BELCHER'S BAY LINK

ENVIRONMENTAL ASSESSMENT REPORT

VOLUME I - NOISE

PYPUN - HOWARD HUMPHREYS LTD.

MAY 1992

BELCHER BAY LINK

ENVIRONMENTAL ASSESSMENT REPORT

This Report consists of the following :

A Introduction

B. Volume I - Noise

C. Volume II - Water Quality & Air Quality

BELCHER BAY LINK

ENVIRONMENTAL ASSESSMENT REPORT

INTRODUCTION

BELCHER BAY LINK

ENVIRONMENTAL ASSESSMENT REPORT

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BELCHER BAY LINK

ENVIRONMENTAL ASSESSMENT REPORT

1. Background of the Project

1.1 In 1988, the "Western District Traffic Study" (WDTS) recommended the construction of Belcher Bay Link to improve the traffic conditions in the Western District.

1.2 On 7th March 1988, the Traffic & Transport Committee of the Central & Western District Board fully supported this scheme and advised Government to accord this scheme with priority.

1.3 This project was presented to the Traffic & Transport Committee of the Central & Western District Board on 22nd May 1991. Members were informed of the following major items of works constituting the Project (see Fig. 1) :

- o the construction of a dual carriageway at ground level across the new reclamation at Belcher Bay to link up the existing upgraded Connaught Road West with Smithfield in Kennedy Town;
- o the construction of a Public Cargo Working Area (PCWA) along the new seafront for reprovisioning of existing cargo handling facilities along Kennedy Town Praya affected by the new reclamation; and
- o the ancillary seawall construction and reclamation works to form the new reclamation at Belcher Bay required for the road link and PCWA.

1.4 It is anticipated that the proposed works would take 44 months to complete.

1.5 The present proposed layout of the Belcher Bay Link is a temporary configuration and would last for around 10 years. Upon implementation of the larger Green Island Reclamation, Belcher Bay Link would be relocated to a more northerly alignment.

2. Method of Construction

Reclamation

2.1 The existing seabed will be dredged to remove the soft marine mud for the construction of seawall foundation.

2.2 The reclamation will be constructed with marine sand fill and other suitable material in three phases (see Fig. 2a, 2b and 2c). Placing of marine sand fill would be by barge open-bottom dumping or grabbing dependent upon the depth of water available.

Seawall

2.3 The majority of the seawall is of the traditional vertical concrete blockwork wall (see Fig. 3) constructed on sand fill and pell mell rubble mound foundation.

2.4 At the west end of the reclamation where dredging of the existing seabed will destabilise the existing seawall, a "Relief Platform" and "Portal Frame" type of seawall is adopted (see Fig. 4 and 5). These types of seawall involve installation of steel pipe piles, steel H-piles and a cast insitu reinforced concrete slab.

Roads and Drainage Works

2.5 The roads and drainage works would involve earth excavation, compaction by rollers and other common construction vehicles.

2.6 The stormwater collector box culvert to be constructed along the existing Kennedy Town Praya will be of cast insitu reinforced concrete and founded on precast concrete piles.

3. Objective of the Assessment

3.1 The objectives of the environmental assessment were :

- o to identify sensitive receivers affected by construction and operation of the ground level road link and the construction of the associated reclamation;
- o to assess noise, air and water quality impacts arising from the construction phase;
- o to assess noise, air and water quality impacts arising from the operational phase;
- o to recommend direct mitigation measures to reduce impacts to acceptable standards; and
- o to propose a series of monitoring programmes to ensure compliance with environmental quality standards during construction.

BELCHER BAY LINK

ENVIRONMENTAL ASSESSMENT REPORT

VOLUME I - NOISE

CONTENTS

1. ASSESSMENT OF CONSTRUCTION NOISE

1.1 Construction Works

1.1.1 The project involves construction of a reclamation, a ground level road and the associated drainage works (Fig. 1 - Appendix I).

1.1.2 The sea bed would be dredged to remove soft marine mud for the seawall foundation. An area of approximately 10.3 ha would be reclaimed by marine sand fill.

1.1.3 The majority of the sea wall would be the traditional vertical concrete blockwork wall constructed by laying pell mell rubble mounds and concrete sea wall blocks with granite facing above 1.65 mCD.

1.1.4 Dredging for sea wall foundation would not be carried out within 25 metres in front of the existing sea wall of the Praya. This would avoid destabilising the existing sea wall during construction. Sea wall in the non-dredged area would take the form of "Relief Platform" or "Portal Frame" formed from steel sheet pipe piles, H-piles and a reinforced concrete slab.

1.1.5 Placing of marine sand fill and other suitable material would be by open-bottom barge or hydraulic pumping.

1.1.6 The roads and drainage works would involve excavation, compaction by rollers and other construction vehicles.

1.2 Technical Memoranda

1.2.1 Procedures for the assessment and control of noise from general construction and piling activities are given in the following Technical Memoranda (TM), of the Noise Control Ordinance (NCO).

a. Technical Memorandum on Noise from Construction work other than Percussive Piling; and

b. Technical Memorandum on Noise from Percussive Piling.

1.2.2 Contractors are required to obtain noise permits from the EPD for carrying out general construction works for time other than weekday daytime, whereas for percussive piling permits are needed in the weekday daytime and no operation is allowed other than these. Contractors' application will be assessed by the EPD in accordance with the two following Technical Memoranda.

a. Technical Memorandum on Noise from Construction work other than Percussive Piling.

For general construction work, no noise restriction is imposed during daytime hours of the normal working day (07.00 - 19.00 hrs., Monday - Saturday inclusive). Contractors are expected to carry out activities including dredging of marine mud, placing of marine sand, pell mell rubbles and seawall blocks, concreting, roadworks and drainage works during these times. However, for 19.00 - 23.00 hrs in the evening, 23.00 - 07.00 hrs at night, Sundays and Public Holidays, Acceptable Noise Levels (ANL) have been stipulated and shown in Table 1.1.

Table 1.1 Acceptable Noise Levels (ANL) for General Construction Work

Time Period	ASR		
	A	B	C
All days during the evening (1900-2300 hours), and general holidays (including Sundays) during the daytime and evening (0700-2300 hours)	60	65	70
All days during the night-time (2300-0700 hours)	45	50	55

From the study of the surrounding noise environment carried out by the Green Island Reclamation Feasibility Study (Appendix VI), the Area Sensitivity Rating for the designated NSRs should be "C" as they are located in the urban area. The corresponding ANL for general construction works are 70 dB(A) at all evenings and daytime for public holidays and 55 dB(A) for night-time.

It is expected that general construction noise level due to the worst combination of dump trucks and excavators for processing land fill material adjacent to Kennedy Town Praya is around 92 dB(A) (see Appendix VI). This represents the worst case scenario and is highly unlikely to be persistent as after working close to Kennedy Town Praya for a few hours, the plants have to be moved to cover the reclamation area further away. Although there are no statutory requirements for limits daytime construction noise, the control of daytime noise will be exercised in the form of contract noise control clauses. The Contractor is required to incorporate mitigation measures approved by the Engineer, wherever necessary into their works to reduce daytime noise levels. Mitigation measures such as acoustic screening of plant equipment, use of silenced equipment and scheduling of construction activities shall be adopted.

b. Technical Memorandum on noise from percussive piling

The ANL for piling noise is generally 85 dB(A) for receivers with windows or other openings but without central air conditioning system. However, 10 dB(A) is subtracted from ANL for NSRs which are hospitals, medical clinics and educational institutions. This is not applicable in the case of Belcher Bay Link (BBL).

Installing the steel pipe piles by percussion method at the west end of the reclamation would have noise level in the order of 100 dB(A) (after applying the correction factor corresponds to a distance of 12 m. for NSRs along the land-side of the Praya). An alternative way of installation would be by boring. Techniques such as grab and chisel, and reverse circulation drill would have noise level reduced to 85 dB(A).

In the case of the steel raking piles further away from the Praya at the west end of the reclamation, it would appear that installation by percussive piling is the most efficient method in terms of subsequent pile performance. The expected noise level would be in the order of 100 dB(A). Some kind of shields would need to be provided to reduce the CNL to ANL. The shield may take the form of casing around the pile head.

1.3 Conclusions and Recommendations

1.3.1 As stipulated by the Noise Control Ordinance, the Contractor is required to obtain the necessary Construction Noise Permit to enable him to carry out the construction works within the specified time periods.

1.3.2 We would recommend the Contractor to carry out activities such as dredging of marine mud, placing of marine sand, pell mell rubbles, sea wall blocks and other suitable reclamation materials, concreting, roadworks and drainage works during the permitted normal daytime working hours (07.00 - 19.00 hrs., Monday - Saturday inclusive). The Contractor would be required to observe the noise control requirements and propose mitigating measures for approval by EPD if he wished to carry out these works in other times.

1.3.3 Installing steel piles by percussive piling would give rise to CNL exceeding ANL. We would recommend that the Contractor should give consideration to alternative installation techniques which could reduce the construction noise level to the level acceptable by EPD. These techniques might include grab and chisel, reverse circulation drill and the use of shield in the form of casing around the pile head.

2. ASSESSMENT OF TRAFFIC NOISE

2.1 Traffic Scenarios

2.1.1 The following traffic scenarios are selected to establish the traffic noise level for comparison:

a. Design year 1991

Traffic flow figures (Fig. AII.1/3 - Appendix II) were obtained from WDTS. The flow figures were used to establish the existing traffic noise level.

b. Design year 1996 (without WHC and BBL)

Traffic flow figures (Fig. AII.2/1 - Appendix II) were obtained from WDTS. The flow figures represent the growth of traffic flow without implementation of WHC and BBL and thus the expected traffic noise level by 1996.

c. Design year 1996 (with WHC and BBL in place)

Traffic flow forecast (Fig. 2.1 - Appendix II) were obtained from a traffic model tailor-made for this project with the following assumptions :

Completion of :

- Belcher Bay Link
- Western Harbour Crossing
- Smithfield Extension
- Route 7 up to Belcher Bay reclamation
- Widening of Kennedy Town Praya
- Kennedy Town Traffic Management Stage "3"

Results were used to establish the implication of Belcher Bay Link on traffic noise.

d. Design year 2006

Results obtained from the same model as described in 2.1 c. at 2006 (Fig. 2.2 - Appendix II) reflect the growth of traffic flow with WHC and BBL in place.

2.1.2 Peak hour traffic flows in PCUs and the equivalent number of vehicles for design years 1991, 1996 and 2006 shown in Appendix II.

2.2 **Selection of Noise Sensitive Receivers (NSRs)**

2.2.1 The layout of BBL is shown in Fig. I. The new road link runs close to Kennedy Town Praya near Queen's Road West. The NSRs in this area are selected for traffic noise assessment.

2.2.2 The NSRs (Fig. 2.3 - Appendix III) selected for the assessment are :

a. No. 430 - 440 Des Voeux Road West — Kwan Yick Building

Building layout	Multi-storey commercial / residential building with a podium at 2/F and a set-back by 9 m for residential flats above.
Road layout	BBL is covered by the elevated deck of Route 7.

