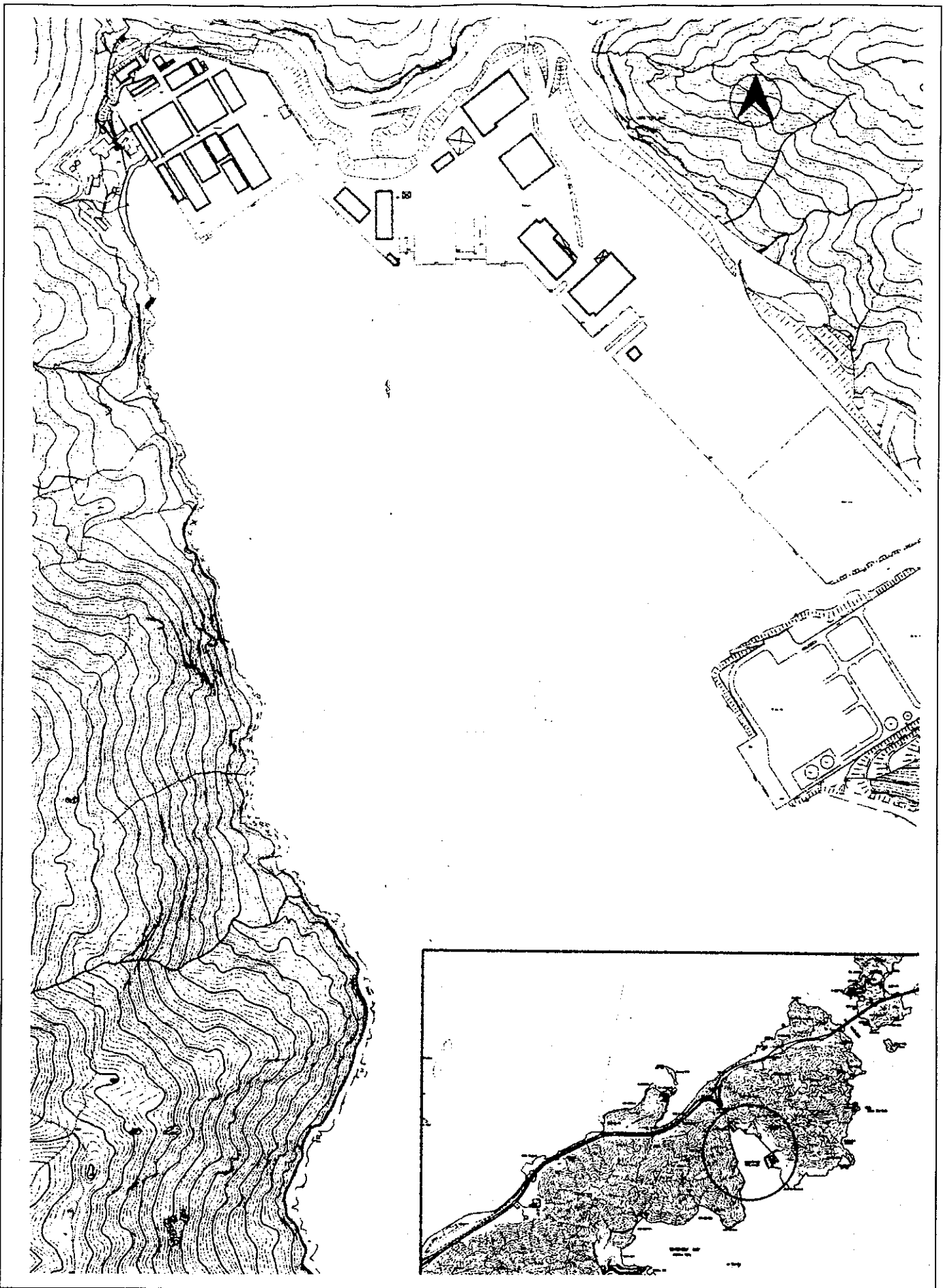
 <p>CIVIL ENGINEERING DEPARTMENT 土木工程署</p>	<p>Department of Planning and Development Planning and Development Department 香港房屋委員會 房屋規劃部</p>	<p>ASSESSMENT OF THE IMPACT OF THE PROPOSED DEVELOPMENT ON THE ENVIRONMENT 環境影響評估</p>	<p>SCALE 1:5000</p>	<p>VILLAGES IDENTIFIED WITHIN THE PROJECT AREA</p>	<p>Figure 1.3a THE CHONGHONG PROJECT</p>	<p>Scale 1:5000</p>	<p>DATE: 1988</p>
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CIVIL ENGINEERING
DEPARTMENT
土木工程署

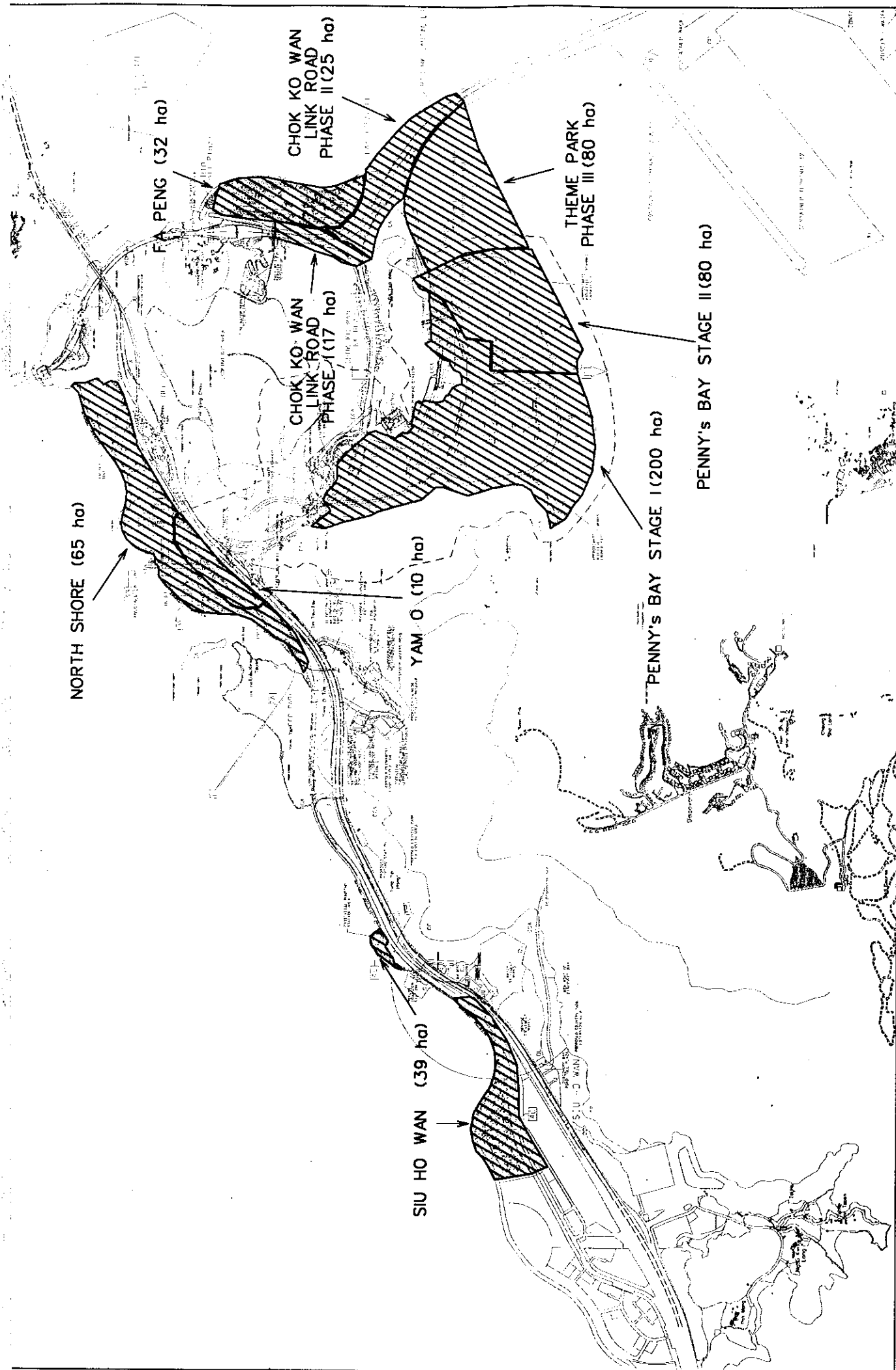
NORTHSHORE LANTAU DEVELOPMENT FEASIBILITY STUDY
CHEOY LEE SHIPYARD



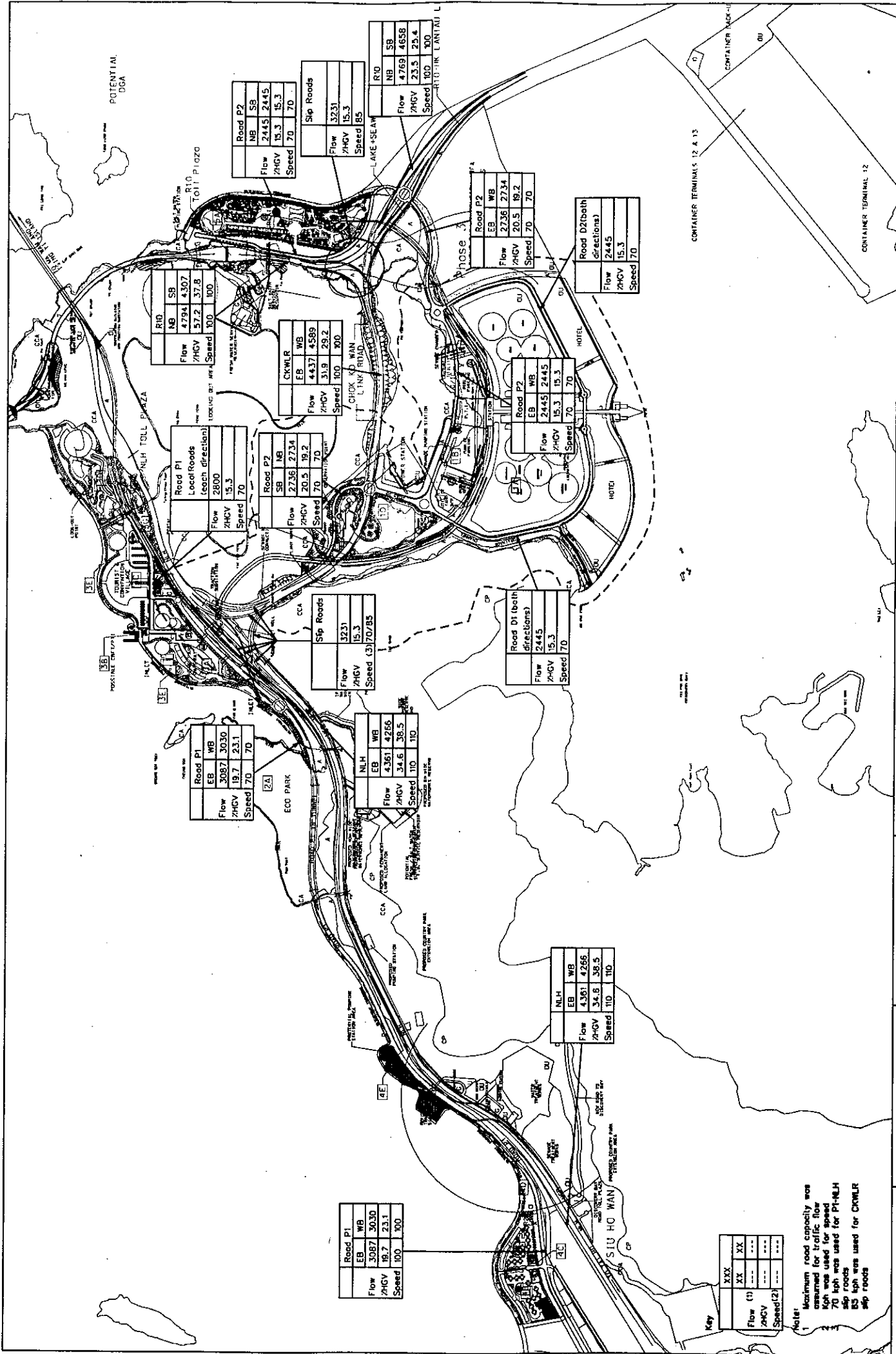
Scott Wilson (Hong Kong) Ltd
in association with City Planning Consultants,
ERM, Shankland Cox, Wilbur Smith Associates

