style="list-style-type: none"> STANDARD PENETRATION TEST IN SITU VANE SHEAR TEST PERMEABILITY TEST IMPRESSION PACKER TEST PACKER TEST PIEZOMETER TIP STANDPIPE TIP 	LOGGED <u>R.T.WU</u> DATE <u>13/05/1998</u> CHECKED <u>M.DAVIDSON</u> DATE <u>19/05/1998</u>
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REMARKS

Figure 4c

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

METHOD	WB + RC	CO-ORDINATES	W.O. NO.	W611	
MACHINE & No.	CLAIRE	E 822725.35 N 824689.47	DATE	09/05/98 to 11/05/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	-0.25 mPD

Winning Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RCD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	
11			100				R = 56 (2, 3, 3, 3, 4, 5) N = 15	25 26		10.00 10.35 10.50				
12			100				R = 24 (2, 3, 3, 4, 4, 5) N = 16	29 30 31		11.90 12.00 -12.70				
13										12.35 -12.45 12.50 12.60			Very dense, reddish yellow (5YR 6/6), silty, fine to coarse SAND, with some subangular, fine gravel of quartz. (ALLUVIUM)	
14	PX HX HX		80					33 34 35		-13.60 13.35 13.45 14.16 14.35		V/IV	Extremely weak to weak, brown (7.5YR 5/3), completely to highly decomposed, medium grained GRANITE. (Fine to coarse SAND, with much angular, fine to coarse gravel and cobble sized granite fragments)	
15			94	90	71	4.4		T2-101		14.75		III/III	Moderately strong to strong, pink and brown, spotted black, moderately to slightly decomposed, medium grained GRANITE, with closely spaced, rough planar, limonite stained joints, dipping 20°, 40°, 65° and subvertical from 14.40m to 14.57m.	
16			100	100	100			T2-101		15.55				
17			100	89	75	18.2		T2-101		16.18				
18			99	99	99	1.6		T2-101		17.60				
19			87	80	47			T2-101		-18.65 -18.87	18.40 18.62		V/IV	Extremely weak to weak, brown (7.5YR 5/3), completely to highly decomposed, medium grained GRANITE. (Angular, fine to coarse GRAVEL sized granite fragments, with some coarse sand)
20		2.30m 19:30	100	75	62			T2-101		18.87		III/III	18.45 - 18.62m: No recovery assumed to be finer rock fragments washed out. Moderately strong to strong, pink and brown.	

- SWELL DISTURBED SAMPLE
- PISTON SAMPLE
- U76 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
- PEZDMETER TIP
- STANDPIPE TIP

LOGGED R.T.WU
 DATE 13/05/1998
 CHECKED M.DAVIDSON
 DATE 19/05/1998

REMARKS

Figure 4c



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO. **B32(M)**

SHEET **3** of **3**

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

METHOD	WB + RC	CO-ORDINATES	W.O. NO.	W611	
MACHINE & No.	CLAIRE	E B22725.35 N 824689.47	DATE	09/05/98 to 11/05/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	-0.25 mPD

Drilling Progress	Casing size	Water level (m) Shift start/end	TCR%	SCR%	RQD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
21									20.29	20.04			spotted black, moderately to slightly decomposed, medium grained GRANITE, with closely spaced, rough planar, limonite stained joints, dipping 20° to 30°, 60° to 65° and subvertical from 19.45m to 19.80m. End of Drillhole at 20.04m.
22													
23													
24													
25													
26													
27													
28													
29													
30													

- SMALL DISTURBED SAMPLE
- PISTON SAMPLE
- U76 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
- PEZOMETER TIP
- STANDPIPE TIP

LOGGED R.T. WU

DATE 13/05/1998

CHECKED M. DAVIDSON

DATE 19/05/1998

REMARKS

Figure 4c



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO. **B35(M)**

SHEET 1 of 2

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

METHOD	RO + RC	CO-ORDINATES	W.D. NO.	W611	
MACHINE & No.	CLAIRE	E 822825.58 N 824668.41	DATE	12/05/98 to 13/05/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	-0.41 mPD

