HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

BELCHER BAY LINK

NOISE IMPACT ASSESSMENT STUDY FOR PWP ITEM NO. 412TH : KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

FINAL NOISE IMPACT ASSESSMENT REPORT

AUGUST 1996

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HIGHWAYS DEPARTMENT

AGREEMENT NO. CE32/88

NOISE IMPACT ASSESSMENT STUDY
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1. INTRODUCTION

1.1 Background

The 1988 Western District Traffic Study (WDTS) proposed various infrastructure links within the strategic road network development in the Western District and a staged implementation programme to cater for this local road network development.

As part of the strategic road network development, the widening of Kennedy Town Praya has been included in the Kennedy Town Traffic Management Measures (KTTMM) Stage 3 (the Project), in conjunction with the Belcher Bay Link (BBL) and the associated traffic management measures to provide a corridor between Connaught Road West, the Western Harbour Crossing and Pokfulam Road.

The Belcher Bay Link EIA study completed in 1992 concluded that the provision of direct mitigation measures to Belcher Bay Link will be ineffective as the traffic noise impact is primarily due to the traffic on the part of Route 7 from Hill Road to Queen's Road West and the proposed widened Kennedy Town Praya. Subsequent to the two landmark cases (Western Harbour Crossing and the Southeast Tsing Yi projects) in which ExCo endorsed the provision of acoustical insulation and air-conditioning as indirect mitigation measures and upon the request of OMLEGCO in 1993 a review was conducted. The review recommended the application of low noise road surfacing on Belcher Bay Link and a further examination of the need to provide indirect mitigation measures based on the eligibility criteria set down in the 2 precedent cases. This remaining issue is now addressed in this EIA study together with the impacts arising from this road widening project.

1.2 Study Objectives

The purpose of the Study is to provide information on the nature and extent of the potential noise impacts on the environment arising from the construction and operation of the Project and all concurrent activities in the area.

The noise assessment results will be used as the basis for the evaluation of the noise impacts of the proposed road widening works on both existing and planned sensitive developments, as well as for the identification of locations where the acceptable noise level criteria are exceeded and appropriate noise mitigation measures are required.

1.3 Report Structure

This Noise Impact Assessment (NIA) Report consists of 9 sections, as follows:

(1) Introduction
(2) Proposed Road Improvement Scheme
(3) Project Site
(4) Methodology
(5) Noise Impact Assessment
(6) Noise Mitigation Measures
(7) Cumulative Noise Impacts
(8) Environmental Monitoring and Audit
(9) Conclusions and Recommendations

The results of the noise assessment on construction noise during road widening works stage, and existing and operational noise levels for the design year 2011 are presented in this report.

2. PROPOSED ROAD IMPROVEMENT SCHEME

2.1 Proposed Road Widening Works

Widening of Kennedy Town Praya is to be carried out on the land being formed under the Belcher Bay Reclamation project to provide two clear eastbound lanes, and at the same time to enhance pedestrian safety through provision of footpaths.

The Kennedy Town Praya will be widened for about 480 m long between Sands Street and Queen's Road West. The alignment of the widened Kennedy Town Praya will follow the existing alignment of Kennedy Town Praya. Figure 1 indicates the extent of the widening works.

2.2 Construction Programme

The preliminary construction programme for the road widening works has been scheduled (also see Figure 2). The widening works will be commenced in March 1997 and completed by the end of September.

Table 2.1 Preliminary Construction Programme

Month	Construction Activity	
	No.	Description
1	1	Introduce temporary traffic management
2	2	Excavate to new road formation level
3	3	Undertake any drainage and street lighting cabling works
4	4	Lay kerbing and prepare tie-ins to existing roads
5	5	Construct new lane, lay bituminous materials
6	6	Erect new roadsigns, street lights, white lining and site tidy up
7	7	Remove temporary traffic management and open new lane to traffic

2.3 Construction Activities

Road works will consist of construction of flexible pavement comprising subbase, roadbase, basecourse and wearing course. Drainage for the carriageway will be provided by a gravity flow drainage system consisting of gullies, manholes, drain pipes, surface channels and possibly subsoil drains.

During the construction period, an appropriate temporary traffic management scheme will be adopted to maintain the existing traffic.

Equipment requirements for each activity are provided in Table 2.2, along with sound power levels (SWLs) for individual and groups of equipment. Equipment SWLs employed for this assessment are based on those contained in Table 3 of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* and Table 11 of *BS 5228: Part 1: 1984*. No percussive pilings are anticipated for the construction of the Project.

Table 2.2 Typical Equipment Requirements

Construction Activity	Equipment	Qty.	CNP Code	SWL, dB(A)	
				Per piece	Total
Introduce temporary traffic management	Truck with crane	1	048	112	112
Excavate to new road formation level	Hydraulic excavator Pneumatic breaker (1) Lorry (2) Vibratory roller	1 1 1 1	- (3) 026 141 186	106 110 112 108	114 (4)
Undertake any drainage and street lighting cabling works	Hydraulic excavator Concrete mixer truck Truck with crane Vibrator poker	1 1 1 1	- (3) 044 048 170	106 109 112 113	117
Lay kerbing and prepare tie-ins to existing roads	Concrete mixer truck Pneumatic breaker (1) Vibrator poker Lorry (2)	1 1 1 1	044 026 170 141	109 110 113 112	116 (4)
Construct new lane, lay bituminous materials	Paving machine Asphalt truck Vibratory roller	1 2 1	004 - (3) 186	109 110 108	115
Erect new roadsigns, street lights, white lining and site tidy up	Truck with crane Pneumatic breaker (1)	1 1	048 026	112 110	114
Remove temporary traffic management and open new lane to traffic	Truck with crane	1	048	112	112

Notes: (1) Silenced type.
(2) 20% on-time is applied to lorry operations.
(3) SWL based on Table 11 of *BS 5228: Part 1: 1984.*
(4) An adjustment of -7 dB(A) for equipment on-time has been allowed for dump truck according to Figure 4 of *BS 5228: Part 1: 1984.*

2.4 Predicted Traffic Flows

A comprehensive survey has been conducted by MVA Asia Limited to predict the traffic demand for the design year 2011 in the study area, including Kennedy Town Praya, Belcher Bay Link, Route 7, Kennedy Town New Praya and other existing roads nearby.

Upon review of other studies, as well as traffic survey results and CTS-2 data, it was concluded that the daily traffic peak in the study area occurs in the AM period. As such, the AM peak hour has been adopted to provide a traffic demand projection that represents the highest flow period.

Projected 2011 AM peak hour traffic flows and vehicle composition for the roads under consideration are given in Table 2.3 below.

Table 2.3 Predicted 2011 AM Peak Traffic Flows

Road	Section Between	2-way Flow (veh/hr)	% of Heavy Vehicles	Speed (kph)
Kennedy Town Praya	Sands Street & Holland Street	1750	54.4	50
Kennedy Town Praya	Holland Street & Sai Cheung Street	1850	60.0	50
Kennedy Town Praya	Sai Cheung Street & Collinson Street	1400	59.9	50
Kennedy Town Praya	Collinson Street & Queen's Road West	1400	59.9	50
Belcher Bay Link	Sands Street & Queen's Road West	2450 (1)	30.9	50
Kennedy Town New Praya	Davis Street & Smithfield Road	800	68.4	50
Kennedy Town New Praya	Smithfield Road & Sands Street	800	68.4	50
Route 7 Up and Down Ramp	-	1341	25.5	70
Catchick Street	Smithfield Road & Sands Street	850	63.2	50
Belcher's Street	Sands Street & Holland Street	1550	25.1	50
Belcher's Street	Holland Street & Sai Cheung Street	2150	24.3	50
Belcher's Street	Sai Cheung Street & Collinson Street	1400	26.1	50
Belcher's Street	Collinson Street & Queen's Road West	1400	26.1	50
Queen's Road West	Belcher's Street & Hill Road	1500	46.6	50
Sands Street	Catchick Street & Belcher's Street	1400	71.5	50
North Road	Catchick Street & Kennedy Town New Praya	50	78.9	50
Holland Street	-	300	41.7	50
Sai Cheung Street	-	600	48.7	50
Collinson Street	-	50	53.2	50

Notes: (1) AM peak traffic flows are 1750 veh/hr (eastbound) and 700 veh/hr (westbound) with 24.2% and 30.9% of heavy vehicles respectively.
PM peak traffic flows are 1500 veh/hr (eastbound) and 1150 veh/hr (westbound) with 44.7% and 22.6% of heavy vehicles respectively.

3. PROJECT SITE

3.1 Existing Noise Environment

The existing noise environment in the vicinity of the Project site is dominated by road traffic noise from Kennedy Town Praya, although sensitive developments at the eastern and western ends of the Study Area are also affected by traffic noises generated from Queen's Road West and Kennedy Town New Praya respectively. According to the traffic survey, the highest traffic volume on Kennedy Town Praya occurs at p.m. peak hour at present. Shown in Figure 3 are the existing p.m. peak hour traffic flows in the Study Area.

A baseline noise monitoring on the p.m. peak hour road traffic noise was undertaken on 21 September 1995, and the monitoring results are summarized in Table 3.1. Three noise monitoring stations have been established for the noise monitoring, as shown in Figure 4. It was also observed that road traffic noise is the dominant noise source in the Study Area.

The calculated existing traffic noise levels at stations M1, M2 and M3, based on recent traffic count information, are 78.1, 77.5 and 73.9 dB(A) respectively. These predicted levels are consistent with the measured L_{10}(1 hour) noise levels at the stations.

In fact, the current (1995) traffic noise levels at the residential developments along Kennedy Town Praya exceed the HKPSG maxima at most of the NSRs (see Table 5.2 below). According to the monitoring and calculated results, it is apparent that the existing NSRs along Kennedy Town Praya are currently suffering from significant traffic noise impacts.

Table 3.1 Existing Noise Levels during PM Peak Hour

Monitoring Station	Designation	Facade Noise Level, dB(A)		
		L_{10}	L_{90}	L_{eq}
M1	Podium of Yick Fung Garden	77.2	68.0	74.1
M2	Podium of Kennedy Town Centre	76.4	67.1	73.8
M3	Podium of Harbour View Garden	73.1	66.2	71.7

3.2 Existing Noise Sensitive Receivers

Noise sensitive receivers in the vicinity of the Project site are likely to be adversely affected by the proposed road works. Site surveys reveals that existing NSRs in the Study Area are mainly high- and medium-rise domestic buildings. The identified NSRs are briefly described in Table 3.2 and depicted in Figure 5.

Table 3.2 Existing Noise Sensitive Receivers

NSR ID	Name/Description	No. of Storey	
		Podium/Commercial	Residential
MKM	Mei King Mansion	2	7
BWC	Bic Wah Court	3	21
WFB	Wo Fat Building	1	20
SWM	Sum Way Mansion	5	20
CC	Chester Court	2	23
SB	Sunglow Building	2	24
SC	Sun Court	4	22
YFG	Yick Fung Garden	3	30
NHM	Nam Hung Mansion	2	24
BC	Belcher Court	2	24
LCG	Lung Cheung Garden	6	33
SFM	Sing Fai Mansion	1	25
BLC	Brilliant Court	2	26
PC	Pearl Court	2	23
THB	Tai Hang Building	2	24
KTC	Kennedy Town Centre	4	34
NHP	Nan Hai Plaza	1	29
JC	Jade Centre	2	25
SVM	Sea View Mansion	2	20
SOB	Shung On Building	2	24
HVG-1	Harbour View Garden, Tower 1	6	27
HVG-2	Harbour View Garden, Tower 2	6	32
HGV-3	Harbour View Garden, Phase 2	5	36
CS-1	1-3, Catchick Street	1	5
CS-5	5, Catchick Street	1	6
CS-7	7, Catchick Street	1	6
KC	Kelly Court	1	8
WPB	Wah Po Building	1	24
TFB	Tung Fat Building	1	8
NFH	New Fortune House	1	23

3.3 Future and Planned Sensitive Uses

Information on future/planned sensitive uses has been obtained from the *Recommended Outline Development Plan* under the Green Island Reclamation Feasibility Study (GIRFS) prepared by Territory Development Department, as presented in Figure 6. It is the only official reference document presently available for the Project area. While a piece of land with a net site area of approximately 0.76 hectare has been zoned for residential development, most of the areas under Belcher Bay Reclamation project have been zoned for open space, amenity areas, government uses and public cargo working area.

Land use proposals for the Green Island Reclamation are also contained in the *Outline Master Development Plan* under the Hong Kong Island West Development Statement (HKWDS). The land use proposals as recommended under the HKWDS are not much different from that proposed under the GIRFS for the concerned area, and the HKWDS is yet to be endorsed. For the purpose of this assessment, a more detailed land use proposals under the GIRFS has been adopted.

Three representative assessment points (P1, P2 and P3) at 14 m P.D. have been selected along the southern boundary of the area zoned for residential development for traffic noise impact assessment, as indicated in Figure 6.