File: C1819x3
Date: 26/02/00

FIG. 1.3b



 CIVIL ENGINEERING DEPARTMENT 土木工程署	Scott Wilson (Hong Kong) Ltd in association with City Planning Consultants and Environmental Consultants WSP PwC Architects	AGREEMENT NO. CE 6006 NORTH-SHORE LANTAU DEVELOPMENT FEASIBILITY STUDY	NLDPS RECLAMATIONS	Figure 18a File: C:\GIS\overhead\6006	Date: 22/02/00
	SCALE 1:4000				



Road P2	
NB	SB
Flow	4794 4307
7HGV	57.2 37.8
Speed	100 100

Slip Roads	
Flow	3231
7HGV	15.3
Speed	85

R/O	
NB	SB
Flow	4769 4658
7HGV	23.5 23.4
Speed	100 100

Road P2	
EB	WB
Flow	2736 2734
7HGV	20.5 19.2
Speed	70 70

Road D2(both directions)	
Flow	2445
7HGV	15.3
Speed	70

Road P1	
NB	SB
Flow	4794 4307
7HGV	57.2 37.8
Speed	100 100

CKWLR	
EB	WB
Flow	4437 4589
7HGV	31.9 29.2
Speed	100 100

Road P2	
EB	WB
Flow	2445 2445
7HGV	15.3 15.3
Speed	70 70

Road P1	
Local Roads (each direction)	
Flow	2800
7HGV	15.3
Speed	70

Road P2	
SB	NB
Flow	2736 2734
7HGV	20.5 19.2
Speed	70 70

Slip Roads	
Flow	3231
7HGV	15.3
Speed	43/70/85

Road D1 (both directions)	
Flow	2445
7HGV	15.3
Speed	70

Road P1	
EB	WB
Flow	3087 3030
7HGV	19.7 23.1
Speed	70 70

NLH	
EB	WB
Flow	4361 4268
7HGV	34.6 38.5
Speed	110 110

NLH	
EB	WB
Flow	4361 4268
7HGV	34.6 38.5
Speed	110 110

Road P1	
EB	WB
Flow	3087 3030
7HGV	19.7 23.1
Speed	100 100

XXX	XX
XX	XX
Flow (1)	...
7HGV	...
Speed(2)	...

Note:
 1. Minimum road capacity was assumed for traffic flow
 2. 70 kph was used for speed
 3. 70 kph was used for P1-NLH slip roads
 4. 85 kph was used for CKWLR slip roads

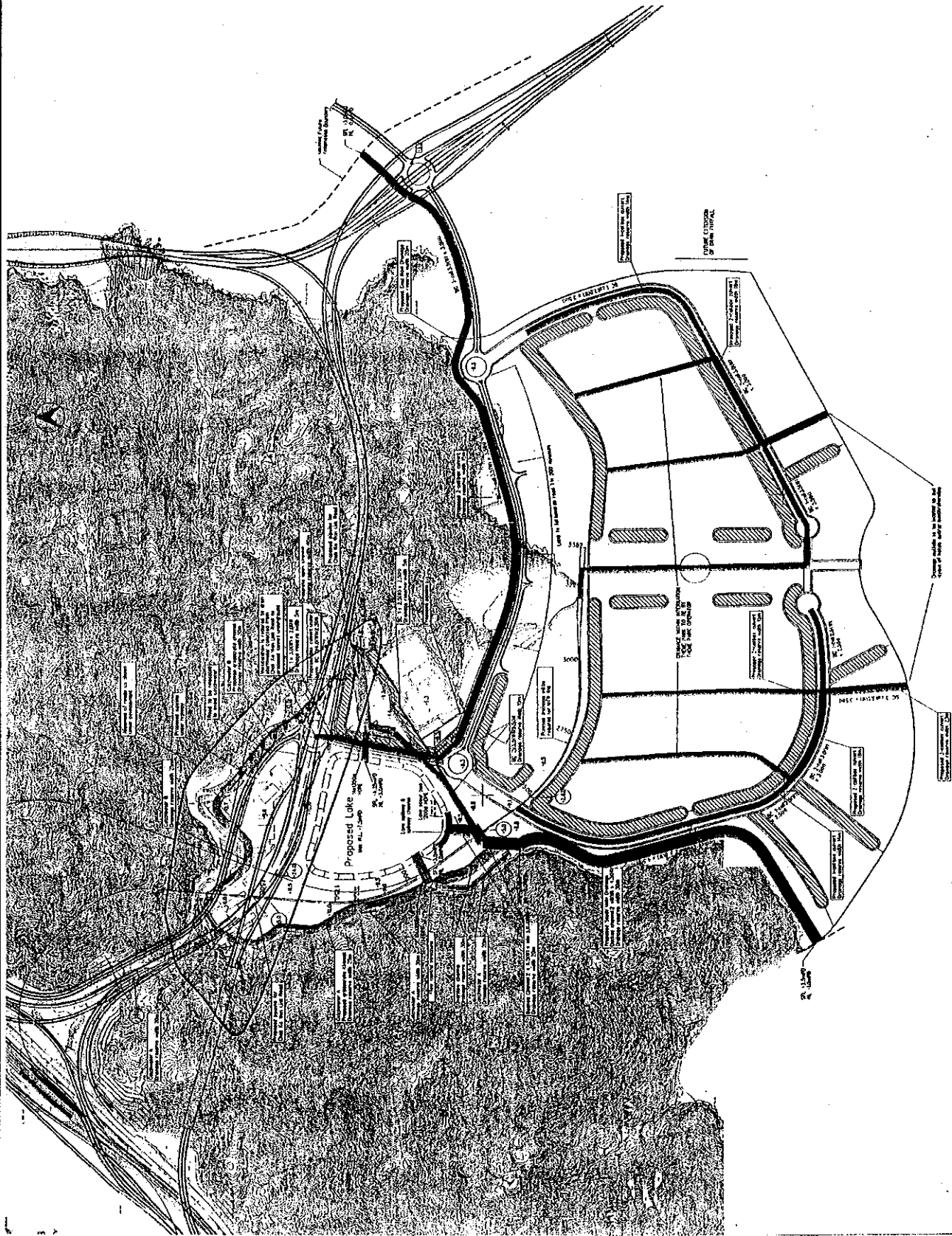


Figure 1.10a

File: C1819415 Date: 28/02/2000

DESIGN DRAINAGE LAYOUT FOR THEME
PHASE I AND PHASE II, AND ITS ASSOCIATED DEVELOPMENT

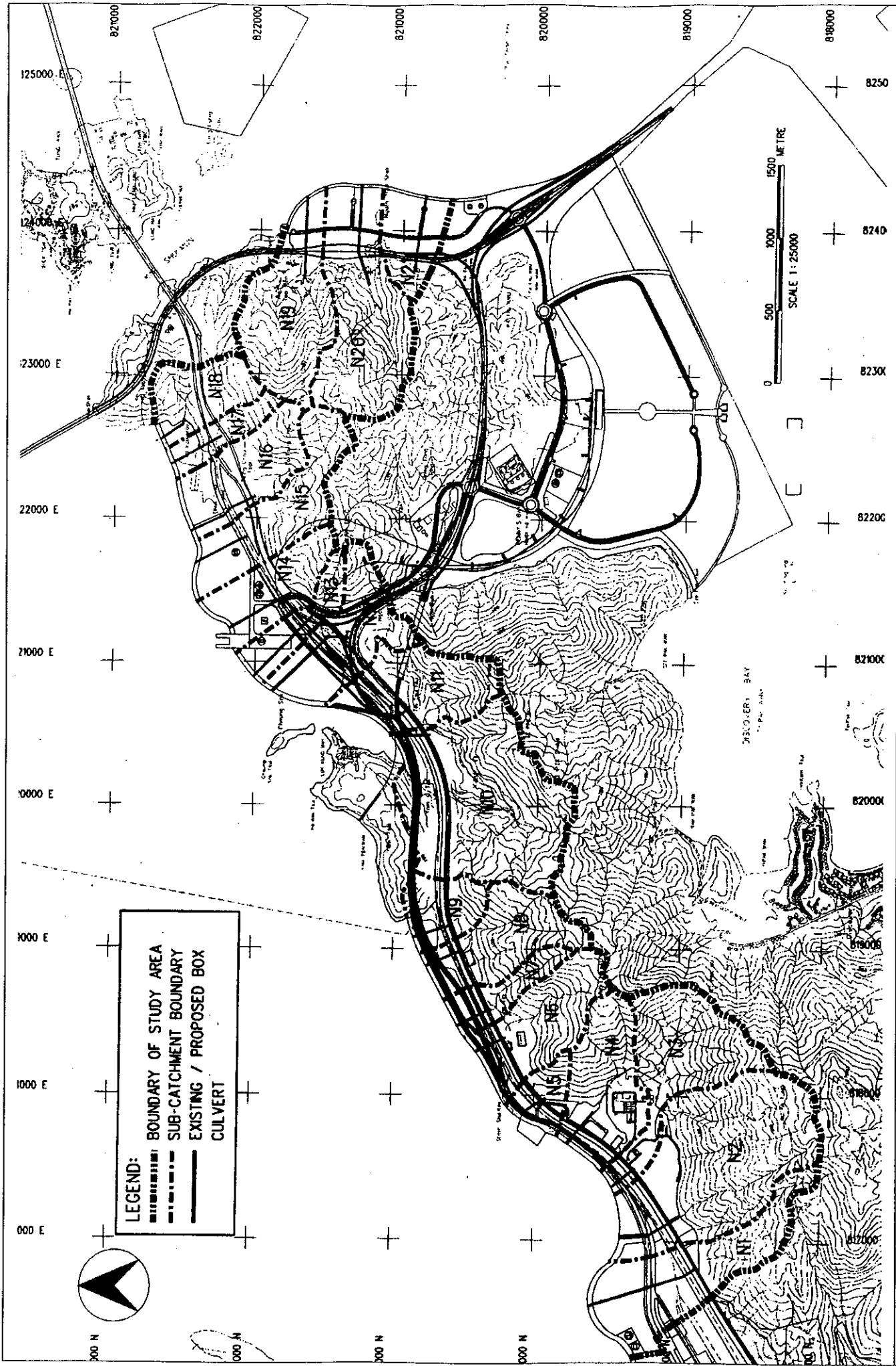
AGREEMENT NO. CE 8008
NORTH SHORE LANTAU DEVELOPMENT
FEASIBILITY STUDY



Scott Wilson (Hong Kong) Ltd
in Association with City Planning Consultants
ENR Hong Kong, Shanghai Co., Ltd.
Wahar South Associates