Drilling Progress	Casing size	Water level (ml Shift start/end)	TCR%	SCR%	RQD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description			
1 2 3 4 5 6 7 8 9	SX	DRY 07:30	100				6 = 50 (1, 0, 0, 1, 0, 1) N = 2	1 2 3 4 5 6 7	0.00 0.35 0.50 0.90 1.40 1.41 1.90 2.00 2.35 2.50				Very loose, grey (N 5/), fine to coarse SAND with some angular, fine to medium gravel of rock and shell fragments. (MARINE DEPOSIT)			
			100				8 = 24 (0, 1, 0, 0, 1, 0) N = 1	8 9 10 11 12	-2.91 2.90 3.40 3.41 3.90 3.91 4.00 4.35			Very loose, reddish yellow (5YR 7/8), mottled grey, silty, very clayey, fine to coarse SAND, with some subangular, fine gravel of quartz. (ALLUVIUM)				
			80				14, 5, 5, 5, 6, 8) N = 22	13 14 15 16 17 18 19	4.50 5.50 5.60 6.00 6.50 7.50 7.60 8.00 8.50		V			Extremely weak, pale red (2.5YR 7/3) and reddish yellow (5YR 7/8), spotted white, completely decomposed, medium grained GRANITE. (Clayey, silty, fine to coarse SAND with some angular, fine to coarse gravel sized quartz fragments)		
			86				14, 8, 13, 22, 25, 47) N = 107	20	9.20 9.35 9.65						Moderately strong, brown, spotted white, moderately decomposed, medium grained GRANITE. (CORESTONE)	
			33	20	0	N.A. N.R.		T2-101	-9.71 -9.96	9.35 9.65						III V?

<ul style="list-style-type: none"> □ WALL DISTURBED SAMPLE ▨ PISTON SAMPLE ▩ U75 UNDISTURBED SAMPLE ▪ U100 UNDISTURBED SAMPLE ▧ MAZER SAMPLE ▯ SPT #1NER SAMPLE △ WATER SAMPLE 	<ul style="list-style-type: none"> ↓ STANDARD PENETRATION TEST ∇ IN SITU VANE SHEAR TEST ┆ PERMEABILITY TEST ○ IMPRESSION PACKER TEST ○ PACKED TEST ○ PEZOMETER TIP ⊕ STANDPIPE TIP 	<p>LOGGED <u>R. T. WU</u></p> <p>DATE <u>15/05/1998</u></p> <p>CHECKED <u>M. DAVIDSON</u></p> <p>DATE <u>23/05/1998</u></p>
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REMARKS
An acoustic borehole televiewer survey was carried out from 10.00m to 15.18m.

Figure 4d



DRILLHOLE RECORD

CONTRACT NO. HY/97/11

HOLE NO. **B35(M)**

SHEET 2 of 2

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

METHOD	RO + RC	CO-ORDINATES	W.O. NO.	W611	
MACHINE & No.	CLAIRE	E 822825.58 N 824668.41	DATE	12/05/98 to 13/05/98	
FLUSHING MEDIUM	WATER	ORIENTATION	Vertical	GROUND LEVEL	-0.41 mPD

Progress	Casing size	Water level (ml) Shift start/end	TCR%	SCR%	RCD%	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11		0.85m 19:30	100	100	80	3.5		T2-101	10.46	10.05	+++	III	<p>9.55 - 10.05m: No recovery assumed to be completely decomposed granite.</p> <p>Moderately strong, brown and pink, spotted white and black, moderately decomposed, medium grained GRANITE, with closely spaced, rough planar and undulating, limonite stained and quartz infilled joints, dipping 10° to 20°, 50° to 60° and subvertical from 11.22m to 11.50m and 11.55m to 11.93m.</p>
13/05/98		2.10m 07:30	100	100	100	5.5		T2-101		11.01	+++		
2						3.3		T2-101		12.10	+++		
3			100	100	95	4.6		T2-101		13.62	+++		
14			100	100	79			T2-101		14.70	+++		
15		0.80m 10:45	100	100	100			T2-101	-15.59	15.18	+++		End of Drillhole at 15.18m.
6													
7													
18													
9													