4. METHODOLOGY

4.1 Environmental Standards and Guidelines

4.1.1 Construction Noise

Non-restricted Hours

Under the existing provisions, there is no legal restriction on noise generated by construction activities (other than percussive piling) between the hours of 07:00 and 19:00 on normal weekdays. However, EPD's *Practice Note for Professional Persons ProPECC PN 2/93* recommends a non-statutory daytime construction noise limit of 75 dB(A) L_{eq}(30 min) at the facades of dwellings. This recommendation has been adopted for the assessment of construction noise during non-restricted hours.

Restricted Hours

It is expected that night works will not be required and therefore the criteria stipulated in *Technical Memorandum on Noise from Construction Work other than Percussive Piling*, as well as in *Technical Memorandum on Noise from Construction Work in Designated Areas*, issued under the Noise Control Ordinance (NCO) are not applicable to this Project.

Percussive Piling

No percussive piling is anticipated during the construction phase and therefore the criteria stipulated in *Technical Memorandum on Noise from Percussive Piling* issued under the NCO are not applicable to this Project.

4.1.2 Operational Noise

The impact of operational noise has been assessed with reference to *Hong Kong Planning Standards and Guidelines* (HKPSG) which stipulates maximum L_{10}(1 hour) road traffic noise levels of 70 dB(A) for domestic premises.

In case where no practical direct technical remedies can be applied, reference has been made to the Exco directive *Equitable Redress for Persons Exposed to Increased Noise Resulting from the Use of*

New Roads. The three conditions (with HKPSG criteria) set down in UK DOT's *Calculation of Road Traffic Noise* (CRTN) have been adopted to test which NSRs may be qualified for indirect technical remedies.

4.2 Noise Assessment Methodologies

Construction Noise

The methodology outlined in *Technical Memorandum on Noise from Construction Work other than Percussive Piling* has been used for the assessment of construction noise. Adjustments for equipment on-time has been made according to Figure 4 of *BS 5228: Part 1: 1984.*

Additionally, for the purpose of this NIA, construction noise impact assessment has been undertaken based on the followings:

- It is assumed that all items of powered mechanical equipment (PME) required for a particular construction activity are located at the notional source position of the segment where such activity is performed.
- The worst case scenario such that the total sound power level arising from construction activity is the highest has been adopted for noise assessment.
- A +3 dB(A) facade correction has been added to the predicted noise levels in order to account for the facade effect at each NSR.
- To represent the worst case scenario, noise impacts at the nearest sensitive facades of the residential buildings to the notional source positions (i.e. the lowest residential floors which will be the most impacted receptors) have been examined. Also, noise screening effect due to topographical barriers such as podium has been ignored.

Operational Noise

Operational noises have been predicted using ENPAC's in-house noise model based on the methodologies and procedures stipulated in the CRTN. Also, projected worst case morning peak hour traffic flows for the design year 2011 have been employed for operational noise assessment.

5. NOISE IMPACT ASSESSMENT

5.1 Construction Phase

As illustrated in the preliminary construction programme (see Figure 2), construction activity will be undertaken on individual basis during the construction period. As shown in Table 2.2, the total SWLs for various construction activities vary from 112 to 117 dB(A). Considering that activity no. 3 (i.e. undertaking any drainage and street lighting cabling works) is apparently the noisiest operation, this scenario has therefore been employed for impact assessment.

Construction noise calculation results for activity no. 3 are summarized in Table 5.1.

With the exception of NSRs HVG-3, TFB and NFH, all NSRs will be exposed to noise levels above 75 dB(A). The predicted construction noise level at the most affected dwellings will exceed the noise limit by 11 dB(A). Mitigation measures are therefore required to alleviate the construction noise impacts.

Table 5.1 Construction Noise Levels for the Worst Case Scenario (Unmitigated)

NSR ID	Undertake any drainage and street lighting cabling works	
	Slant Distance, (m)	Noise Level, dB(A)
MKM	45	79
BWC	24	84
WFB	25	84
SWM	26	84
CC	26	84
SB	25	84
SC	26	84
YFG	21	86
NHM	21	86
BC	26	84
LCG	33	82
SFM	28	83
BLC	21	86
PC	20	86
THB	21	86
KTC	211	86
NHP	21	86
JC	23	85
SVM	26	84
SOB	20	86
HVG-1	42	79
HVG-2	60	76
HVG-3	77	74
CS-1	20	86
CS-5	32	82
CS-7	36	81
KC	46	79
WPB	40	80
TFB	125	70
NFH	291	63

5.2 Operation Phase

According to the initial noise impact assessment (*Noise Impact Assessment Study for PWP Item No.412TH : Kennedy Town Traffic Management Measures Stage 3, Working Paper No. 3, Initial Impact Assessment*), it has been concluded that tramway noise impact is unlikely be significant. As such, this issue will not further be addressed in this report, and detailed noise impact assessment during the operation phase is focused on road traffic noise.

Road traffic noise levels at the sensitive facades of the chosen NSRs have been modelled using the CRTN procedures. Traffic flows used in the computer simulation are shown in Table 2.3 and Figure 3.

As recommended in *Belcher Bay Link Environmental Assessment Report, Volume 1 - Noise*, friction course surfacing will be provided on the Belcher Bay Link as a noise mitigation provision. A 2.5 dB(A) noise reduction has therefore been allowed in the calculation of traffic noise arising from the link.

5.2.1 Existing NSRs

A traffic noise analysis for the existing NSRs is provided in Appendix A, and a summary of the predicted noise levels is shown in Table 5.2. In addition, a sample noise calculation for NSR HVG-1 on 15/F is presented in Appendix B.

According to the 2011 modelling results, the NSRs along the Project alignment will be subject to severe operational noise impacts. The predicted L_{10} noise levels are ranging from 71 to 85 dB(A), representing a maximum noise exceedance of 15 dB(A). Such adverse impacts are mainly due to: (a) limited source-receiver buffer distances, (b) high percentage of heavy vehicles (about 59%), and (c) lack of topographical barriers (e.g. embankments, hill slopes and large non-sensitive buildings) in the Project area.

Given that the predicted noise levels at the identified NSRs are well in excess of the HKPSG criteria, appropriate noise mitigation measures should be provided to remedy the adverse noise environment.

5.2.2 Planned NSRs

With regard to the representative planned NSRs, the predicted traffic noise levels at P1, P2 and P3 will be 76, 78 and 78 dB(A) respectively for the design year 2011.

Considering that the predicted noise levels at the representative planned NSRs are well in excess of the HKPSG criteria, appropriate noise mitigation measures should be provided in these future developments to remedy the adverse noise environment.

Table 5.2 Summary of Current and 2011 Traffic Noise Levels (Unmitigated)

NSR ID	L_{10}(1 hour) Noise Level, dB(A)				
	Overall Noise Level at Year		Contributions from Individual Roads in 2011		
			New/Improved Roads		Existing Roads
	1995	2011	Improved Kennedy Town Praya	Belcher Bay Link	
MKM	74.9 - 78.8	79.0 - 82.7	61.5 - 62.9	63.0 - 63.5	78.8 - 82.6
BWC	71.0 - 76.3	74.0 - 79.9	70.4 - 75.5	63.8 - 66.3	68.8 - 77.7
WFB	73.7 - 79.5	76.2 - 81.6	73.6 - 78.3	65.8 - 67.5	71.8 - 78.5
SWM	70.1 - 77.4	73.0 - 79.2	70.7 - 78.2	66.6 - 68.1	62.0 - 70.5
CC	67.8 - 77.4	72.2 - 78.5	69.8 - 78.1	66.6 - 67.9	58.8 - 65.1
SB	69.8 - 77.6	72.4 - 78.8	70.1 - 78.4	66.3 - 67.5	61.9 - 64.3
SC	71.0 - 76.6	73.5 - 78.6	71.8 - 78.1	66.2 - 67.3	62.6 - 63.6
YFG	71.0 - 79.4	73.1 - 80.5	71.8 - 80.2	65.4 - 66.7	62.8 - 64.1
NHM	71.8 - 80.7	73.9 - 81.6	72.9 - 81.4	65.3 - 66.0	62.5 - 63.7
BC	71.8 - 78.0	74.2 - 79.1	73.1 - 78.7	64.8 - 65.4	64.5 - 67.7
LCG	68.3 - 73.5	72.9 - 77.1	70.2 - 76.4	62.4 - 64.9	62.0 - 66.7
SFM	66.5 - 75.7	70.8 - 78.2	70.0 - 78.0	62.8 - 64.1	44.0 - 58.4
BLC	72.2 - 81.2	75.0 - 83.0	74.3 - 82.9	64.1 - 65.0	63.8 - 64.8
PC	72.7 - 80.9	75.5 - 83.2	74.8 - 83.0	64.0 - 64.7	64.9 - 66.8
THB	68.4 - 79.4	70.8 - 81.6	70.5 - 81.4	54.9 - 64.4	58.0 - 67.2

Table 5.2 (Cont'd)

NSR ID	L_{10}(1 hour) Noise Level, dB(A)				
	Overall Noise Level at Year		Contributions from Individual Roads in 2011		
			New/Improved Roads		Existing Roads
	1995	2011	Improved Kennedy Town Praya	Belcher Bay Link	
KTC	70.6 - 79.1	73.8 - 81.6	72.5 - 81.3	63.0 - 64.4	66.1 - 67.8
NHP	71.4 - 80.6	74.8 - 82.1	73.3 - 81.6	63.2 - 64.1	68.5 - 71.3
JC	72.1 - 80.6	75.7 - 82.3	73.8 - 81.6	63.1 - 63.9	70.4 - 73.7
SVM	72.2 - 78.8	75.7 - 81.0	74.0 - 80.0	62.9 - 63.4	70.1 - 74.0
SOB	72.5 - 81.1	76.7 - 84.6	73.4 - 82.1	62.7 - 63.5	73.6 - 81.0
HVG-1	69.3 - 74.1	75.5 - 80.8	67.4 - 71.8	60.1 - 61.6	74.6 - 80.2
HVG-2	66.9 - 73.9	72.4 - 77.6	61.6 - 68.4	55.8 - 60.9	71.7 - 77.0
HVG-3	66.8 - 74.8	71.9 - 78.6	57.7 - 64.3	43.3 - 61.1	71.4 - 78.4
CS-1	76.1 - 78.7	82.0 - 84.9	75.8 - 79.1	64.0 - 64.2	80.7 - 83.5
CS-5	75.4 - 78.5	79.8 - 82.4	68.7 - 72.1	0.0	79.5 - 82.0
CS-7	75.4 - 78.5	79.8 - 82.4	68.7 - 72.1	0.0	79.5 - 82.0
KC	73.8 - 78.1	78.1 - 81.8	65.4 - 70.1	0.0	77.9 - 81.5
WPB	70.5 - 76.5	76.2 - 82.1	70.2 - 74.5	63.1 - 66.5	74.6 - 81.1
TFB	69.0 - 73.4	75.3 - 78.4	0.0	71.6 - 72.4	72.9 - 77.1
NFH	64.4 - 71.3	72.0 - 76.9	0.0	69.0 - 71.8	69.0 - 75.3

6. NOISE MITIGATION MEASURES

6.1 Construction Phase

As discussed in Section 5.1, most of the NSRs will be exposed to significant construction noise impacts. Suitable noise mitigation measures should be provided to protect the affected NSRs throughout the construction period.

While it is not feasible to dictate the methods and exact schedule of construction to be employed by the Contractor, noise control requirements can be incorporated in the Contract Documents, specifying the noise standards to be met and requirements of noise monitoring on the site. A set of recommended pollution control clauses is provided in Appendix C for incorporation onto the Contract Documents. Also, details of the proposed environmental monitoring and audit (EM&A) requirements are contained in the EM&A Manual for the Contractor's observation.

Potential noise control provisions to reduce noise levels from project activities include, but not be limited to, the following:

- Noisy equipment and activities shall be sited as far from sensitive receivers as is practical.
- Noisy plant or processes shall be replaced by quieter alternatives where possible. For example, pneumatic concrete breakers can be silenced with mufflers and bit dampers. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressors, can be readily obtained. Manual operations are generally quietest, but may require long periods of time.
- Noisy activities can be scheduled to minimise exposure of nearby NSRs to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours). Prolonged operation of noisy equipment close to dwellings should be avoided.
- Idle equipment shall be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.
- Construction activities shall be planned so that parallel operation of several sets of equipment close to a given receiver is avoided.
- If possible, the numbers of operating items of powered mechanical equipment should be reduced.
- Construction plant should be properly maintained and operated. Construction equipment often has silencing measures built in or added on, e.g., bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilised.
- Temporary noise reducing measures (e.g. curved or inverted-L acoustic barriers) may be used to screen specific receivers. Enclosures for noisy activities such as concrete breaking should be applied where the noise impact is potentially severe.

The most effective mitigation measures for construction noise is to control noise at its source. In the case of powered mechanical equipment, this involves either selecting silenced equipment, or reducing the transmission of noise using mufflers, silencers or acoustic enclosures. In addition, construction noise along the noise path may be mitigated by the early construction of temporary noise screening structures. Given the high-rise nature of NSRs within the Study Area, the use of acoustic enclosures and curved/inverted-L noise barriers (located close to the noise source) are considered appropriate.