CIVIL ENGINEERING
DEPARTMENT
土木工程

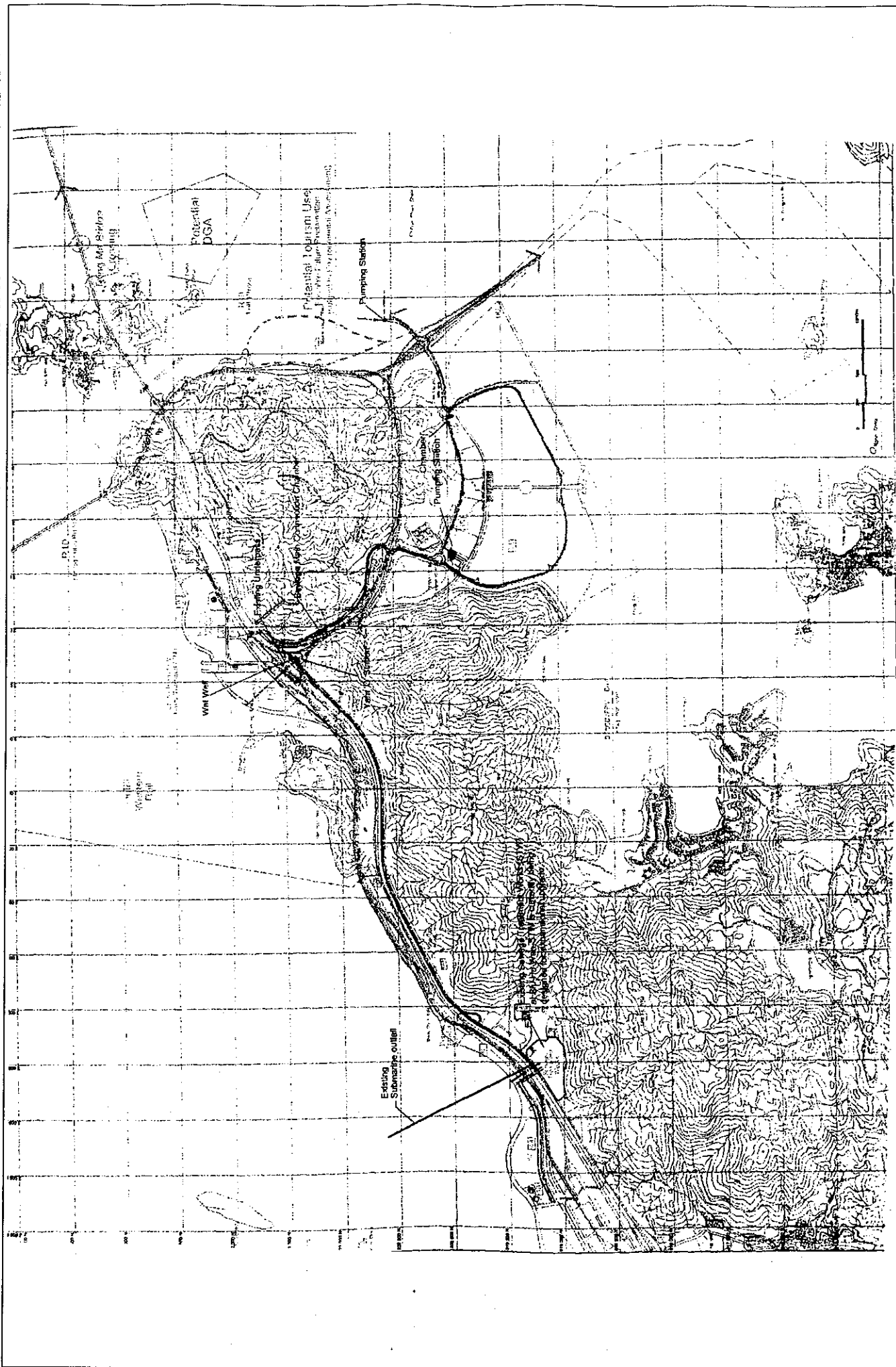




LEGEND:

- BOUNDARY OF STUDY AREA
- - - SUB-CATCHMENT BOUNDARY
- ▭ EXISTING / PROPOSED BOX
- CULVERT

0 500 1000 1500 METRE
SCALE 1:25000



CONCEPTUAL SEWERAGE LAYOUT PLAN

AGREEMENT NO. CE 8006
NORTHSHORE LANTAU DEVELOPMENT
FEASIBILITY STUDY



Scott Wilson (Hong Kong) Ltd.
Incorporated in Hong Kong
25/F, 26/F, 27/F, 28/F, 29/F, 30/F, 31/F, 32/F, 33/F, 34/F, 35/F, 36/F, 37/F, 38/F, 39/F, 40/F, 41/F, 42/F, 43/F, 44/F, 45/F, 46/F, 47/F, 48/F, 49/F, 50/F, 51/F, 52/F, 53/F, 54/F, 55/F, 56/F, 57/F, 58/F, 59/F, 60/F, 61/F, 62/F, 63/F, 64/F, 65/F, 66/F, 67/F, 68/F, 69/F, 70/F, 71/F, 72/F, 73/F, 74/F, 75/F, 76/F, 77/F, 78/F, 79/F, 80/F, 81/F, 82/F, 83/F, 84/F, 85/F, 86/F, 87/F, 88/F, 89/F, 90/F, 91/F, 92/F, 93/F, 94/F, 95/F, 96/F, 97/F, 98/F, 99/F, 100/F

CIVIL ENGINEERING
DEPARTMENT
土木工程署



Figure 1.10c



File: C1819X1a Date: 2002/00

Relevant Communication

Environmental Protection Department



環境保護署

Original copy NOT sent separately

Total no. of pages including this page: 1

TO :	ERM	FROM:	Raymond L. Y. LAI
(Attn: Mr. Jon Pyke)		OUR REF:	(78) in An(15) to EP1/G/42 XVI
YOUR REF:	123070\C1937	TEL NO.:	2835 1127
YOUR FAX NO.:	23676396	DATE:	17 December 1999
		OUR FAX NO.:	2591 0558

Dear Mr. Pyke,

Disney Rail Link - Noise Assessment

I refer to your fax dated 9.12.99

2. Confirmations from PlanD and CED (as proponent of Northshore Lantau Development Feasibility Study, NSLDFS) are required to ascertain any existing and planned NSRs in the relevant Outline Zoning/ Development / Layout plans, and in particular, the Theme Park. I understand that the landuse in NE Lantau may be subject to changes depending on the recommendations from the NLSDFS.

3. Please note that the last sentence of para. 3.8.2.2 of the Study Brief states that "Subject to the agreement of the Director, the area shall be expanded to include NSRs at larger distance which would be affected by the construction and operation of the proposed project.". Besides, page 6 of the Technical Memorandum For The Assessment of Noise From Places Other Than Domestic Premises, Public Places Or Construction Sites does not help locate the NSRs but determine the type of area within which the NSRs are situated. Further, the cumulative noise assessment would certainly require assessment of Luk Keng Tsuen. Therefore, we are of the view that Luk Keng Tsuen, which is located some 400 m away from Yam O Station, should be included as one of the NSRs under consideration

Regards,

(Raymond L. Y. LAI)

for Director of Environmental Protection

Scott Wilson	(Attn: Mr. A. Arul Kumarasan)	24289922
ERM	(Attn: Mr. Dave Ng)	27235660
CED	(Attn: Mr. M Y Tang)	27140103
DPO/SKIs, PlanD	(Attn: Mr. Teresa Chu)	28905194

Internal: S(NP)1 An(1) to EP CR 2/N9/O/65

Note: Disney Rail Link is the former name of Penny's Bay Rail Link.

Facsimile
message

C1937/36-3
Environmental
Resources
Management

To Raymond L Y Lai, Environmental Protection
Department

6/F, Hecny Tower
9 Chatham Road
Tsimshatsui, Kowloon
Hong Kong
Telephone: 2271 3106
Facsimile: 2367 6396
E-mail: jp@ermhk.com

Copied to Dr Frommer, MTRC
Mr M Y Tang, CED
Ms Terersa Chu, DPO/SKIs, PlanD

From Jon Pyke

Ref/Project number 123070\C1937

Subject Disney Rail Link EIA

Date 9 December 1999



Page 1 of 19

Dear Mr Lai

Thank you for your fax today which we assume, in the absence of any other response, is a consolidated reply to our letter dated 19 November 1999 (ref 121856\C1937) as well as 6 December 1999 (ref 122773/C1937).

We comment as follows using your paragraph numbers:

2. Please note that Disney Rail Link EIA is being prepared by MTRC. Nevertheless, PlanD and CED's EIA consultants have been consulted on any existing and planned NSRs in the relevant Outline Zoning/Development/Layout Plans, and in particular, the Theme Park.
3. We note that Study Brief 043 refers to railway noise assessment at Noise Sensitive Receivers within an "Assessment Area" defined as 300 m from the project. We confirm that sufficient information and data will be provided for cumulative assessment in the EIA and NSLD EIA.
5. We attached a plan showing an area defined 300 m from the boundary of the Disney Rail Link, copy of page 6 the Technical Memorandum For The Assessment of Noise From Places Other Than Domestic Premises, Public Places Or Construction Sites and plans showing Option A and Option B Recommended Outline Development Plans.
6. Please contact me immediately should you feel that you do not have sufficient information. We attach copies of our previous correspondence in this matter.

Please respond if you are not in agreement with the above.

CONFIDENTIALITY NOTICE

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Destination fax number 2591 0558, 2993 7743, 27140103, 28905194

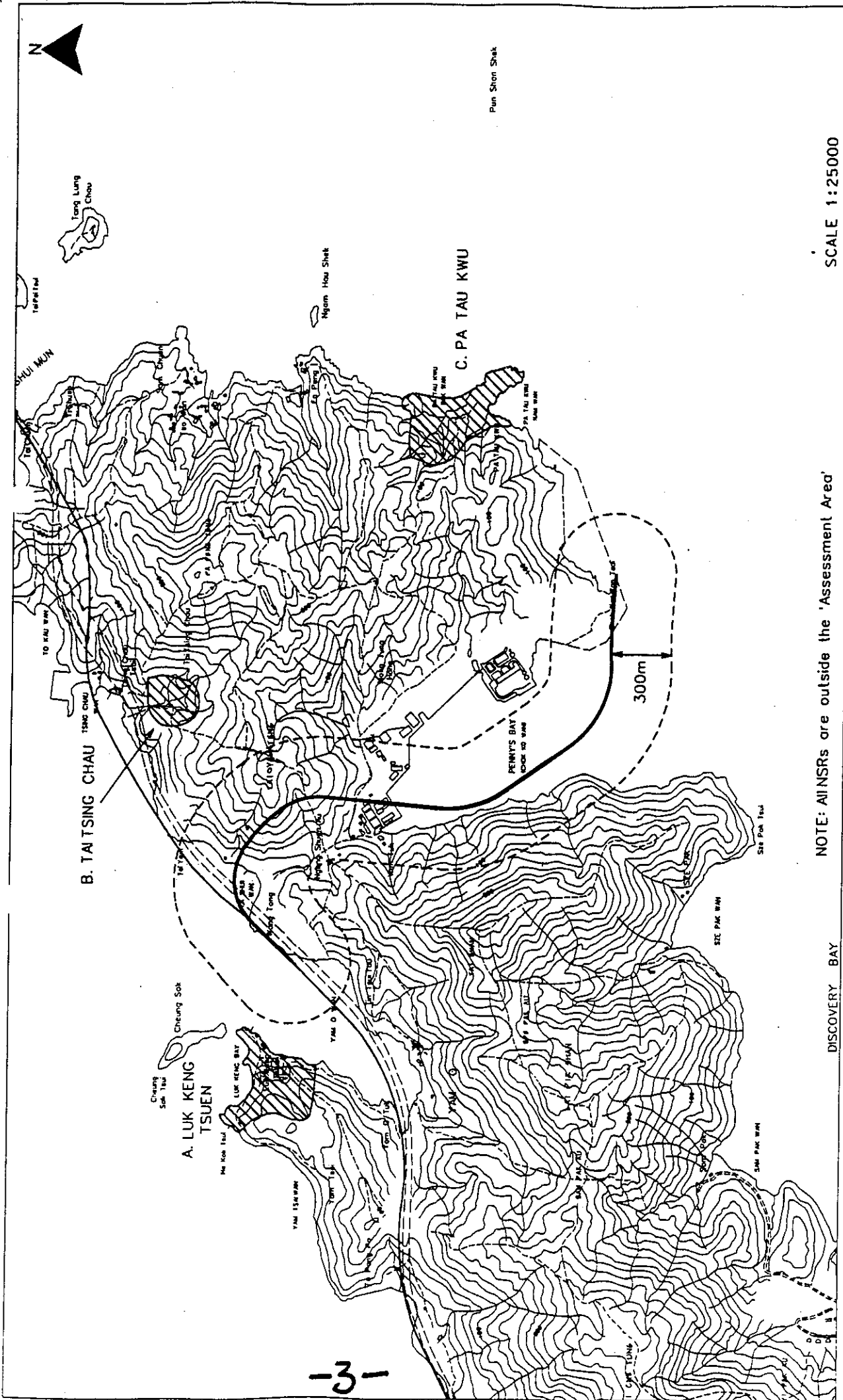
Facsimile
message

Regards,

JK Pyne.



