



Hong Kong Government
Architectural Services Department

**Stonecutters' Island
South Shore Naval Facilities
Environmental Impact Assessment**

Agreement No. CAO B18

EXECUTIVE SUMMARY REPORT

~~CONFIDENTIAL~~ *downgraded*

July 1994

Mott MacDonald Hong Kong Ltd.

in association with
EBC Hasselt

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STONECUTTERS' ISLAND SOUTH SHORE NAVAL FACILITIES

ENVIRONMENTAL IMPACT ASSESSMENT

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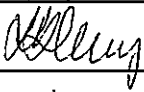
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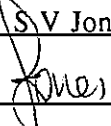
EXECUTIVE SUMMARY REPORT

CONFIDENTIAL

Prepared by
Project Manager

Approved by
Project Director

Name Laura Wong
Signature 
Date 15/7/94

Name S V Jones
Signature 
Date 15/7/94

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STONECUTTERS' ISLAND SOUTH SHORE NAVAL FACILITIES

ENVIRONMENTAL IMPACT ASSESSMENT

EXECUTIVE SUMMARY

1. Introduction

This project is to conduct an Environmental Impact Assessment (EIA) of the construction and operation phases of the naval facilities which are proposed to be located on the south shore of Stonecutters' Island. These facilities will replace the existing HMS Tamar naval base on Hong Kong Island and will be built for an intended handover to the People's Republic of China (PRC) at the end of the British occupancy of the Territory in mid 1997. The naval base will be an operating base with restricted repair capability for ships of a range of sizes. There will be slipping capability for vessels up to 45 tonnes. The Study Area is shown on Figure 1 and the layout proposed for the Naval Base is shown on Figure 2.

2. Scope of Work and Key Objectives

The scope of this Environmental Impact Assessment (EIA) is to assess the environmental disturbances and nuisances that may arise from the construction and operation of the Stonecutters' Island South Shore Naval Facilities. The key objectives of the environmental assessment are to:

- describe the characteristics of the proposed naval facilities and the related facilities and the requirements for their development;
- establish baseline environmental conditions;
- evaluate and assess the extent and distribution of impacts during construction and operation relative to the sensitive receivers and adjacent land uses and determine the extent to which conditions may result in non-compliance with statutory provisions and guidelines;
- identify design criteria and operating practices to minimise environmental disruption during both construction and operation; and
- identify appropriate mitigation measures to minimise impacts to satisfactory levels and where necessary to reinforce these through recommendations for monitoring and audit.

The Study has assessed noise, air, waste, ecological, water quality and visual impacts. In addition a marine impact analysis has been carried out.

3. Environmental Framework

3.1 General Characteristics

Stonecutters' Island is 77 ha in area and located 2.1 km west of Kowloon Peninsula. It comprises mainly hilly terrain rising to a maximum height of about 60 mPD in the west with most of the natural slopes covered with dense and mature vegetation. To the north west and west is Container Terminal 8 (CT8) and to the north and north east is the

West Kowloon Reclamation (WKR). (see Figure 1). Land is reserved on the north of the island for a new sewage treatment works.

Most of the island is a restricted area with no access available to the general public. The restricted area is held by the UK Secretary of State for Defence for the use of Ministry of Defence (MOD), with the exception of the private lot held by Du Pont (HK) Ltd., for the manufacture of water gel explosives. The military uses include the new HMS Tamar Naval Base, support facilities for the Hong Kong Military Service Corps, Army firing ranges, the British Military and Hong Kong Government Explosives Depots and a military club and leave facilities. There are also a number of military married quarters and recreational area on the island. These have all been identified as sensitive receivers. The British military facilities are expected to remain on the island until June 1997.

Stonecutters' Island was garrisoned as a military post around 1860. It has served continually since then as a munitions storage and production site and as a training facility. There are currently about 600 naval and army personnel stationed on the island. Housing and recreational facilities are concentrated at lower elevations at the east side of north bay, the southeast arm, and the west arm of the island. The central area of the island away from the shoreline is higher in elevation, has a low density of buildings, and is a low-use area. The munitions magazine area is also a low-use area, as most of the structures and human activity are underground.