Though not effective in reducing noise impacts, the establishment of good community relations can be

of great assistance to both the Contractor and local communities. Residents should be notified in advance of planned operations and informed of progress. If necessary, a liaison body can be established to bring together representatives of the affected communities, the Government and the Contractor. In addition, residents should be provided with a telephone number for the Engineer's office, where they may register complaints concerning excessive noise. If justified, the Engineer may authorise noisy operations to cease or to be conducted at more restricted hours.

Appendix D presents one of the many possible construction noise mitigation schemes to demonstrate the application of the above measures to control noise at specific locations. Through the proper implementation of the sample package of mitigation measures, the noise levels at all the affected NSRs can be reduced to or below the 75 dB(A) criterion.

6.2 Operation Phase

6.2.1 Introduction

Traffic noise may be controlled at source, along its path, or at NSR facades. The various options available for mitigating traffic noise have been reviewed, and their suitability for use in this Project is presented below.

6.2.2 Control at Source

Controlling traffic noise at its source involves the design of quieter vehicles, traffic management and road surface treatments, all of which result in less noise being generated.

Traffic Management

Traffic management measures may be introduced, such as reducing traffic flow or vehicle speed or limiting the use of the road by heavy vehicles. The primary objective of the Project however is, as part of the local road network in the Western District, to improve the road infrastructure so as to help cater for the future traffic movements in the area. Traffic management measures for traffic noise reduction would be difficult to be effectively enforced, and would reduce the capacity of the road, thus defeating the purpose of the road improvement works. Hence, these noise mitigation measures would be impractical for this Project.

Road Surface Treatments

A pervious macadam paving surface (also known as friction course surfacing) has high acoustic absorption characteristics that can significantly reduce traffic noise levels. According to the CRTN, the presence of pervious macadam paving reduces the traffic noise levels by 2.5 dB(A) as compared with impervious bituminous and concrete road surfaces.

While the application of friction course surfacing to some high speed roads has been found successful in reducing traffic noise, the performance of this surfacing material employed on low speed road such as Kennedy Town Praya (with speed limit of 50 kph) is yet to be determined, as the feasibility of the use of the material on low speed road is still being studied by EPD and HyD. Attempt to evaluate this kind of paving material at this stage is premature.

The improved Kennedy Town Praya will have a number of road junctions, loading and unloading bays, bus bays and pedestrian crossings. The road therefore would not be ideal for the application of friction course surfacing. Requirements on maintenance and repair of the surfacing are likely be very high. The benefits of the reduced traffic noise would be offset by the inconvenience of frequent surfacing repair and replacement operations. In addition, in view of the initial limited widening works and the reconstruction of the full width of the Praya at a later date, application of friction course surfacing at the present time would be inappropriate.

Potential sources of additional traffic noise can be minimised by omitting manhole covers in the carriageway as far as possible during detailed design and by close supervision of finished pavement level tolerances during construction. Where possible, the existing utilities and drainage services should be diverted to the footpaths or to the central median space, to avoid placing manhole covers and valve chambers in the carriageway.

6.2.3 Control along Noise Path

Controlling traffic noise along its path includes the use of natural or man-made topographical barriers or purpose-built barriers of different types to intercept the noise path.

Road Alignment

Road alignment can be designed so that it incorporates features which will reduce traffic noise at sensitive developments. The road alignment can be altered so that the distance between the carriageway and the affected receiver is increased, thus permitting greater natural attenuation of noise along the path to the receiver.

The alignment of the improved Kennedy Town Praya is however fixed by the existing road alignment. It would not be practical or effective to alter the road alignment to control traffic noise in this Project.

Barriers and Enclosures

Roadside barriers may be provided along the carriageway. Under normal circumstances, barriers are more effective when provided close to the noise source. However, the high-rise nature of the existing developments, compounded by the extremely limited road-receiver separation within the Project area, will render the use of plain barriers impractical. Should existing infrastructure permit, partial or full enclosures would be an effective means to ameliorate road traffic noise for the particular road-receiver configuration in the study area.

The Project site is, however, located in a high-rise, high-density developed area, with considerable commercial activities, pedestrian flows and loading/unloading operations at the street level (Figure 7). Assessing the requirements and side implications of these direct mitigation measures against the actual site conditions, it is considered that the installation of such noise screening structures at Kennedy Town Praya would likely be impractical and inappropriate, not to mention that noise barriers will not be an acoustically effective measure:

- Provision of barriers or enclosures may severely impair the rescue and fire fighting operation. For examples, (a) external rescue and fire fighting operation by means of ladder will likely be rendered impossible, (b) rescue of falling victims will become difficult if not impossible, (c) egress of public in crisis situations could be hindered, and (d) appraisal of situation of fire at street level will be obscured or even blocked.

- From a road safety standpoint, erection of barriers or enclosures installed along Kennedy Town Praya may present a hazard to the drivers as sightlines will likely be detrimentally affected due to the presence of multiple road junctions and lack of roadside space for barrier/enclosure setback.

- Installation of the noise screening structures will cause significant disturbance and obstruction to the commercial operators, frontage users and pedestrians.

- Insufficient space will be available for the installation of the noise reduction structures due to the congested road-receiver conditions.

- Construction of the foundations for the noise amelioration measures will cause serious disruption to existing facilities and underground services/utilities.

- The presence of multiple road junctions, lay-bys, pedestrian crossings and private driveways, etc. over such a short length of Kennedy Town Praya tends to degrade the acoustic performance of the noise screening structures and may render these structures ineffective to protect the target NSRs, as openings are needed in the structures to maintain the flow of traffic and pedestrian.

6.2.4 Control at NSRs

Control of traffic noise at the receiver includes insulation of sensitive facades, use of self-protecting buildings, orientation of building facades, building setback, and internal arrangement of rooms to screen sensitive areas.

Site survey indicates that the existing receivers within the study area do not incorporate any of these measures. Those receivers that will be affected by increased traffic noise levels following improvement to Kennedy Town Praya as well as the implementation of Belcher Bay Link could be protected by the insulation of sensitive facades. This would involve the provision of good quality glazing and air conditioning units. Insulation can reduce total noise levels at the receivers by up to 25 dB(A).

Current practice in noise assessment and mitigation in Hong Kong is that the provision of noise insulation at receivers should only be considered as the last resort to be applied should the implementation of all feasible direct technical remedies prove to be impracticable and ineffective. Only those receivers which meet the following three criteria are eligible for consideration of indirect technical remedies by Exco:

- The predicted overall noise level from the improved road, together with other traffic noise in the vicinity, must be above the HKPSG criteria of, for instance, L_{10}(peak hour) 70 dB(A) for sensitive residential facades.

- The predicted noise level is at least 1.0 dB(A) more than the prevailing noise level, i.e. the total traffic noise level existing before the commencement of the construction works.

- The contribution to the increase in the noise level from the new or improved road must be at least 1.0 dB(A).

6.2.5 Potential Mitigation Options

As far as the actual conditions allow, controlling traffic noise at its source and along the noise path are more preferable to controlling at NSRs. However, the preceding review of the various traffic noise mitigation options, together with the considerations on source-receiver configurations, existing environment, road conditions and other site constraints has shown that the applications of noise control measures at source and direct technical remedies on the improved Kennedy Town Praya are impractical and unseemly mitigation options.

Controlling traffic noise at NSRs with measures such as acoustical insulation and air conditioning units is therefore be inevitable, although it is always seen as the last resort of noise mitigation measures. Results of the eligibility assessment are presented in Appendix A, and the estimated number of dwellings eligible for indirect technical remedies are depicted in Table 6.1.

The eligibility assessment indicates that, with the exception of NSRs MKM, HVG-1, HVG-2, HVG-3, CS-5, CS-7 and KC, the remaining NSRs are eligible for indirect technical remedies through the provision of building insulation and room air conditioners. It should be noted that all dwellings of NSRs MKM, BWC and WFB have already been found to be qualified for indirect technical remedies under the Western Harbour Crossing Project, thus no further study on noise insulation works for these NSRs has been made in this Project.

While no quantitative evaluation can be made, reducing no. of manhole covers and valve chambers in

Table 6.1 Number of Dwellings Eligible for Indirect Technical Remedies

NSR ID	Total No. of Dwellings	Total No. of Affected Dwellings [1]	Estimated No. of Eligible Dwellings	% of Eligible Dwellings
MKM	70	70	0	0% [2]
BWC	63	63	0	0% [2]
WFB	120	40	0	0% [2]
SWM	160	120	120	100%
CC	138	92	92	100%
SB	144	72	72	100%
SC	88	66	66	100%
YFG	120	90	90	100%
NHM	192	96	96	100%
BC	176	120	120	100%
LCG	132	66	66	100%
SFM	75	75	75	100%
BLC	156	104	104	100%
PC	184	115	115	100%
THB	96	72	72	100%
KTC	272	136	136	100%
NHP	174	87	87	100%
JC	150	75	75	100%
SVM	80	60	60	100%
SOB	72	24	24	100%
HVG-1	108	81	0	0%
HVG-2	128	96	0	0%
HVG-3	216	72	0	0%
CS-1	20	20	20	100%
CS-5	6	6	0	0%
CS-7	6	6	0	0%
KC	32	32	0	0%
WPB	192	96	96	100%
TFB	32	16	16	100%
NFH	358	184	184	100%
Total	**3,760**	**2,252**	**1,786**	**79%**

Note: (1) Estimated no. of dwellings exposed to both sections of Kennedy Town Praya and Belcher Bay Link under consideration.

(2) As NSR has been included in the noise insulation work of Western Harbour Crossing, all dwellings are not eligible for indirect technical remedies.

the carriageway will help reduce the generation of traffic noise from Kennedy Town praya.

The noise levels at the representative assessment points of the planned NSRs exceed the HKPSG criterion by up to 8 dB(A). The practicabilities of various mitigation measures have been evaluated.

- Setback Distance

  By taking the traffic noise arising from Kennedy Town Praya and Belcher Bay Link into consideration, the minimum setback distances from these two roads are 89m and 93m respectively (see Appendix E). With reference to the linear shape of the residential zone as shown in the *Green Island Recommended Outline Development Plan*, it is apparent that building setback is unlikely be a workable solution.

- Noise Tolerant Structures

  As no information on future development is available, the relationship between the height of noise sensitive structure and noise tolerant structure is shown in Table 6.2 below for indication purpose.

Table 6.2 Height of Noise Tolerant Structure

Height (Meter Above Ground Level)	
Noise Sensitive Structure (1)	**Noise Tolerant Structure**
56 (about 20 storey) (2)	39 (about 14 storey)
70 (about 25 storey)	49 (about 18 storey)
84 (about 30 storey)	60 (about 22 storey)
98 (about 35 storey)	70 (about 25 storey)

Notes: (1) Noise sensitive structure has been assumed to be located at 10m from the boundary of Residential Zone I.
(2) 2.8 meters each storey has been assumed.

In view of the space constraint for Residential Zone I, it is not practicable to erect two high-rise noise tolerant structures (one along southeast boundary and one along northwest boundary) to protect the future residential buildings.

- Orientation of Windows

  In the light of the linear geometry of the residential zone, there will be a great difficulty in orientation of sensitive windows to avoid facing Kennedy Town Praya and Belcher Bay Link. It is anticipated that this measure will only provide limited benefit to the future developments and is therefore ineffective.

As Residential Zone I will be subject to severe traffic noise impact and no effective noise mitigation measures will be available to safeguard the environmental quality of the site, due consideration should be given to a review of land use. It is recommended that the land use for this area should be changed to non-noise sensitive or commercial uses instead of residential zone.

6.2.6 Costs of Indirect Technical Remedies

Each living unit requiring mitigation is assumed to require provision of two sealed window and two 1hp air-conditioners. A cost of $15,540 per dwelling has been derived as capital cost, giving a total amount of HK$27.75 million for 1,786 number of dwellings.

7. CUMULATIVE NOISE IMPACTS

7.1 Concurrent Projects

As several major infrastructure developments have been scheduled to be implemented close to the Study Area, it is likely that there could be cumulative noise impact during construction and operation of the Project, depending on the detailed implementation programmes. These concurrent projects include:

- Belcher Bay Link
- Ramps up to Route 7
- Route 7 extension to Aberdeen
- Green Island Reclamation

7.2 Cumulative Construction Impacts

While details of the construction programmes for Route 7 extension to Aberdeen and Green Island Reclamation are unavailable to the present study, it is unlikely that these projects will have a cumulative noise impact during the present improvement works. The extent of the impact is uncertain because of the lack of construction programmes for these two projects.

On the other hand, the potential for cumulative impacts from the construction of Belcher Bay Link and Ramps up to Route 7 is negligible given that the these projects have been scheduled to be completed prior to the commencement of the widening works of Kennedy Town Praya.

