



CABLE & WIRELESS

HKT

香港電訊

Installation of Radio Base Station at Kei Ling Ha (Sai Sha Road), Sai Kung

Project Profile

Cable & Wireless HKT CSL Limited

Prepared by : Mouchel Asia Limited

May 2000

PROJECT PROFILE

1.0 BASIC INFORMATION

1.1 Project Title

Installation of Radio Base Station at Kei Ling Ha (Sai Sha Road), Sai Kung.

1.2 Purpose and nature of the project

Since the Pat Sin Ling Hill Fire, an inter-department Investigation Team has recommended to encourage mobile phone operators to provide full coverage of their services in the countryside. The project is a joint development comprising all the mobile phone operators with Government to improve the mobile phone coverage in order to provide the alternative means of communication for hikers and visitors of the Country Parks.

1.3 Name of Project Proponent

Cable & Wireless HKT CSL Limited.

1.4 Location and scale of project

The proposed Base Station will be constructed within the boundary of the Sai Kung West Country Park as shown on the location plan in Attachment 1. A total area of 82.5 m² of Country Park will be required. One BBQ area, a playground and a toilet site are located just adjacent to the site and close to Sai Sha Road. The construction work will comprise the installation of a Radio Equipment Base Station which will comprise the equipment shelters for eleven mobile phone network and two 10m high antenna poles for 1800MHz and 900MHz mobile networks. Metal fencing surrounding the station, together with a telephone line and electric facilities will be provided prior to the construction of the Base Station.

The Country and Marine Parks Authority and the Office of Telecommunications Authority have agreed to the establishment of an integrated mobile phone Base Station at the proposed location. The proposed site is considered to provide significant radio coverage to the Sai Kung West Country Park and the coverage area is shown in Attachment 2.

The equipment layout plan and equipment details are shown in Attachment 3 and 4 respectively.

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

In accordance with EIAO, Schedule 2, Part 1, Section Q1, the proposed project is a designated project as it involves building works in an existing country park and is not exempted under clauses Section Q.1 (a) to (j). Therefore, an Environmental Permit under the EIA Ordinance must be obtained prior to the commencement of construction.

1.6 Name and telephone number of contact person(s)

2.0 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 How will the project be planned and implemented

The project is a joint development of six mobile phone operators to install telecommunications equipment for eleven networks in the proposed site.

No land use zoning has been specified for this area as it is not covered by any existing plan. However, the short term tenancy (STT 1041) will be granted by the District Lands Office of Tai Po. An environmental permit will also be required prior to the commencement of the construction works.

The works will be designed by Mouchel Asia Limited and carried out by a CSL Contractor.

2.2 What is the project time table

Construction is expected to commence in July 2000 and continue for 6 months, ending in December 2000. The exact timing of the construction events will be dependent upon the Contractor=s programme. However, an estimation of the duration of the key construction activities is given below:

Setting up of temporary hoarding	1 week
Foundation work for the site	4 weeks
Telephone line & electric facilities	8 weeks
Metal fence installation	3 weeks
Antenna pole installation	4 weeks
Equipment installation	2 weeks
Commission test	1 week

An indicative works programme is presented in Attachment 5.

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

No.

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

Background

The Country and Marine Parks Authority and the Office of Telecommunications Authority have agreed to the establishment of the proposed site as a Base Station for all mobile operators. The site area falls within the Sai Kung West Country Park area. One BBQ area, one playground and a toilet site are within 20m and the Country Park Management Centre is approximately 200m away. The Sai Sha Road provides direct access to the BBQ area and the proposed site.

No declared monument or site of cultural heritage will be affected by the proposed work.

Noise

The hikers and visitors to the country park will be Noise Sensitive Receivers (NSRs). As the Country Park Management Centre is approximately 200m away, it will not be subject to adverse impacts and thus, will not be further discussed in the following section.

Air quality

Although the Sai Sha Road is a source of air pollution, the level of traffic is low in weekdays. Thus, the overall background air quality is considered to be good. No other source of air pollution has been identified.

Water Quality

No watercourse has been identified within the site boundary or adjacent to the site.

Ecology

The only affected habitat is grassland as shown in Attachment 6. This habitat contains common grassland species such as *Mikania guaco*, *Vernonia cinerea*, *Thysanolaena maxima* and *Lantana camara* as well as a few saplings of *Rhus succedanea*. The habitat also supports a very limited number of invertebrate but no rare flora and fauna species were recorded. However, one bulbul was observed in the woodland habitat behind the site during a site inspection. In general, the habitat is considered to be of low ecological importance due to its low species diversity and being close to areas of human disturbance.

Although the site is very close to the vegetated woodland to its northeast, no woodland habitats will be affected by construction works.

Landscape and Visual

The hikers or visitors enjoying the BBQ site and the playground will be vulnerable to visual impacts associated with vegetation removal, construction works and the new structures, although their sensitivity will be moderate, given the other man-made elements in the vicinity.

No tree will be affected within the proposed site in accordance with the criteria stated in WBTC No.24/94 that a plant is considered as a tree if its diameter measures 95mm. The existing landscape of the site is of low landscape quality comprising grassland and the landscape context of the area has been modified by the presence of the BBQ area and facilities.

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

A typical construction sequence will include foundation work, installation of telephone lines, metal fence and antennae erection.

The location plan and construction details are shown on Attachments 1 and 4 respectively and an indicative works programme is presented in Attachment 5. The work period for the installation of equipment shelters, antennae and metal fencing will last for about four months.

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 only during construction of the antenna pole base. The anticipated equipment to be used for the concrete work is detailed in Table 1 below.

Table 1 : Predicted Sound Power Levels for the Concrete Base of the Antenna Poles Construction

Powered Mechanical Equipment	ID Code	Sound Power Level dB(A)
Concrete lorry mixer	CNP044	109
Dumper	CNP066	106

The construction noise has been assessed in accordance with the methodology of the *Technical Memorandum on Noise from Construction Work Other than Percussive Piling*. Assuming the employment of the concrete lorry mixer and dumper simultaneously, noise levels exceeding the daytime criteria of 75dB(A) will be expected. The results indicate that any visitors present within 25m of the site boundary during this activity will experience noise levels in the region of 86dB(A). The duration of this noisy activity will

be for only 1 week and it is expected that visitors will be small in number during the week and will also be transient.

Except for the base of the antenna poles, all other parts of the Base Station will not be constructed in-situ but delivered ready for installation on site. Thus, no other activities are expected to result in excessive noise levels.

Air Quality

Stockpiling of construction material could act as a source of dust. If works are not mitigated, dust generation may pose a short term effect to air quality in the areas.

Water Quality

No adverse water quality impacts are anticipated.