- SMALL DISTURBED SAMPLE
- PISTON SAMPLE
- U75 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZAR SAMPLE
- SPT LINER SAMPLE
- WATER SAMPLE
- STANDARD PENETRATION TEST
- IN SITU VANE SHEAR TEST
- FELINEARITY TEST
- IMPRESSION PACKER TEST
- PACKER TEST
- PEZOMETER TIP
- STANDPIPE TIP

LOGGED R. T. WU

DATE 15/05/1998

CHECKED M. DAVIDSON

DATE 23/05/1998

REMARKS

Figure 4d

- NOTES:
1. REFER TO THE ABBREVIATION AND LEGEND DRAWING IN 90612/TD/1000 FOR PLANT BOTANICAL NAMES, TYPES AND SPACING.
 2. REFER TO TRAFFIC SIGNS AND ROAD MARKING DRAWINGS FOR ROAD SIGNAGE TYPES.
 3. VISIBILITY SPLAYS ARE IN ACCORDANCE WITH H.D. 80/81 DISTANCE AND VISIBILITY SPLAYS TPO/2V.3 A1/87.
 4. VISIBILITY SPLAYS TAKE INTO CONSIDERATION EXISTING BUILDINGS AND SLOPES ADJACENT INTERSECTIONS.
 5. SLOPES REQUIRING REMEDIAL ENGINEERING WORKS WILL BE HYDROSEDED WITH GRASS. NO TREE PLANTS BE REQUIRED. ALL EXISTING TREES ARE TO BE RETAINED.

B	2nd Issue	PROJECT NO.	HY / 98 / 18
A	1st Issue	PROJECT NO.	HY / 98 / 18
Rev	Issue	PROJECT NO.	HY / 98 / 18
	Issue	PROJECT NO.	HY / 98 / 18
	Issue	PROJECT NO.	HY / 98 / 18

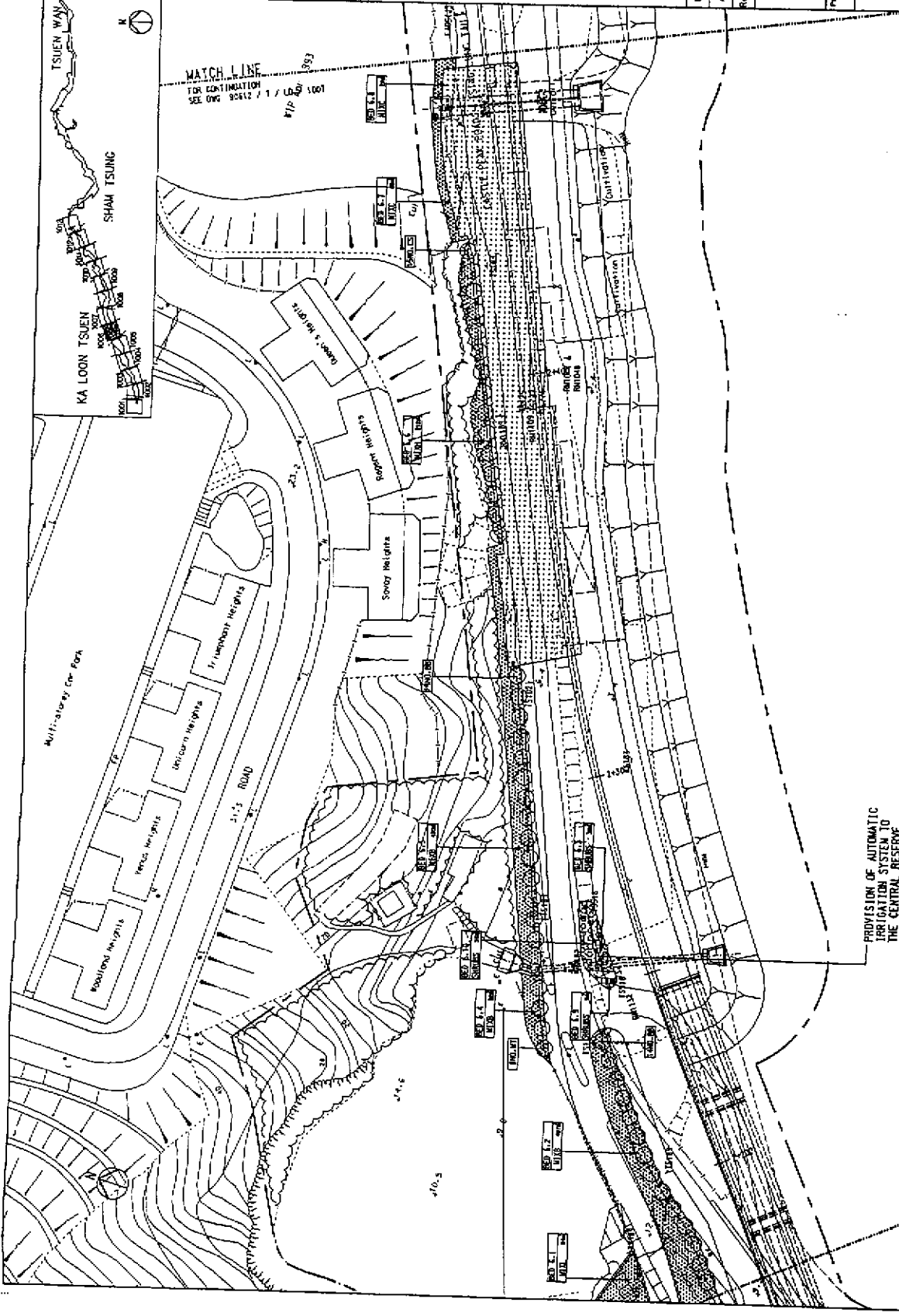
Major Works Project Management Office,
Highways Department,
Hong Kong