7.3 Cumulative Operational Impacts

The Belcher Bay Link and Ramps up to Route 7 will have a cumulative operational impact on the NSRs in the Study Area. However, the impacts are less significant as traffic noises at the affected NSRs are mainly dominated by that arising from Kennedy Town Praya, as demonstrated in Appendix A.

8. ENVIRONMENTAL MONITORING AND AUDIT

An environmental monitoring and audit (EM&A) programme performs three functions. It ensures that noise from the construction of the project are kept to acceptable levels; it establishs procedures for checking that mitigation measures, if needed, have been applied and are effective; and it provides the means by which compliance may be checked, exceedances documented, and corrective action recorded.

In view of the close proximity of the Kennedy Town Praya to the identified NSRs, an EM&A programme is considered necessary during the construction period. The proposed EM&A programme for this Project which forms part of this NIA is contained and described in a stand-alone document, Environmental Monitoring and Audit (EM&A) Manual.

Detailed monitoring schedules and audit requirements should be incorporated into the construction contract for the widening of Kennedy Town Praya. The clauses containing these schedules and requirements should be formulated in consultation with EPD.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

Construction of the Project has been shown to cause significant noise impacts on the noise sensitive receivers in the Study Area. The predicted maximum anticipated construction noise levels are above 75 dB(A) at most NSR locations. However, the impacts are amendable through proper implementation of appropriate noise control measures and environmental monitoring programme during the construction of the Project.

Road traffic noise has shown be the major environmental issue during the operation phase. Based on the projected traffic figures for 2011, it has been predicted that the traffic noise levels at most existing and planned NSRs will exceed the 70 dB(A) noise criterion. Due to site conditions and other constraints, no direct technical remedies and noise controlling measures at source are considered practicable and effective. As such, CRTN's eligibility procedures (with HKPSG criteria) have been applied to determine which affected NSRs are eligible for consideration of indirect technical remedies by Exco. As NSRs MKM, BWC and WFB have been already found to be qualified for indirect technical remedies under the Western Harbour Crossing Project, these NSRs have been excluded from this Project. It has been estimated that noise levels at 2,252 number of dwellings in the Study Area will exceed the HKPSG noise limits. Of them, 1,786 number of dwellings (79%) are eligible for consideration of indirect technical remedies.

Cumulative noise impacts from concurrent projects have been identified and considered. In the absence of information about the construction programmes of the Route 7 to Aberdeen and Green Island Reclamation, no definitive conclusion has been drawn. Considering that Belcher Bay Link and Ramps up to Route 7 have been scheduled to be completed before the commencement of this Project, no cumulative construction noise impact is anticipated. In addition, cumulative operation impacts caused by these two projects are considered insignificant since traffic noise generated from Kennedy Town Praya will be the dominant noise source.

9.2 Recommendations

The following recommendations are made:

- Inclusion of noise pollution control clauses as recommended in Appendix C to the Contract Documents to control construction noise from the improvement works.
- Implementation of the EM&A programme as detailed in the EM&A Manual during the construction stage of the project.
- Further study to identify the exact extent of eligible premises and detailed scope of noise insulation works for indirect technical remedies.
- Implementation of noise insulation work to qualified dwellings.
- Change Residential Zone I to other non-noise sensitive or commercial uses.

APPENDIX A CURRENT AND 2011 TRAFFIC NOISE LEVELS AT REPRESENTATIVE NSRs

Current and Future Traffic Noise Levels at Mei King Mansion (MKM)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads			New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link	Other Road	
1	82.7	78.8	3.9	62.9	63.5	82.6	0.1
3	81.3	77.3	4.0	62.5	63.4	81.2	0.1
5	80.1	76	4.1	62.1	63.2	79.9	0.2
7	79.0	74.9	4.1	61.5	63	78.8	0.2

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Remark: While the affected premises are considered not qualified for indirect technical remedies under the scope of this study, these premises, however, have been found to be qualified for indirect technical remedies under the Western Harbour Crossing Project. As such, building insulation/provision of air conditioners will be provided to these premises in accordance with the recommendation of the Western Harbour Crossing Project.

Current and Future Traffic Noise Levels at Bic Wah Court (BWC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		(3)
1	74.0	71	3.0	71.2	66.3	68.8	5.2
3	79.9	76.3	3.6	75.5	66.2	77.7	2.2
5	79.0	75.4	3.6	74.7	66	76.7	2.3
7	78.3	74.7	3.6	73.9	65.7	75.9	2.4
9	77.6	74	3.6	73.2	65.5	75.2	2.4
11	77.0	73.4	3.6	72.6	65.2	74.6	2.4
13	76.5	72.8	3.7	72.1	64.9	74.1	2.4
15	76.0	72.4	3.6	71.6	64.6	73.6	2.4
17	75.6	71.9	3.7	71.2	64.3	73.1	2.5
19	75.2	71.5	3.7	70.8	64.1	72.7	2.5
21	74.9	71.2	3.7	70.4	63.8	72.4	2.5

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Remark: The affected premises have also been found to be qualified for indirect technical remedies under the Western Harbour Crossing Project.

Current and Future Traffic Noise Levels at Wo Fat Building (WFB)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Lin		
1	79.0	75.8	3.2	77	67.5	73.7	5.3
3	81.6	79.5	2.1	78.3	67.4	78.5	3.1
5	80.8	78.6	2.2	77.7	67.3	77.4	3.4
7	80.1	77.8	2.3	77.2	67.2	76.4	3.7
9	79.3	77.1	2.2	76.5	67	75.6	3.7
11	78.6	76.4	2.2	75.8	66.8	74.8	3.8
13	77.8	75.4	2.4	75.2	66.6	73.5	4.3
15	77.3	74.8	2.5	74.7	66.4	72.9	4.4
17	76.8	74.4	2.4	74.2	66.2	72.5	4.3
19	76.4	73.9	2.5	73.8	66	72	4.4
20	76.2	73.7	2.5	73.6	65.8	71.8	4.4

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Remark: The affected premises have also been found to be qualified for indirect technical remedies under the Western Harbour Crossing Project.

Current and Future Traffic Noise Levels at Sum Way Mansion (SWM)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	73.0	70.1	2.9	70.7	68.1	62	11.0
3	79.2	77.4	1.8	78.2	68	70.1	9.1
5	78.5	76.8	1.7	77.4	67.9	69.8	8.7
7	77.9	76.1	1.8	76.7	67.8	69.8	8.1
9	77.6	75.7	1.9	76.1	67.6	70.5	7.1
11	77.1	75.2	1.9	75.5	67.5	70.1	7.0
13	76.7	74.7	2.0	75	67.3	69.7	7.0
15	76.3	74.2	2.1	74.6	67.1	69.3	7.0
17	75.9	73.8	2.1	74.2	66.9	69	6.9
19	75.6	73.4	2.2	73.8	66.7	68.7	6.9
20	75.4	73.2	2.2	73.6	66.6	68.5	6.9

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Chester Court (CC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Lin		
1	72.2	67.8	4.4	69.8	67.9	58.8	13.4
3	78.5	77.4	1.1	78.1	67.8	59.6	18.9
5	78.2	76.9	1.3	77.7	67.8	60	18.2
7	78.1	76.2	1.9	77.6	67.7	61.8	16.3
9	77.6	76	1.6	76.9	67.6	65.1	12.5
11	77.0	75.3	1.7	76.2	67.5	65	12.0
13	76.6	74.8	1.8	75.7	67.4	64.7	11.9
15	76.1	74.2	1.9	75.1	67.2	64.5	11.6
17	75.7	73.8	1.9	74.7	67.1	64.3	11.4
19	75.3	73.3	2.0	74.2	66.9	64.2	11.1
21	75.0	72.9	2.1	73.8	66.8	64	11.0
23	74.7	72.6	2.1	73.5	66.6	64	10.7

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Sunglow Building (SB)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	72.4	69.8	2.6	70.1	67.5	61.9	10.5
3	78.8	77.6	1.2	78.4	67.5	62.5	16.3
5	78.4	77.1	1.3	77.9	67.4	62.8	15.6
7	77.7	76.3	1.4	77.1	67.4	64	13.7
9	77.2	75.6	1.6	76.5	67.3	63.9	13.3
11	76.6	74.9	1.7	75.8	67.2	64	12.6
13	76.2	74.4	1.8	75.3	67.1	64.3	11.9
15	75.8	73.9	1.9	74.8	66.9	64.3	11.5
17	75.4	73.5	1.9	74.4	66.8	64.2	11.2
19	75.1	73.1	2.0	74	66.7	64.1	11.0
21	75.3	73.4	1.9	74.3	66.8	64.1	11.2
23	74.4	72.4	2.0	73.2	66.4	63.8	10.6
24	74.3	72.2	2.1	73.1	66.3	63.7	10.6

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Sun Court (SC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads			New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link	Other Road	
1	73.5	71	2.5	71.8	67.3	62.6	10.9
3	78.6	74.3	4.3	78.1	67.2	62.8	15.8
5	77.8	76.6	1.2	77.3	67.1	63.1	14.7
7	77.3	75.8	1.5	76.6	67.1	63.6	13.7
9	76.6	75.2	1.4	75.9	67	63.5	13.1
11	76.2	74.6	1.6	75.4	66.9	63.4	12.8
13	75.8	74	1.8	74.9	66.8	63.3	12.5
15	75.4	73.6	1.8	74.4	66.7	63.4	12.0
17	75.0	73.2	1.8	74	66.6	63.3	11.7
19	74.7	72.8	1.9	73.6	66.4	63.1	11.6
21	74.3	72.4	1.9	73.2	66.3	63	11.3
22	74.2	72.3	1.9	73	66.2	62.9	11.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

▒▒▒▒ NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Yick Fung Garden (YFG)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	80.5	79.4	1.1	80.2	66.7	63.9	16.4
3	79.3	78	1.3	78.9	66.7	64.1	15.2
5	78.3	76.9	1.4	77.8	66.6	64.1	14.2
7	77.5	76	1.5	76.9	66.6	64	13.5
9	76.8	75.3	1.5	76.1	66.5	63.9	12.9
11	76.3	74.6	1.7	75.5	66.4	63.8	12.5
13	75.7	74.1	1.6	74.9	66.3	63.7	12.0
15	75.3	73.6	1.7	74.4	66.2	63.7	11.6
17	74.9	73.1	1.8	73.9	66.1	63.6	11.3
19	74.6	72.7	1.9	73.5	66	63.5	11.1
21	74.3	72.4	1.9	73.2	65.9	63.4	10.9
23	74.0	72	2.0	72.8	65.8	63.3	10.7
25	73.7	71.7	2.0	72.5	65.7	63.1	10.6
27	73.5	71.4	2.1	72.2	65.6	62.9	10.6
29	73.2	71.1	2.1	71.9	65.5	62.9	10.3
30	73.1	71	2.1	71.8	65.4	62.8	10.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Nam Hung Mansion (NHM)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	81.6	80.7	0.9	81.4	66	63.6	17.9
3	80.4	79.1	1.3	80.1	66	63.7	16.7
5	79.1	77.8	1.3	78.8	66	63.6	15.5
7	78.1	76.7	1.4	77.7	66	63.6	14.5
9	77.4	75.7	1.7	76.9	65.9	63.5	13.9
11	76.7	75	1.7	76.1	65.9	63.4	13.3
13	76.2	74.3	1.9	75.5	65.8	63.3	12.9
15	75.6	73.8	1.8	74.9	65.7	63.1	12.5
17	75.2	73.3	1.9	74.4	65.6	63	12.2
19	74.8	72.8	2.0	73.9	65.6	62.9	11.9
21	74.4	72.4	2.0	73.5	65.5	62.8	11.6
23	74.1	72	2.1	73.1	65.4	62.6	11.5
24	73.9	71.8	2.1	72.9	65.3	62.5	11.4

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Belcher Court (BC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	76.2	74.7	1.5	75.6	65.4	61.8	14.4
3	79.1	78	1.1	78.7	65.4	67.5	13.6
5	78.5	76.9	1.6	77.9	65.4	67.7	10.8
7	78.0	76.1	1.9	77.3	65.3	67.6	10.4
9	77.4	75.5	1.9	76.7	65.3	67.2	10.2
11	76.9	74.9	2.0	76.1	65.2	66.7	10.2
13	76.4	74.3	2.1	75.5	65.2	66.4	10.0
15	75.9	73.7	2.2	75	65.1	66	9.9
17	75.4	73.2	2.2	74.5	65.1	65.6	9.8
19	75.0	72.8	2.2	74	65	65.3	9.7
21	74.6	72.4	2.2	73.6	64.9	64.9	9.7
23	74.4	72	2.4	73.3	64.8	64.6	9.8
24	74.2	71.8	2.4	73.1	64.8	64.5	9.7