Waste Management

Although the amount of construction waste to be produced is expected to be relatively small, it may cause nuisance and visual intrusion to visitors or hikers if it is not properly stored, handled and disposed of. In addition, in order to prevent unnecessary landtake or land disturbance, placement of waste materials should be done with care.

Ecology

The loss of 85.2m² grassland habitat will be unavoidable. Although the loss is permanent, this kind of grassland is very common throughout Hong Kong and is very easy to recreate and of low ecological importance. In addition, the site is close to areas of human disturbance. Thus, due to the low ecological importance of the habitat, in addition to the small area lost, the ecological impact of this project is judged to be insignificant.

No other area of ecological importance will be impacted.

Landscape and Visual

There is the potential for visual and landscape impacts on the hikers and visitors due to the removal of vegetation and the addition of a man-made element into the landscape. Notwithstanding, no tree felling will be required. However, landscape and visual impacts associated with the construction of the Base Station are not anticipated to be significant due to the small scale of the project, the low visual and landscape quality of the existing area and the already disturbed nature of the area.

4.2.2 Operational Phase

As the proposed Mobile Phone Base Station will be very close to a BBQ site and other human activities, the operation should be strictly comply with the “ Code of Practice for

the Protection of Workers and Members of Public Against Non-Ionising Radiation Hazards from Radio Transmitting Equipment” issued by OFTA.

Planting of trees in front of the site will help screening the area from the visitors to the BBQ area once the vegetation matures.

No other operational phase impacts are predicted.

5.0 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED

5.1 Describe measures to minimise environmental impacts

Noise

Adverse noise impacts could occur on the hikers and especially the visitors to the BBQ area and the playground. Thus, it is recommended that no construction work should be scheduled on Saturday, Sunday or public holidays as the Country Park will be subject to most frequent use during these days. Also, it is proposed to restrict the access of visitors to the closest BBQ area and the playground for a week during the period of antenna base construction. In this way, no residual noise impacts on the hikers and visitors will be expected.

Air Quality

Stockpiles should be enclosed or covered and watered during dry or windy conditions. Watering exposed surfaces should be carried out to reduce dust emissions. In addition, with the adoption of the relevant pollution control clauses in the construction Contract as detailed in Attachment 7, environmental nuisance can be kept to a minimum. Dust impacts from the construction activities are considered to be minimal due to the small scale of the project and based upon the implementation of good site practice mitigation as mentioned above.

Waste Management

The site will be screened by temporary hoarding during construction. The waste material should be stockpiled inside the site area and will be removed off site as soon as possible. Relevant pollution control clauses as detailed in Attachment 7 will be included in the construction Contract so as to minimize the environmental nuisance to the sensitive receivers.

Ecology

Care should be taken to avoid damage to areas that do not require any work. Storage of material subject to run-off and exposed areas of soil should be kept to a minimum, especially during the wet season. It shall be specified in the Contract that unnecessary land take during construction should be restricted.

Landscape and Visual

In order to mitigate the visual impact of vegetation removal, the project proponent will carry out the plantation of trees in front of the site in order to screen off the Base Station from the BBQ area. In addition, the colour of the Base Station, antennae and metal fencing will be painted in a subdued and non-reflective colour. To further mitigate the visual impacts and maintain good condition of the site, the Base Station will be cleaned and painted every year if necessary. In case of any trouble shooting and emergency repair, the periodic inspection will only be carried out every three months in the first year and once a year afterwards.

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

The resulting environmental impacts are considered to be insignificant due to the small scale of the project and the limited number of sensitive receivers present. Although the proposed site is located in the Country Park, no significant ecological impacts will be expected as the loss of grassland habitat is of low ecological importance.

Adverse noise impacts are not be predicted if the mitigation measures are implemented. No other adverse impacts will be expected after the application of the full set of recommended mitigation measures together with the pollution control clauses.