The ground and 1/F shops and offices are not classified as NSRs. Dwellings from 2/F up are classified as NSRs. However, the presence of the elevated deck of Route 7 would effectively shield most of the noise from BBL. It is evident that BBL would be a small contributor at this location. Traffic noise calculations are therefore not necessary.

b. No. 453 - 462 Des Voeux Road West — Location A

Building layout	7 storey residential building from 1st floor up; and Shops at ground level.
Road layout	West bound down ramp of Route 7 lies between BBL and NSRs.

This location is the closest point to both BBL and Route 7. Two levels, 6 m. and 22 m. (top floor) above ground are chosen to assess traffic noise. Shielding effect due to the Route 7 down ramp has been ignored. The calculated noise levels can therefore be expected to represent a high assessment.

c. No. 1 - 2 Kennedy Town Praya — Location B

Building layout	Multi-storey commercial / residential building with a podium at 4/F and a 3 m set-back for residential flats above; and Shops at ground level.
Road layout	The retaining wall of Route 7 down ramp acts as noise barrier to BBL.

Two levels, 5 m. and 25 m. above ground are chosen to assess the traffic noise level.

d.	No. 468 - 470 Des Voeux Road West Wo Fat Building	Location C
	Building layout	Multi-storey residential building with a podium at 1/F and a 3m set back for residential flats from 2/F up; and Garage at ground level.
	Road layout	The retaining wall of Route 7 down ramp acts as noise barrier to BBL.
e.	Pearl Court Kennedy Town Praya	Location P
	Building layout	Multi-storey residential building.
	Road layout	BBL is approximately 100 m. north of the building.
f.	New Fortune House Kennedy Town New Praya	Location Q
	Building layout	Multi-storey residential building.
	Road layout	Approximately 30 m. south of the eastbound carriageway of BBL near the Smithfield junction.

Note : Two levels 7.3 m. and 28 m. above ground are chosen to calculate the traffic noise level for NSRs of a, b, c and d. Levels of 5 m. and 10.5 m. were chosen for NSRs of e. and f. respectively.

2.3 Reference of Calculations

2.3.1 General

The method of calculating traffic noise levels is that given in "The Calculation of Road Traffic Noise - 1988" by U.K. Department of Transport as required by the Hong Kong Planning Standards & Guidelines. Road traffic noise is presented in terms of L10 (1 hour) dB(A) for both AM and PM peak traffic flows (Appendix V).

2.3.2 Vehicle speed and gradient

Design speed of BBL and Route 7 is 50 kph and 70 kph respectively. Vehicles along Kennedy Town Praya are observed travelling at lower speed of about 30 kph due to tram movements and loading and unloading activities. With the implementation of Kennedy Town Traffic Management Stage 3, traffic speed would be normalised to 50 kph. Gradient of the ramps and ground routes are 8% and approximately 0% respectively.

2.3.3 Pavement surfaces

An open texture wearing course has been recommended to be used on the Route 7 ramps whilst BBL and Kennedy Town Praya would have ordinary flexible pavement. Reclaimed land surface other than carriageway is assumed to have a noise absorbent nature and is classified as soft ground.

2.3.4 Barriers

Retaining structures of the Route 7 down ramp would act as a noise barrier to BBL. Concrete profile barriers on elevated structures and along central reserves of the ground level road are assumed to act as noise barriers not greater than 0.8m above carriageway, and have been incorporated into the model accordingly.

2.4 Traffic Noise Level

2.4.1 The summary of traffic noise levels and calculations are appended to this report (Appendix IV). Table 1 and 2 summarise the noise levels for the selected NSRs :

a. At 1991, traffic noise levels have been assessed at 76/77 dB(A) at the lower level and 71/72 dB(A) at the higher level along Des Voeux Road West and Kennedy Town Praya.

The traffic noise level increases by approximately 1 dB(A)(L10) from 1991 to 1996 in the absence of BBL.

b. With BBL and Route 7 down ramps in place, traffic noise levels at 2006 are predicted to be 77/78 dB(A) at the lower level and 75/76 dB(A) at the higher level along Des Voeux Road West and Kennedy Town Praya.

2.4.2 Conclusions

a. The noise assessment shows a relative small increase of up to 2 dB(A) in noise level at lower floor levels by 2006 when compared with noise level at 1996 in the absence of BBL. Due to the redistribution of traffic flow with BBL in place, some of the selected NSRs would experience a slight reduction in noise level.

b. Similarly, at higher floor levels, it is predicted that traffic noise level would be increased by 2 to 4 dB(A) by 2006. when compared with noise level at 1996 in the absence of BBL

c. The noise level contribution break down shows that Kennedy Town Praya, being the nearest to the NSRs, is the major contributor of traffic noise.

2.5 Mitigation Measures and Opportunities

2.5.1 Open Texture Friction Course

The use of open texture friction course on BBL would further reduce the traffic noise level contribution from BBL about by 2.5 dB(A) (ordinary flexible pavement has been assumed in the initial assessment). However, the overall improvement to NSRs at lower floor levels is found to be negligible as the major contribution of traffic noise comes from Kennedy Town Praya which would not have the benefit of open texture friction course. At the higher floor levels, a reduction of 1 dB(A) is predicted with the use of open texture friction course on BBL. The reduction of traffic noise levels resulted from the use of friction course is shown in Table 3 and 4 of the summary (Appendix IV).

2.5.2 Noise Barriers

Possible locations for installing noise barriers within BBL project area would be along the central reserve and the near-side of the west bound carriageway (fig. 2.3) and the corresponding shielding areas for the NSRs are shown in Fig. 2.3A-C of Appendix III.

With BBL only contributing a marginal increase in traffic noise at lower floor levels, the installation of noise barriers along the central reserve and the near-side of the west bound carriageway would have little effect on reducing the overall traffic noise level.

At higher floor levels, the maximum increase in traffic noise would be 4 dB(A) (Table 2 of Appendix IV) at Location A by 2006. Major contributions of the increase in traffic noise come from Kennedy Town Praya and Route 7 west bound down ramp. The installation of noise barriers within the limit of BBL would again have little effect on reducing the noise level (Table 7 and 8 - Appendix IV). Noise barriers up to 3 m. high on Route 7 down ramp would give rise to a reduction of 1 dB(A) in traffic noise at high floor levels (up to 22 m.). However, this would have implication on the temporary ramp structure and is outside the scope of this project.

2.6 Conclusion and Recommendations

2.6.1 Traffic noise contributed by BBL to NSRs in the vicinity of Des Voeux Road West and Queen's Road West would be negligible at lower floor levels, based on the traffic model set up for BBL with the implementation of Kennedy Town Traffic Management Stage 3 and inclusion of Western Harbour Crossing and Route 7 up to Kennedy Town.

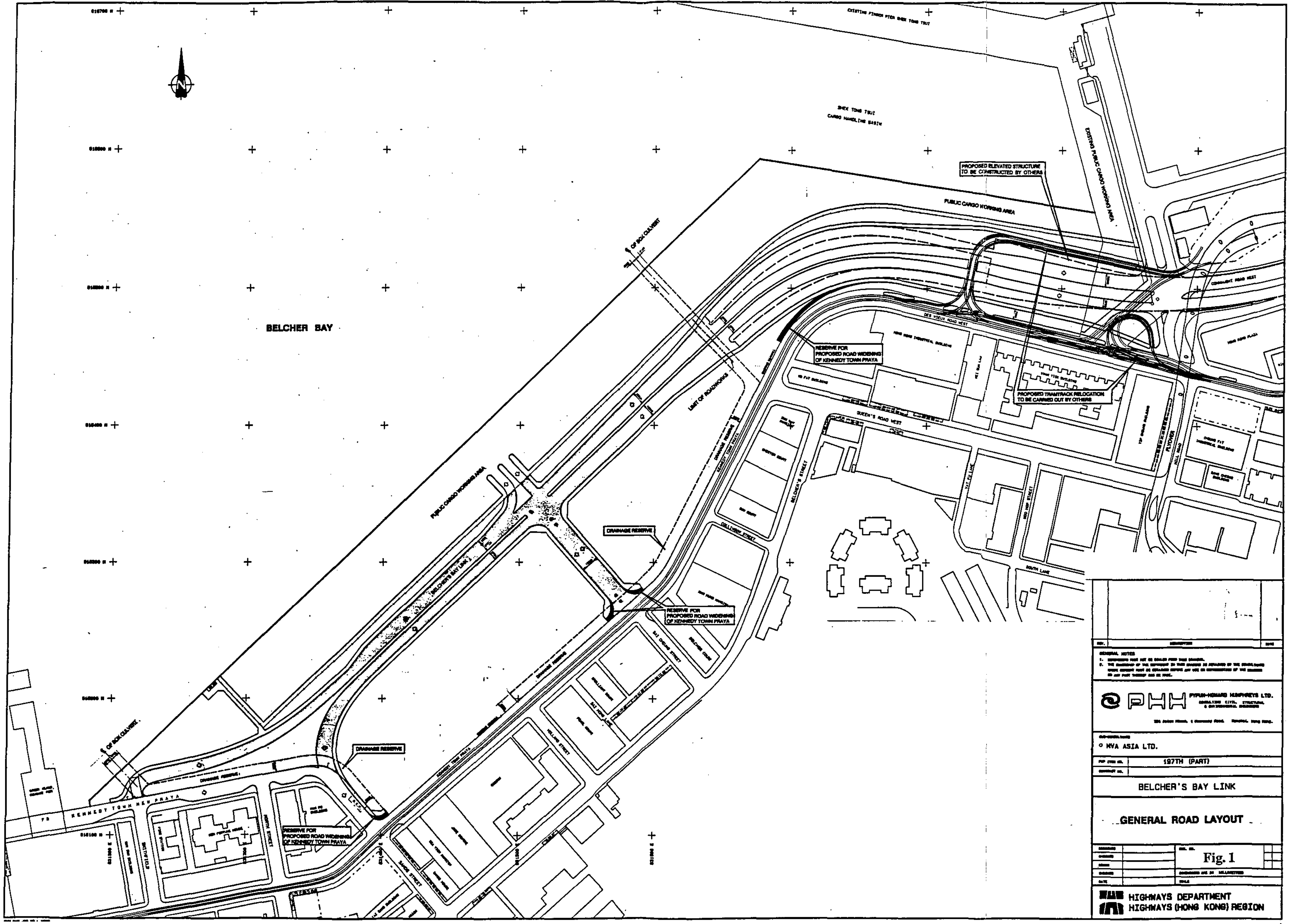
2.6.2 NSRs at higher floor levels would experience noise level increase up to 4 dB(A) by 2006 when compared with the predicted traffic noise level at 1996 in the absence of BBL. The main contribution of the increase in traffic noise level comes from Route 7 westbound down ramp and Kennedy Town Praya.