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

▒▒▒▒ NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Lung Cheung Garden (LCG)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Lin		
1	71.4	68.3	3.1	70.2	62.4	62	9.4
3	74.1	71.5	2.6	73.2	64.9	62.8	11.3
5	74.6	71.4	3.2	73.6	64.8	64.4	10.2
7	77.1	71.3	5.8	76.4	64.8	66.7	10.3
9	76.6	71.7	4.9	75.9	64.7	66.4	10.2
11	76.2	73.5	2.7	75.4	64.7	66	10.2
13	75.7	73.1	2.6	74.9	64.6	65.6	10.1
15	75.4	72.6	2.8	74.5	64.5	65.3	10.1
17	75.0	72.2	2.8	74.1	64.5	65	10.0
19	74.6	71.9	2.7	73.7	64.4	64.7	9.9
21	74.4	71.5	2.9	73.4	64.3	64.4	10.0
23	74.1	71.2	2.9	73.1	64.2	64.2	9.9
25	73.8	70.9	2.9	72.8	64.1	64	9.8
27	73.6	70.7	2.9	72.5	64	63.8	9.8
29	73.4	70.4	3.0	72.3	63.9	63.6	9.8
31	73.1	70.2	2.9	72	63.8	63.4	9.7
33	72.9	69.9	3.0	71.8	63.7	63.3	9.6

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Sing Fai Mansion (SFM)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads			
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link	Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
1	70.8	66.5	4.3	70	62.8	44	26.8
3	78.2	75.7	2.5	78	63.4	46	32.3
5	77.6	75.5	2.1	77.4	63.5	49.5	28.1
7	77.1	74.8	2.3	76.8	64.6	51.4	25.7
9	76.6	74.2	2.4	76.3	64.6	52.1	24.5
11	76.8	73.6	3.2	76.5	64.5	53.9	22.9
13	76.3	73.2	3.1	76	64.5	54.5	21.8
15	75.9	73.5	2.4	75.5	64.4	58.4	17.5
17	75.4	73	2.4	75	64.4	58.2	17.2
19	75.1	72.6	2.5	74.6	64.3	57.9	17.2
21	74.7	72.2	2.5	74.2	64.2	57.7	17.0
23	74.3	71.8	2.5	73.8	64.1	57.5	16.8
25	74.1	71.5	2.6	73.5	64.1	57.4	16.7

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Brilliant Court (BLC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		(3)
1	83.0	81.2	1.8	82.9	65	64.8	18.2
3	81.9	79.8	2.1	81.7	64.9	64.8	17.1
5	80.7	78.4	2.3	80.5	64.9	64.8	15.9
7	79.7	77.3	2.4	79.4	64.9	64.8	14.9
9	78.9	76.5	2.4	78.6	64.8	64.7	14.2
11	78.2	75.7	2.5	77.8	64.8	64.6	13.6
13	77.7	75	2.7	77.2	64.7	64.5	13.2
15	77.1	74.4	2.7	76.6	64.6	64.4	12.7
17	76.7	73.9	2.8	76.1	64.5	64.3	12.4
19	76.2	73.5	2.7	75.6	64.5	64.1	12.1
21	75.8	73.1	2.7	75.2	64.4	64	11.8
23	75.5	72.7	2.8	74.8	64.3	63.9	11.6
25	75.2	72.3	2.9	74.5	64.2	63.8	11.4
26	75.0	72.2	2.8	74.3	64.1	63.8	11.2

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Pearl Court (PC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	83.2	80.9	2.3	83	64.7	66.8	16.4
3	81.8	79.4	2.4	81.6	64.7	66.6	15.2
5	80.6	78.2	2.4	80.3	64.7	66.4	14.2
7	79.6	77.2	2.4	79.3	64.7	66.2	13.4
9	78.9	76.3	2.6	78.5	64.6	66	12.9
11	78.2	75.6	2.6	77.7	64.5	65.8	12.4
13	77.6	75	2.6	77.1	64.5	65.6	12.0
15	77.1	74.4	2.7	76.5	64.4	65.4	11.7
17	76.6	73.9	2.7	76	64.3	65.3	11.3
19	76.3	73.4	2.9	75.6	64.2	65.2	11.1
21	75.8	73	2.8	75.1	64.1	65	10.8
23	75.5	72.7	2.8	74.8	64	64.9	10.6

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Tai Hang Building (THB)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		(3)
1	70.8	68.4	2.4	70.5	54.9	58	12.8
3	81.6	79.4	2.2	81.4	64.4	66.3	15.3
5	80.5	78.2	2.3	80.2	64.4	67.2	13.3
7	79.6	77.1	2.5	79.2	64.4	67	12.6
9	78.8	76.2	2.6	78.3	64.3	66.9	11.9
11	78.1	75.4	2.7	77.6	64.3	66.7	11.4
13	77.5	74.8	2.7	76.9	64.2	66.5	11.0
15	77.0	74.2	2.8	76.4	64.1	66.4	10.6
17	76.5	73.7	2.8	75.8	64	66.3	10.2
19	76.1	73.3	2.8	75.3	64	66.1	10.0
21	75.7	72.8	2.9	74.9	63.9	66	9.7
23	75.4	72.5	2.9	74.5	63.8	65.9	9.5
24	75.2	72.3	2.9	74.3	63.7	65.8	9.4

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Kennedy Town Centre (KTC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	81.6	79.1	2.5	81.3	64.4	67.8	13.8
3	80.4	77.8	2.6	80	64.4	67.7	12.7
5	79.4	76.8	2.6	79	64.3	67.6	11.8
7	78.6	76	2.6	78.1	64.3	67.5	11.1
9	78.0	75.2	2.8	77.4	64.2	67.5	10.5
11	77.5	74.6	2.9	76.8	64.1	67.4	10.1
13	76.9	74	2.9	76.1	64.1	67.3	9.6
15	76.5	73.6	2.9	75.7	64	67.1	9.4
17	76.1	73.2	2.9	75.2	63.9	67	9.1
19	75.7	72.7	3.0	74.8	63.8	66.9	8.8
21	75.4	72.4	3.0	74.4	63.7	66.8	8.6
23	75.0	72	3.0	74	63.6	66.6	8.4
25	74.8	71.7	3.1	73.7	63.5	66.5	8.3
27	74.5	71.5	3.0	73.4	63.4	66.4	8.1
29	74.4	71.2	3.2	73.2	63.3	66.3	8.1
31	74.1	71	3.1	72.9	63.2	66.3	7.8
33	73.9	70.7	3.2	72.7	63	66.2	7.7
34	73.8	70.6	3.2	72.5	63	66.1	7.7

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Nan Hai Plaza (NHP)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads			New/Improved Roads:
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link	Other Roads	Contribution to Overall Noise Levels (3)
1	82.1	80.6	1.5	81.6	64.1	71.3	10.8
3	81.2	79.2	2.0	80.7	64.1	71.2	10.0
5	80.5	78.0	2.5	79.9	64.1	71	9.5
7	79.7	77.1	2.6	79.0	64.1	70.7	9.0
9	78.9	76.2	2.7	78.1	64.0	70.5	8.4
11	78.2	75.3	2.9	77.2	63.9	70.3	7.9
13	77.8	74.8	3.0	76.7	63.9	70.2	7.6
15	77.3	74.2	3.1	76.2	63.8	69.9	7.4
17	76.8	73.6	3.2	75.6	63.7	69.7	7.1
19	76.4	73.2	3.2	75.1	63.7	69.5	6.9
21	76.1	72.8	3.3	74.7	63.6	69.3	6.8
23	75.7	72.4	3.3	74.3	63.5	69.1	6.6
25	75.4	72.0	3.4	74.0	63.4	68.9	6.5
27	75.1	71.7	3.4	73.6	63.3	68.7	6.4
29	74.8	71.4	3.4	73.3	63.2	68.5	6.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Jade Centre (JC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	82.3	80.6	1.7	81.6	63.9	73.7	8.6
3	81.5	79.2	2.3	80.7	63.9	73.5	8.0
5	80.6	77.9	2.7	79.6	63.9	73.2	7.4
7	79.8	76.9	2.9	78.7	63.9	72.9	6.9
9	79.1	76	3.1	77.8	63.8	72.6	6.5
11	78.5	75.3	3.2	77.1	63.7	72.3	6.2
13	78.0	74.7	3.3	76.5	63.7	72	6.0
15	77.5	74.1	3.4	75.9	63.6	71.7	5.8
17	77.0	73.6	3.4	75.3	63.5	71.4	5.6
19	76.7	73.2	3.5	74.9	63.4	71.2	5.5
21	76.3	72.8	3.5	74.5	63.3	70.9	5.4
23	75.9	72.4	3.5	74.1	63.2	70.6	5.3
25	75.7	72.1	3.6	73.8	63.1	70.4	5.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Sea View Mansion (SVM)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	81.0	78.8	2.2	80	63.4	74	7.0
3	80.5	77.9	2.6	79.3	63.4	73.8	6.7
5	79.7	76.9	2.8	78.5	63.4	73.3	6.4
7	79.1	76	3.1	77.7	63.3	72.9	6.2
9	78.4	75.2	3.2	76.9	63.3	72.4	6.0
11	77.8	74.5	3.3	76.3	63.2	71.9	5.9
13	77.3	73.9	3.4	75.7	63.1	71.5	5.8
15	76.8	73.4	3.4	75.2	63.1	71.1	5.7
17	76.4	72.8	3.6	74.7	63	70.7	5.7
19	75.9	72.4	3.5	74.2	62.9	70.3	5.6
20	75.7	72.2	3.5	74	62.9	70.1	5.6

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

▒▒▒▒ NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Shung On Building (SOB)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		(3)
1	84.6	81.1	3.5	82.1	63.5	81	3.6
3	83.5	79.6	3.9	80.7	63.5	80.1	3.4
5	82.3	78.3	4.0	79.4	63.4	79.1	3.2
7	81.3	77.2	4.1	78.3	63.4	78.2	3.1
9	80.5	76.4	4.1	77.4	63.3	77.4	3.1
11	79.8	75.6	4.2	76.6	63.2	76.7	3.1
13	79.2	75.0	4.2	76.0	63.2	76.1	3.1
15	78.6	74.5	4.1	75.4	63.1	75.6	3.0
17	78.2	73.9	4.3	74.8	63.1	75.2	3.0
19	77.6	73.4	4.2	74.3	63	74.6	3.0
21	77.2	73.0	4.2	73.9	62.9	74.2	3.0
23	77.5	73.4	4.1	74.2	63	74.5	3.0
24	76.7	72.5	4.2	73.4	62.7	73.6	3.1

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Harbour View Garden, Tower 1 (HVG-1)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		(3)
1	80.8	74.1	6.7	71.8	60.1	80.2	0.6
3	80.0	73.3	6.7	71.2	60.1	79.3	0.7
5	79.2	72.6	6.6	70.6	60.5	78.5	0.7
7	78.6	72	6.6	70.1	61.1	77.9	0.7
9	78.1	71.5	6.6	69.6	61.1	77.3	0.8
11	77.6	71	6.6	69.1	61	76.8	0.8
13	77.2	70.6	6.6	68.7	60.9	76.4	0.8
15	76.7	70.1	6.6	68.3	60.8	75.9	0.8
17	76.3	69.7	6.6	68	60.7	75.5	0.8
19	76.0	69.4	6.6	67.6	60.8	75.2	0.8
21	75.8	69.4	6.4	67.4	60.8	74.9	0.9
23	75.6	69.4	6.2	67.4	61.6	74.7	0.9
25	75.5	69.3	6.2	67.5	61.4	74.6	0.9
27	75.5	69.4	6.1	67.5	61.3	74.6	0.9

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Harbour View Garden, Tower 2 (HVG-2)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	77.6	73.9	3.7	68.4	55.8	77	0.6
3	76.7	73	3.7	67.6	56.6	76.1	0.6
5	76.0	72.2	3.8	66.8	59.5	75.3	0.7
7	75.6	71.6	4.0	66.2	60.9	74.9	0.7
9	75.1	71	4.1	65.6	60.9	74.4	0.7
11	74.6	70.4	4.2	65.1	61.2	73.8	0.8
13	74.4	70	4.4	64.6	61.7	73.6	0.8
15	74.7	69.9	4.8	64.2	61.6	74.1	0.6
17	74.4	69.5	4.9	63.8	61.6	73.8	0.6
19	74.1	69.2	4.9	63.4	61.5	73.5	0.6
21	73.3	68.1	5.2	63.1	61.4	72.6	0.7
23	73.1	67.9	5.2	62.8	61.3	72.4	0.7
25	73.1	67.7	5.4	62.5	61.2	72.4	0.7
27	72.9	67.5	5.4	62.2	61.1	72.2	0.7
29	72.7	67.2	5.5	62	61	72	0.7
31	72.5	67	5.5	61.7	60.9	71.8	0.7
32	72.4	66.9	5.5	61.6	60.9	71.7	0.7