5.3 Comment on any further implications

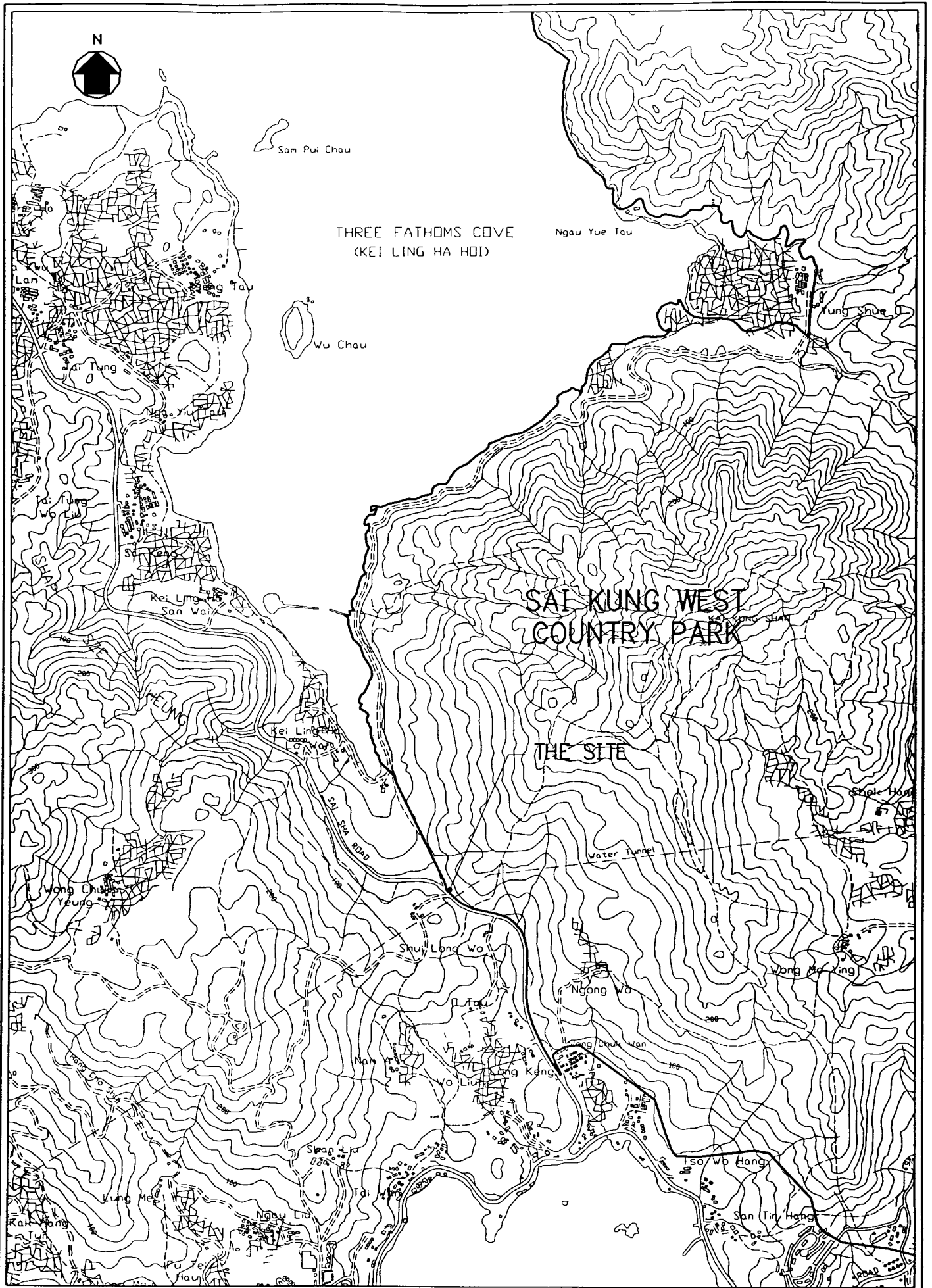
None

5.4 Use of previous approved EIA

None

Attachments

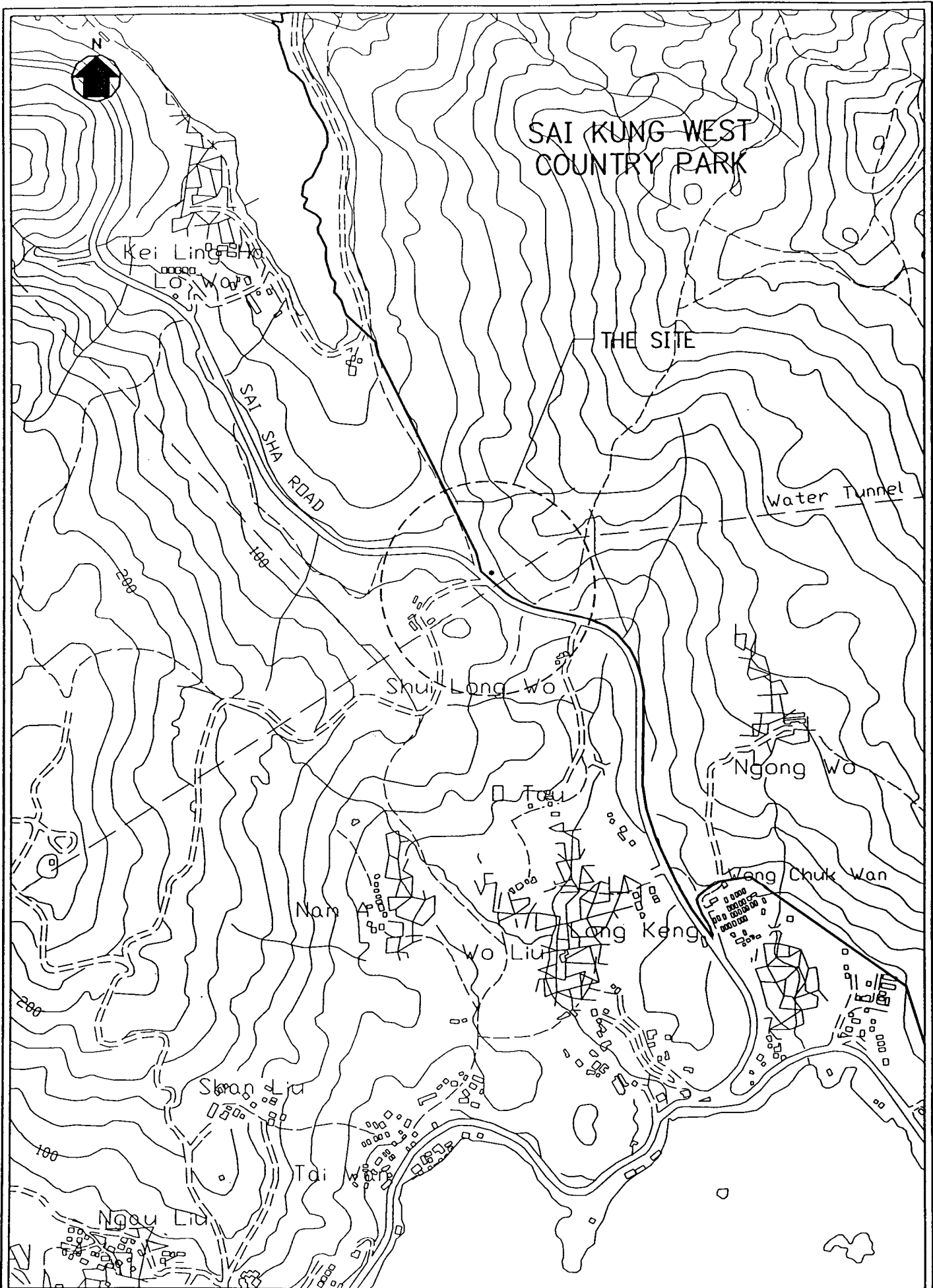
Attachment 1	Proposed Site Location
Attachment 2	Proposed TCSL Site Coverage Map
Attachment 3	Equipment 3D Layout Plan
Attachment 4	Typical Equipment Layout and equipment details
Attachment 5	Indicative Works Programme
Attachment 6	Habitat Type Present within the Proposed Site
Attachment 7	Recommended Pollution Control Clauses for Construction Contracts