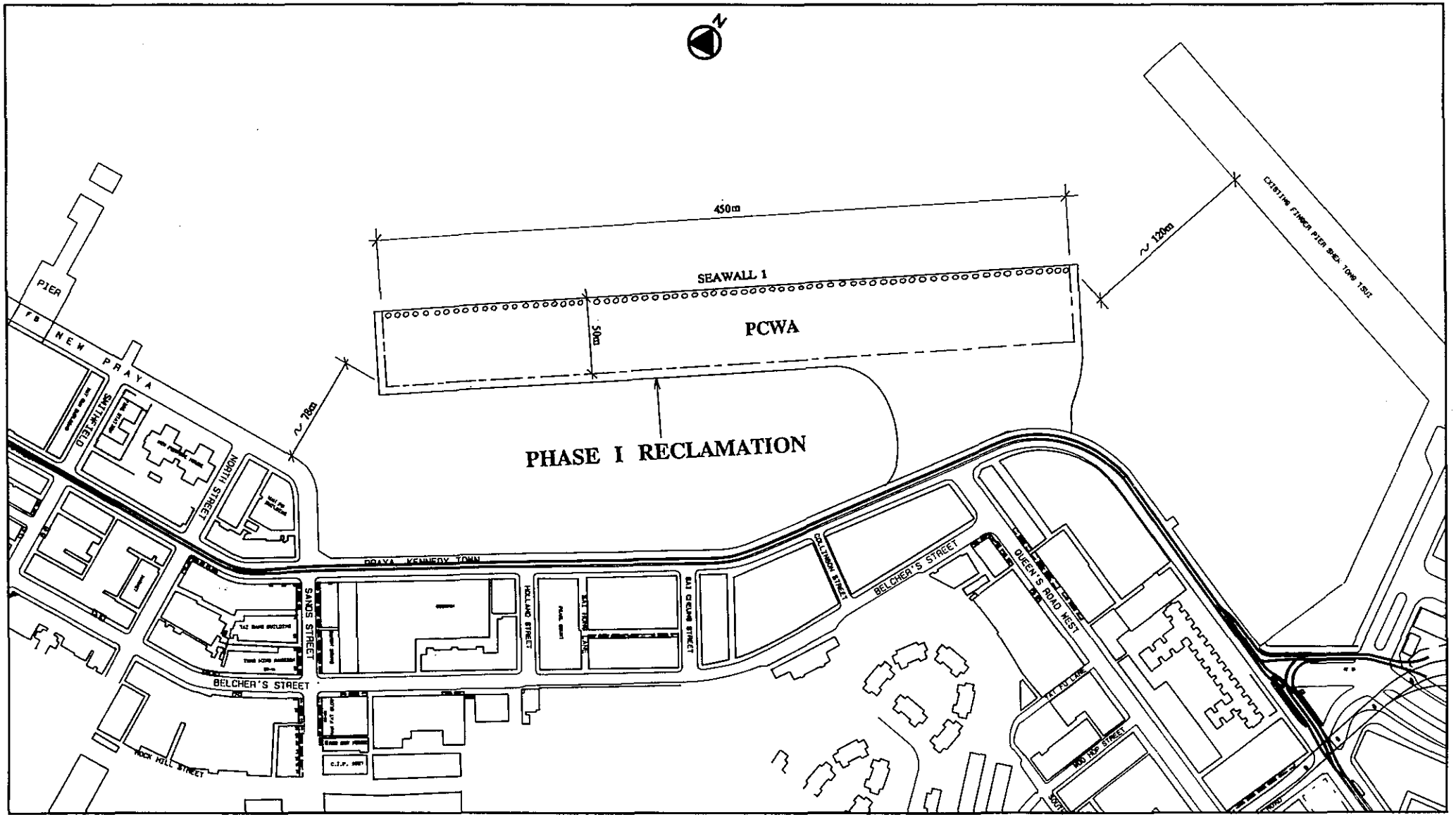
2.6.3 With the Route 7 down ramp and Kennedy Town Praya as the major contributor in traffic noise, mitigating measures implemented within BBL would not improve the overall noise level significantly. The improvements are limited to 1 dB(A). The installation of noise barriers within BBL boundaries is not recommended. However, it is recommended that suitable mitigation measures should, whenever possible, be incorporated into works associated with these major contributors.

2.6.4 The use of open texture friction course material for BBL road surface is predicted to reduce traffic noise level by 1 dB(A). The result is similar to the case of noise barriers. Because of the small improvement achieved, it can be concluded that the types of flexible road pavement material to be used on BBL would not have significant effects on noise reduction. The use of open texture material is not recommended for BBL.

2.6.5 Reduction of noise level for NSRs at higher floor levels as concluded in 2.6.2 should be obtained from mitigation measures on the major traffic noise contributors which include the Route 7 down ramp and Kennedy Town Praya. However, works in these areas are outside the limits of this project.

APPENDIX I


BELCHER BAY
SHEK TONG TSUI CARGO HANDLING BASIN
EXISTING PUBLIC CARGO WORKING AREA
PUBLIC CARGO WORKING AREA
PROPOSED ELEVATED STRUCTURE TO BE CONSTRUCTED BY OTHERS
PROPOSED TRAMTRACK RELOCATION TO BE CARRIED OUT BY OTHERS
RESERVE FOR PROPOSED ROAD WIDENING OF KENNEDY TOWN PRAYA
DRAINAGE RESERVE
LIMIT OF ROADWORKS
DES VOEUX ROAD WEST
QUEEN'S ROAD WEST
BELCHER'S STREET
HILL ROAD
FLYOVER
SOUTH LANE
NORTH STREET
SANDS STREET
HOLLAND STREET
KENNEDY TOWN NEW PRAYA
BELCHER'S BAY LINK
CONNAUGHT ROAD WEST
PHH PYPUN-HOWARD HUMPHREYS LTD.
O HVA ASIA LTD.
197TH (PART)
BELCHER'S BAY LINK
GENERAL ROAD LAYOUT
HIGHWAYS DEPARTMENT
HIGHWAYS (HONG KONG) REGION
Fig. 1



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RECLAMATION PHASE I

FIGURE 2 A

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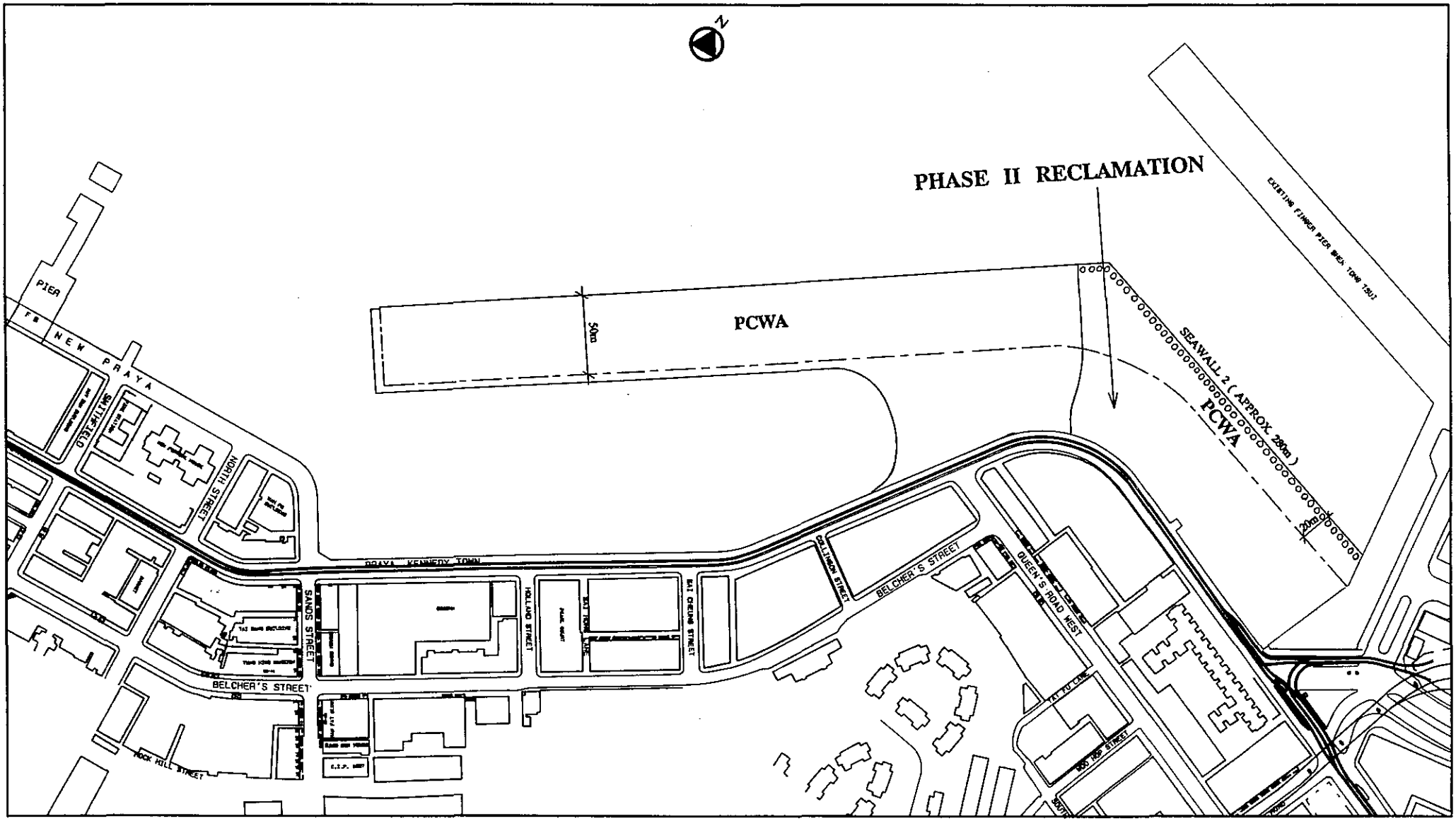