3.2 Background Noise Levels

The Study Area is situated in a rural area where there are no dominant noise generating sources. CT8 has been partly completed but the Study Area is shielded from this development by the steep hill on the western extremity of the island. On the north shore of the island the Government Dockyard is located in the East Basin where there are facilities such as ship and buoy repair shops, steel fabrication yards, and fuel stores. These facilities are also located on the opposite side of the steep hill thus sheltering the Study Area from noise impacts.

At present the only noise sources are ferries, shipping, aircraft, helicopters, wave noise, and animals. The background noise is, therefore, very low.

3.3 Background Air Quality

Background air quality levels in the study area are determined by the following:

- there are no industrial/commercial land uses in the area. The existing air quality impacts arise from the operation of CT8 and the Government Dockyard on the north shore. These sites have some impact on the environment particularly in terms of dust.
- roads on the island are only used for local transportation between military locations. The island is small and access to most points is easily attained by foot.

At present there are no baseline data for air pollution available on Stonecutters Island. However, the annual average background level of TSP and RSP collected by EPD in 1992 at Sham Shui Po is $125 \mu\text{g}/\text{m}^3$ and $70 \mu\text{g}/\text{m}^3$ respectively. Both of these levels are well within the Air Quality Objectives.

3.4 Water Quality

Seasonal variations in the circulation patterns in Hong Kong's coastal waters are best illustrated by the residual flows, which vary extensively between summer and winter. Freshwater inflow from the Pearl River plays a significant role in the variations in temporal and spatial conditions in the wet season in terms of salinity gradients and transport of pollutants. In the dry season conditions are generally well mixed. The proposed naval facilities will be located within a sheltered embayment which is separated from the mainstream flows by a distance of about 200m.

Some dramatic physical changes have occurred over the past two or three years in the vicinity of the Study Area, with a consequential impact on local water quality. Not only has the channel between Stonecutters Island and West Kowloon been closed but extensive marine works have been, and are still being, carried out within the area. The Interim Outfall for the Strategic Sewage Disposal Scheme (SSDS) will be built on Stonecutters Island. The Stage I Scheme of the SSDS will provide many benefits in that it will collect point sources of pollution from West Kowloon and parts of Hong Kong Island and will provide a higher level of treatment than presently exists, resulting in a general improvement in water quality within Victoria Harbour. In the context of the present Study, effluent discharges from the diffuser of the outfall are a major issue to be addressed as a part of the pollution load could be conveyed into the naval basin at certain stages of the tide.

The dominant influence of the Pearl River in Victoria Harbour is further demonstrated by the high percentage of fine silt content in the bottom sediments. Through extensive laboratory testing carried out for other projects, it has been concluded that in the area between south Stonecutters Island and Green Island about 60% of sediments are < 63 μm with approximately 90% of the sediments having a particle size < 200 μm . Review of data collected from various sources indicates a high organic content in the sediment samples in the western Victoria Harbour, which also reflects their source. Many of the sediments are contaminated.

3.5 Noise and Air Sensitive Receivers

The noise sensitive receivers and air sensitive receivers have been identified as follows (see Figure 3):

- Married quarters on the south shore
These quarters are occupied full time and are equipped to standard military married quarters standard. The quarters have air conditioning only in bedrooms.
- Rosia Cottage
This leave bungalow is occupied for approximately 60% of the year, predominantly in summer time. There is air conditioning only in bed rooms.
- Leave quarters (group of five bungalows)
These are occupied for around 60% of the time, predominantly in summer time.
- Married quarters on the top of the hill
These are occupied full time.

- Lido Area (this area is an air sensitive receiver only)
This area comprises the NAFFI family shop, swimming pool, barbecue area, snack bar, salt water pump room, squash court and store rooms.

Water Quality Sensitive Receivers

Seawater intakes are located near the ferry jetty on the south shore of Stonecutters Island. The south shore pumping station provides firefighting and flushing water to all the facilities in the south shore area and draws water from beside the jetty. No work can be permitted to begin on the reclamation area until satisfactory arrangements to supply salt water of acceptable quality are re-provided.

Victoria Harbour will be gazetted shortly as a Water Control Zone and will be ascribed Water Quality Objectives for Beneficial Use 3 as a habitat for marine life and a resource for human exploitation.

4. Environmental Impacts and Mitigation Measures

The environmental assessment has concluded that there are a number of key impacts that must be mitigated. The key impacts and the mitigation measures that are proposed are discussed below. Environmental monitoring and audit has been recommended throughout the construction of the project.