PROPOSED SITE LOCATION

Mouchel

ATTACHMENT 1



SAI KUNG WEST
COUNTRY PARK

THE SITE

Water Tunnel

Shui Long wo

Ngong wo

Weng Chuk Wan

Long Keng

Nam

Wo Liu

Skan

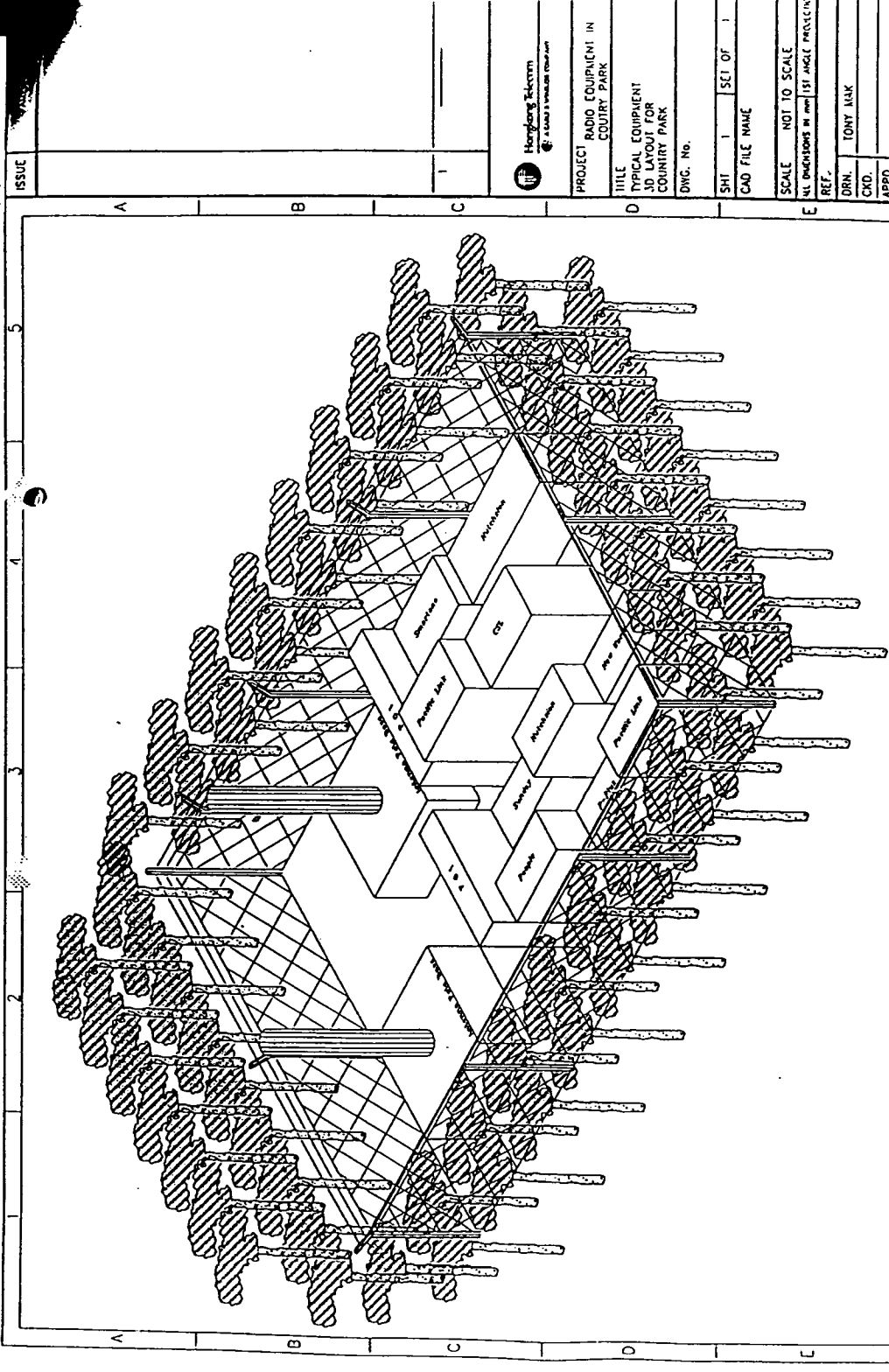
Tai

Ngau Liu

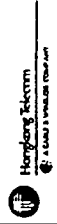
TCSL SITE COVERAGE MAP

Mouchel

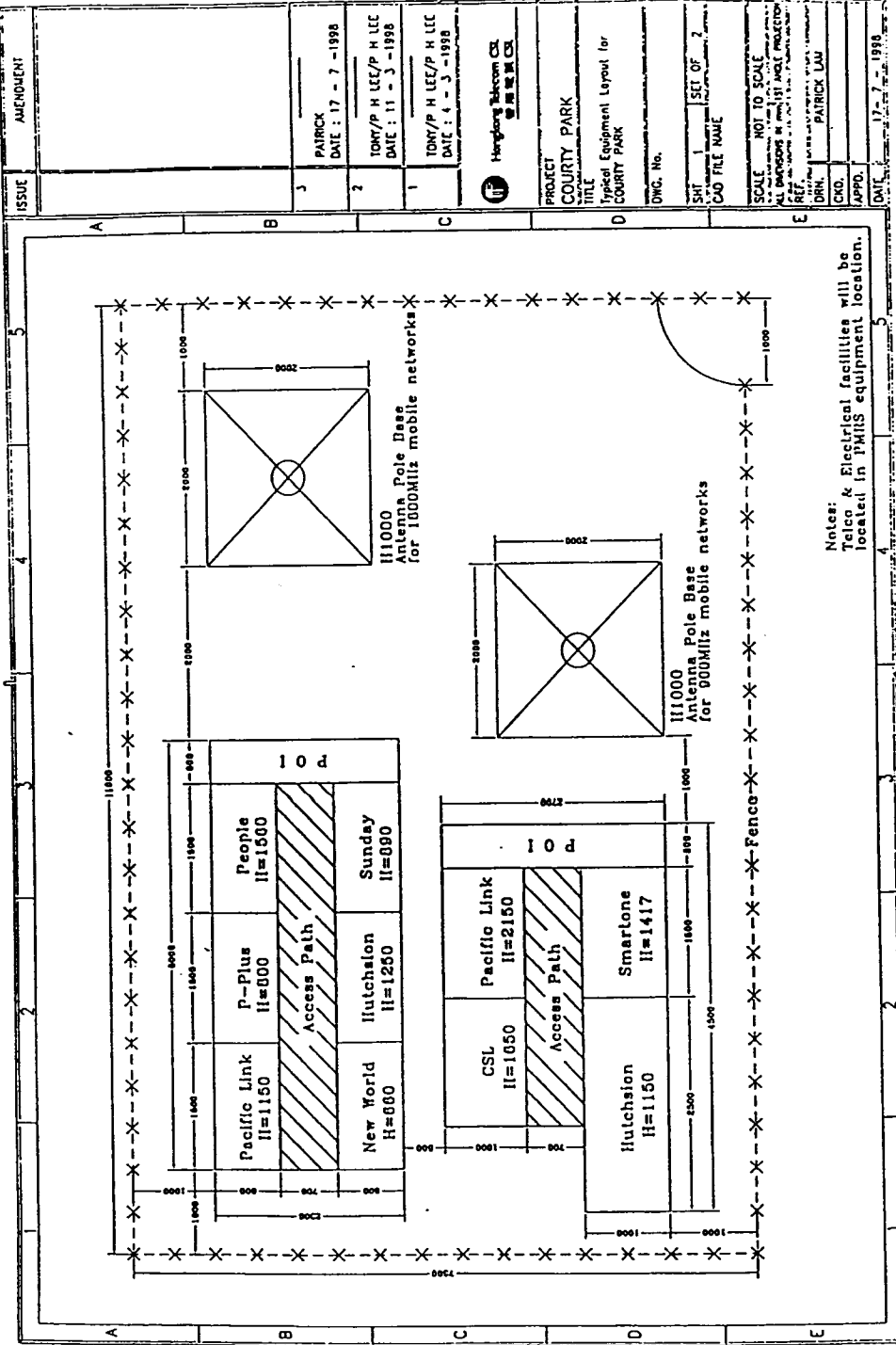
ATTACHMENT 2



PROJECT	RADIO EQUIPMENT IN COUNTRY PARK	
TITLE	TYPICAL EQUIPMENT 3D LAYOUT FOR COUNTRY PARK	
DWG. No.		
SHT	1	SET OF 1
CAD FILE NAME		
SCALE	NOT TO SCALE	
ALL DIMENSIONS IN mm (1st ANGLE PROJECTION)		
REF.		
DRN.	TONY MAK	
CKD.		
APPD.		