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Harbour View Garden, Phase 2 (HVG-3)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		(3)
1	78.6	74.8	3.8	64.3	43.3	78.4	0.2
3	77.6	73.7	3.9	63.4	51.7	77.4	0.2
5	76.7	72.8	3.9	62.6	57.7	76.5	0.2
7	76.3	72.2	4.1	62.1	60.1	76	0.3
9	75.7	71.6	4.1	61.6	60.8	75.4	0.3
11	75.4	71.1	4.3	61.1	61.1	75.1	0.3
13	75.3	70.8	4.5	60.5	61	75	0.3
15	75.3	71.1	4.2	61	61.1	75	0.3
17	74.5	69.9	4.6	59.6	60.8	74.2	0.3
19	74.2	69.5	4.7	59.4	60.7	73.8	0.4
21	73.3	68.4	4.9	59.1	60.7	72.9	0.4
23	73.1	68.2	4.9	58.9	60.6	72.7	0.4
25	72.8	67.9	4.9	58.7	60.5	72.4	0.4
27	72.6	67.7	4.9	58.4	60.4	72.2	0.4
29	72.5	67.5	5.0	58.2	60.3	72	0.5
31	72.4	67.3	5.1	58.1	60.2	71.9	0.5
33	72.2	67.1	5.1	57.9	60.1	71.7	0.5
35	72.0	66.9	5.1	57.7	60.1	71.5	0.5
36	71.9	66.8	5.1	57.7	60.1	71.4	0.5

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at 1-3, Catchick Street (CS-1)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		
1	84.9	78.7	6.2	79.1	64.2	83.5	1.4
3	83.3	77.3	6.0	77.1	64.1	82.1	1.2
5	82.0	76.1	5.9	75.8	64	80.7	1.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels Wah Po Building (WPB)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	82.1	76.5	5.6	74.5	66.5	81.1	1.0
3	81.3	75.7	5.6	74.4	66	80.2	1.1
5	80.9	74.6	6.3	73.6	65.6	79.9	1.0
7	80.6	74	6.6	73.3	65.3	79.5	1.1
9	79.8	73.4	6.4	72.9	65	78.6	1.2
11	79.2	73	6.2	72.6	64.7	77.9	1.3
13	78.6	72.6	6.0	72.3	64.5	77.2	1.4
15	78.1	72.2	5.9	72	64.2	76.6	1.5
17	77.6	71.8	5.8	71.4	64	76.2	1.4
19	77.2	71.5	5.7	71.1	63.7	75.7	1.5
21	76.8	71.1	5.7	70.8	63.5	75.3	1.5
23	76.5	70.8	5.7	70.5	63.3	74.9	1.6
24	76.2	70.5	5.7	70.2	63.1	74.6	1.6

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at 5, Catchick Street (CS-5)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	82.4	78.5	3.9	72.1	0	82	0.4
3	81.4	77.2	4.2	70.6	0	81	0.4
5	80.3	75.9	4.4	69.2	0	79.9	0.4
6	79.8	75.4	4.4	68.7	0	79.5	0.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at 7, Catchick Street (CS-7)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		(3)
1	82.4	78.5	3.9	72.1	0	82	0.4
3	81.4	77.2	4.2	70.6	0	81	0.4
5	80.3	75.9	4.4	69.2	0	79.9	0.4
6	79.8	75.4	4.4	68.7	0	79.5	0.3

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Kelly Court (KC)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	81.8	78.1	3.7	70.1	0	81.5	0.3
3	80.6	76.6	4.0	68.5	0	80.3	0.3
5	79.5	75.3	4.2	67.1	0	79.2	0.3
7	78.5	74.2	4.3	65.9	0	78.3	0.2
8	78.1	73.8	4.3	65.4	0	77.9	0.2

Note: Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

Current and Future Traffic Noise Levels at Tung Fat Building (TFB)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Roads	New/Improved Roads: Contribution to Overall Noise Levels
	2011 (1)	1995	Difference (2)	Kennedy Town Pray	Belcher Bay Link		(3)
1	78.4	73.4	5.0	-	72.4	77.1	1.3
3	77.3	71	6.3	-	72.3	75.6	1.7
5	76.2	69.8	6.4	-	72	74.3	1.9
7	75.6	69.3	6.3	-	71.7	73.3	2.3
8	75.3	69	6.3	-	71.6	72.9	2.4

Note: (A) Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

(B) Noise contribution from Kennedy Town Praya is negligible as sensitive receivers are screened by Wah Po Building.

Current and Future Traffic Noise Levels at New Fortune House (NFH)

Storey	L_{10}(1 hour) Noise,dB(A)						
	Overall Facade Noise Levels and Comparison			Contributions from Individual Roads in 2011			
				New/Improved Roads		Other Road	New/Improved Roads: Contribution to Overall Noise Levels (3)
	2011 (1)	1995	Difference (2)	Kennedy Town Praya	Belcher Bay Link		
1	76.9	71.3	5.6	-	71.8	75.3	1.6
3	76.3	70.4	5.9	-	71.7	74.4	1.9
5	75.6	69.2	6.4	-	71.4	73.5	2.1
7	75.0	69.1	5.9	-	70.9	72.9	2.1
9	74.2	68.9	5.3	-	70.6	71.7	2.5
11	74.0	68.1	5.9	-	70.4	71.5	2.5
13	73.5	67.2	6.3	-	70.1	70.9	2.6
15	73.2	66.3	6.9	-	69.9	70.4	2.8
17	72.8	65.8	7.0	-	69.7	69.9	2.9
19	72.4	65.3	7.1	-	69.5	69.3	3.1
21	72.2	64.9	7.3	-	69.2	69.2	3.0
23	72.0	64.4	7.6	-	69	69	3.0

Note: (A) Eligibility Criteria:

(1) The predicted overall noise level from the new road together with other traffic noise in the vicinity must be above 70 dB(A) L_{10}(1 hour).

(2) The predicted overall noise level is at least 1.0 dB(A) more than the prevailing noise level.

(3) The contribution to the increase in the overall noise level from the new road must be at least 1.0 dB(A).

NSRs NOT qualify for indirect technical remedies.

(B) Noise contribution from Kennedy Town Praya is negligible as sensitive receivers are screened by Wah Po Building.

APPENDIX B SAMPLE CALCULATION FOR OPERATIONAL NOISE

Sample noise calculation for Sensitive Facade HVG-1 on 15/F

Kennedy Town Praya (Section between Sands Street & Holland Street)

Total Hourly Flow	1084 veh/hr
Percentage Heavy Vehicles	49.4%
Mean Traffic Speed	50 kph
Perpendicular Distance	18.0 m
Angle of View	52.5°
Noise Calculation, dB(A)	
Basic Noise Level	71.56
% Heavy Vehicles and Speed Correction	+ 4.94
Gradient Correction	+ 0.00
Distance Correction	- 6.40
Angle of View Correction	- 5.40
Barrier Correction	- 1.70
Opposite Facade Correction	+ 0.00
Facade Correction	+ 2.50
Noise Contribution	65.50

Sands Street (Section between Kennedy Town New Praya & Catchick Street)

Total Hourly Flow	296 veh/hr
Percentage Heavy Vehicles	35.5%
Mean Traffic Speed	50 kph
Perpendicular Distance	10.7 m
Angle of View	21.9°
Noise Calculation, dB(A)	
Basic Noise Level	65.92
% Heavy Vehicles and Speed Correction	+ 3.78
Gradient Correction	+ 0.00
Distance Correction	- 6.20
Angle of View Correction	- 9.10
Barrier Correction	+ 0.00
Opposite Facade Correction	+ 0.00
Facade Correction	+ 2.50
Noise Contribution	56.90

Sands Street (Section between Catchick Street & Belcher's Street)

Total Hourly Flow	296 veh/hr
Percentage Heavy Vehicles	35.5%
Mean Traffic Speed	50 kph
Perpendicular Distance	10.7 m
Angle of View	115.5°
Noise Calculation, dB(A)	
Basic Noise Level	65.92
% Heavy Vehicles and Speed Correction	+ 3.78
Gradient Correction	+ 0.00
Distance Correction	- 6.20
Angle of View Correction	- 1.90
Barrier Correction	+ 0.00
Opposite Facade Correction	+ 1.00
Facade Correction	+ 2.50
Noise Contribution	65.10

Catchick Street (Section between Sands Street & North Street)

Total Hourly Flow	415 veh/hr
Percentage Heavy Vehicles	52.4%
Mean Traffic Speed	50 kph
Perpendicular Distance	18.0 m
Angle of View	52.1°
Noise Calculation, dB(A)	
Basic Noise Level	67.35
% Heavy Vehicles and Speed Correction	+ 5.15
Gradient Correction	+ 0.00
Distance Correction	- 6.40
Angle of View Correction	- 5.40
Barrier Correction	+ 0.00
Opposite Facade Correction	+ 0.90
Facade Correction	+ 2.50
Noise Contribution	64.10

Kennedy Town New Praya (Section between Sands Street & North Street)

Total Hourly Flow	212 veh/hr
Percentage Heavy Vehicles	50%
Mean Traffic Speed	50 kph
Perpendicular Distance	73.9 m
Angle of View	22.8°
Noise Calculation, dB(A)	
Basic Noise Level	64.42
% Heavy Vehicles and Speed Correction	+ 4.98
Gradient Correction	+ 0.00
Distance Correction	- 8.30
Angle of View Correction	- 9.00
Barrier Correction	+ 0.00
Opposite Facade Correction	+ 0.00
Facade Correction	+ 2.50
Noise Contribution	54.60

Kennedy Town New Praya (Section between North Street & Smithfield)

Total Hourly Flow	212 veh/hr
Percentage Heavy Vehicles	50%
Mean Traffic Speed	50 kph
Perpendicular Distance	73.9 m
Angle of View	7.2°
Noise Calculation, dB(A)	
Basic Noise Level	64.42
% Heavy Vehicles and Speed Correction	+ 4.98
Gradient Correction	+ 0.00
Distance Correction	- 8.30
Angle of View Correction	- 14.00
Barrier Correction	- 13.50
Opposite Facade Correction	+ 0.00
Facade Correction	+ 2.50
Noise Contribution	36.10

Overall prevailing noise level at sensitive facade HVG-1 on 15/F = 70.1 dB(A)

APPENDIX C RECOMMENDED NOISE POLLUTION CONTROL CLAUSES

1. AVOIDANCE OF NUISANCE

(a) 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.

(b) The Contractor shall carry out the Works in such a manner as to minimize adverse impacts on the environment during execution of the Works.

2. NOISE POLLUTION CONTROL

(a) The Contractor shall comply with and observe the Noise Control Ordinance and its subsidiary regulations in force in Hong Kong.

(b) The Contractor shall provide an approved integrating sound level meter to IEC 651:1979 (Type 1) and 804:1985 (Type 1) and THE manufacturer's recommended sound level calibrator for the exclusive use of the Engineer at all times. The Contractor shall maintain the equipment in proper working order and provide a substitute when the equipment are out of order or otherwise not available.

The sound level meter including the sound level calibrator shall be verified by the manufactures every two years to ensure they perform the same levels of accuracies as stated in the manufacturer's specifications. That is to say at the times of measurements, the equipment shall have been verified within the last two years.

(c) 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 07:00 to 19:00 hours on any day not being a general holiday (including Sundays), the following requirements shall also be complied with:

(i) The noise level measured at 1 m from the most affected external facade of the nearby noise sensitive receivers from the construction work alone during any 30 minute period shall not exceed an equivalent sound level (L_{eq}) of 75 dB(A).

(ii) Should the limits stated in the above sub-clause (i) 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.

(d) Before the commencement of any work, the Engineer may require the methods of working, equipment and sound-reducing intended to be used on the Site to be made available for inspection and approval to ensure that they are suitable for the project.

(e) 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.

(f) Construction works shall be suitably phased to minimise noise impacts on the surrounding environment.

(g) The Contractor shall ensure that all plant and equipment to be used on site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings or shields, acoustic sheds or screens or other means to avoid disturbance to any nearby noise sensitive receivers.

(h) Notwithstanding the requirements and limitations set out in clause (c) above and subject to compliance with clauses (e) and (f) above, the Engineer may, upon application in writing by the Contractor, allow the use of any equipment and the carrying out of any construction activities for any duration provided that he is satisfied with the application which, in his opinion, to be of absolute necessity and adequate noise insulation has been provided to the educational institutions to be affected, or of emergency nature, and not in contravention with the Noise Control Ordinance in any respect.

(i) No excavator mounted breaker shall be used within 125 m from any nearby noise sensitive receivers. The Contractor shall use hydraulic concrete crusher wherever applicable.

(j) The only equipment that shall be allowed on the Site for rock drilling works will be quiet drilling rigs with a sound power level not exceeding 110 dB(A). Conventional pneumatically driven drilling rigs are specifically prohibited.

(k) For the purposes of the above clauses, any domestic premises, hotel, hostel, temporary housing accommodation, hospital, medical clinic, educational institution, place of public worship, library, court of law, or performing arts centre or office building shall be considered a noise sensitive receiver.

(l) The Contractor shall, when necessary, apply as soon as possible for a construction noise permit in accordancewith the Noise Control (General) Regulations, display the permit as required and copy to the Engineer.