Water Quality Impacts

The study has identified water quality to be a critical issue. The water quality impacts that have been identified are presented in Table 1 together with the recommended mitigation measures.

Table 1 Water Quality Impacts and Recommended Mitigation Measures

Impact	Mitigation Measure
Construction	
Dredging on marine life	Use low impact dredging
Dredging on seawater intakes	The intakes should be relocated prior to the start of dredging
Spillage	Spill action plan and control of site activities
Runoff from works areas into the embayment	Runoff from areas that could be contaminated to be collected and treated before discharge. Flows to be connected to the new foul sewerage system as soon as practical. All drainage to be discharged outside the existing and new embayment
Sewage and drainage	The existing sewerage and drainage should be improved prior to the start of construction

Table 1 Water Quality Impacts and Recommended Mitigation Measures (Cont'd)

Impact	Mitigation Measure
<p>Operation Spillage from ships and shore activities</p>	<p>Include openings in the breakwaters to provide flushing and water exchange providing do not affect the operational requirement of the Basin. Provide pumpout at all berths and solid waste reception facilities. The design of the openings should not conflict with the operation requirements of the Basin.</p>
<p>Effluent inflow from the SSDS Interim Outfall</p>	<p>Design the basin to minimise ingress of effluent and encourage water circulation in the basin. Include openings in the breakwaters to improve flushing and water exchange. The design of the openings should not conflict with the operation requirements of the Basin.</p>
<p>Sewage and drainage</p>	<p>Design sewerage to flow to the SSDS sewerage system. Design drainage to avoid runoff into embayed areas</p>

Marine Operations

It has been concluded that a southern facing Naval entrance would be acceptable.

Ecology

This project will result in the loss of most of the intertidal habitats within the study area to be replaced by a naval basin surrounded by seawalls the faces of the western, eastern, and part of the northern walls will be of concrete block construction and the outer walls of the western and eastern breakwaters and both sides of the southern breakwater will be of rubble mound construction, which will provide substrates of low habitat diversity. Consequently biodiversity of the intertidal flora and fauna will be reduced.

Mitigation measures identified should compensate for the poor habitat diversity for intertidal organisms offered by the physical structure of the project. With this regard new boulder shoreline should be created.

Noise

Prediction of construction noise indicates that, with the exception of the married quarters, Rosia Cottage, and the leave quarters, the noise generated by the works will be within the daytime recommended noise standard of 75dB(A) if noise abatement measures at the source are applied. Working in the evening will cause very high noise impacts to all of the residents. Therefore, it is recommended that working be restricted to 0700-1900 hours. The noise levels have been calculated based upon a provisional

construction programme. To further reduce the noise levels calculated in this report it is recommended that the actual construction programme is reviewed, and the phasing of works such that the noise impacts are minimised.

Noise from the operation of the proposed naval base is not likely to cause significant impacts as there will be no noise sensitive receivers on Stonecutters Island outside the naval base.

Air Pollution

The assessment has considered the impact of dust from reclamation, filling and surcharging. It has concluded that the impact of dust from these activities on sensitive receivers will not be significant. The air quality objectives should not be exceeded at any sensitive receivers.

There will be no air sensitive receivers on Stonecutters Island affected by the operation of the naval base and it has been concluded that there will not be any significant air pollution impacts from activities in the base.

Visual Impacts/Landscape Masterplan

The proposed development extends approximately 500 metres from the shoreline and will have a major impact on the harbour, especially as the development will incorporate different built forms and straight edges. This impact will be mitigated to some degree by the existing wooded ridgeline of the island which will help to soften the outline and provide a unifying backdrop.

A landscape masterplan has been prepared with the aim of softening the outline of the proposed buildings and to help tie them visually into the existing island edge. Natural building materials and sympathetic colour schemes should be used wherever possible.