Project No. 6553TH
Contract No. HY / 98 / 18
MouchelHalcrow JV
Sub-Consultants
ACL Asia, MYA Asia Ltd.,
Towalad Consultants Ltd., Chesterton Pelly Ltd.

Contract Title
Castle Peak Road Improvement Between
Sham Tsung and Ka Loon Tsuen,
Tsuen Wan

Drawing Title
LANDSCAPE PLAN
SHEET 6 OF 13

Drawn	PEL	Checked	Approved	TYD
Scale	1:500 AT A1	CAO File No.	4005600001	Date
Date Issued	NOV2000	Drawing No.	90612/TD/1006	Rev.
				B

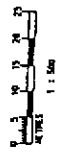


PROVISION OF AUTOMATIC IRRIGATION SYSTEM TO THE CENTRAL RESERVE

PLANTING SCHEDULE

NO	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE	PLANTING SCHEDULE
1
2
3
4
5
6
7
8
9
10

MATCH LINE FOR CONTINUATION SEE DRG 90612 / 1 / LD / 1006



NOTES:

1. REFER TO THE ABBREVIATION AND LEGEND DRAWING NO 9062/7/LD/1000 FOR PLANT BOTANICAL NAMES, TYPES AND SPACING.
2. REFER TO TRAFFIC SIGNS AND ROAD MARKING DRAWINGS FOR ROAD SIGNAGE TYPES.
3. VISIBILITY SPLAYS ARE IN ACCORDANCE WITH 100' SIGHT DISTANCE AND VISIBILITY SPLAYS FROM VZ.3 A1/B7.
4. VISIBILITY SPLAYS TAKEN INTO CONSIDERATION EXISTING BUILDINGS AND SLOPES ADJACENT INTERSECTIONS.
5. SLOPES REQUIRING REMEDIAL ENGINEERING WORKS WILL BE HYDROSEEDING WITH GRASS AND TREE PLANTING IS REQUIRED. ALL EXISTING TREES ARE TO BE RETAINED.

2nd	revision	date	BY	CHK	APP'D	DATE
A	Issue	10/10/00	WJ	WJ	WJ	10/10/00
B	Issue	11/01/00	WJ	WJ	WJ	11/01/00
C	Issue	11/01/00	WJ	WJ	WJ	11/01/00
D	Issue	11/01/00	WJ	WJ	WJ	11/01/00
E	Issue	11/01/00	WJ	WJ	WJ	11/01/00