In the interests of conserving resources, ERM's Christmas greetings can be found in electronic form on our home page, <http://www.ermhk.com>. We hope that you will join us in sharing our message of festive goodwill and sustaining the environment that we cherish as we enter the new millennium.



SCALE 1:25000

NOTE: All NSRs are outside the 'Assessment Area'

DISCOVERY BAY

LOCATIONS OF NSRS

FIGURE 5.4a

- (c) compare the Corrected Noise Level with the Acceptable Noise Level to determine if a Noise Abatement Notice may be issued (in accordance with Section 4).

2. DETERMINATION OF THE ACCEPTABLE NOISE LEVEL

2.1 General

The appropriate Acceptable Noise Level (ANL) for a particular Noise Sensitive Receiver (NSR) is dependent upon the character of the area within which the NSR is located, and the time of day under consideration.

The steps to be followed in determining an ANL are as follows:—

- (a) identify the NSR, in accordance with Section 2.2;
- (b) determine the Area Sensitivity Rating (ASR) of the area within which the NSR is located, in accordance with Section 2.3; and
- (c) determine the ANL from the appropriate table in Section 2.4, by reference to the ASR and the time period under consideration.

2.2 Location of the Noise Sensitive Receiver (NSR)

For the purpose of this Technical Memorandum 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 shall be considered to be a NSR. Any other premises or place, not being in the nature of either industrial or commercial premises, which is considered by the Authority to have a similar sensitivity to noise as the premises and places above shall also be considered to be a NSR. Any premises or place shall, however, be considered to be a NSR only when it is in use for its intended purpose.

2.3 Determination of the Area Sensitivity Rating (ASR)

2.3.1 General

The ASR is a function of the type of area within which the NSR is located and the degree of the effect on the NSR of particular Influencing Factors (IFs) as defined in Section 2.3.3. After a careful examination of the area under consideration and the effect of any IFs, the ASR may be determined from Table 1.

2.3.2 Type of area within which the Noise Sensitive Receiver (NSR) is located

The Authority shall have regard to an area of adequate size when determining the type of area within which the NSR is located in accordance with the descriptions in Table 1. Typically, in urban areas an area of 100 m radius around the NSR should be adequate, whereas in sparsely developed areas, such as rural districts, an area of 500 m radius or even more should be considered, depending upon the circumstances. Special factors may dictate that other distances should be used at the discretion of the Authority.

When determining the type of area within which the NSR is located the Authority should not generally take into account the presence of the premises or place from which the noise under investigation is emanating.

- R2 RESIDENTIAL ZONE 2
- R3 RESIDENTIAL ZONE 3
- O OPEN SPACE
- E EDUCATION
- G GOVERNMENT
- OU OTHER SPECIFIED USES
- LA AMENITY AREA
- CP COUNTRY PARK
- CA CONSERVATION AREA
- CCA COUNTRYSIDE CONSERVATION AREA
- PS PRIMARY SCHOOL
- SS SECONDARY SCHOOL
- BT BUS TERMINUS
- CP CAR PARK
- DP DIVISIONAL POLICE STATION
- DF DIVISIONAL FIRE STATION
- SD SD/DM1 STADIUM
- PT PETROL / LPG STATION
- HC HC/USE COLLECTION POINT
- PI PUBLIC TRANSPORT INTERCHANGE
- PA PLANNING AREA NUMBERS
- RA RAIL STATION
- RAIL RAILWAY
- WR WATERWORKS RESERVE
- R ROADS
- CT CYCLE TRACK
- KP FOOTPATH
- M MONORAIL

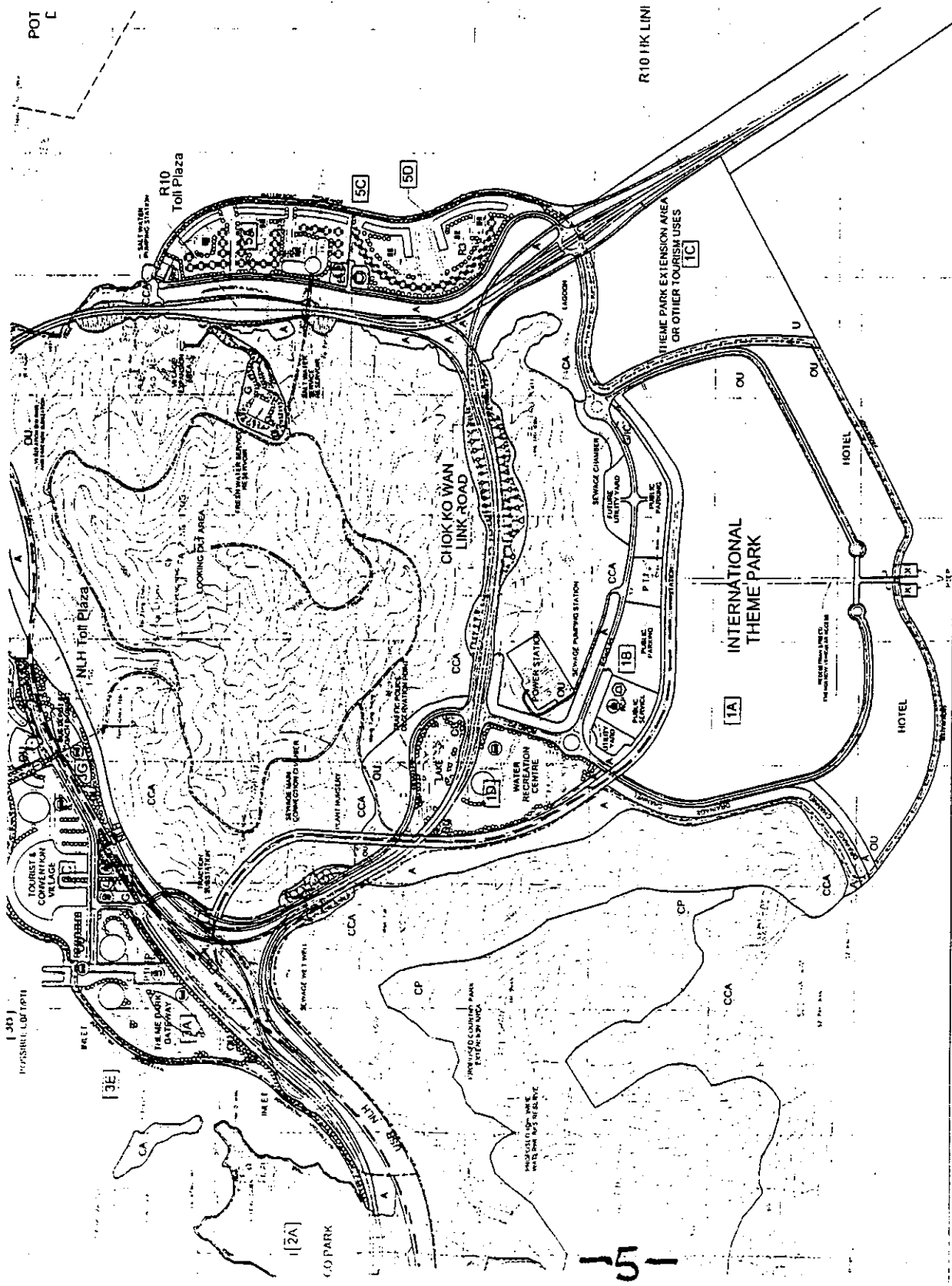


FIGURE 3.2a DRAFT RECOMMENDED OUTLINE DEVELOPMENT PLAN A

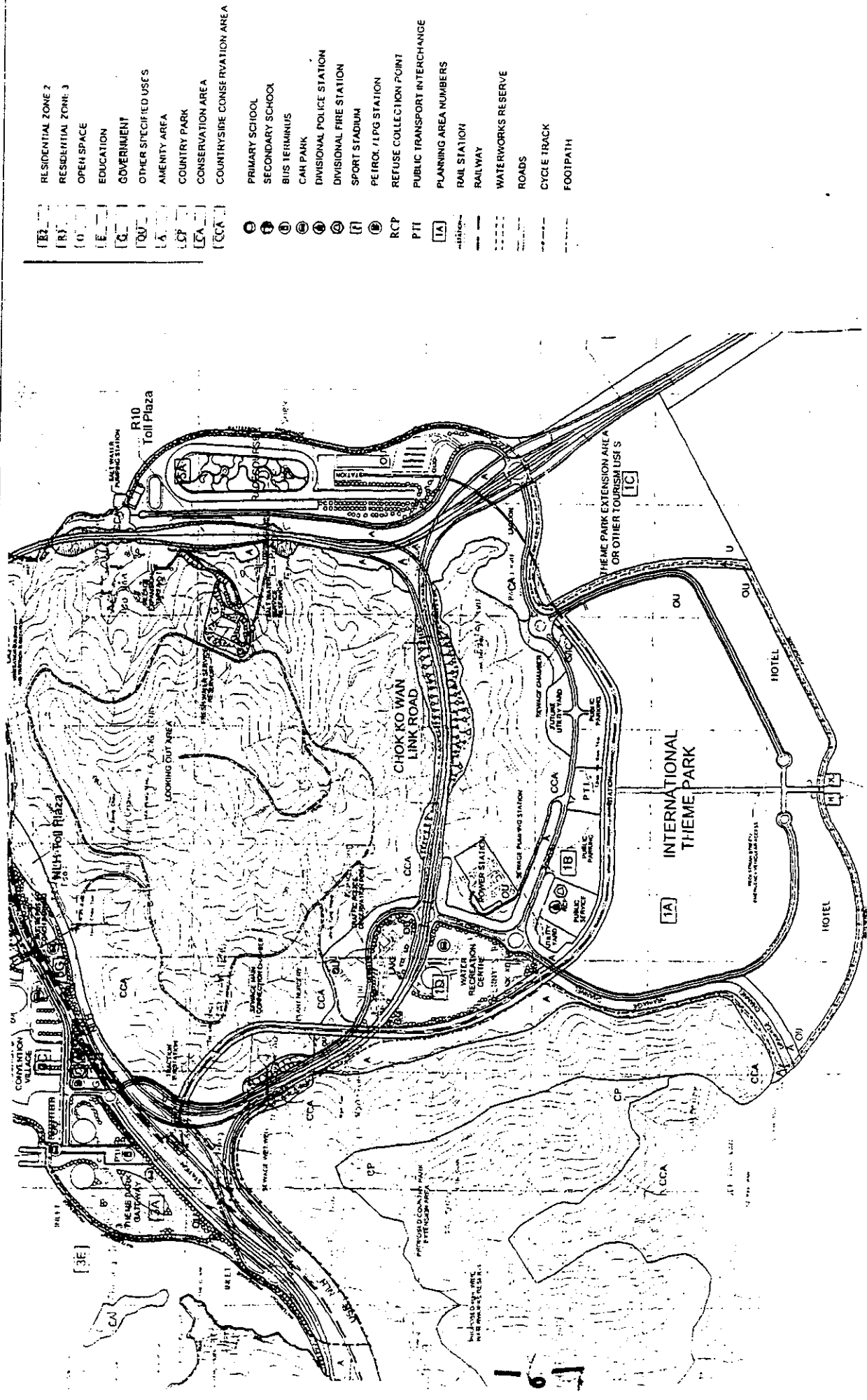
SUPERCEDED
Please see Figure 3.2a of the Main Report