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CONSULTING ENGINEERS

RECLAMATION PHASE II

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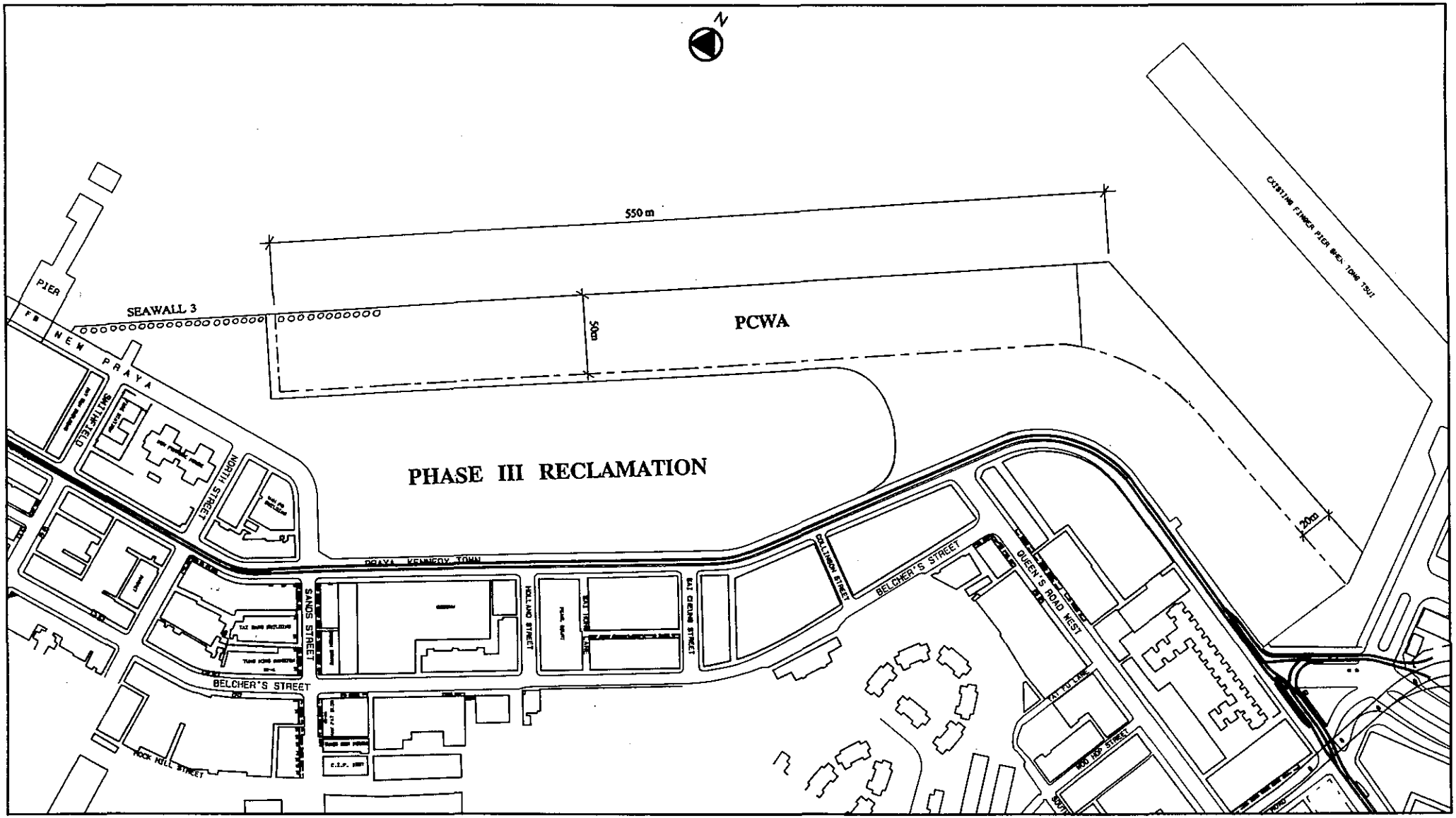
FIGURE 2B



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RECLAMATION PHASE III

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FIGURE 2 C

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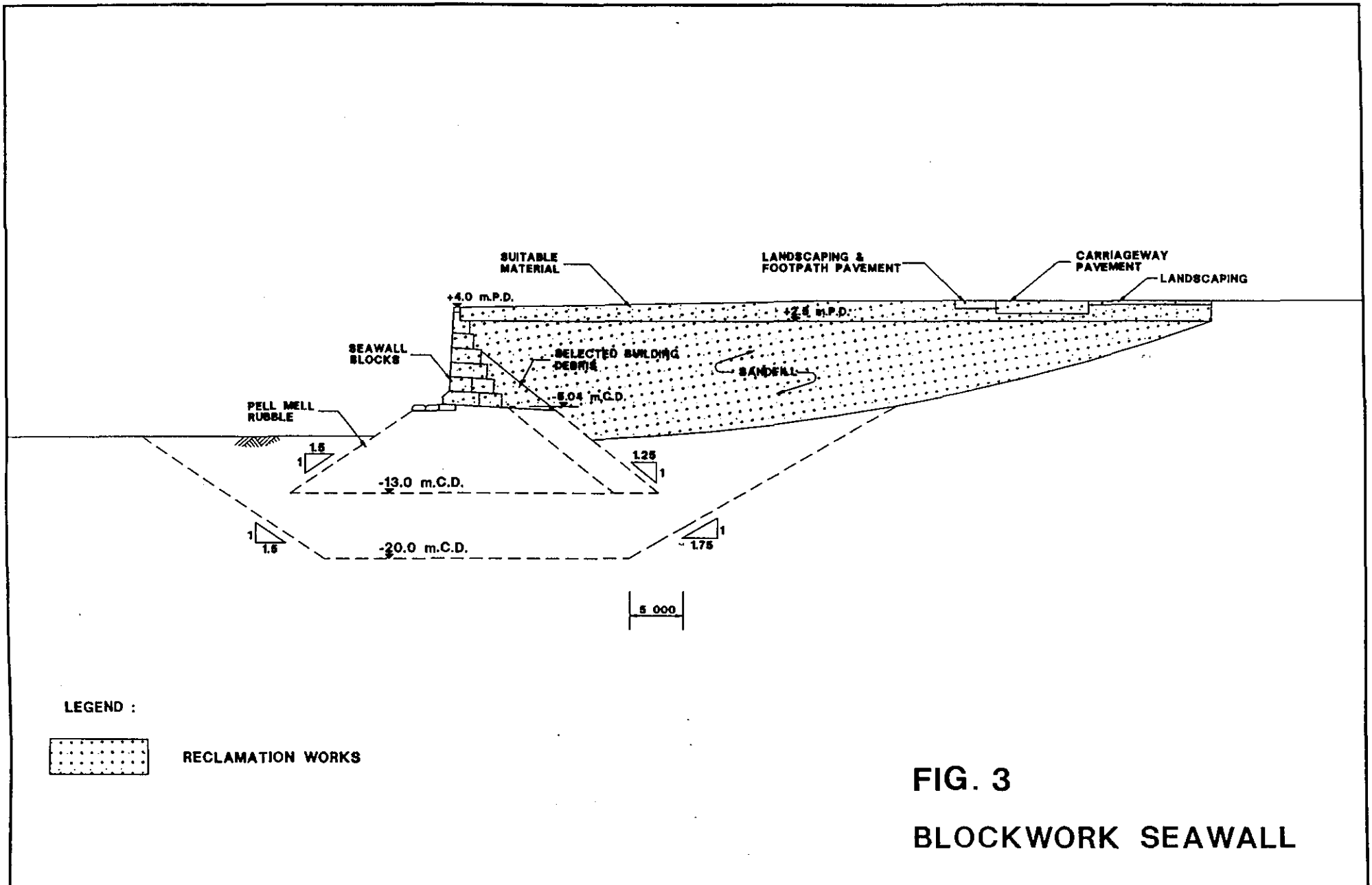
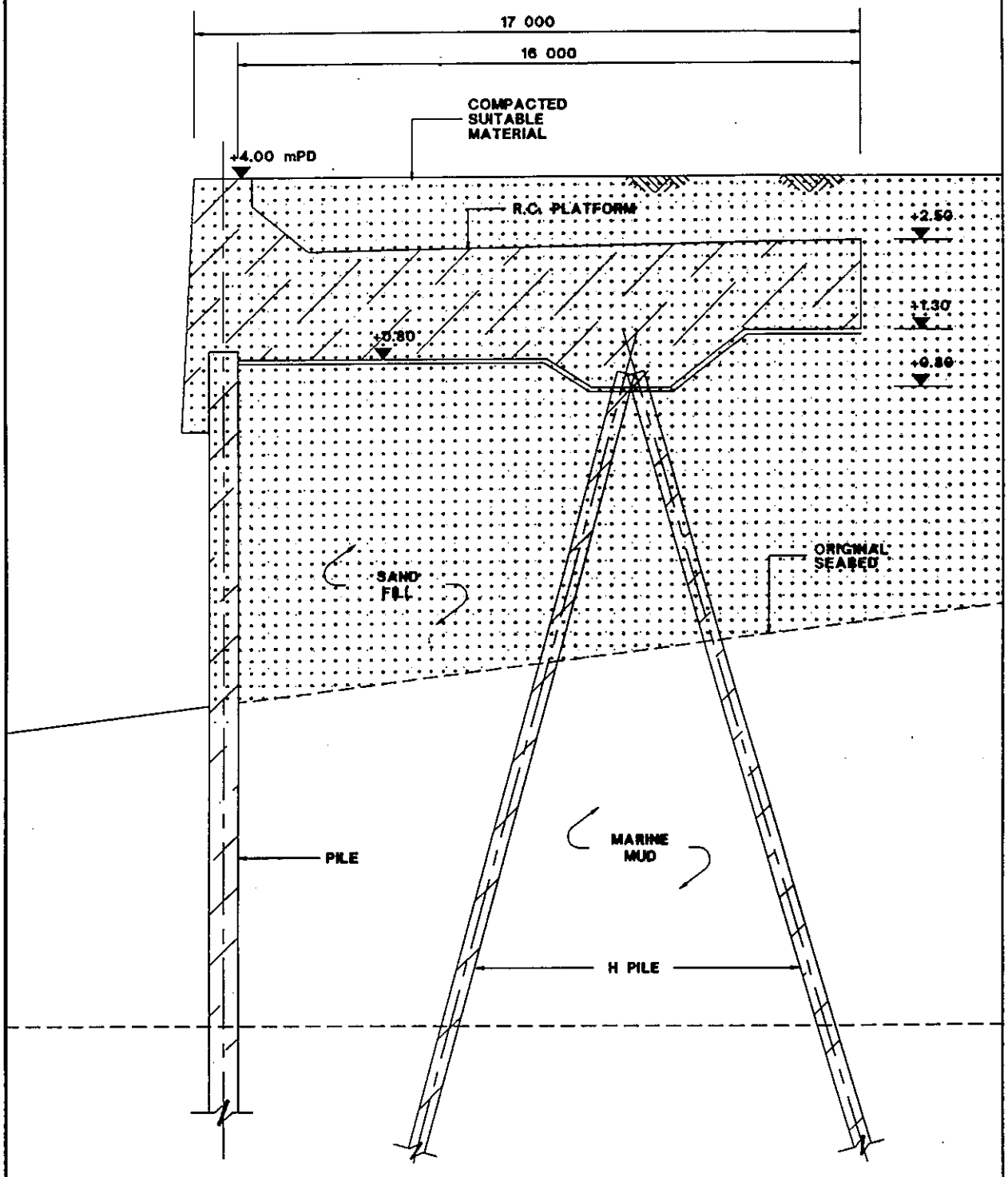