Major Works Project Management Office,
Highways Department,
Hong Kong

Project No. 6553TH Contract No. HY/99/18

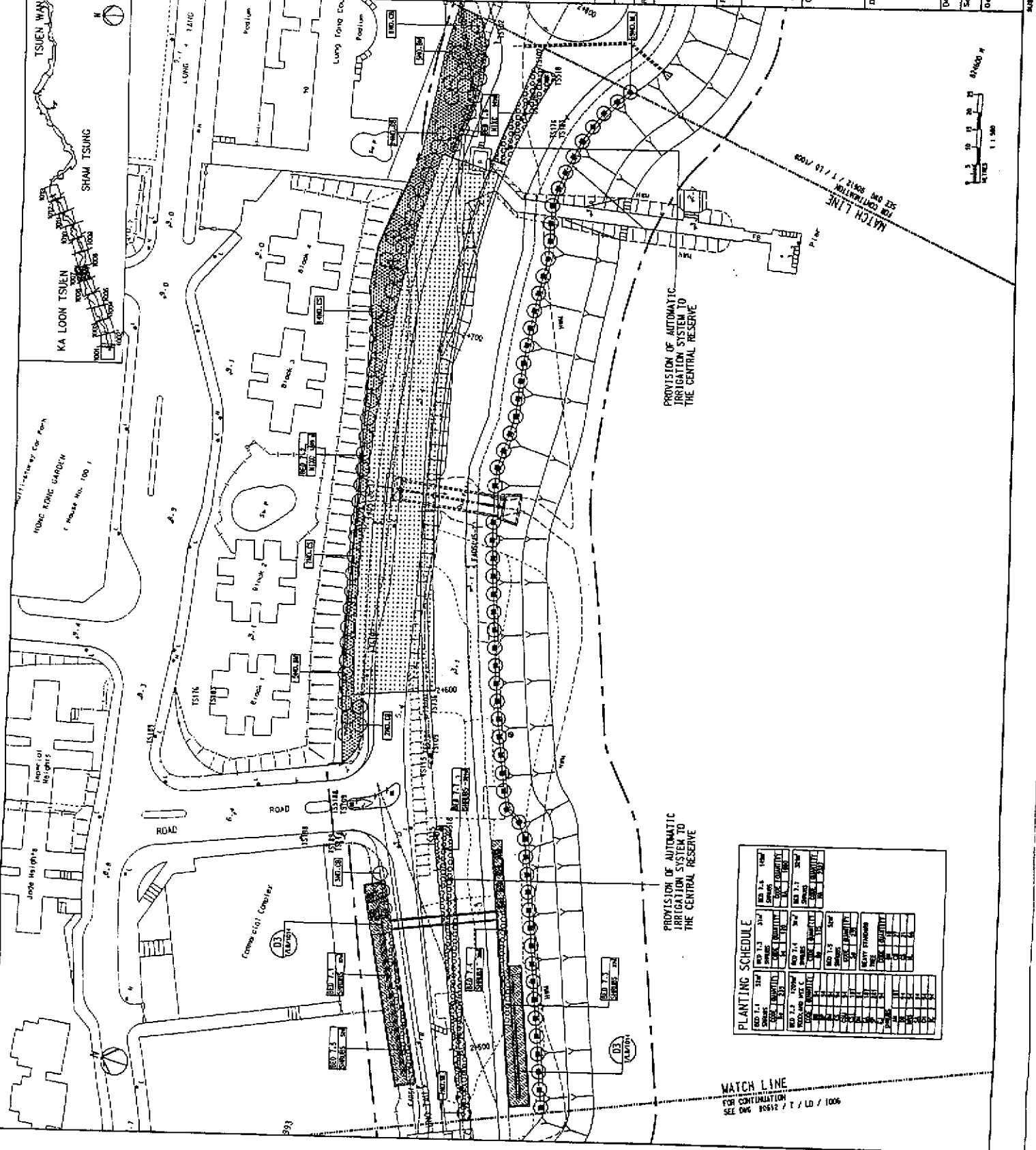
MouchelHalcrow JV

Sub-Consultants
ACL Asia, KVA Asia Ltd.,
Townlead Consultants Ltd., Chesterton Petty Ltd.