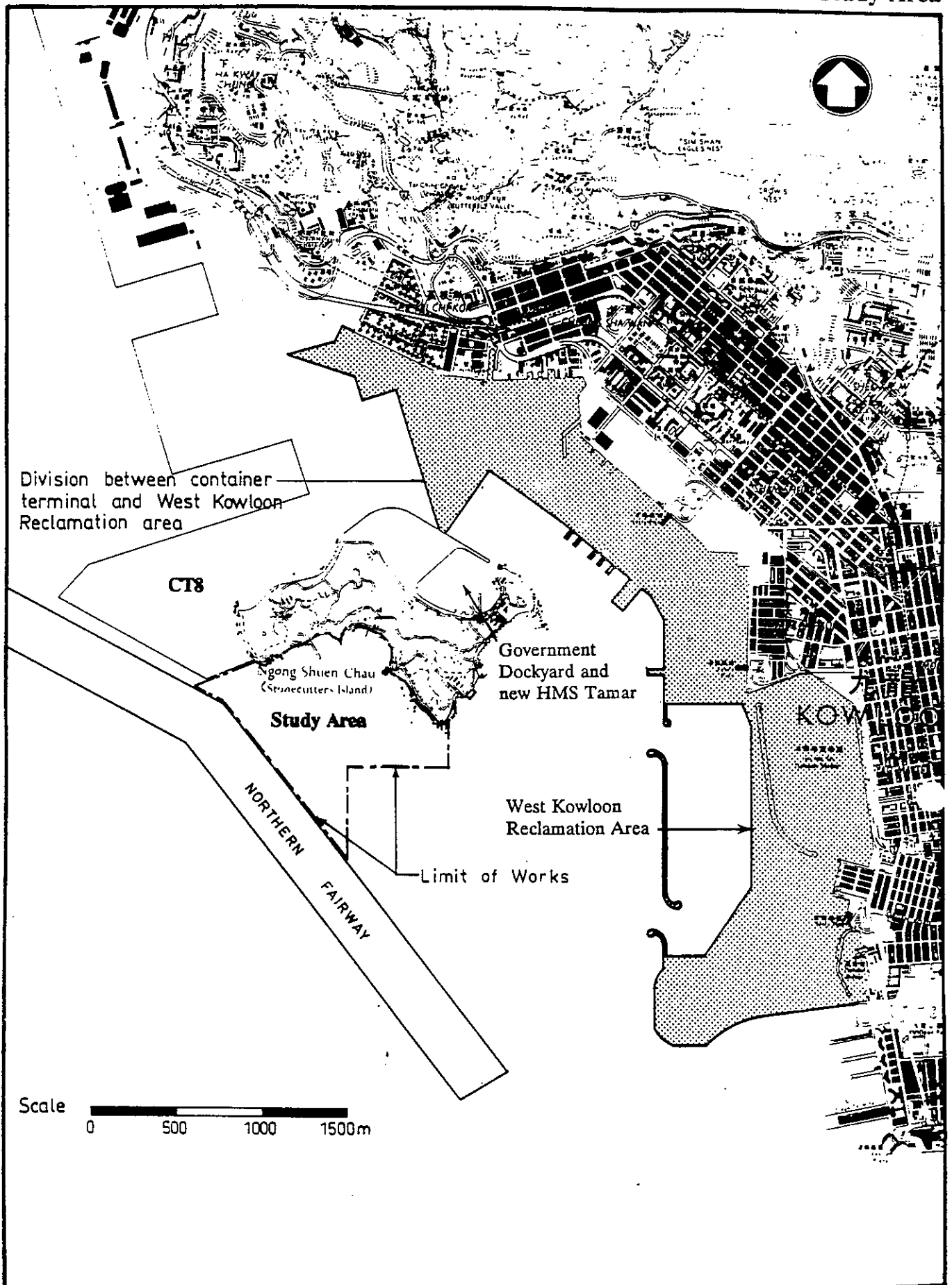
Any planting should be undertaken early on to shield the construction site from view. Measures must be taken before the commencement of construction to safeguard trees from damage.

5. Recommendations

The general conclusion of the study has been that it will be possible to construct and operate the proposed naval facilities within guidelines for acceptable environmental impacts so long as careful note is taken of environmental impacts throughout the design. The key recommendations of the Study are:

- the basin should be designed to optimise water circulation;
- new boulder shoreline should be created on Stonecutters Island;
- contract clauses for environmental protection should be applied to minimise pollution during construction.