FIG. 3

BLOCKWORK SEAWALL

RELIEF PLATFORM SEAWALL



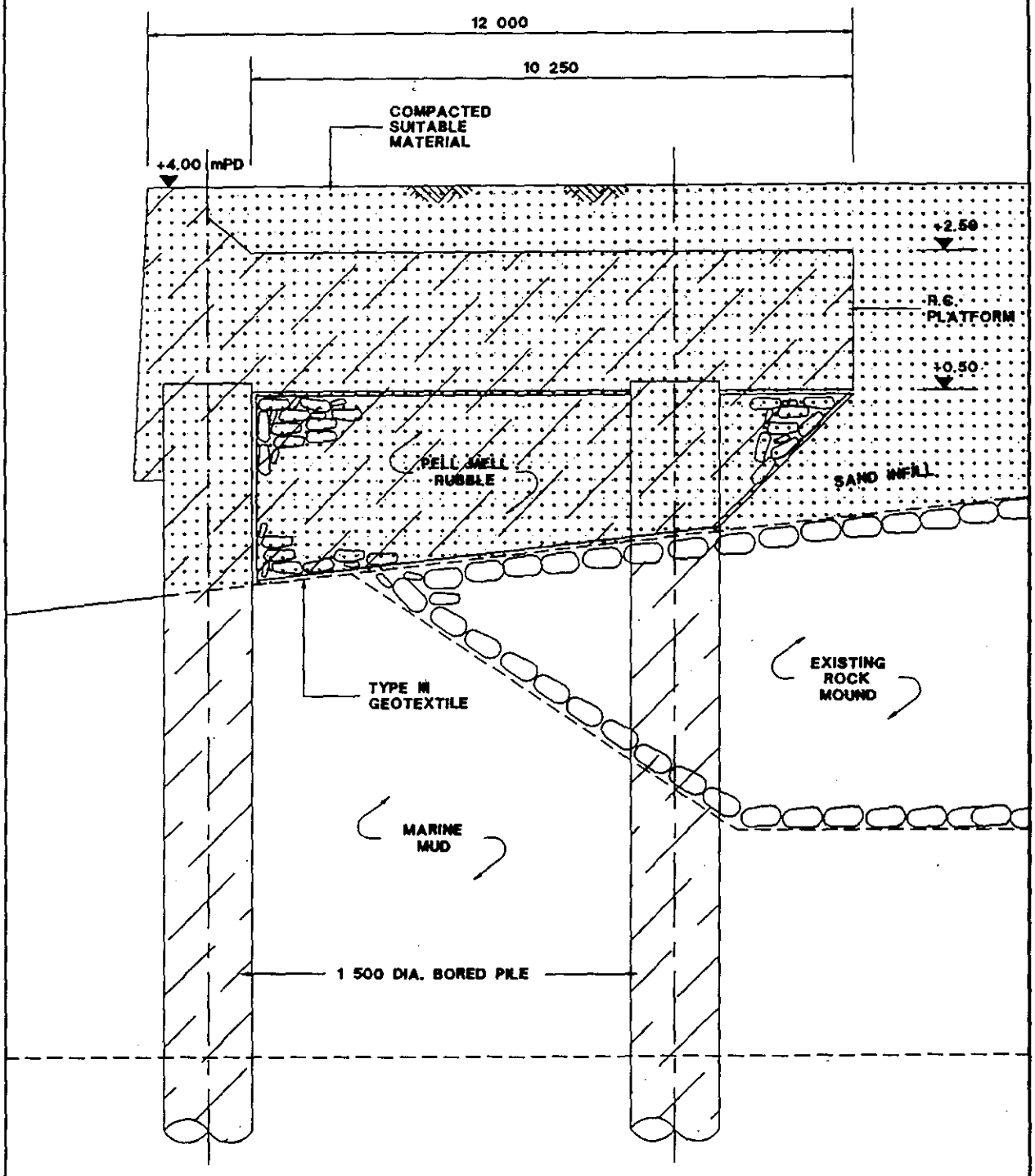
LEGEND :

RELIEVING PLATFORM SEAWALL

RECLAMATION WORKS

FIG. 4

PORTAL FRAME SEAWALL



LEGEND :

PORTAL FRAME SEAWALL

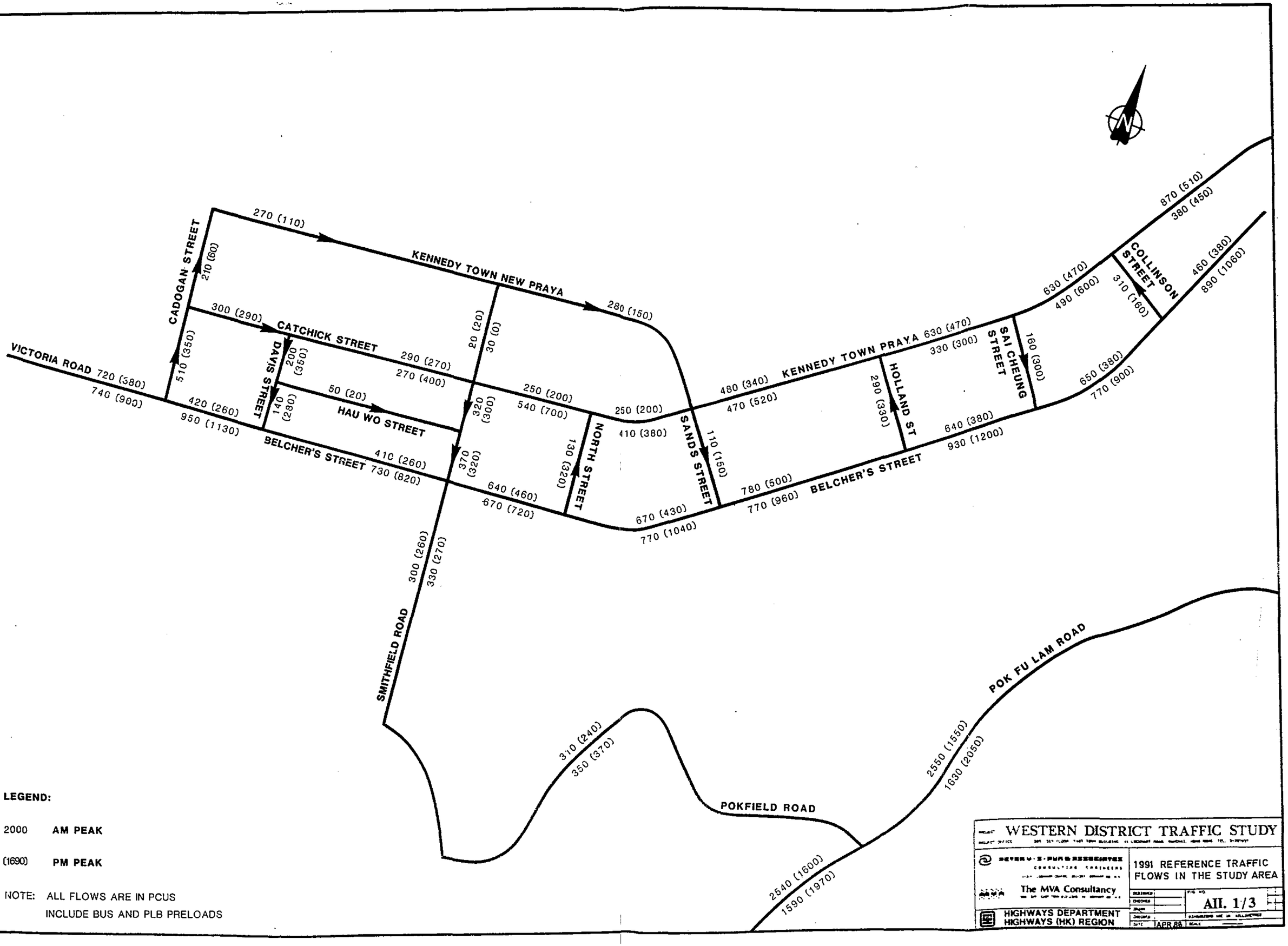
RECLAMATION WORKS

FIG. 5

APPENDIX II

APPENDIX II : Traffic Flow Figures Diagram

Content



LEGEND:

2000 **AM PEAK**

(1690) **PM PEAK**

NOTE: ALL FLOWS ARE IN PCUS
INCLUDE BUS AND PLB PRELOADS

WESTERN DISTRICT TRAFFIC STUDY

PETER M. S. PUK & ASSOCIATES
CONSULTING ENGINEERS

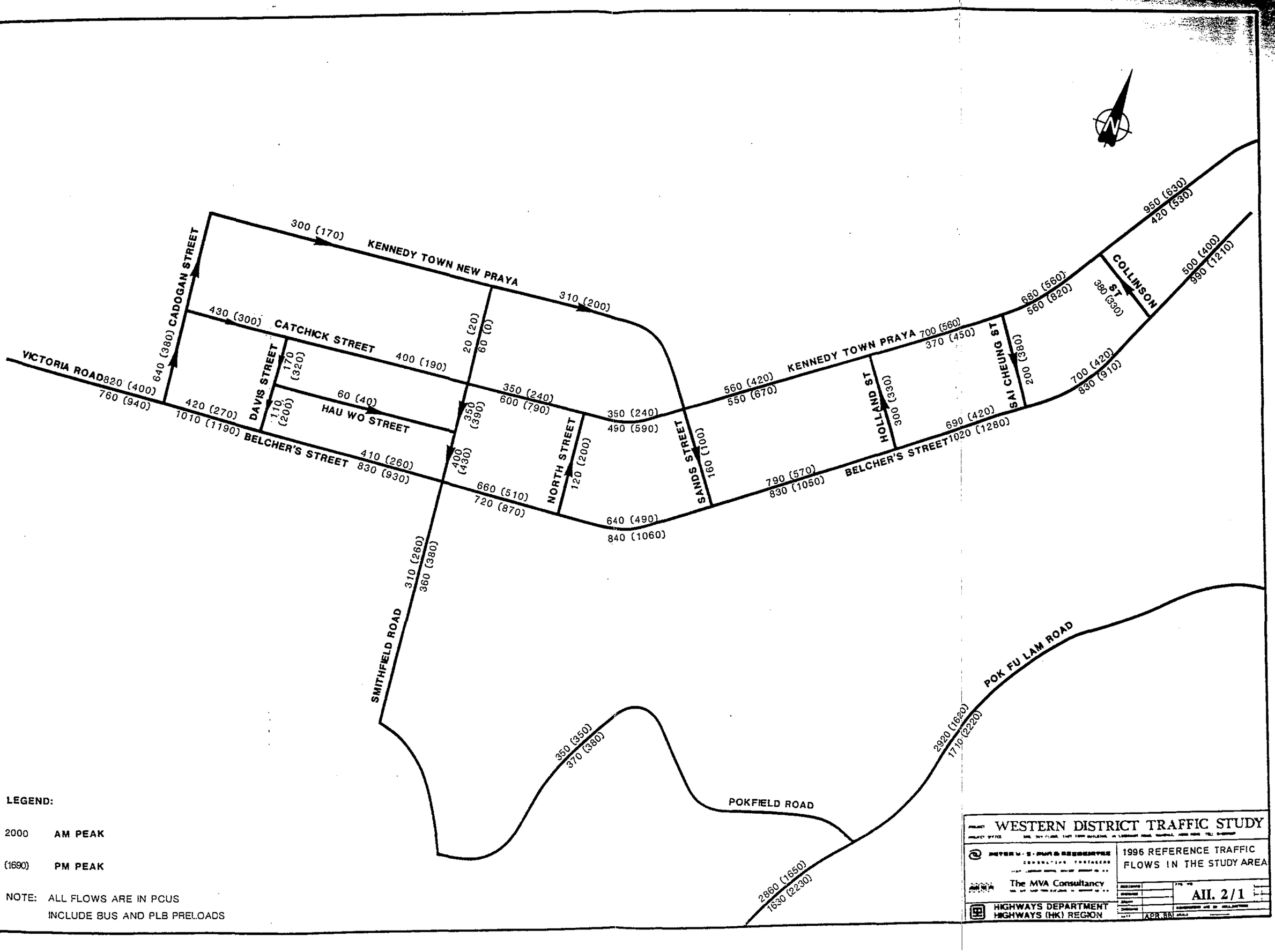
The MVA Consultancy

1991 REFERENCE TRAFFIC FLOWS IN THE STUDY AREA

FIG NO. AII. 1/3

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

APR 88



LEGEND:

2000 **AM PEAK**

(1690) **PM PEAK**

NOTE: ALL FLOWS ARE IN PCUS
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WESTERN DISTRICT TRAFFIC STUDY

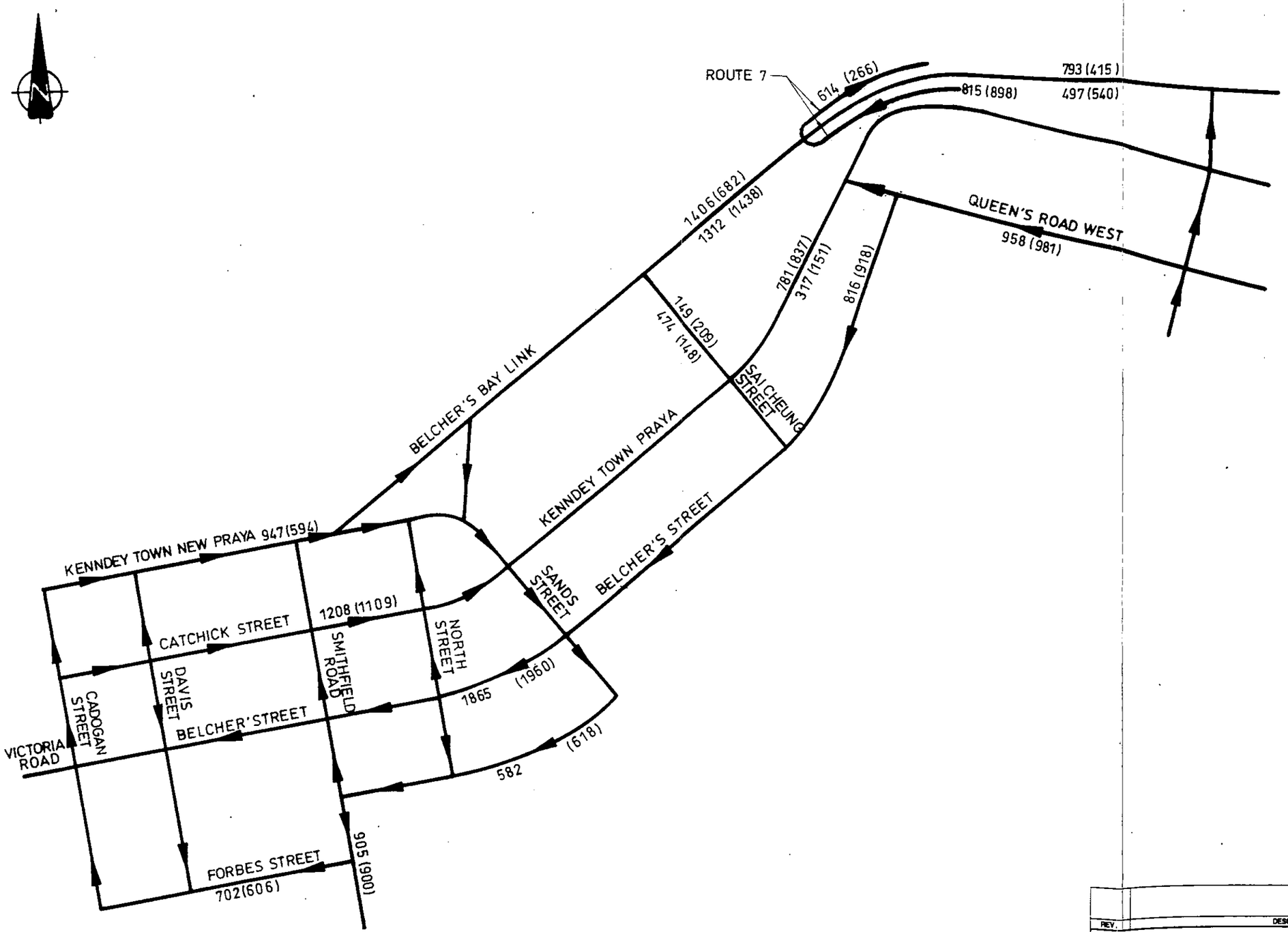
1996 REFERENCE TRAFFIC FLOWS IN THE STUDY AREA

The MVA Consultancy

HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

APR 96

AII. 2/1



LEGEND :-

1810 AM PEAK

(1106) PM PEAK

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BELCHER'S BAY LINK

1996 REFERENCE TRAFFIC FLOWS

Fig. 2.1

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HONG KONG REGION HIGHWAYS DEPARTMENT

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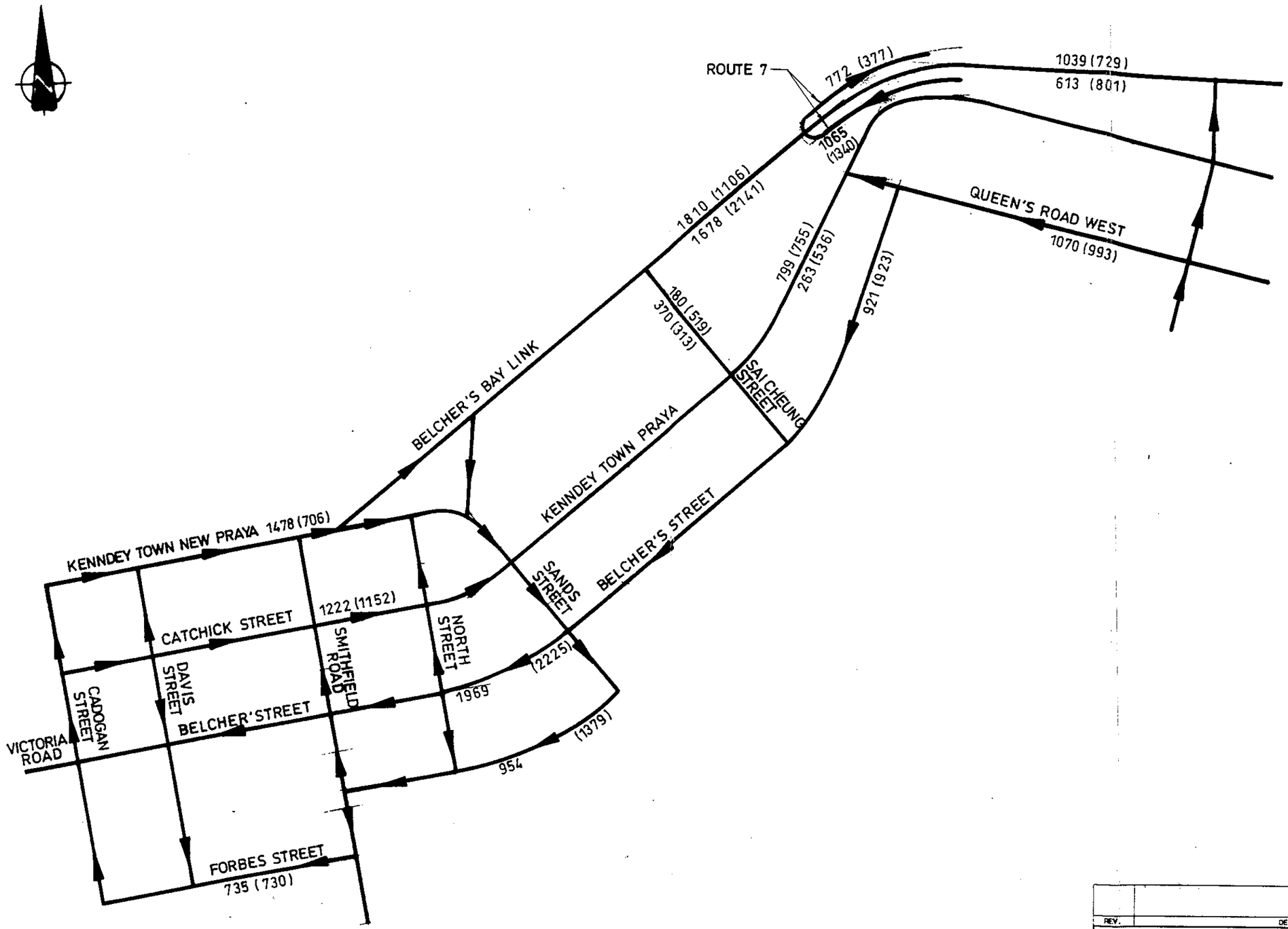

LEGEND :-

1810 AM PEAK

(1106) PM PEAK

NOTE :-

ALL FLOWS ARE IN PCUS
INCLUDE BUS AND PLB PRELOADS

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BELCHER'S BAY LINK

PETER-S-PUN ASSOCIATES CONSULTING ENGINEERS

2006 REFERENCE TRAFFIC FLOWS

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CHECKED
DATE

DIMENSIONS ARE IN

Fig. 2.2

APPENDIX III

Summary of Traffic Noise

Table 1

NSR Elevation : Location A : 6m above ground
Location B : 5m above ground
Location C : 7.3m above ground

Mitigating Measure : NIL

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	77	77	76
1996	Kennedy Town Praya	77	78	77
2006	Route 7 down ramp	61.7	61.6	64.1
	BLL W/B	63.9	63.3	63.9
	BLL E/B	64.4	62.2	63.4
	Route 7 up ramp	60.0	57.4	60.2
	Kennedy Town Praya	76.4	76.3	76.0
	COMBINED	77	77	77

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	76	76	75
1996	Kennedy Town Praya	77	77	76
2006	Route 7 down ramp	62.7	62.6	65.1
	BLL W/B	65.0	64.4	65.0
	BLL E/B	62.9	60.3	61.6
	Route 7 up ramp	56.8	54.2	57.0
	Kennedy Town Praya	77.3	77.2	76.9
	COMBINED	78	78	78

Summary of Traffic Noise

Table 1A

NSR Elevation : Location A : 6m above ground
Location B : 5m above ground
Location C : 7.3m above ground

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	77	77	76
1996	Kennedy Town Praya	77	78	77
1996	Route 7 down ramp	60.5	60.4	62.9
	BLL W/B	62.9	62.3	62.9
	BLL E/B	63.3	61.1	62.3
	Route 7 up ramp	59.0	56.4	59.2
	Kennedy Town Praya	76.7	76.6	76.3
	COMBINED	77	77	77

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	76	76	75
1996	Kennedy Town Praya	77	77	76
1996	Route 7 down ramp	60.9	60.8	63.3
	BLL W/B	63.3	62.7	63.3
	BLL E/B	60.5	58.1	59.3
	Route 7 up ramp	55.3	52.7	55.5
	Kennedy Town Praya	76.1	76.0	75.7
	COMBINED	77	76	76

Summary of Traffic Noise

Table 2

NSR Elevation : Location A : 22m above ground
Location B : 25m above ground
Location C : 28m above ground

Mitigating Measure : NIL

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	73	72	72
1996	Kennedy Town Praya	74	73	72
2006	Route 7 down ramp	69.5	64.6	66.1
	BLL W/B	67.4	66.5	66.1
	BLL E/B	69.0	67.4	67.2
	Route 7 up ramp	64.9	62.2	63.9
	Kennedy Town Praya	72.6	71.7	71.2
	COMBINED	76	75	75

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	72	71	71
1996	Kennedy Town Praya	73	72	72
2006	Route 7 down ramp	70.5	65.6	67.1
	BLL W/B	68.5	67.6	67.2
	BLL E/B	67.5	65.5	65.5
	Route 7 up ramp	61.7	59.0	60.7
	Kennedy Town Praya	73.5	72.6	72.1
	COMBINED	77	75	75