FIGURE 3.2a

SUPERCEDED
Please see Figure 3.2a of the Main Report

DRAFT RECOMMENDED OUTLINE DEVELOPMENT PLAN B

FIGURE 3.2b



- [R2] RESIDENTIAL ZONE 2
- [R3] RESIDENTIAL ZONE 3
- [O] OPEN SPACE
- [E] EDUCATION
- [G] GOVERNMENT
- [OU] OTHER SPECIFIED USES
- [A] AMENITY AREA
- [CP] COUNTRY PARK
- [CA] CONSERVATION AREA
- [CCA] COUNTRYSIDE CONSERVATION AREA
- PRIMARY SCHOOL
- SECONDARY SCHOOL
- BUS TERMINUS
- CAH PARK
- DIVISIONAL POLICE STATION
- DIVISIONAL FIRE STATION
- SPORT STADIUM
- PETROL / LPG STATION
- REFUSE COLLECTION POINT
- PUBLIC TRANSPORT INTERCHANGE
- [A] PLANNING AREA NUMBERS
- RAIL STATION
- RAILWAY
- WATERWORKS RESERVE
- ROADS
- CYCLE TRACK
- FOOTPATH

Annex B

Construction & Operational Noise Assessment

Construction Noise Assessment

Penny's Bay Rail Link EIA						
Sound Power Level Evaluation						
A	YAO Station	PME	TM Identification Code	Unit	SWL	Sub-Total
1	Foundation (Concreting)	Concrete Lorry Mixer	CNP 044	2	109	112
		Poker Vibrator, Hand-held	CNP 170	6	113	121
		Concrete Pump	CNP 047	1	109	109
					Total:	122
2	Foundation (Formwork & Reinforcement)	Mobile Crane	CNP 048	1	112	112
		Air Compressor (air flow $\leq 10\text{m}^3/\text{min}$)	CNP 001	1	100	100
		Bar Bender	CNP 021	1	90	90
		Generator (standard)	CNP 101	1	108	108
					Total:	114
3	Excavation	Excavator/ Loader	CNP 081	2	112	115
		Lorry	CNP 141	3	112	117
		Air Compressor (air flow $\leq 10\text{m}^3/\text{min}$)	CNP 001	4	100	106
		Submersible Pump	Provided by MTRC	1	96	96
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122
					Total:	124
4	Station Construction	Hand-held Breaker (20kg \leq mass \geq 35kg)	CNP 025	2	111	114
		Air Compressor (air flow $\leq 10\text{m}^3/\text{min}$)	CNP 001	2	100	103
		Mobile Crane	CNP 048	1	112	112
		Lorry	CNP 141	1	112	112
		Poker Vibrator, Hand-held	CNP 170	6	113	121
		Concrete Lorry Mixer	CNP 044	3	109	114
		Tower Crane	CNP 049	2	95	98
		Hoist, material (electric)	CNP 122	1	95	95
		Concrete Pump	CNP 047	1	109	109
		Saw, circular, wood	CNP 201	1	108	108
					Total:	123
5	Sheet Piling for Protection on Existing Tracks/ Platforms	Sheet Piling (Hydraulic Vibratory Driver)	BS 5228:Part4:1992 1/ 53	1	118	118
					Total:	118
B	Tunnel Portal (Start-up Works)	PME	TM Identification Code	Unit	SWL	Sub-Total
1	Excavation	Excavator/ Loader (for Trench)	CNP 081	3	112	117
		Lorry	CNP 141	6	112	120
					Total:	122
2	Sheet Piling	Sheet Piling (Hydraulic Vibratory Driver)	BS 5228:Part4:1992 1/ 53	1	118	118
					Total:	118
3	Soil Nail Installation and Initial Tunnel Excavation	Air Compressor (air flow $\leq 10\text{m}^3/\text{min}$)	CNP 001	3	100	105
		Drilling Rigs	BS 5228:Part1:1992 C11/ 1	2	117	120
					Total:	120
4	Re-construction of Roads	Vibrating Roller	CNP 186	1	108	108
		Bulldozer	CNP 030	1	115	115
					Total:	116
5	Mechanical Rock Excavation	Breaker, excavator mounted (hydraulic)	CNP 028	2	122	125
					Total:	125

Penny's Bay Rail Link EIA						
Sound Power Level Evaluation						
C	Tunnel Works	PME	TM Identification Code	Unit	SWL	Sub-Total
1	Works at Tunnel Portal	Ventilation Fan	CNP 241	2	108	111
		Air Compressor (air flow > 30m ³ /min)	CNP 003	4	104	110
		Mobile Crane	CNP 048	1	112	112
		Forklift	BS 5228:Part1:1997 C7/ 95	1	122	122
		Batching Plant	CNP 022	1	108	108
		Lorry	CNP 141	1	112	112
					Total:	123
2	Removal of Spoil at Tunnel Portal	Excavator/ Loader	CNP 081	1	112	112
		Lorry	CNP 141	3	112	117
					Total:	118
3	Concrete Lining, Track Laying	Air Compressor (air flow > 30m ³ /min)	CNP 003	2	104	107
		Concrete Truck	CNP 044	4	109	115
		Excavator/ Loader	CNP 081	2	112	115
		Mobile Crane	CNP 048	1	112	112
		Concrete Pump	CNP 047	1	109	109
		Lorry	CNP 141	1	112	112
					Total:	120
D	At Grade Track	PME	TM Identification Code	Unit	SWL	Sub-Total
1	Surface Drainage Construction (including pumps to control water influx and the construction of flood protection barrier)	Air Compressor (air flow > 30m ³ /min)	CNP 003	2	104	107
		Bulldozer	CNP 030	1	115	115
		Dump Truck	CNP 067	2	117	120
		Crane/ vibrocompaction	by SW(HK)	1	112	112
		Excavator/ Loader	CNP 081	2	112	115
		Mobile Crane	CNP 048	2	112	115
		Lorry	CNP 141	1	112	112
		Water Pump (petrol)	CNP 282	8	103	112
		Concrete Truck	CNP 044	1	109	109
		Poker Vibrator, Hand-held	CNP 170	1	113	113
		Concrete Pump	CNP 047	1	109	109
					Total:	125
2	Track Laying	Diesel Locomotive	from West Rail	2	118	121
		Generator (standard)	CNP 101	1	108	108
		Lorry	CNP 141	1	112	112
					Total:	122

Penny's Bay Rail Link EIA						
Sound Power Level Evaluation						
E	DIS Station	PME	TM Identification Code	Unit	SWL	Sub-Total
1	Excavation	Excavator/ Loader	CNP 081	3	112	117
		Lorry	CNP 141	8	112	121
		Generator (standard)	CNP 101	2	108	111
						Total:
2	Foundation (Concreting)	Concrete Lorry Mixer	CNP 044	2	109	112
		Poker Vibrator, Hand-held	CNP 170	6	113	121
		Concrete Pump	CNP 047	1	109	109
						Total:
3	Foundation (Formwork & Reinforcement)	Mobile Crane	CNP 048	1	112	112
		Air Compressor (air flow $\leq 10\text{m}^3/\text{min}$)	CNP 001	1	100	100
		Bar Bender	CNP 021	1	90	90
		Generator (standard)	CNP 101	2	108	111
						Total:
4	Station Construction	Hand-held Breaker (20kg \leq mass \geq 35kg)	CNP 025	4	111	117
		Air Compressor (air flow $\leq 10\text{m}^3/\text{min}$)	CNP 001	4	100	106
		Lorry	CNP 141	1	112	112
		Poker Vibrator, Hand-held	CNP 170	6	113	121
		Concrete Lorry Mixer	CNP 044	3	109	114
		Tower Crane	CNP 049	1	95	95
		Mobile Crane	CNP 048	2	112	115
						Total:
F	Ventilation Building	PME	TM Identification Code	Unit	SWL	Sub-Total
1	Building Foundation	Air Compressor (air flow $> 30\text{m}^3/\text{min}$)	CNP 003	2	104	107
		Breaker, Hand-held, mass $> 35\text{kg}$	CNP 026	3	114	119
		Concrete Lorry Mixer	CNP 044	4	109	115
		Dump Truck	CNP 067	2	117	120
		Excavator/ Loader	CNP 081	2	112	115
		Generator (standard)	CNP 101	1	108	108
		Piling, Large Diameter Bored, Grab and Chisel	CNP 164	1	115	115
		Poker Vibrator, Hand-held	CNP 170	1	113	113
				Total:	125	
2	Building Superstructure	Air Compressor (air flow $> 30\text{m}^3/\text{min}$)	CNP 003	1	104	104
		Concrete Lorry Mixer	CNP 044	4	109	115
		Excavator/ Loader	CNP 081	2	112	115
		Mobile Crane	CNP 048	2	112	115
		Generator (standard)	CNP 101	1	108	108
		Poker Vibrator, Hand-held	CNP 170	1	113	113
				Total:	121	

Operational Noise Assessment Results

PBRL EIA									
ERM Rail Noise Model - Output Table Results									
NSR	Description	Leq Hard Ground	Leq Soft Ground	Leq with Barriers	Lmax Hard Ground	Lmax Soft Ground	Lmax with Barriers	Distance	
A	Luk Keng Tsuen	44.96604706	39.19808538	44.96604706	55.21937659	59.6314859	55.21937659	498.4361143	
B	Country Park	50.31051352	41.6170857	50.31051352	59.9641544	52.94752978	59.9641544	464.2746351	
C	Country Park	55.67456918	48.01539748	55.67456918	65.02787124	59.42130617	65.02787124	281.8962894	
D	Country Park	49.06748603	40.32594978	48.05792522	56.65303422	49.47600443	56.65303422	665.6259911	
E	Theme Park	66.32756096	62.50951744	45.42756096	78.3326013	76.52083634	57.4326013	54.7693832	
F	Theme Park	66.70865664	63.08943349	45.80865664	78.93714828	77.36774646	58.03714828	48.65086062	
G	Theme Park	63.95281122	58.66160278	43.05281122	74.3940091	71.11909607	53.4940091	51.71012191	

Annex C

Construction Dust Emission Factors Evaluations

Penny's Bay - Evaluation of Dust Emission Factors

(I) Details of Site Activities			
Volume of Spoil to be handled (m ³)	68500		
Construction Period (major earth works) (months)	18		
Material Handling Rate (m ³ /day)	110		
Wt. of Material Handling per second (Mg/s)	4.94E-03		
Site Traffic (veh/day)	20.0		
Assumed Blasting Area (m ²)	36.00		
Worksite Area of Yam O Station (m ²)	1.29E+05		
Worksite Area of Disney Station (m ²)	9.38E+04		
Worksite Area of Portal (m ²)	4.13E+04		
Worksite Area of Alignment (m ²)	6.69E+04		
Total Worksite Area (m ²)	3.30E+05		
(II) Parameters Used in Calculation of Dust Emission Factor			
Parameters	Code	Unit	Remark
Particle Size Multiplier	k	10	for TSP, haul road
Particle Size Multiplier	k	0.74	for TSP, aggregate handling
Mean Vehicle Speed	Sp	10	km/hr
Mean Number of Wheel	w	10	
Mean Vehicle Weight	W	12.5	Mg
Number of Days with at least 0.254 mm ppt.	p	182	days
Mean Wind Speed	U	1	m/s
Material Moisture Content w/o Watering	M	10	%
Silt Content of Road Surface	s	18	%
Density		1.94	Mg/m ³
(III) Calculation of Dust Emission Rates			
Activities	Values	Units	Equations
Material Handling	4.4632E-02	g/Mg	$k(0.0016)[(U/2.2)^{1.3}][f(M/2)^{1.4}]$
	2.5054E-04	g/s	
Haul Road	2.4967E+02	g/VKT	$k(s/12)^{0.8} (W/3)^{0.5} \times 281.9 / (M/0.2)^{0.4}$
	1.3871E-03	g/m/s	
Wind Erosion	8.5000E+05	g/hectare/year	0.85
Batching Plant	1.6400E+02	g/Mg	0.164
Blasting	4.7520E+01	g/blast	$0.00022A^{1.5}$
			(unit used in Equation)
			kg/Mg
			Section 13.2.4-4
			kg/VKT
			Section 13.2.2-1
			Mg/hectare/year
			kg/Mg
			Section 11.12-3
			kg/blast
			Section 11.9-5
			Table 11.12-1
			Table 11.9-1

emission rate

Annex D

Environmental Monitoring and Audit Manual

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1.1 PURPOSE OF THE MANUAL

This Environmental Monitoring and Audit (EM&A) Manual has been prepared by ERM as a supplementary document to the *Penny's Bay Rail Link Environmental Impact Assessment*, ERM-Hong Kong, Ltd, December 1999.