Contract Title
Castle Peak Road Improvement Between
Sham Tseung and Ka Loon Tsuen,
Tsuen Wan

Drawing Title
LANDSCAPE PLAN
SHEET 7 OF 13

Drawn	REL	Checked	APPRO	Approved	TVD
Scale	1:500 AT A1	CAD File No.	4005018.DCH	Date	JAN2000
Date Issued	NOV2000	Drawing No.	90612/7/LD/1007	Rev	B



PLANTING SCHEDULE

NO.	SP. NO.	PLANT	QUANTITY	DATE
1	101	PLANT	100	10/10/00
2	102	PLANT	200	10/10/00
3	103	PLANT	150	10/10/00
4	104	PLANT	300	10/10/00
5	105	PLANT	100	10/10/00
6	106	PLANT	200	10/10/00
7	107	PLANT	150	10/10/00
8	108	PLANT	300	10/10/00
9	109	PLANT	100	10/10/00
10	110	PLANT	200	10/10/00

ATCH LINE
FOR CONTINUATION
SEE DWG 9062/7/LD/1006

NOTES:

1. REFER TO THE APPROPRIATION AND LITEROAL DRAWING NO. 80622/L/D/1008 FOR PLANT BOTANICAL NAMES, TYPES AND SPACING.
2. REFER TO TRAFFIC SIGNS AND ROAD MARKING DRAWINGS FOR ROAD SIGNAGE TYPES.
3. VISIBILITY SPLAYS ARE IN ACCORDANCE WITH HYD. SIGHT DISTANCE AND VISIBILITY SPLAYS (TPW/2.3. AV/87).
- 3.1 VISIBILITY SPLAYS TAKE INTO CONSIDERATION EXISTING BUILDINGS AND SLOPES ADJACENT INTERSECTIONS.
4. SLOPES IN DURING REMEDIAL ENGINEERING WORKS WILL BE HYDROSEEDED WITH GRASS. NO TREE FELLING IS REQUIRED. ALL EXISTING TREES ARE TO BE RETAINED.

Rev	Issue	By	CHK	APP	Date
B	2nd Issue	TSW	TSW	TSW	11/09
A	1st Issue	TSW	TSW	TSW	09/09

Major Works Project Management Office,
Highways Department,
Hong Kong

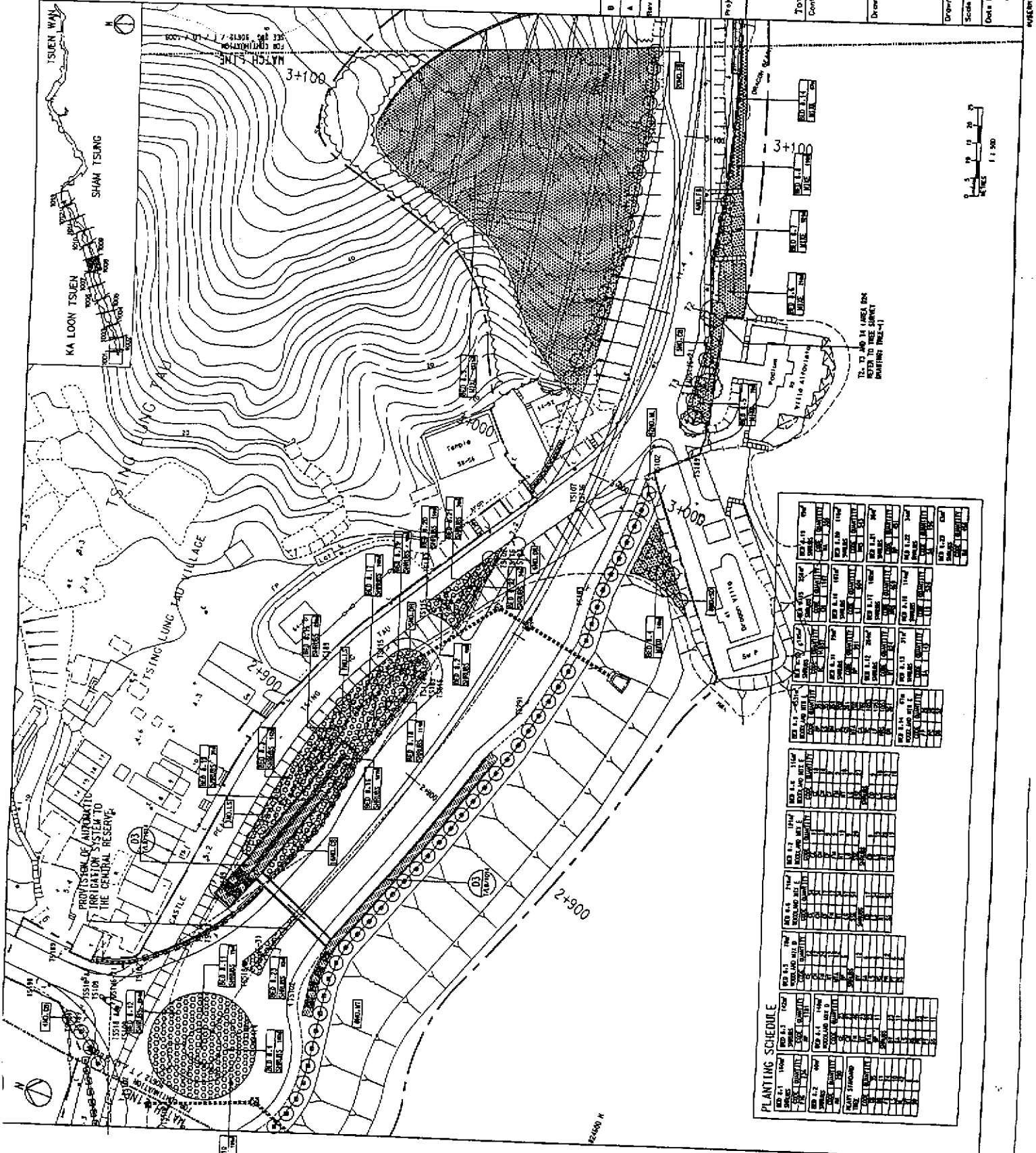
Project No. 6653TH Contract No. HY / 99 / 18