APPENDIX D SAMPLE CALCULATION FOR MITIGATION OF CONSTRUCTION NOISE

In order to reduce the maximum anticipated construction noise to an acceptable level, the following package of noise control measures could be used:

	Mitigation Measures	*Anticipated Noise Reduction*
A.	Fit more efficient exhaust or sound reduction equipment, and keep closed the machine's enclosure panels	10 dB(A)
B.	Erect inverted-L acoustic barrier between the equipment and NSRs, and locate the barrier right adjacent the equipment	15 dB(A)
C.	Enclose the equipment in acoustic enclosure	20 dB(A)

The above measures are then applied to the construction equipment requirements for the noisiest construction activity, as indicated in Table D.1.

Table D.1 Mitigated Construction Activity

Noisiest Activity	Equipment	Mitigation	Mitigated SWL, dB(A) (Per piece)
Undertake any drainage and street lighting cabling works	Hydraulic excavator	A	96
	Concrete mixer truck	B	94
	Truck with crane	B	97
	Vibrator poker	C	93

Table D.2 demonstrates how construction noise could be mitigated at the adversely affected NSRs by providing above-mentioned mitigation measures.

Table D.2 Construction Noise Levels for the Worst Case Scenario (Mitigated)

NSR ID	Undertake any drainage and street lighting cabling works	
	Slant Distance, (m)	Noise Level, dB(A)
MKM	45	63
BWC	24	68
WFB	25	68
SWM	26	68
CC	26	68
SB	25	68
SC	26	68
YFG	21	70
NHM	21	70
BC	26	68
LCG	33	66
SFM	28	67
BLC	21	70
PC	20	70
THB	21	70
KTC	21	70
NHP	21	70
JC	23	69
SVM	26	68
SOB	20	70
HVG-1	42	63
HVG-2	60	60
HVG-3	77	58
CS-1	20	70
CS-5	32	66
CS-7	36	65
KC	46	63
WPB	40	64
TFB	125	54
NFH	291	47

APPENDIX E SAMPLE CALCULATION FOR SETBACK DISTANCES

Kennedy Town Praya (Section between Sands Street and Sai Cheung Street)

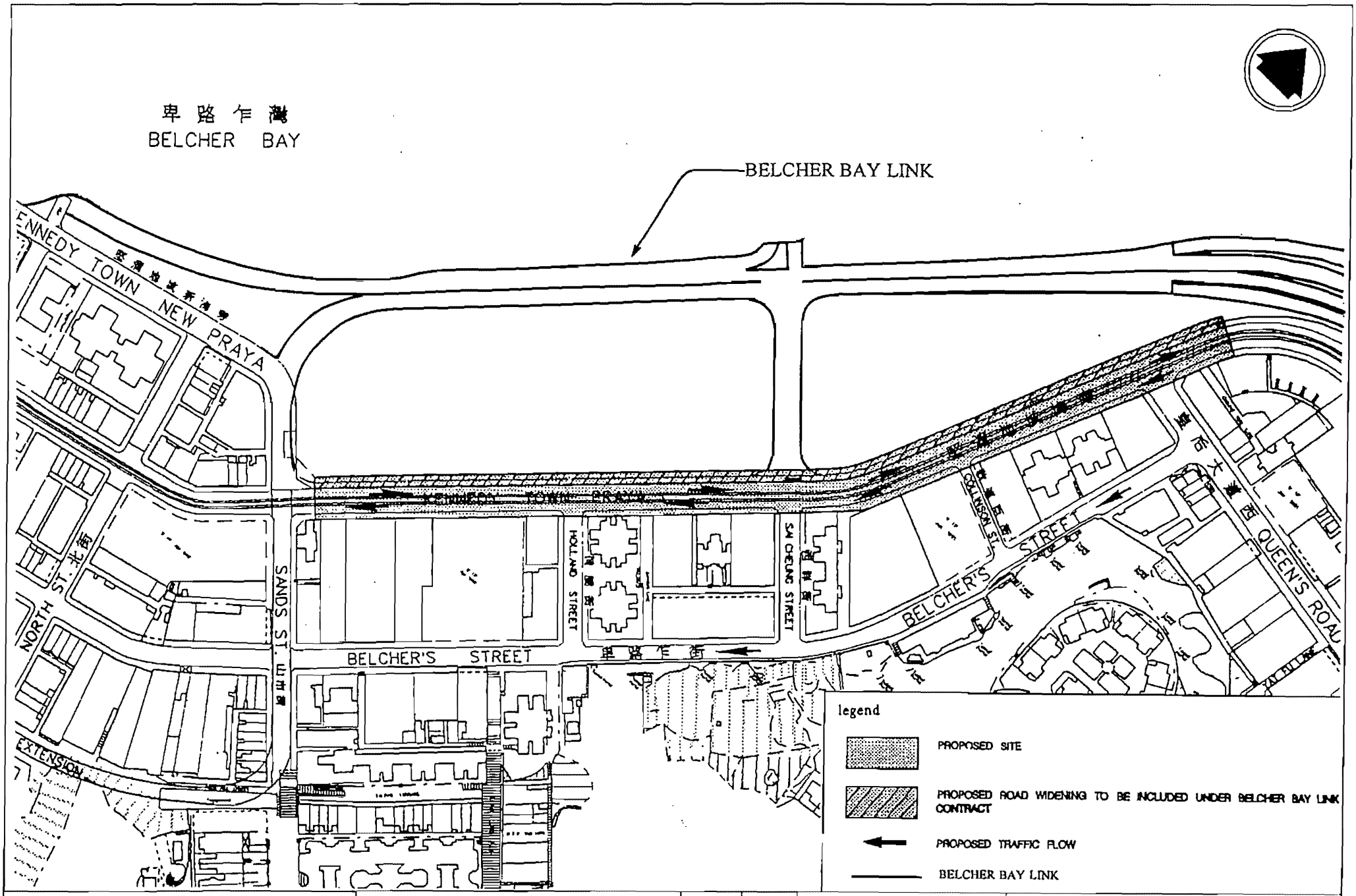
Total Hourly Flow	1850 veh/hr
Percentage Heavy Vehicles	57.9%
Mean Traffic Speed	50 kph
Perpendicular Distance	89 m
Angle of View	80°
Noise Calculation, dB(A)	
Basic Noise Level	73.87
% Heavy Vehicles and Speed Correction	+ 5.52
Gradient Correction	+ 0.00
Distance Correction	- 8.37
Angle of View Correction	- 3.52
Barrier Correction	+ 0.00
Opposite Facade Correction	+ 0.00
Facade Correction	+ 2.50
Noise Contribution	70.00

To achieve the noise limit of 70 dB(A), a minimum setback distance of 89m with negative distance correction of 8.37 dB(A) is required.

Belcher Bay Link (Section between Sands Street and Sai Cheung Street)

Total Hourly Flow	2450 veh/hr
Percentage Heavy Vehicles	30.9%
Mean Traffic Speed	50 kph
Perpendicular Distance	93 m
Angle of View	80°
Noise Calculation, dB(A)	
Basic Noise Level	76.09
% Heavy Vehicles and Speed Correction	+ 3.32
Gradient Correction	+ 0.00
Distance Correction	- 8.39
Angle of View Correction	- 3.52
Barrier Correction	+ 0.00
Opposite Facade Correction	+ 0.00
Facade Correction	+ 2.50
Noise Contribution	70.00

To achieve the noise limit of 70 dB(A), a minimum setback distance of 93m with negative distance correction of 8.39 dB(A) is required.



DRAWING TITLE:

WORKS LIMIT OF PROPOSED ROAD IMPROVEMENT WORKS

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

DESIGNED		FIGURE NO.
DRAWN		1
CHECKED		
APPROVED		
DATE	Mar 98	SCALE: 1:2500

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—M V A— —ENPAC—

Task Name	1997											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Introduce temporary traffic management												
Excavate to new road formation level												
Undertake any drainage and street lighting cabling works												
Lay kerbing and prepare tie-ins to existing roads												
Construct new lane, lay bituminous materials												
Erect new roadsigns, street lights, white lining and site tidy up												
Remove temporary traffic management and open new lane to traffic												

DRAWING TITLE:

WIDENING OF KENNEDY TOWN PRAYA
PRELIMINARY CONSTRUCTION PROGRAMME

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

KENNEDY TOWN TRAFFIC
MANAGEMENT MEASURES STAGE 3

DESIGNED	
DRAWN	
CHECKED	
APPROVED	
DATE	Mar 96
SCALE	N.T.S.

FIGURE NO.
2

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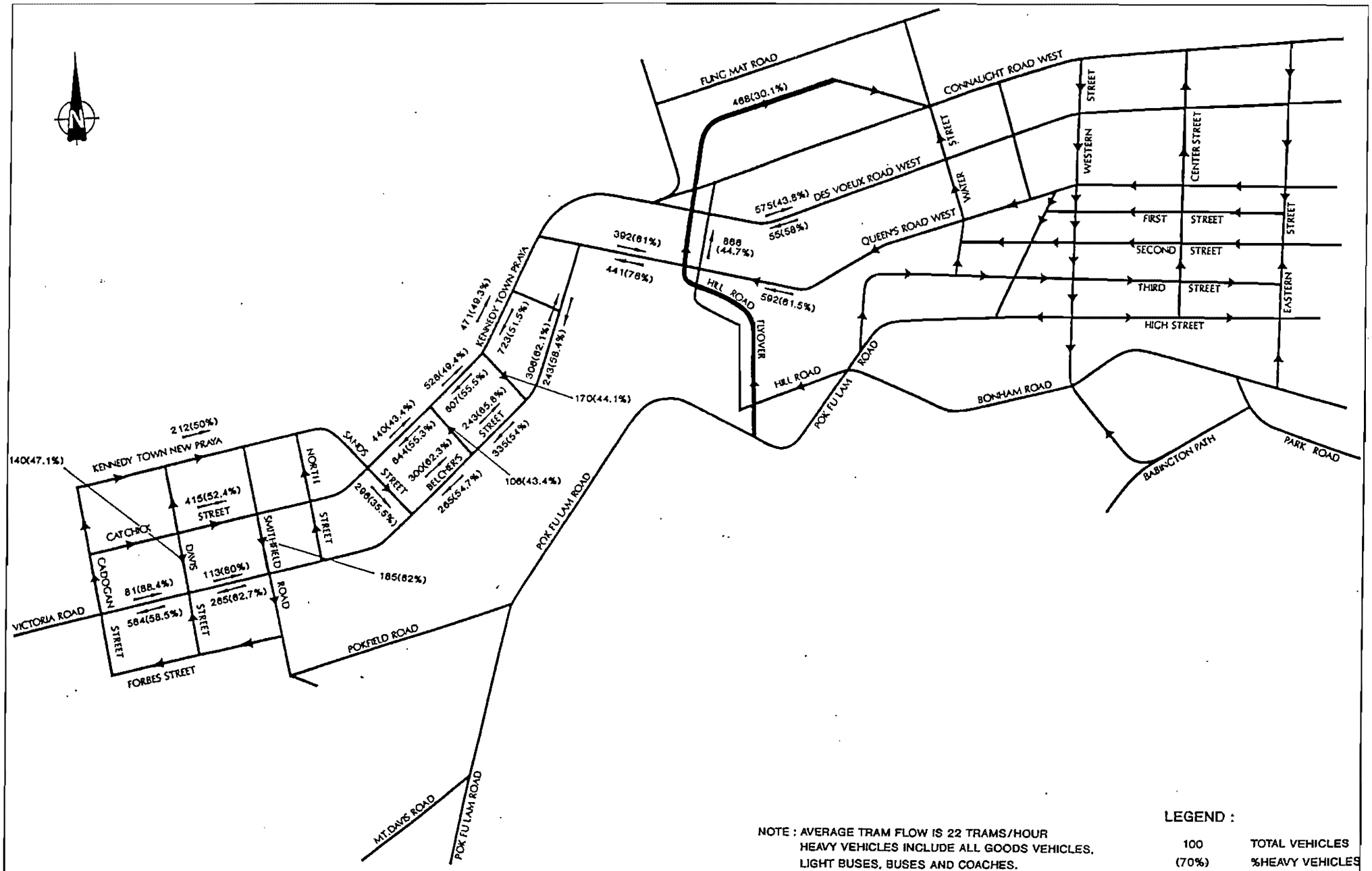

NOTE : AVERAGE TRAM FLOW IS 22 TRAMS/HOUR
HEAVY VEHICLES INCLUDE ALL GOODS VEHICLES, LIGHT BUSES, BUSES AND COACHES.

LEGEND :

100	TOTAL VEHICLES
(70%)	%HEAVY VEHICLES

DRAWING TITLE:

1995 TRAFFIC FLOWS
(EVENING PEAK)

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

DESIGNED		FIGURE NO.	3
DRAWN			
CHECKED			
APPROVED			
DATE	Mar 96	SCALE:	N.T.S.