The purpose of the EM&A Manual is to provide information, guidance and instruction to personnel charged with environmental responsibilities and undertaking environmental monitoring or audit work during the construction and operational phases of Mass Transit Railway Corporation's (MTRC) *Penny's Bay Rail Link*. It provides systematic procedures for the monitoring and auditing of potential impacts that may arise from the works.

1.2 BACKGROUND TO THE STUDY

The Civil Engineering Department (CED) undertook the Northshore Lantau Development Feasibility Study (NSLDFS) (Agreement No CE 60/96) in June 1999. The study consisted of two Preliminary Outline Development Plans (PODPs) for the Northshore Lantau Development (NSLD) and Chok Ko Wan Link Road (CKWLR), which confirmed the environmental feasibility of developing the areas for tourism and recreation, as endorsed by the Committee on Planning Development (CPLD) in March 1999.

The MTRC commissioned ERM-Hong Kong to prepare an Environmental Monitoring and Audit (EM&A) Manual, as part of the *Penny's Bay Rail Link (PBRL) EIA*. The EIA has highlighted the potential impacts from the construction and operation of the PBRL and outlined the potential EM&A requirements. This EM&A Manual provides further detail of the specific EM&A requirements that have been recommended to be implemented during the construction and operation of PBRL. In particular, the requirements for ensuring compliance with the mitigation measures specified for noise, dust, water quality, waste management, and landscape and visual impacts are defined. The scope of this Manual is restricted to the EM&A requirements which are directly associated with the development of the PBRL. The impacts and EM&A requirements for the main Theme Park and other associated infrastructure are addressed in the separate *Theme Park EIA* and *EM&A Manual*.

1.2.1 Previous Reports

Relevant background information on the study may be found from the following sources;

- Disney Rail Link : Environmental Assessment (*June 1999, ERM*)

- Northshore Lantau Development Feasibility Study (Agreement No CE 60/96) (*Scott Wilson(Hong Kong) Ltd*)
- Penny's Bay Reclamation-Design and Construction (Agreement No CE 18/98) Environmental Review (*March 1999, ERM*)
- Contract CE 11/93 Lantau Port Development Stage 1: Container Terminals No. 10 & 11 Ancillary Works [Design] EIA - (*December 1994, Halcrow Asia Partnership Ltd*)
- Contract CE 50/94 Lantau Port Development Stage 1: Design of Reclamation and Edge Structures for Container Terminals 10 and 11 and Back-up Areas EIA- (*August 1995, Maunsell Consultant Ltd*)
- The Lantau Port Development - Stage 1 Container Terminals Nos. 10 & 11 Ancillary Works (Design); Environmental Monitoring and Audit Manual - (*July 1995, Halcrow Asia Partnership Ltd*)

1.2.2

Proposed Works

The MTRC is proposing to build a new railway linking the existing Tung Chung Line at Yam O to the site of the proposed new Disney Theme Park at Penny's Bay.

The proposed PBRL will be approximately 3.6 km in length, and will run from a new station at Yam O, constructed adjacent to the existing Tung Chung line, to a new Disneyland Rail Station located on reclaimed land at Penny's Bay.

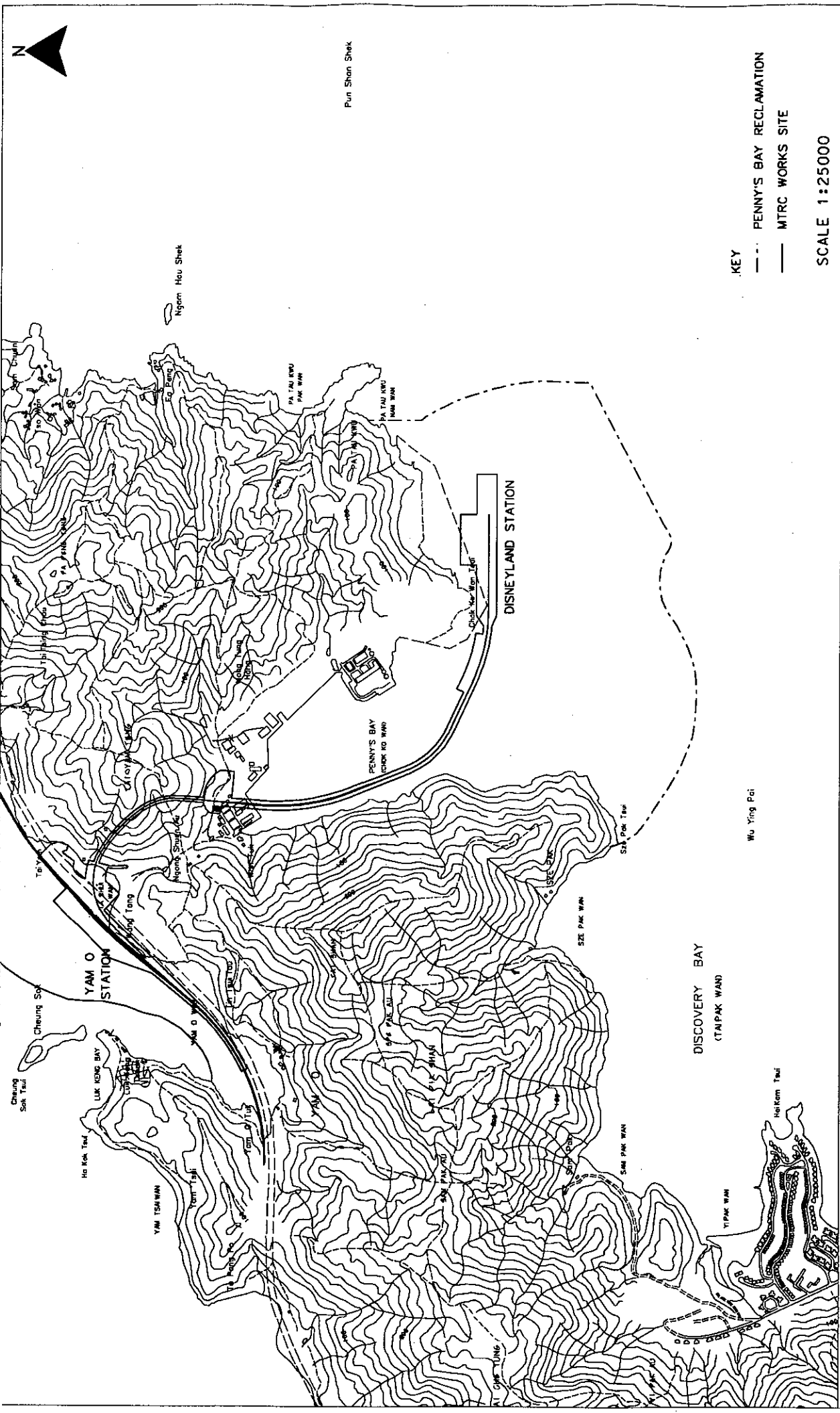
The PBRL will comprise a single track running from a new platform at Yam O Station along the Tung Chung line before passing under the existing Tung Chung and Airport Express formation and the North Lantau Expressway and into a 100-metre length of cut and cover tunnel. The PBRL will then enter a 750 metre long(drill and blast), single cell, horse-shoe tunnel to pass below the central hills of Lantau and emerge to the north of Penny's Bay. A passing loop will be constructed to the south of the portal before the PBRL enters the new Disneyland Station. The station will be built on the Penny's Bay reclamation and will comprise of a single platform. The majority of the line will be constructed at grade, although, portions of the track will be in cutting in the vicinity of Yam O Station.

The project area and route of the alignment are shown in *Figure 1.2a*.

1.3

OBJECTIVES OF THE ENVIRONMENTAL MONITORING AUDIT & PROGRAMME

The construction and operational impacts resulting from the implementation of the PBRL are specified in the Environmental Impact Assessment Report



Pun Shan Shek

Ngam Hau Shek

KEY

--- PENNY'S BAY RECLAMATION

— MTRC WORKS SITE

SCALE 1:25000



Environmental Resources Management

PROJECT AREA & ROUTE OF PBRL

FIGURE 1.20

(EIA). The EIA also specifies the mitigation measures that need to be implemented to ensure compliance with the required environmental criteria; these mitigation measures, and their implementation requirements, are presented in the Implementation Schedule (IS) contained in *Annex E*. In order to ensure that these mitigation measures are fully and effectively implemented, the EIA recommends that EM&A is undertaken for noise, air, water, waste, and landscape and visual issues.

This PBRL EM&A Manual provides specific details of the environmental monitoring and audit requirements that have been recommended to ensure compliance with the mitigation measures specified in the EIA.

The main objectives of the EM&A programme are:

1. To monitor the performance of the Project and the effectiveness of mitigation measures;
2. To provide an early indication should any of the environmental control measures or practices fail to achieve the acceptable standards;
3. To take remedial action if unexpected problems or unacceptable impacts arise;
4. To determine project compliance with regulatory requirements, standards and government policies; and
5. To verify the environmental impacts predicted in the Environmental Impact Assessment.

1.4

THE SCOPE OF THE ENVIRONMENTAL MONITORING AND AUDIT PROGRAMME

The scope of this EM&A programme is to:

- Implement inspection and audit requirements for noise, air and water quality, and waste management issues;
- Liaise with, and provide environmental advice (as requested or when otherwise necessary) to construction site staff on issues arising from the construction of the Project;
- Check and quantify the Contractor's overall environmental performance, and remedial actions taken to mitigate adverse environmental effects as they may arise from the works;
- Conduct regular site inspections of a formal or informal nature to assess:
 - the level of the Contractor's general environmental awareness;
 - the Contractor's implementation of the recommendations in the EIA;
 - the Contractor's performance as measured by the EM&A;
 - the need for specific mitigation measures to be implemented or the continued usage of those previously agreed; and
 - to advise the site staff of any identified potential environmental issues;
- Submit EM&A reports, on a three monthly basis, which summarise the acceptability or otherwise of any environmental impacts and identification or assessment of the implementation status of agreed mitigation measures.

Following this introductory Section, the remainder of the Manual is set out as follows:

- *Section 2* outlines the wider aspects of Environmental Management which should be employed during construction to minimise environmental impacts;
- *Section 3* presents the organisation and structure of the Environmental Team, outlines the various parties involved in the EM&A process, the responsibilities and contact details of key individuals;
- *Section 4* sets out the EM&A general requirements;
- *Section 5* details the audit procedures with regard to noise;
- *Section 6* details the audit procedures with regard to air quality;
- *Section 7* details the audit procedures with regard to water quality;
- *Section 8* details the audit procedures with regard to waste management issues;
- *Section 9* details the audit procedures and key locations with regard to landscape and visual issues;
- *Section 10* describes the scope and frequency of site auditing;
- *Section 11* details the EM&A reporting requirements; and
- *Annex E* of the main PBRL EIA Report presents the summary of mitigation measures recommended in the Environmental Review in the form of an Implementation Schedule.

2.1**INTRODUCTION**

The management of the construction phase of the PBRL will be undertaken in line with an EM&A procedure which has been agreed with Government. The EM&A process will seek to ensure that the works are carried out in a manner which meet all legal, contractual and environmental commitments.

Past experience with projects of this nature has revealed that the implementation of EM&A procedures tends to result in an over-reliance on the process, and on mitigating impacts *after* they are identified. To complement the EM&A process, a level of proactivity is required which seeks to minimise the incidence of environmental problems. This can be referred to as an Environmental Management System (EMS) approach and is based upon the specification of a number of management mechanisms, processes and organisational arrangements including the EM&A programme. A wider environmental management system approach, if adopted, should draw upon all available environmental documentation and particularly the following:

- *The Penny's Bay Rail Link EIA; and*
- *Penny's Bay Reclamation Environmental Review.*

In developing and formalising an environmental management approach, a number of documents, procedures and systems can be used. The role and environmental management function that each of these elements plays is discussed below.