Figure 1
Study Area

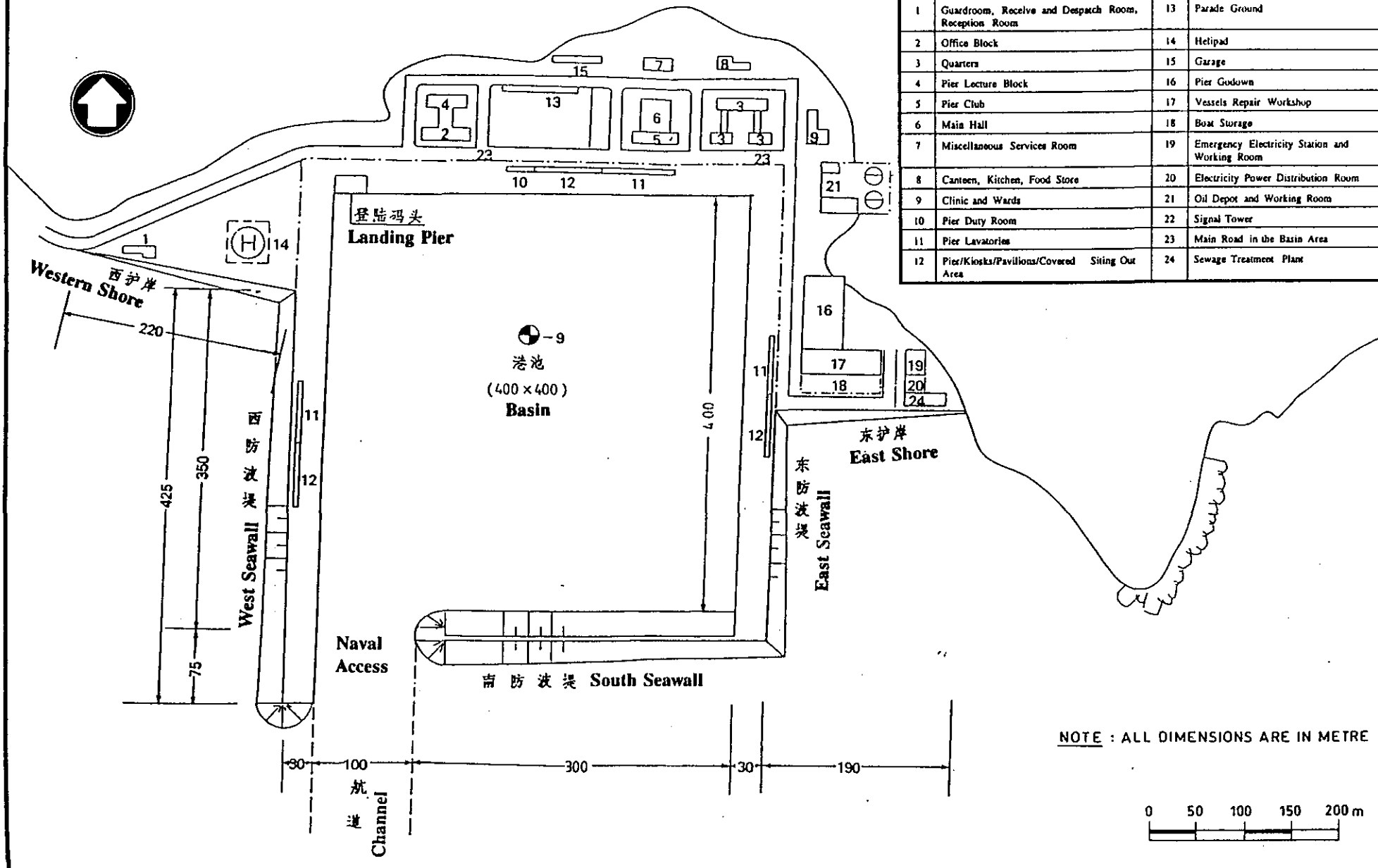


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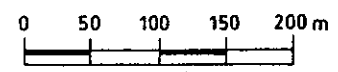
Stonecutters' Island