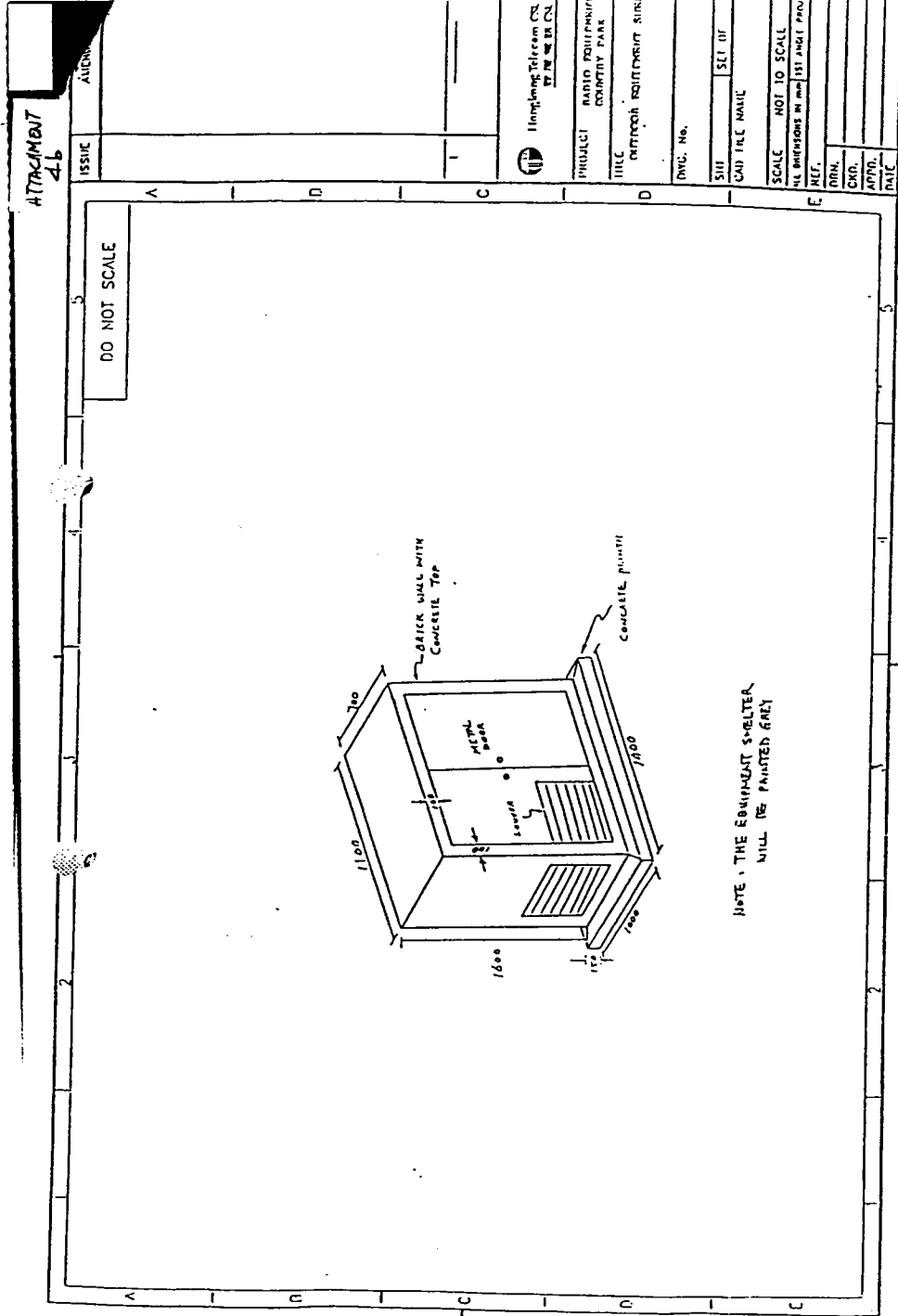


ATTACHMENT 4a



ISSUE	AMENDMENT
3	PATRICK DATE: 17 - 7 - 1998
2	TONY/P H LEE/P H LEE DATE: 11 - 3 - 1998
1	TONY/P H LEE/P H LEE DATE: 4 - 3 - 1998
PROJECT	COURTY PARK
TITLE	Vertical Equipment Layout for COURTY PARK
DWG. No.	
SHEET	1 SET OF 2
COO FILE NAME	
SCALE	NOT TO SCALE
<small>ALL DIMENSIONS IN METERS UNLESS OTHERWISE SPECIFIED</small>	
CHKD.	PATRICK LAW
APPRO.	
DATE	17 - 7 - 1998