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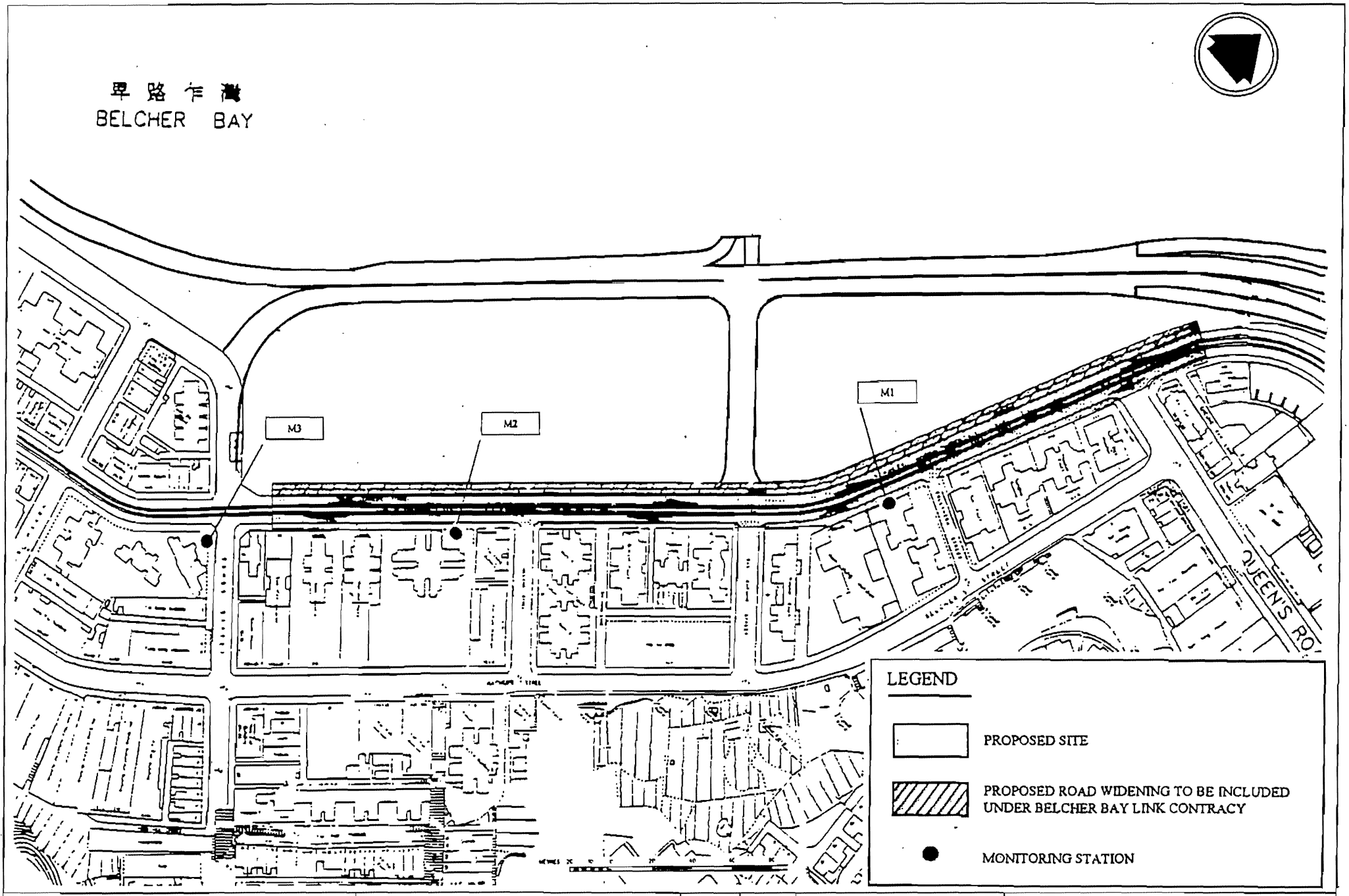

DRAWING TITLE:

LOCATIONS OF BACKGROUND NOISE MONITORING STATIONS

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE

DESIGNED	
DRAWN	
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APPROVED	

FIGURE NO.
4

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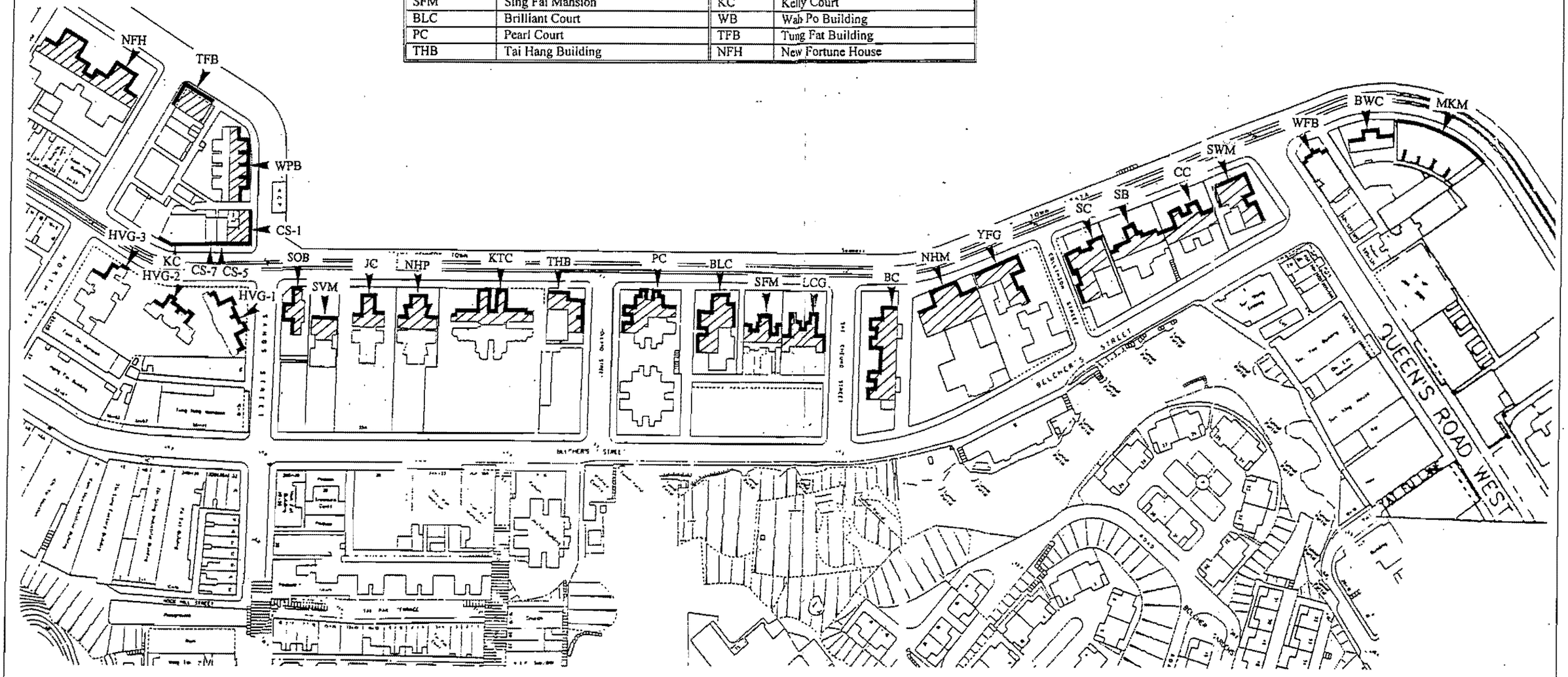
NSR ID	Name / Description	NSR ID	Name / Description
MKM	Mei King Mansion	KTC	Kennedy Town Centre
BWC	Bic Wah Building	NHP	Nan Hai Plaza
WFB	Wo Fat Building	JC	Jade Centre
SWM	Sum Way Mansion	SVM	Sea View Mansion
CC	Chester Court	SOB	Shung On Building
SB	Sunglow Building	HVG-1	Harbour View Garden, Tower 1
SC	Sun Court	HVG-2	Harbour View Garden, Tower 2
YFG	Yick Fung Garden	HVG-3	Harbour View Garden, Phase 3
NHM	Nam Hung Mansion	CS-1	1-3, Catchick Street
BC	Belcher Court	CS-5	5, Catchick Street
LCG	Lung Cheung Garden	CS-7	7, Catchick Street
SFM	Sing Fai Mansion	KC	Kelly Court
BLC	Brilliant Court	WB	Wah Po Building
PC	Pearl Court	TFB	Tung Fat Building
THB	Tai Hang Building	NFH	New Fortune House



Legend

- 100% of dwelling which are located at affected facades are eligible for consideration of Indirect Technical Remedies by ExCo
- JC — Representative sensitive facade at NSR JC
- Extent of affected facades

DRAWING TITLE:

NOISE SENSITIVE RECEIVERS AND REPRESENTATIVE SENSITIVE FACADES

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

DESIGNED	
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CHECKED	
APPROVED	
DATE Mar 96	SCALE: As Shown

FIGURE NO. 5

PYPUN ENGINEERING CONSULTANTS LTD.
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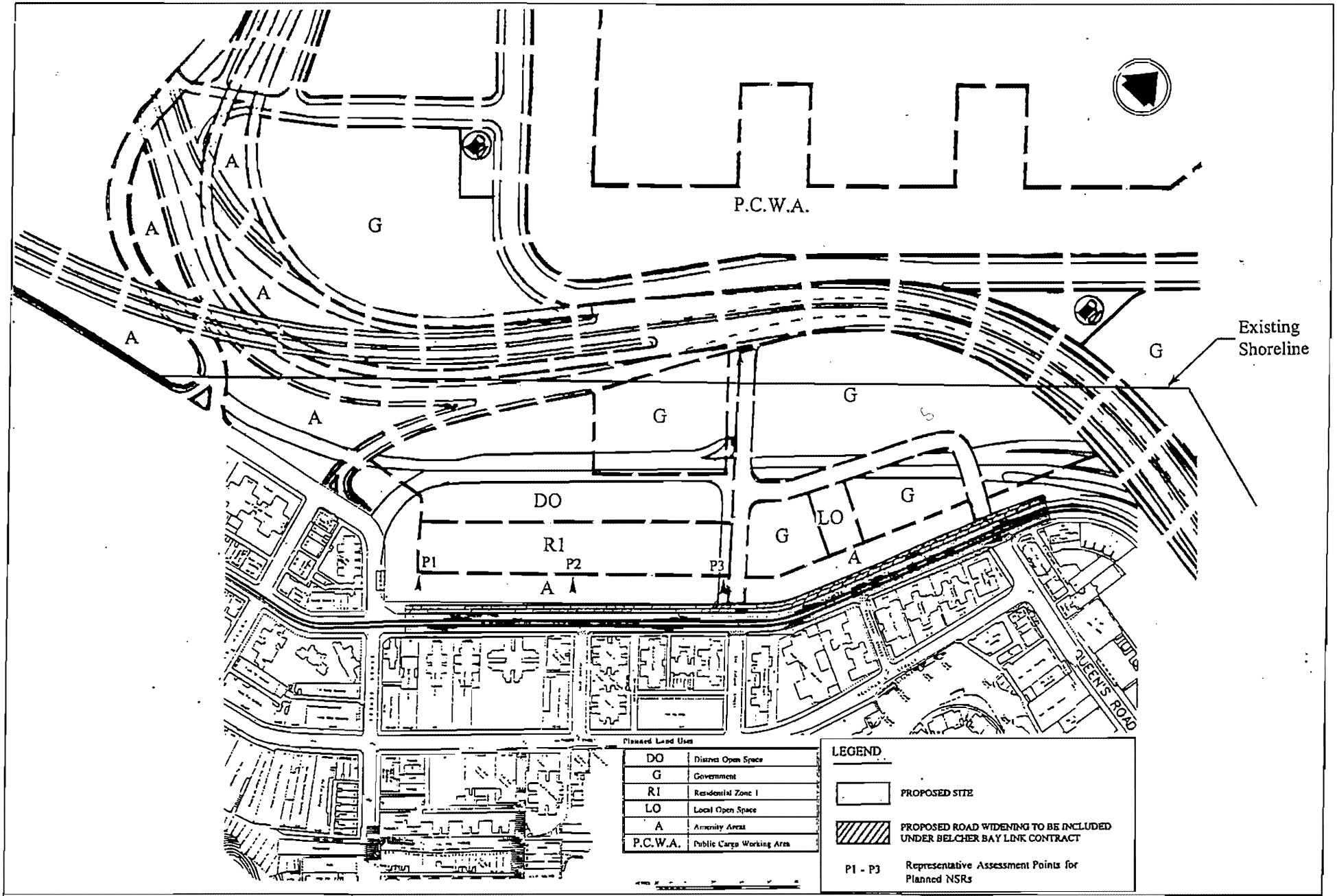

DRAWING TITLE:

PLANNED LAND USES WITHIN STUDY AREA

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

DESIGNED		FIGURE NO.
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APPROVED		
DATE	Mar 98	SCALE: As Shown

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Jade Centre

Wo Fat Building

Shung On Building

Figure 7 Existing Environment at Kennedy Town Praya