Mouchel Halcrow JV
Sub-Consultants

ACL Asia, MVA Asia Ltd,
Townland Consultants Ltd, Chelation Pelly Ltd.
Contract Title
Castle Peak Road Improvement Between
Shem Teung and Ka Loon Tsuen,
Tsuen Wan

Drawn	FEL	Checked	Approved	Approved	TVD
Scale	1:500 AT A1	CUO TSW	CUO	Date	JAN2000
Date Issued	NOV2000	6653TH	6653TH	6653TH	6653TH
Drawing No.	90612/T/LD/1008	Rev. B			

LANDSCAPE PLAN
SHEET 8 OF 13



PLANTING SCHEDULE

NO.	PLANT	SIZE	QUANTITY	REMARKS
RD 1.1	PLANT	SIZE	QUANTITY	REMARKS
RD 1.2	PLANT	SIZE	QUANTITY	REMARKS
RD 1.3	PLANT	SIZE	QUANTITY	REMARKS
RD 1.4	PLANT	SIZE	QUANTITY	REMARKS
RD 1.5	PLANT	SIZE	QUANTITY	REMARKS
RD 1.6	PLANT	SIZE	QUANTITY	REMARKS
RD 1.7	PLANT	SIZE	QUANTITY	REMARKS
RD 1.8	PLANT	SIZE	QUANTITY	REMARKS
RD 1.9	PLANT	SIZE	QUANTITY	REMARKS
RD 1.10	PLANT	SIZE	QUANTITY	REMARKS
RD 1.11	PLANT	SIZE	QUANTITY	REMARKS
RD 1.12	PLANT	SIZE	QUANTITY	REMARKS
RD 1.13	PLANT	SIZE	QUANTITY	REMARKS
RD 1.14	PLANT	SIZE	QUANTITY	REMARKS
RD 1.15	PLANT	SIZE	QUANTITY	REMARKS
RD 1.16	PLANT	SIZE	QUANTITY	REMARKS
RD 1.17	PLANT	SIZE	QUANTITY	REMARKS
RD 1.18	PLANT	SIZE	QUANTITY	REMARKS
RD 1.19	PLANT	SIZE	QUANTITY	REMARKS
RD 1.20	PLANT	SIZE	QUANTITY	REMARKS