Summary of Traffic Noise

Table 2A

NSR Elevation : Location A : 22m above ground
Location B : 25m above ground
Location C : 28m above ground

Mitigating Measure : NIL

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	73	72	72
1996	Kennedy Town Praya	74	73	72
1996	Route 7 down ramp	68.3	62.2	64.9
	BLL W/B	66.4	65.5	65.1
	BLL E/B	67.9	66.3	66.1
	Route 7 up ramp	63.9	60.3	62.9
	Kennedy Town Praya	72.9	72.0	71.5
	COMBINED	76	74	74

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	72	71	71
1996	Kennedy Town Praya	73	72	72
1996	Route 7 down ramp	68.7	62.6	64.5
	BLL W/B	66.8	65.9	65.5
	BLL E/B	65.1	63.3	63.2
	Route 7 up ramp	60.2	56.6	58.7
	Kennedy Town Praya	72.3	71.4	70.9
	COMBINED	75	73	73

Summary of Traffic Noise

Table 3

NSR Elevation : Location A : 6m above ground
Location B : 5m above ground
Location C : 7.3m above ground

Mitigating Measure : Belcher's Bay Link with Friction course

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	77	77	76
1996	Kennedy Town Praya	77	78	77
2006	Route 7 down ramp	61.7	60.1	62.9
	BLL W/B	61.4	60.8	61.4
	BLL E/B	61.9	59.7	60.9
	Route 7 up ramp	60.0	56.3	59.4
	Kennedy Town Praya	76.4	76.3	76.0
	COMBINED	77	77	77

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	76	76	75
1996	Kennedy Town Praya	77	77	76
2006	Route 7 down ramp	62.7	61.1	63.9
	BLL W/B	62.5	61.9	62.5
	BLL E/B	60.4	58.8	59.1
	Route 7 up ramp	56.8	53.1	56.2
	Kennedy Town Praya	77.3	77.2	76.9
	COMBINED	78	78	77

Summary of Traffic Noise

Table 3

No. 430 - 440 Des Voeux Road West Kwan Yick Building

NSR : Location X : 16m above ground
: 41m above ground
: 66m above ground

Mitigating Measure : NIL

(AM) PEAK

YEAR	ELEVATION	16m	41m	66m
1991	Des Voeux Road West	67	70	68
1996	Des Voeux Road West	67	71	69
2006	Route 7 Eastbound	61.7	64.1	63.5
	Route 7 Westbound	64.8	66.7	65.8
	DVRW Eastbound	70.8	69.1	67.5
	DVRW Westbound	60.0	63.7	61.8
	COMBINED	72	72	71

(PM) PEAK

YEAR	ELEVATION	16m	41m	66m
1991	Des Voeux Road West	66	69	67
1996	Des Voeux Road West	66	70	68
2006	Route 7 Eastbound	58.5	60.9	60.3
	Route 7 Westbound	65.8	67.7	66.8
	DVRW Eastbound	69.4	67.7	66.1
	DVRW Westbound	63.1	66.8	64.9
	COMBINED	72	73	71

Summary of Traffic Noise

Table 3A

No. 430 - 440 Des Voeux Road West Kwan Yick Building

NSR : Location X : 16m above ground
: 41m above ground
: 66m above ground

Mitigating Measure : NIL

(AM) PEAK

YEAR	ELEVATION	16m	41m	66m
1991	Des Voeux Road West	67	70	68
1996	Des Voeux Road West	67	71	69
1996	Route 7 Eastbound	60.7	63.1	62.5
	Route 7 Westbound	63.6	65.5	64.6
	DVRW Eastbound	69.5	67.8	66.2
	DVRW Westbound	60.8	64.5	62.6
	COMBINED	71	72	70

(PM) PEAK

YEAR	ELEVATION	16m	41m	66m
1991	Des Voeux Road West	66	69	67
1996	Des Voeux Road West	66	70	68
1996	Route 7 Eastbound	57.0	59.4	58.8
	Route 7 Westbound	64.0	65.9	65.0
	DVRW Eastbound	69.8	68.1	66.5
	DVRW Westbound	57.6	61.3	59.4
	COMBINED	71	71	70

Summary of Traffic Noise

Table 4

NSR Elevation : Location A : 22m above ground
Location B : 25m above ground
Location C : 28m above ground

Mitigating Measure : Belcher's Bay Link with Friction course

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	73	72	72
1996	Kennedy Town Praya	74	73	72
2006	Route 7 down ramp	69.5	63.4	65.3
	BLL W/B	64.9	64.0	63.6
	BLL E/B	66.5	64.9	64.7
	Route 7 up ramp	64.9	61.3	60.5
	Kennedy Town Praya	72.6	71.7	71.2
	COMBINED	76	74	74

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	72	71	71
1996	Kennedy Town Praya	73	72	72
2006	Route 7 down ramp	70.5	64.4	66.3
	BLL W/B	66.0	65.1	64.7
	BLL E/B	65.0	63.0	63.0
	Route 7 up ramp	61.7	58.1	60.2
	Kennedy Town Praya	73.5	72.6	72.1
	COMBINED	76	74	74

Summary of Traffic Noise

Table 5

NSR Elevation : Location A : 6m above ground
Location B : 5m above ground
Location C : 7.3m above ground

Mitigating Measure : Belcher's Bay Link with Friction course
: Kennedy Town Praya with Friction course

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	77	77	76
1996	Kennedy Town Praya	77	78	77
2006	Route 7 down ramp	61.7	60.1	62.9
	BLL W/B	61.4	60.8	61.4
	BLL E/B	61.9	59.7	60.9
	Route 7 up ramp	60.0	56.3	59.4
	Kennedy Town Praya	73.9	73.8	73.5
	COMBINED	75	74	74

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	76	76	75
1996	Kennedy Town Praya	77	77	76
2006	Route 7 down ramp	62.7	61.1	63.9
	BLL W/B	62.5	61.9	62.5
	BLL E/B	60.4	58.8	59.1
	Route 7 up ramp	56.8	53.1	56.2
	Kennedy Town Praya	74.8	74.7	74.4
	COMBINED	75	75	75

Summary of Traffic Noise

Table 6

NSR Elevation : Location A : 22m above ground
Location B : 25m above ground
Location C : 28m above ground

Mitigating Measure : Belcher's Bay Link with Friction course
Kennedy Town Praya with Friction course

(AM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	73	72	72
1996	Kennedy Town Praya	74	73	72
2006	Route 7 down ramp	69.5	63.4	65.3
	BLL W/B	64.9	64.0	63.6
	BLL E/B	66.5	64.9	64.7
	Route 7 up ramp	64.9	61.3	60.5
	Kennedy Town Praya	70.1	69.2	68.7
	COMBINED	75	72	72

(PM) PEAK

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	72	71	71
1996	Kennedy Town Praya	73	72	72
2006	Route 7 down ramp	70.5	64.4	66.3
	BLL W/B	66.0	65.1	64.7
	BLL E/B	65.0	63.0	63.0
	Route 7 up ramp	61.7	58.1	60.2
	Kennedy Town Praya	71.0	70.1	69.6
	COMBINED	75	73	73

Summary of Traffic Noise

Table 7

(PM) PEAK

NSR Elevation : Location A : 22m above ground
Location B : 25m above ground
Location C : 28m above ground

Mitigating Measure : 3m height Noise Barrier at central reserve of BBL

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	72	71	71
1996	Kennedy Town Praya	73	72	72
2006	Route 7 down ramp	70.5	65.6	67.1
	BLL W/B	68.5	67.6	67.2
	BLL E/B	58.4	54.2	55.5
	Route 7 up ramp	61.7	58.0	60.4
	Kennedy Town Praya	73.5	72.6	72.1
	COMBINED	76	75	74

Mitigating Measure : 3m height Noise Barrier at central reserve of BBL
Belcher's Bay Link with Friction course

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	73	72	72
1996	Kennedy Town Praya	74	73	72
2006	Route 7 down ramp	70.5	64.4	66.3
	BLL W/B	65.0	65.1	64.7
	BLL E/B	56.0	51.7	53.0
	Route 7 up ramp	61.7	57.5	60.0
	Kennedy Town Praya	73.5	72.6	72.1
	COMBINED	76	74	74

Summary of Traffic Noise

Table 8

(PM) PEAK

NSR Elevation : Location A : 22m above ground
Location B : 25m above ground
Location C : 28m above ground

Mitigating Measure : 3m height Noise Barrier at inner side of W/B of BBL

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	72	71	71
1996	Kennedy Town Praya	73	72	72
2006	Route 7 down ramp	70.5	62.7	65.6
	BLL W/B	62.5	65.5	64.7
	BLL E/B	67.8	63.0	65.5
	Route 7 up ramp	61.7	58.1	60.7
	Kennedy Town Praya	73.5	72.6	72.1
	COMBINED	76	74	74

Mitigating Measure : 3m height Noise Barrier at inner side of W/B of BBL Belcher's Bay Link with Friction course

YEAR	LOCATION	A	B	C
1991	Kennedy Town Praya	73	72	72
1996	Kennedy Town Praya	74	73	72
2006	Route 7 down ramp	70.5	62.4	65.4
	BLL W/B	60.0	63.0	62.2
	BLL E/B	65.0	63.0	63.0
	Route 7 up ramp	61.7	58.1	60.2
	Kennedy Town Praya	73.5	72.6	71.2
	COMBINED	76	74	74

Summary of Traffic Noise

NSR Elevation : Location P : PEARL COURT 5m above ground
Location Q : NEW FORTUNE HOUSE 10.5m above ground