2.2**PENNY'S BAY RAIL LINK EIA**

The PBRL EIA document provides an assessment of the predicted scope and extent of likely impacts resulting from the construction and operation of the railway. Mitigation recommendations are subsequently drawn up to ensure that the environmental quality objectives are met. The recommendations from the EIA are summarised in the form of an Implementation Schedule (IS). The IS provides the primary means by which the EIA recommendations are transferred from the planning phase to the construction and later the operational phases of the project.

An integral part of these recommendations is the requirement to undertake an EM&A process to verify the level of environmental performance achieved and the effectiveness of the recommended mitigation measures.

The EM&A programme provides the means by which feedback on the environmental impacts of the construction and operational phases are provided to the Contractor, the Client and the Environmental Protection Department (EPD).

A draft EM&A Manual is submitted at the time of the EIA and provides an outline of the likely monitoring and auditing protocols and requirements which will be necessary to achieve the objectives of the EM&A. This includes a description of the organisational arrangements required for the EM&A programme, stipulation of the scope of any necessary construction monitoring (e.g. for noise, air, water etc), the parameters to be measured (e.g. $L_{Aeq,30min}$, Total Suspended Particulates, Suspended Solids, etc.), the frequency of monitoring and the actions to be taken in the event of exceedances of the environmental criteria being recorded. In this case, for the implementation of the PBRL, there are no construction monitoring requirements for the Project, and so the EM&A programme will be restricted to reviewing and assessing the Contractor's environmental performance and compliance with relevant legislation through the site inspection and auditing procedures. This EM&A programme also outlines guidelines for site inspections as a means of identifying and resolving problems, and the associated reporting requirements.

This draft EM&A Manual should be reviewed (as necessary) during the detailed design stage of the project if it is determined, or anticipated, that substantial changes to the extent or scope of the project may occur which could have an influence on the Project's environmental performance. In this instance, it is customary that a revised assessment and EM&A Manual are produced to maintain the relevance of the EM&A process to the Works. The same process should also be followed on award of the project.

CONTRACTUAL DOCUMENTATION

The contractual documentation produced for all MTRC construction projects includes specific reference to environmental requirements that the Contractor is bound to comply with. These requirements have been developed and successfully implemented during the construction phase of numerous projects including the LAR and TKO. With proper enforcement, MTRC's contractual environmental requirements provide a robust means of ensuring a high level of environmental performance.

The key element included in MTRC's contractual documentation, and a key means of ensuring good on-site environmental performance, is the requirement to prepare, implement and maintain an Environmental Management Plan (EMP). The EMP places a contractual responsibility for on-site environmental management with the Contractor, thereby focussing his attentions upon this important element of the Works.

The contractual requirement for an EMP includes the need for the Contractor to detail the relevant statutory and contractual environmental obligations, the means by which he will supervise, monitor and audit his site assurance system to ensure compliance with these obligations, the predicted impacts and specific mitigation proposals, the environmental responsibilities of the site team and the means of communication.

Consideration should be given to defining appropriate contractual mechanisms for ensuring compliance with the contractual environmental requirements. Such mechanisms could include provisions for suspending works pending the remediation of persistent environmental problems, or, the inclusion of environmental performance milestone payments which can act as a means of enhancing the environmental performance and encouraging the Contractor to meet these contractual obligations.

2.5

ENVIRONMENTAL MANAGEMENT PLANS

The production of an EMP is a contractual requirement within MTRC's contractual documentation. The EMP is a document that defines the management framework by which the Contractor will effectively implement and report upon his environmental management of the Works and any associated environmental monitoring/auditing.

An EMP is similar in nature to a quality plan and provides details of the means by which the Contractor (and all subcontractors working to the Contractor) will implement the recommended mitigation measures and achieve the environmental performance standards defined in Hong Kong environmental legislation, the contract and in the EIA documentation. The primary reason for adopting the EMP approach is to make the Contractor aware of his environmental responsibilities and to be pro-active about the commitment to achieve the standards specified, rather than relying on the EM&A programme.

2.6

CONSTRUCTION METHOD STATEMENTS

It is common practice for the Contractor to submit details of forthcoming works to the Engineer to seek approval for the commencement of the works as well as the methodology and equipment proposed to be used.

The broad environmental controls for the Contract will be defined in the EMP, however, as a means of further focussing the Contractor's attention on the potential environmental impacts from specific, forthcoming items of work, it is recommended that the construction method statements include reference to the specific environmental controls required for the item of work under consideration. Further, the Contractor's Environmental Manager should comment on any deviations of the Works from the construction methods assumed in the project EIA and advise on the implications for achieving the environmental performance criteria set out in the EIA documentation and the EMP.

This ongoing requirement for the Contractor to review proposed working methods, in terms of their potential to impact upon the environment, would reduce the time taken to implement the necessary environmental control measures and reduce the number of iterations a measure may have to go through before becoming effective.

Any changes in construction methods will need to be reflected in a revised EMP or the Contractor will be required to demonstrate the manner in which the existing EMP shall accommodate the proposed changes.

2.7

ENVIRONMENTAL PERFORMANCE REVIEWS

The environmental performance review programme should comprise the regular assessment of the effectiveness of the EMPs, site practices and procedures to ensure that the required mitigation measures are routinely implemented and that they are being effective in achieving the required environmental standards.

The criteria against which the review should be undertaken should be derived from the EMP requirements, the contractual environmental requirements and, if appropriate, relevant sections of the Contractor's works method statement.

The review protocols, which should be developed prior to the commencement of works, should focus on the *effectiveness* of the implemented measures in achieving their purpose, and not simply the fact that a measure has been implemented.

The protocols should comprise checklists of environmental requirements and should be amended as necessary throughout the construction phase, to focus on areas of previous non-compliance and to reflect the potential impacts associated with specific activities within the construction programme.

2.8

ELECTRONIC QUALITY PERFORMANCE MONITORING SYSTEM

The use of MRTC's "*Electronic Quality Performance Monitoring System*" (EQPMS) provides a rapid and effective method of communicating a sites' environmental status, as well as serving as a management tool for the Contractor. The system has the potential to interface with EPD's "*Specialised Electronic Environmental Monitoring and Audit*" (SEEMA) system and so function as a database for the entry of all recorded monitoring and audit information. In addition, the system could:

- store details of complaints;
- store details of licenses/permits and notify forthcoming expires;
- store construction activity details and other relevant site information and link these to the EM&A Implementation Schedule; and

- allow retrieval and of electronic versions of the EM&A Manual and other documents.

2.9

SUMMARY

The environmental management concepts described above have evolved from previous experiences in implementing large scale EM&As in Hong Kong, and from MTRC's own contractual environmental management requirements developed during the implementation of Projects including the LAR and TKO Extension. Experience has shown that in order to harness the full potential of the EM&A process, a number of complementary procedures and tools should be adopted in order to fulfil the wider objectives of the process which include the preservation of the environment.

The uptake and specification of these procedures within the appropriate documents would facilitate a greater level of environmental management and responsibility to be achieved, however, the adoption of some or all of these practises must ultimately be directed by the Client before they can form part of the proposed EM&A programme.

It is considered that the environmental management procedures developed by MTRC provide a strong framework for ensuring that the proposed project can be implemented to a high level of environmental performance. With proper implementation and enforcement, MTRC's procedures should be sufficient to control the majority of the predicted impacts.

3.1 GENERAL

The size and scale of the PBRL is likely to require that the Contractor(s) appoint an Environmental Team (ET) to conduct the monitoring and auditing works and to provide specialist advice on the undertaking and implementation of environmental responsibilities.

The ET shall have previous relevant experience of managing similarly sized EM&A programmes and the Environmental Team Leader shall be a recognised environmental professional, preferably with a minimum of seven years relevant experience in impact assessments and impact monitoring programmes.

To maintain strict control of the EM&A process, MTRC's Environmental Manager (ENM) shall act as the "Environmental Checker" to verify and validate the environmental performance of the Contractor and his Environmental Team.

3.2 PROJECT ORGANISATION

The roles and responsibilities of the various parties involved in the EM&A process outlined above are further expanded upon in the following sections. The organisation and lines of communication with respect to environmental works are shown in *Figure 3.2a*.

3.2.1 Environmental Manager

MTRC shall appoint an Environmental Manager (ENM) to audit and verify the overall environmental performance of the works and to assess the effectiveness of the ET in their duties. The ENM's main objectives will be to:

- Monitor the implementation of the EM&A programme and the overall level of environmental performance being achieved;
- Arrange and conduct regular site inspections/audits of the works;
- Provide specialist advice on environmental matters,
- Check that the necessary mitigation measures recommended in the EIA and Contract documents, or as subsequently required, are effectively implemented, and
- Report the findings of site inspections/audits and other environmental performance reviews to the Engineer.

3.2.1 Contractor's Environmental Team

The duties of the Contractor's Environmental Team are:

- To monitor the various environmental parameters as required by this or subsequent revisions to the EM&A Manual;
- To conduct site inspections and to investigate and inspect the Contractor's equipment and work methodologies with respect to pollution control and environmental mitigation, and to anticipate environmental issues that may require mitigation before the problem arises;
- Review the programme of works, in order to anticipate any potential environmental impacts before they arise;
- To report the status of the general site environmental conditions and of the implementation of mitigation measures resulting from site inspections; and
- To report the environmental monitoring and audit results and the wider environmental issues and conditions to the Contractor and the Engineer.

3.2.2 *Engineer*

With advice as necessary from the ENM, the Engineer shall:

- Monitor the Contractor's compliance with contract specifications, including the effective implementation and operation of environmental mitigation measures and other aspects of the EM&A programme;
- Instruct the Contractor to follow the agreed protocols or those in the Contract Specifications in the event of exceedances or complaints; and
- Comply with the agreed Event Contingency Plan in the event of any exceedance.

3.2.3 *Contractor*

Reporting to the Engineer, the Contractor shall:

- Work within the scope of the construction contract and other tender conditions;
- Participate in the site inspections undertaken by the Environmental Team and the ENM, as required, and undertake any corrective actions instructed by the Engineer;
- Provide information/advice to the Environmental Team or ENM regarding works activities which may contribute, or be contributing to the generation of adverse environmental conditions; and
- Take responsibility and strictly adhere to the guidelines of the EM&A programme and complementary protocols developed by their project staff.

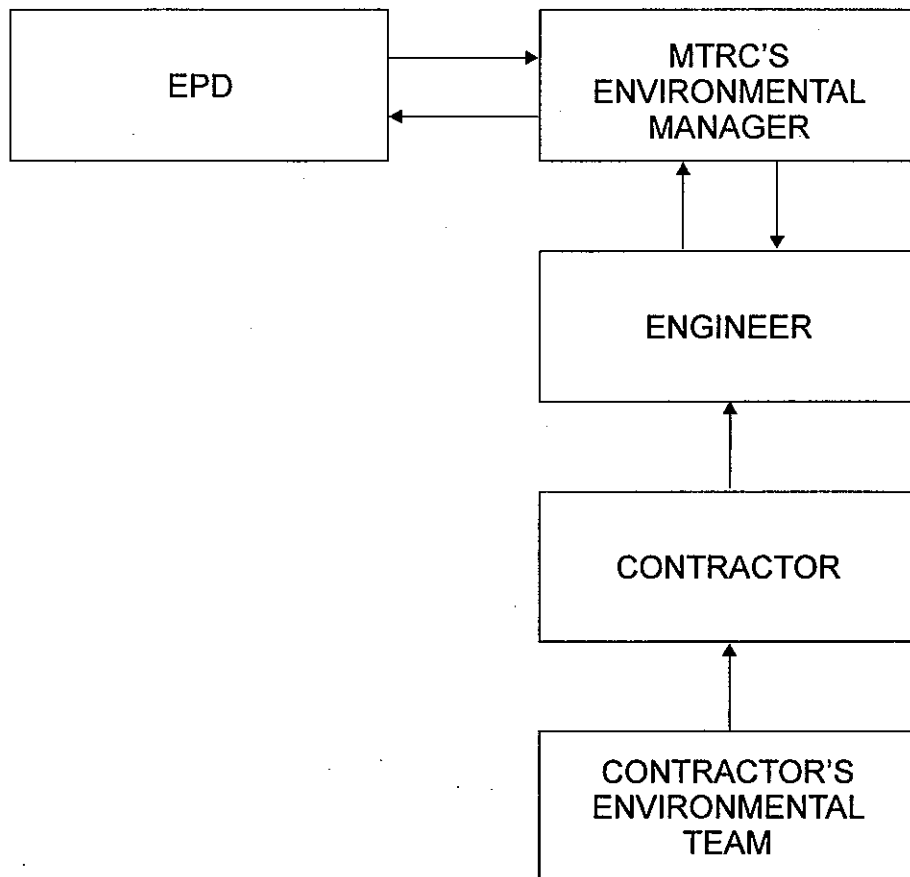


FIGURE 3.2a

LINES OF REPORTING IN THE PENNY'S BAY RAIL LINK EM&A

showing the project area (these details are only required within the first three-monthly EM&A Report);

- Basic project information (e.g. current permits and licences);
- Brief account of construction activities;
- Review of the implementation status and effectiveness of environmental protection works in relation to non-compliances and deficiencies in the mitigation measures recommended in the EIA;
- Summary of complaints, results of investigations and follow-up actions; and
- Future key issues and steps taken to combat them.