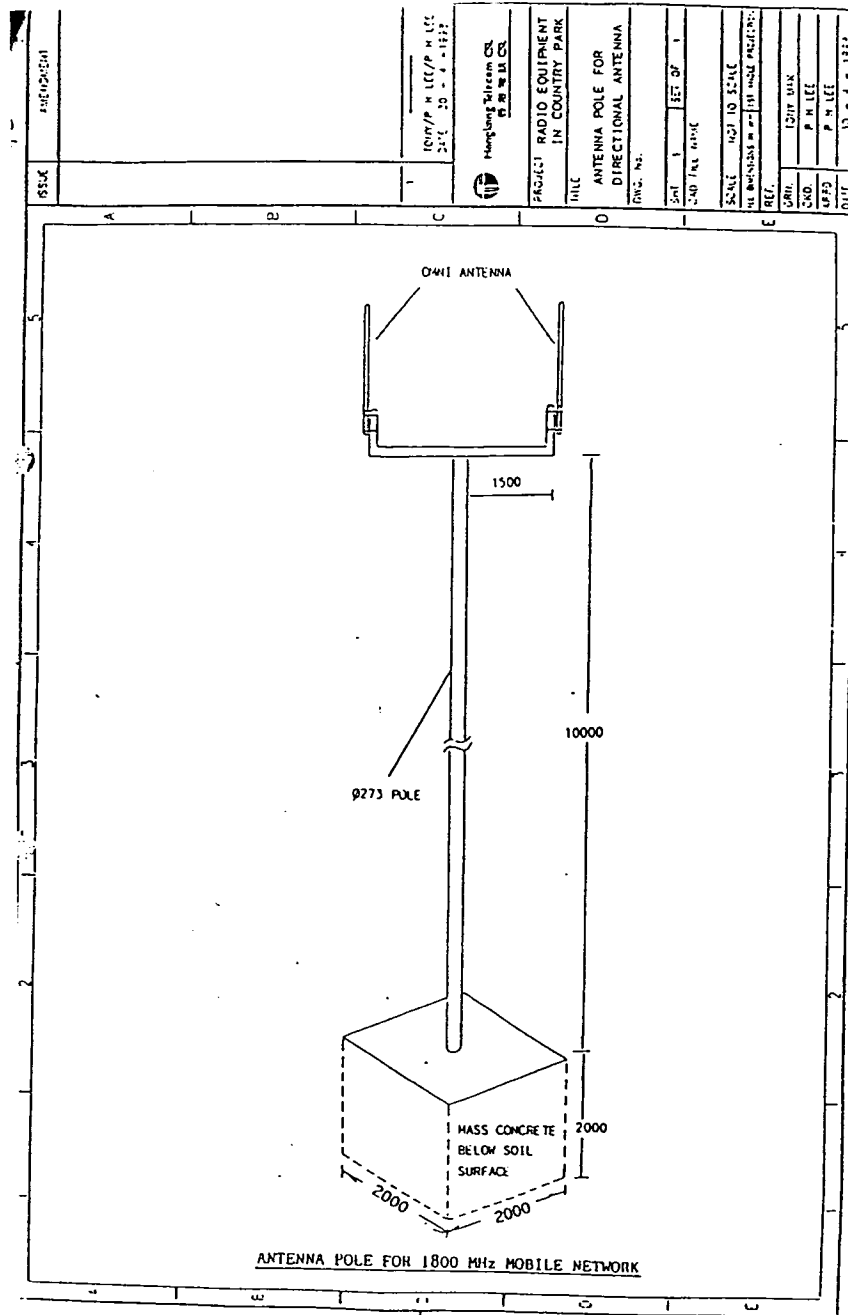
ATTACHMENT 4 b



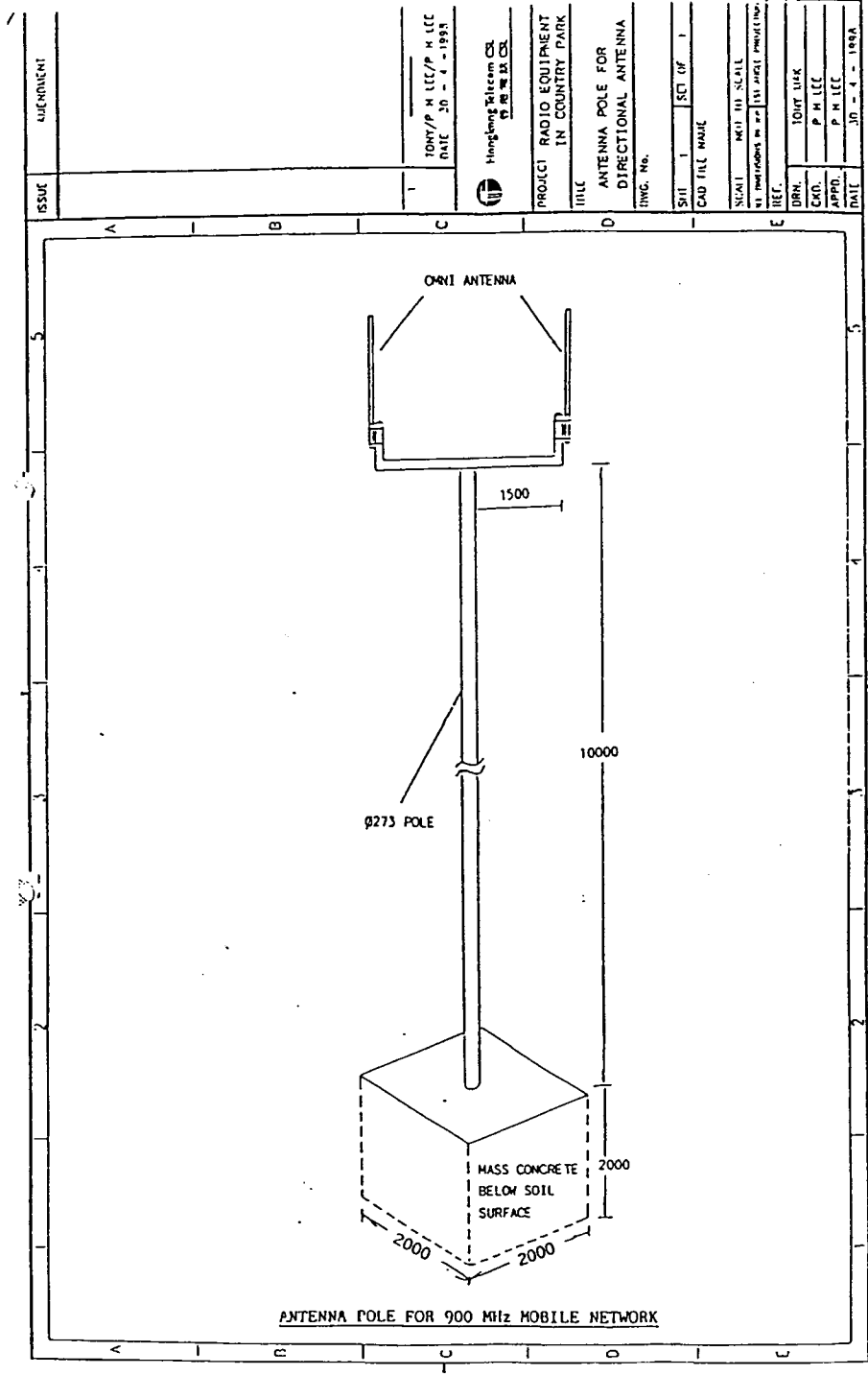
ATTACHMENT
4b

ISSUE	1
DATE	
Hampshire Telecom Co. 177 W. 10th St.	
PROJECT	RADIO EQUIPMENT COUNTRY PARK
TITLE	EQUIPMENT REQUIREMENT SIGN
DWG. No.	
SHT.	SET OF
GIVE TITLE NAME	
SCALE	NOT TO SCALE
ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE	
REF.	
DRN.	
CHKD.	
APPD.	
DATE	

ATTACHMENT 4 c



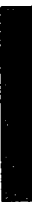


ATTACHMENT 4 d





**Installation of Base Station at Kei Ling Ha (Sal Sha Road),
Sal Kung**


INDICATIVE WORKS PROGRAMME



ID	Task Name	Duration	Start	Finish	2000											
					Jun '00	Jul '00	Aug '00	Sep '00	Oct '00	Nov '00	Dec '00	Jan '01				
1	Total Working Days	115d	Mon 03/07/00	Thu 07/12/00												
2	Temporary hoarding	1w	Mon 03/07/00	Fri 07/07/00												
3	Foundation work	4w	Mon 10/07/00	Fri 04/08/00												
4	Telephone line & electric facilities	8w	Mon 07/08/00	Fri 29/09/00												
5	Metal fence installation	3w	Thu 28/09/00	Tue 17/10/00												
6	Antenna pole installation	4w	Thu 19/10/00	Wed 15/11/00												
7	Equipment installation	2w	Thu 16/11/00	Wed 29/11/00												
8	Commission test	1w	Fri 01/12/00	Thu 07/12/00												