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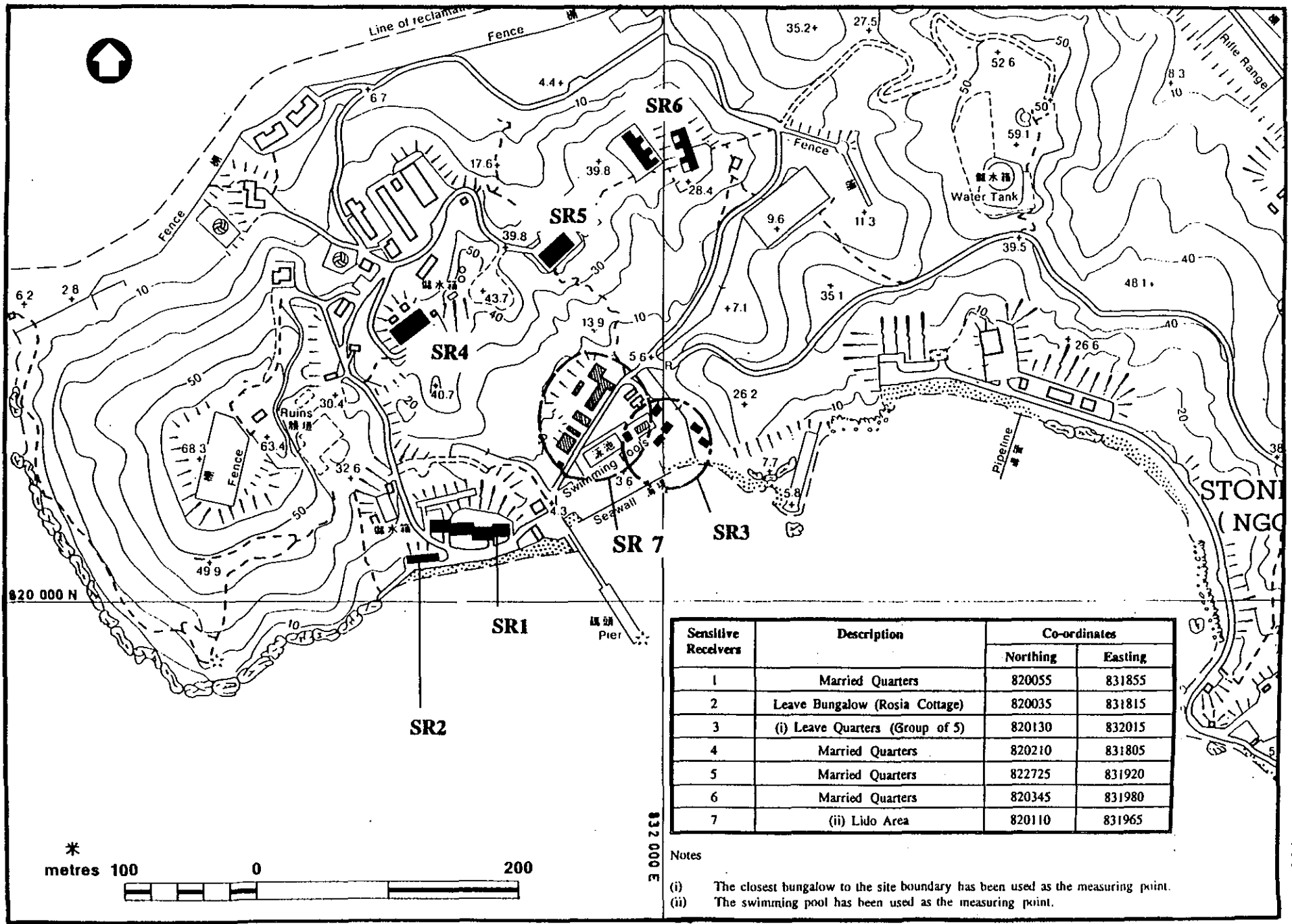
List of Land Facilities			
No.	Project Title	No.	Project Title
1	Guardroom, Receive and Despatch Room, Reception Room	13	Parade Ground
2	Office Block	14	Helipad
3	Quarters	15	Garage
4	Pier Lecture Block	16	Pier Godown
5	Pier Club	17	Vessels Repair Workshop
6	Main Hall	18	Boat Storage
7	Miscellaneous Services Room	19	Emergency Electricity Station and Working Room
8	Canteen, Kitchen, Food Store	20	Electricity Power Distribution Room
9	Clinic and Wards	21	Oil Depot and Working Room
10	Pier Duty Room	22	Signal Tower
11	Pier Lavatories	23	Main Road in the Basin Area
12	Pier/Kiosks/Pavilions/Covered Siting Out Area	24	Sewage Treatment Plant



NOTE : ALL DIMENSIONS ARE IN METRE



Proposed Development (Base Facilities) Scheme I
Figure 2



Location of Air and Noise Sensitive Receivers
 Figure 3