As outlined earlier, formal paper-based monthly reporting requirements may be waived if an electronic management system software is adopted.

11.4

ANNUAL AND BI-ANNUAL REPORTS

In addition to the three-monthly reports, annual and bi-annual reports will be issued which will provide a general overview of the progress of the Project EM&A to date, and will include details of all complaints received and the actions taken to resolve them.

An evaluation of the Contractor's Project Management staff in relation to their environmental performance shall be included. This shall include a review of their roles, based on their reactivity and initiative when investigating complaints or deficiencies in the EMS, and their effectiveness in implementing the agreed mitigation measures and communicating their actions.

A summary of the main findings, together with recommendations on how to further improve the environmental performance of the Project will be included, as appropriate, in the conclusions.

11.5

DATA KEEPING

All documents and records, in both paper and electronic format, pertaining to the PBRL EM&A will be retained by the Contractor as part of the Project files and will be subject to appropriate data handling procedures.

11 REPORTING

11.1 INTRODUCTION

In order to ensure that the EM&A programme is effectively implemented it will be necessary to establish efficient reporting requirements between each the parties involved. Such reporting is likely to include written correspondence, site inspections and minutes and notes of meetings between the Contractor's ET, the Contractor, the Engineer and the ENM.

In addition, periodic reviews of the EM&A process and subsequent revisions to the EM&A Manual, as appropriate, will be prepared and circulated to relevant personnel within the Contractor's Project Team as a means of gauging site staff and contractor performance. Three-monthly, bi-annual and annual EM&A Reports will be produced to formally report the finding of these reviews; these reports will be copied to the EPD. The exact details of the frequency, distribution and timeframe for submission shall be agreed with the EPD prior to the commencement of the works.

Subject to gaining EPD's approval, MRTC's "Electronic Quality Performance Monitoring System" (EQPMS) may be used for reporting purposes, obviating the requirement for formal, paper-based reporting.

11.2 BASELINE MONITORING REPORT

As there is no requirement for physical environmental monitoring, a baseline monitoring report, which establishes the 'background' conditions against which monitoring is undertaken, will not be required for this Project.

11.3 THREE-MONTHLY EM&A REPORTS

Three-monthly EM&A Reports shall be prepared and submitted to the Engineer and copied to the EPD within ten working days of the end of the third calendar month. The first three-monthly report will be submitted in the third month after construction works commence.

The three-monthly EM&A reports shall include, but not be limited to, the following elements:

- Executive Summary highlighting areas of complaints, reporting changes and future key issues;
- Brief background to the project, including a synopsis of the project organisation, programme and management structure, and a figure

- Log complaint and date of receipt onto the complaint database;
- Investigate the complaint to determine its validity, and to assess whether the source of the problem is due to works activities;
- If considered necessary by the Engineer following consultation with the ENM, undertake monitoring to verify the existence and severity of the alleged complaint;
- If a complaint is valid and due to the Works, identify appropriate mitigation measures;
- If mitigation measures are required, advise the Contractor accordingly;
- Review the Contractor's response on the identified mitigation measures, and the updated situation;
- If the complaint is transferred from the EPD, submit interim report to the EPD on status of the complaint investigation and follow-up action within the time frame assigned by the EPD;
- Undertake additional monitoring (if conducted), audit and inspections as necessary to verify the effectiveness of the mitigation measures;
- Report the investigation results and the subsequent actions to the source of complaint for responding to the complainant (if the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
- Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports and filing system.

During the complaint investigation work, the Contractor shall co-operate with the Environmental Team Leader in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation works. The Engineer shall ensure that the measures have been carried out by the Contractor.

Ad hoc site inspections shall also be carried out if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental complaint, or as part of the associated investigation work.

10.2

COMPLIANCE WITH LEGAL AND CONTRACTUAL REQUIREMENTS

There shall be contractual environmental protection and pollution control requirements as well as Hong Kong's environmental protection and pollution control laws which the Contractor shall comply with.

The Environmental Team Leader shall review the progress and programme of the works to check that relevant environmental laws have not been violated, and that the any foreseeable potential for violating the laws can be prevented.

The Contractor shall also regularly copy relevant documents to the Environmental Team Leader so that the checking work can be carried out. The relevant documents are expected to include the updated Work Progress Reports, the updated Works Programme, the application letters for different licences/permits under the environmental protection laws, and all the valid licences/permit. The site diary shall also be available, upon request, to the Contractor's Environmental Team during their site inspection.

After reviewing the documentation, the Environmental Team Leader shall advise the Engineer and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the Environmental Team Leader's review concludes that the current status on licence/permit application and any environmental protection and pollution control preparation works is incompatible with the works programme or may result in potential violation of environmental protection and pollution control requirements by the works in due course, he shall also advise the Contractor and the Engineer accordingly.

Upon receipt of the advice, the Contractor shall undertake immediate action to remedy the situation. The Engineer shall follow up to ensure that appropriate action has been taken by the Contractor in order that the environmental protection and pollution control requirements are fulfilled.

10.3

ENVIRONMENTAL COMPLAINTS

Complaints shall be referred to the Engineer and passed onto the Contractor for carrying out complaint investigation procedures. The Contractor's ET shall undertake the following procedures upon receipt of the complaints:

10.1

SITE INSPECTIONS

Site inspections provide a direct means to track and ensure the enforcement of specified environmental protection and pollution control measures. The inspections should be undertaken routinely by the Contractor's ET to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Additionally, the Contractor's ET shall be responsible for defining the scope of the inspections, detailing any deficiencies that are identified, and reporting any necessary action or mitigation measures that were implemented as a result of the inspection; the results of the inspections shall be made available to the ENM when conducting his Environmental Performance Reviews.

Site inspections shall be carried out at least once per month. The areas of inspection should include the general environmental conditions in the vicinity of the site and pollution control and mitigation measures within the site; it should also review the environmental conditions outside the site area which are likely to be affected, directly or indirectly, by site activities. The Contractor's ET shall make reference to the following information in conducting the inspections:

- The EIA and EM&A recommendations on environmental protection and pollution control mitigation measures;
- Ongoing results of the EM&A programme;
- Works progress and programme;
- Individual works method statements which shall include proposals on associated pollution control measures;
- The contract specifications on environmental protection;
- The relevant environmental protection and pollution control laws; and
- Previous site inspection results and the results of Environmental Performance Reviews undertaken by the ENM.

The inspection results and their associated recommendations on improvements to the environmental protection and pollution control works shall be submitted to the Engineer and the Contractor within 24 hours, for reference and for taking immediate action, if required. The Contractor shall follow the procedures and time-frames stipulated in the environmental site inspection for the implementation of mitigation proposals and the resolution of deficiencies in the Contractor's EMS. An action reporting system shall be formulated and implemented to report on any remedial measures implemented subsequent to the site inspections.

9.1 INTRODUCTION

As determined in the PBRL EIA, the landscape and visual impacts associated with the construction and operation of the rail link are anticipated to be acceptable with mitigation. The scope of the landscape and visual issues are summarised below.

9.2 OBJECTIVES OF THE LANDSCAPE AND VISUAL AUDIT

The aims of the landscape and visual audit will include, but not limited to, the following:

- ensuring that the Contractor properly implements the appropriate mitigation measures, as outlined in the IS (*Annex E*), to minimise and control the potential for landscape and visual impacts;
- ensuring the effective implementation of the Contractor's Environmental Management System (EMS).

9.3 METHODOLOGY AND CRITERIA

The Contractor should ensure that all of the contractual and legal requirements are met as outlined in the various Ordinances. In addition, the Contractor and his ET should regularly review the progress and programme of the works and check that the recommendations given in the Implementation Schedule (*Annex E*) have been properly implemented.

- Environmental Impact Assessment Ordinance (Cap.499.S.16) and the Technical Memorandum on EIA Process (EIAO TM), particularly Annexes 10 and 18;
- South West New Territories Development Strategy Review (August 1999);
- Draft North-East Lantau Outline Zoning Plan No. S/I-NEL/5 (13TH August 1999);
- Hong Kong Planning Standards and Guideline;
- WBTC No.25/93 - Control of Visual Impact of Slopes;
- WBTC No. 18/94 - Management and Maintenance of both Natural Vegetation and Landscape Works;
- WBTC No. 24/94 [PELBTC No. 3/94] - Tree Preservation;
- GEO (1999) - Use of Vegetation as Surface Protection on Slopes.

- *Waste Disposal Ordinance (Cap 354);*
- *Waste Disposal (Chemical Waste) (General) Regulation (Cap 354);*
- *Land (Miscellaneous Provisions) Ordinance (Cap 28); and*
- *Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-laws*

The storage, handling and disposal of chemical waste should be audited with reference to the requirements of the *Code of Practice on the Package, Labelling and Storage of Chemical Wastes* published by the EPD.

The recommended disposal sites for different types of waste are shown below in *Table 8.3a*.

Table 8.3a *Recommended Waste Disposal Sites*

Type of Waste	Disposal Site
Steel (including steel mesh, reinforcement bars, window frame, railings, banisters, etc.)	-Licensed steel mills in Hong Kong; or -Overseas steel mills.
Inert demolition material (reinforced concrete, asphaltic concrete, dirt/soil, bricks, masonry, mortar, plastic, ceramic/ceiling tiles, etc.) which comply with the requirements of the Public Dumping Licence	-Construction sites which require fill material; -Public filling areas; -Public filling barging points; and -Public filling sorting facility (if available).
Chemical waste as defined under <i>Schedule 1 of the Waste Disposal (Chemical Waste) Regulation</i>	-Chemical Waste Treatment Facility at Tsing Yi; or -Other facilities approved by the EPD.
General Refuse	-Licensed landfill sites; or -Refuse transfer stations.

8.1 INTRODUCTION

The effective management of waste arising during the construction and operational phases of the PBRL will be monitored through the site inspection programme. The scope of that part of the programme relating to waste management is presented below.

8.2 OBJECTIVES OF THE WASTE AUDIT

The aims of the waste management audit will include, but are not limited to, the following:

- ensuring that the wastes arising from works are handled, stored, collected, transferred and disposed of in an environmentally acceptable manner and comply with the relevant requirements under the *Waste Disposal Ordinance (WDO)* and its regulations;
- ensuring that the Contractor properly implements the appropriate environmental protection and waste pollution control mitigation measures, as outlined in the IS (*Annex E*), to minimise and control the potential for waste impacts;
- ensuring the effective implementation of the Contractor's Environmental Management System (EMS); and
- to encourage the reuse and recycling of materials.

It is recommended that the Contractor prepares and implements a waste management plan based upon the preferred waste management hierarchy of avoidance and minimisation, reuse and recycling and treatment and disposal.

8.3 METHODOLOGY AND CRITERIA

The Contractor should ensure that the necessary waste disposal permits or licences are obtained from appropriate authorities in accordance with the various Ordinances. In addition, the Contractor and his Environmental Team should regularly inspect and audit the waste management practices on site with reference to the recommendations given in the Implementation Schedule contained in *Annex E*.

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- *Water Pollution Control Ordinance (WPCO); and*
- *Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM).*