Project:  Milestone  Rolled Up Progress 

Date: Tue 18/04/00

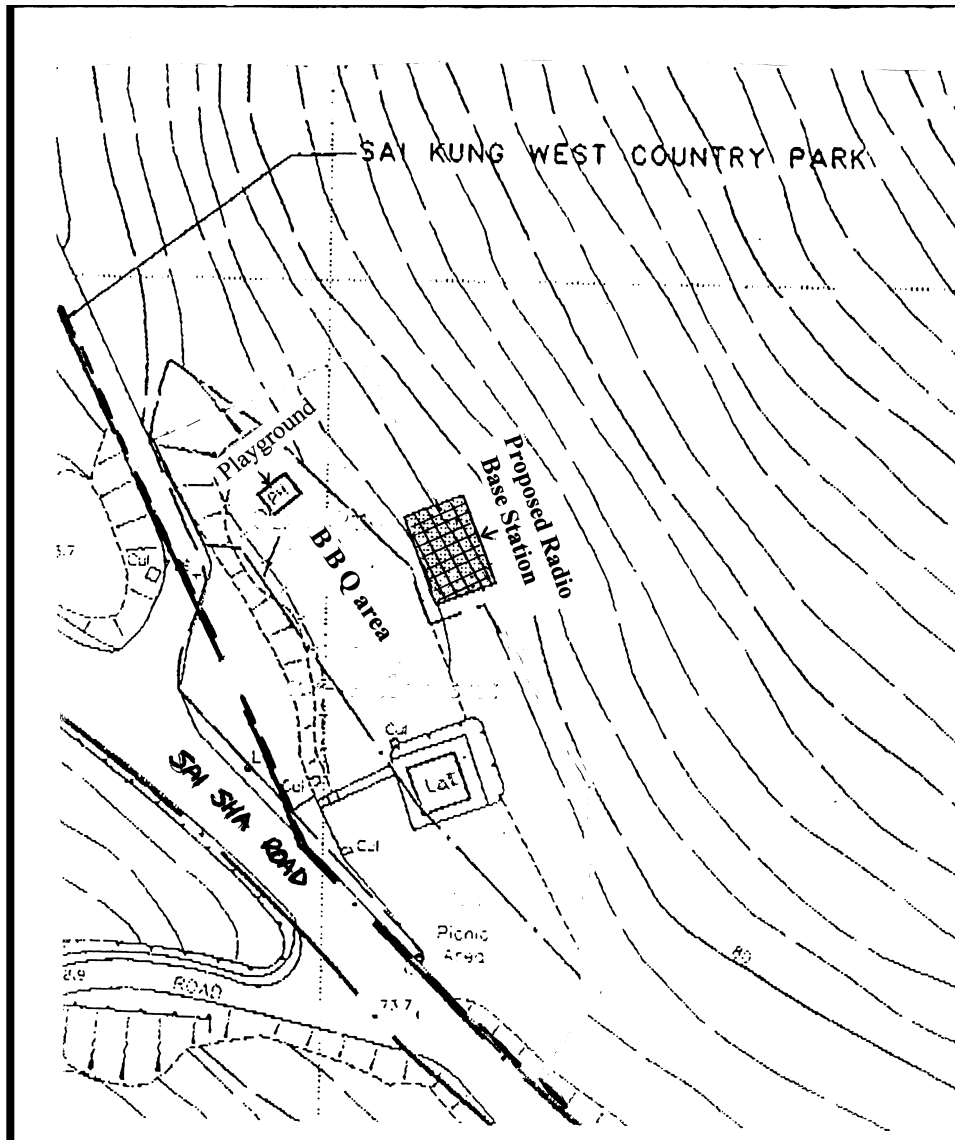
Task  Progress 

Progress 

Rolled Up Task  Rolled Up Milestone 

Please Note: All construction periods are estimated. The duration and times may vary according to the Contractor's actual programme.

Attachment 6 **Habitat Type Present within the Proposed Site**



Habitat Type Recorded Within the Proposed Site :



ATTACHMENT 7

RECOMMENDED POLLUTION CONTROL CLAUSES FOR CONSTRUCTION CONTRACTS

AVOIDANCE OF NUISANCE

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

NOISE POLLUTION CONTROL

General Requirements

- (i) The Contractor shall comply with and observe the Noise Control Ordinance and its subsidiary regulations in force in Hong Kong.
- (ii) The Contractor shall consider noise as an environmental constraint in his planning and execution of the Works.
- (iii) The Contractor shall take all necessary measures to ensure that the operation of mechanical equipment and construction processes on or off the works areas will not cause any unnecessary and excessive noise which may disturb any occupant or any nearby dwellings, school, hospitals, or premises with similar sensitivity to noise. The Contractor shall submit to the Engineer for his consent details of the Contractor's equipment including methods of use and construction operations together with proposed measures for limiting noise therefrom which shall include, inter alia, the use of silencers, mufflers, acoustic linings or shields, or acoustic sheds or screens and shall be based upon the best reasonable practice. Information on the types and models of silenced equipment and acoustic treatment for unsilenced equipment shall be included. The Contractor shall use such measures and shall maintain plant and silencing equipment in good condition so as to minimise the noise emission during construction works.
- (iv) 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.
- (v) 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. The noise reduction methods include scheduling of works; siting of facilities; selection of quiet equipment; and the use of purpose-built acoustic panels and enclosures.

- (vi) After commencement of the Works if the equipment or work methods are believed by the Engineer to be causing serious noise pollution impacts, the equipment or work methods shall be inspected and remedial proposals drawn up by the Contractor and once approved by the Engineer, implemented. In developing these remedial measures, the Contractor shall review all construction noise sources that may be contributing to the pollution impacts, and propose changes to scheduling of activities, installation of plant soundproofing, provision of alternative plant, erection of sound barriers around part of the works areas or the location of construction noise sources, or any other measures that may be effective in reducing noise. Where such remedial measures include the use of additional or alternative equipment, such equipment shall not be used on the Works until approved by the Engineer. Where remedial measures include maintenance or modification of previously approved equipment such equipment shall not be used on the Works until such maintenance or modification is completed and the adequacy of the maintenance or modification is demonstrated to the satisfaction of the Engineer.
- (vii) If the Engineer finds that approved remedial measures are not being implemented and that serious impacts persist, he may direct the Contractor to cease related parts of the Works until the measures are implemented. No claims by the Contractor shall be entertained in connection with such a direction.
- (viii) 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 the nearby noise sensitive receivers from the construction work along during any 30 minute period shall not exceed an equivalent sound level (Leq) of 75 dB(A).
- (ix) 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.
- (x) Notwithstanding the requirements and limitations set out in clause (vii) above and subject to compliance with clauses (iii) and (iv) 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 absolute necessary and adequate 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.

- (xi) Hand-held breakers used by the Contractor shall comply with the standards specified in EEC Technical Directive 84/537, and portable compressors shall comply with the standards specified in EEC Technical Directive 84/533.
- (xii) For the purposes of the above clauses, any domestic premises, hotels, hostel, temporary housing accommodation, hospital, medical clinic, educational institution, place of public worship, library, court of law, performing arts centre or office building shall be considered a noise sensitive receiver.

Noise Monitoring and Compliance Audit Reporting

- (i) Monitoring equipment and methodology shall comply with the Technical Memorandum on Noise from Construction work other than Percussive Piling, issued under section 9 of the Noise Control Ordinance. Monitoring will be carried out by the Contractor to the specification of the Engineer. The data will be provided to the Engineer on a regular basis, or as requested.
- (ii) A monthly summary of monitoring data will be prepared by the Engineer. This will include an interpretation of the significance of the monitoring results. The monthly summary shall also identify any additional mitigation measures taken by the Contractor as a result. A copy of the summary report shall be made available for inspection by the Director of Environmental Protection at his request and by the Contractor.
- (iii) The Contractor shall provide within one week of the commencement of the Contract at least one portable sound level meter complying with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) (Bruel & Kjaer Type 2221 or similar approved) complete with tripods. These meters will be used by the Contractor or Engineer for noise monitoring, and should be regularly calibrated to ensure accuracy and consistency.
- (iv) The Engineer will, prior to commencement of construction works, carry out baseline monitoring to determine baseline noise levels. The baseline monitoring will be carried out for a period of at least one week, with measurements to be taken every day at locations and to a schedule determined by the Engineer. From these measurements baseline noise level (L_{eq} (5 min)) will be calculated. The target level for maximum construction noise levels will be 5dB(A) above the measured background.

Permitted Noise Levels

- (i) In the event that the Contractor intends to carry out works of a type and during periods (Athe Restricted Periods \cong) to which Section 6 of the Noise Control Ordinance applies, the Contractor shall apply for and obtain a Construction Noise Permit and thereafter shall comply with the conditions which may be imposed in relation thereto.
- (ii) Work will be permitted during Athe Restricted Periods \cong subject to:
 - (a) the Contractor complying with its obligations under the general requirement stated above;

- (b) the Contractor making an application for an obtaining a Construction Noise Permit in due time and in due form; and
- (c) the Contractor not causing the cancellation or adverse variation of such Construction Noise Permit as may be issued by reason of the generation of noise in excess of the limits set out in Technical memorandum on Noise from Construction Work for the identified NSRs.

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 $500 \mu\text{m}/\text{m}^3$, at standard temperature (25°C) and pressure 91.0 bar averaged over one hour, and 0.26 milligrams per cubic metre, at standard temperature (25°C) and pressure (1.0 bar) averaged over 24 hours.
- (iii) The Contractor shall not burn debris or other materials on the works areas.
- (iv) The Contractor shall implement dust suppression measures which shall include, but not be limited, to be following:
 - (a) The Contractor shall frequently clean and water the site to minimize the fugitive dust emissions.
 - (b) 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.
 - (c) Stockpiles of sand and aggregate greater than 20m^3 for use in concrete manufacture shall be enclosed on three sides, with walls extending above the pile and 2m beyond the front of the pile.
 - (d) Effective water sprays shall be used during the delivery and handling of all raw sand and aggregate, and other similar materials, when dust is likely to be created and to dampen stored materials during dry and windy weather.
 - (e) Areas where there is a regular movement of vehicles shall have all-weather surfaces to a standard agreed with the Engineer and be kept clear of loose surface material.
 - (f) The provision of adequate dust suppression plant including water bowsers with spray bars or means of applying surface chemical treatment, the details of which shall be submitted to and approved by the Engineer.
 - (g) Where dusty material 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.

- (h) 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.
- (i) 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.

WATER POLLUTION CONTROL

General Requirements

- (i) The Contractor shall carry out the Works in such a manner as to minimise adverse impacts on the water quality during the execution of the Works. In particular he shall arrange his method of working to minimise the effects on the water quality within the works areas, adjacent to the works areas, on the transport routes to and from the works areas and at the loading, and dumping areas.
- (ii) The Contractor shall devise and arrange methods of working to minimise water pollution and shall provide experienced personnel with suitable training to ensure that these methods are implemented. Reference should be made to ProPECC PN1/94"Construction Site Drainage" for appropriate methods & techniques.
- (iii) Before the commencement of the Works, the Contractor shall submit to the Engineer the proposed methods of working.
- (iv) After the commencement of the Works, if the plant or work methods are believed by the Engineer to be causing serious water pollution impacts, the Contractor shall proposed remedial measures. Where such remedial measures include the use of additional or alternative plant such plant shall not be used on the Works until approved by the Engineer. Where remedial measures include maintenance or modification of previously approved plant, such plant shall not be used on the Works until such maintenance or modification is completed and the adequacy of the maintenance or modification is demonstrated to the satisfaction of the Engineer.
- (v) If the Engineer finds that approved remedial measures are not being implemented and that serious impacts persist, he may direct the Contractor to cease related parts of the Works

until the measured are implemented. No claims by the Contractor shall be entertained in connection with such a direction.

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 AConstruction Site Drainage=.

Removal of Waste Material

- (i) Notwithstanding the provisions of the GCC 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 works areas onto any adjoining land or allow any waste matter or refuse to be deposited anywhere within the works areas or onto any adjoining land and shall have all such matter removed from the works areas.
- (ii) 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.
- (iii) The Contractor shall submit any proposed stream course and nullah temporary diversions 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.
- (iv) The Contractor's attention is drawn to the Waste Disposal Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance.

WASTE MANAGEMENT

- (i) The Contractor shall segregate inert construction waste material suitable for reclamation or land formation and shall dispose of residual material at a public dumping area(s).
- (ii) Non-inert construction waste material deemed unsuitable for reclamation or land

formation and other waste material shall be disposed of at a public landfill.

- (iii) The Contractor should ensure that all waste paints, oils and solvents are handled, collected, treated and disposed of in accordance with the Waste Disposal Regulations (Chemical Waste and General). These materials should be separated from non-chemical wastes, stored in a labelled container and collected by a licenced body.
- (iv) The Contractor should provide a temporary storage area for general refuse during the construction phase which should be enclosed to avoid environmental impacts. General refuse should be stored on site for a minimum period and disposed of to a licenced facility.