YEAR	P (PM)	Q (AM)
1991	76	67
1996	77	68
1996 BBL	76	72
2006 BBL	78	73

Summary of Traffic Noise

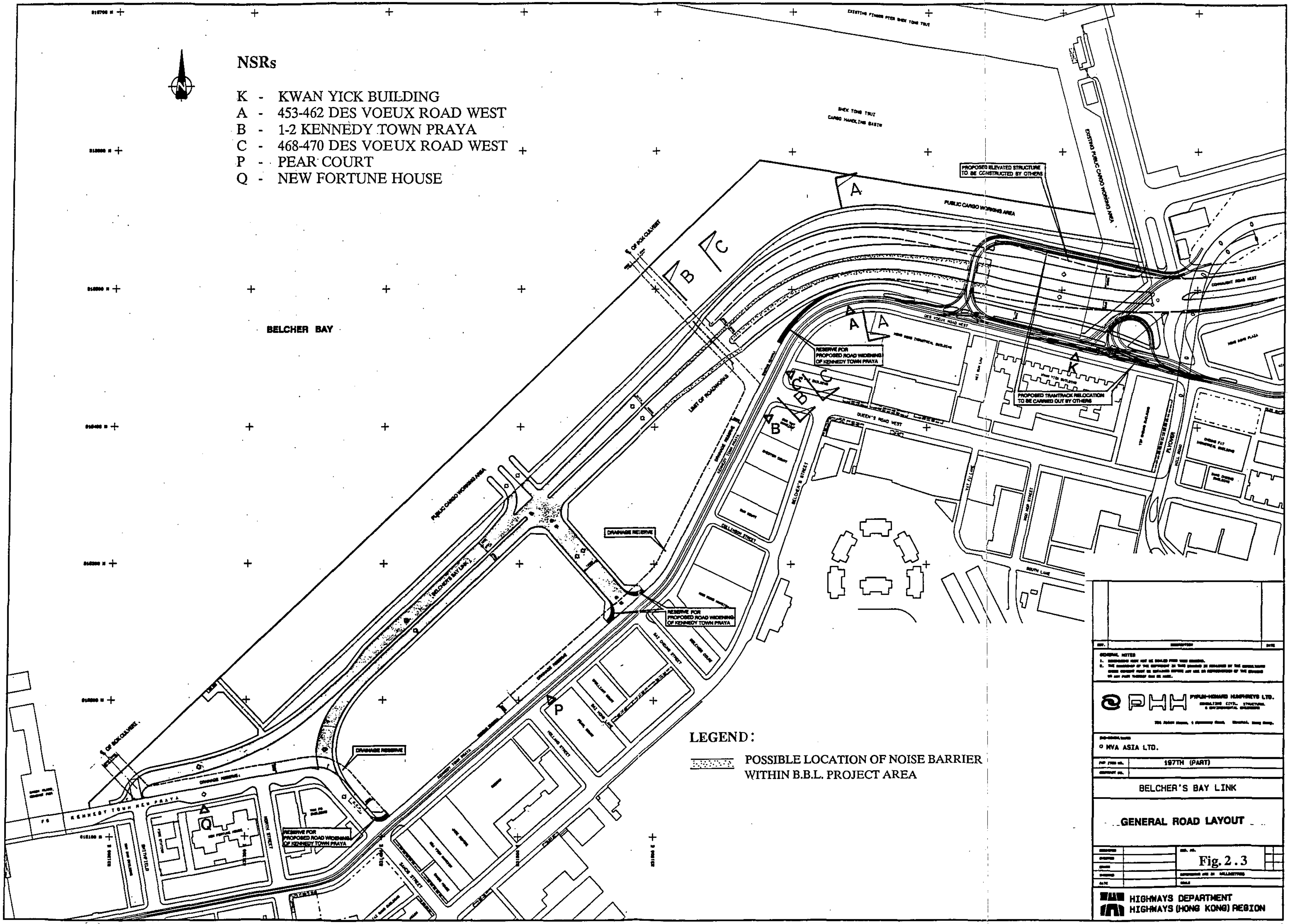
NSR Elevation : Location P : PEARL COURT 5m above ground
Location Q : NEW FORTUNE HOUSE 10.5m above ground

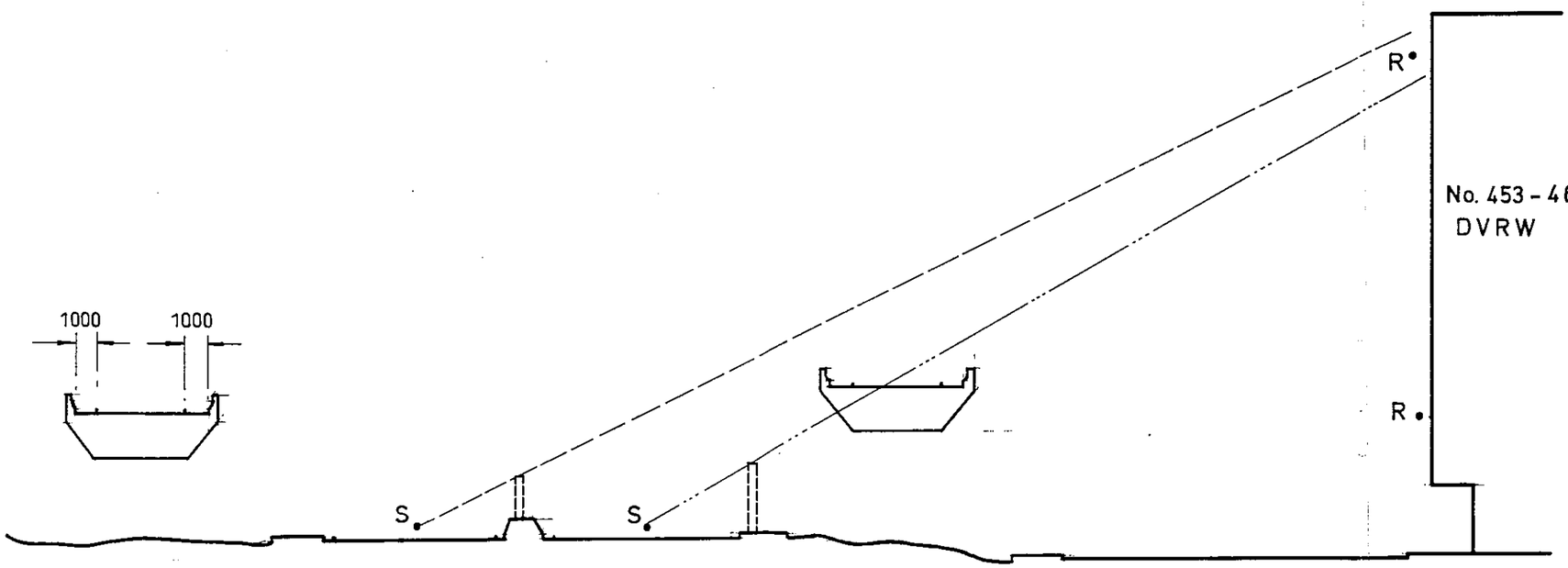
YEAR	P (PM)	Q (AM)
1991	76	67
1996	77	68
1996 BBL	74	70
2006 BBL	75	71

} overall

Mitigating Measure : Belcher's Bay Link with Friction Course
Kennedy Town New Praya with Friction Course

APPENDIX IV


NSRs
K - KWAN YICK BUILDING
A - 453-462 DES VOEUX ROAD WEST
B - 1-2 KENNEDY TOWN PRAYA
C - 468-470 DES VOEUX ROAD WEST
P - PEAR COURT
Q - NEW FORTUNE HOUSE
BELCHER BAY
PUBLIC CARGO WORKING AREA
PROPOSED ELEVATED STRUCTURE TO BE CONSTRUCTED BY OTHERS
RESERVE FOR PROPOSED ROAD WIDENING OF KENNEDY TOWN PRAYA
PROPOSED TRAMTRACK RELOCATION TO BE CARRIED OUT BY OTHERS
DRAINAGE RESERVE
QUEEN'S ROAD WEST
DES VOEUX ROAD WEST
KENNEDY TOWN NEW PRAYA
LEGEND:
POSSIBLE LOCATION OF NOISE BARRIER WITHIN B.B.L. PROJECT AREA
PHH
MVA ASIA LTD.
197TH (PART)
BELCHER'S BAY LINK
GENERAL ROAD LAYOUT
Fig. 2.3
HIGHWAYS DEPARTMENT
HIGHWAYS (HONG KONG) REGION



R RECEPTION POINT

S EFFECTIVE SOURCE POSITION

SCALE 2 0 2 4 6 METRES

REV.	DESCRIPTION	DATE

GENERAL NOTES

1. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING.
2. THE OWNERSHIP OF THE COPYRIGHT IN THIS DRAWING IS RETAINED BY THE CONSULTANTS WHOSE CONSENT MUST BE OBTAINED BEFORE ANY USE OR REPRODUCTION OF THE DRAWING OR ANY PART THEREOF CAN BE MADE

BELCHER'S BAY LINK

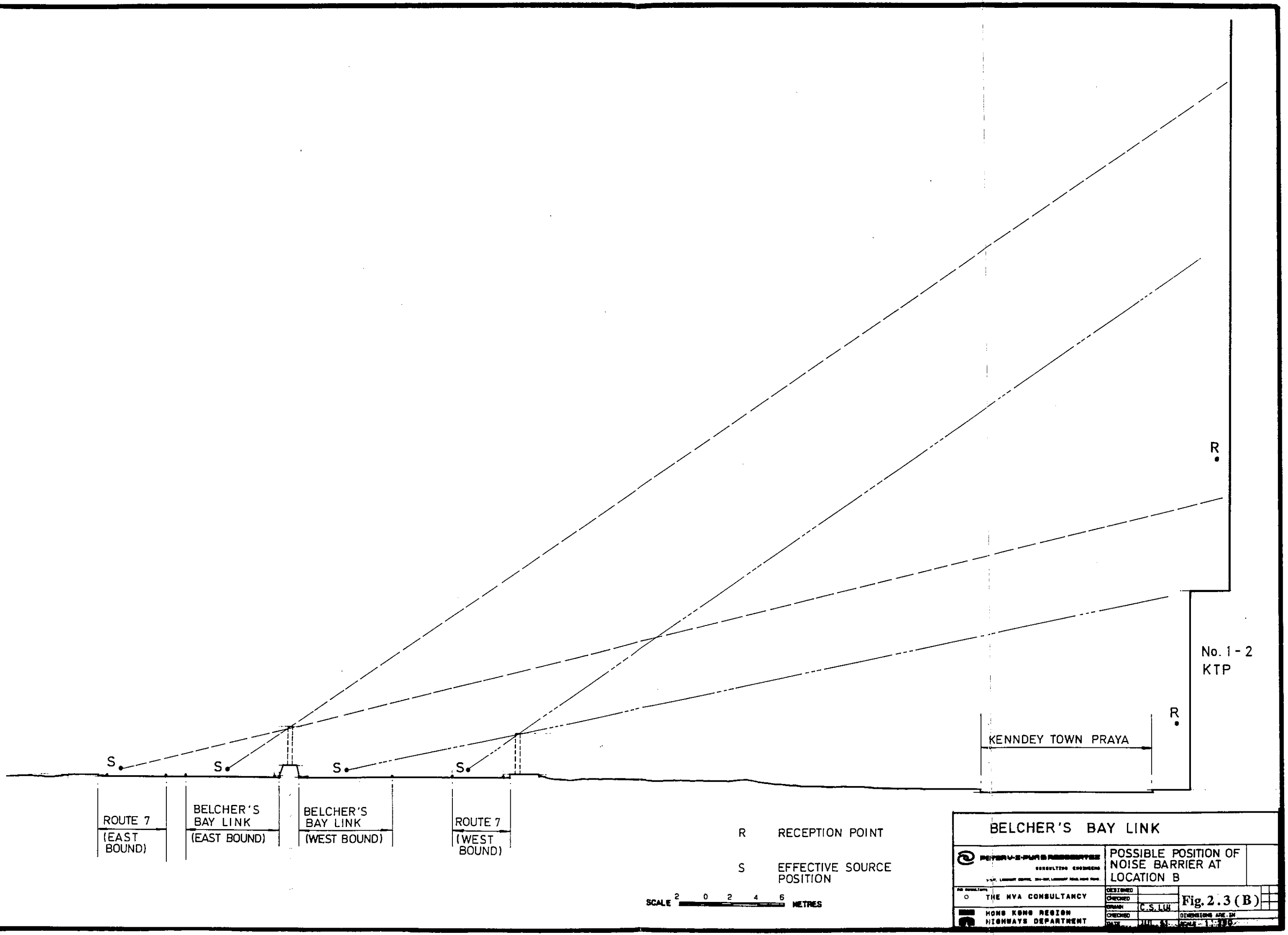
PETER V-E-PUN & ASSOCIATES
CONSULTING ENGINEERS

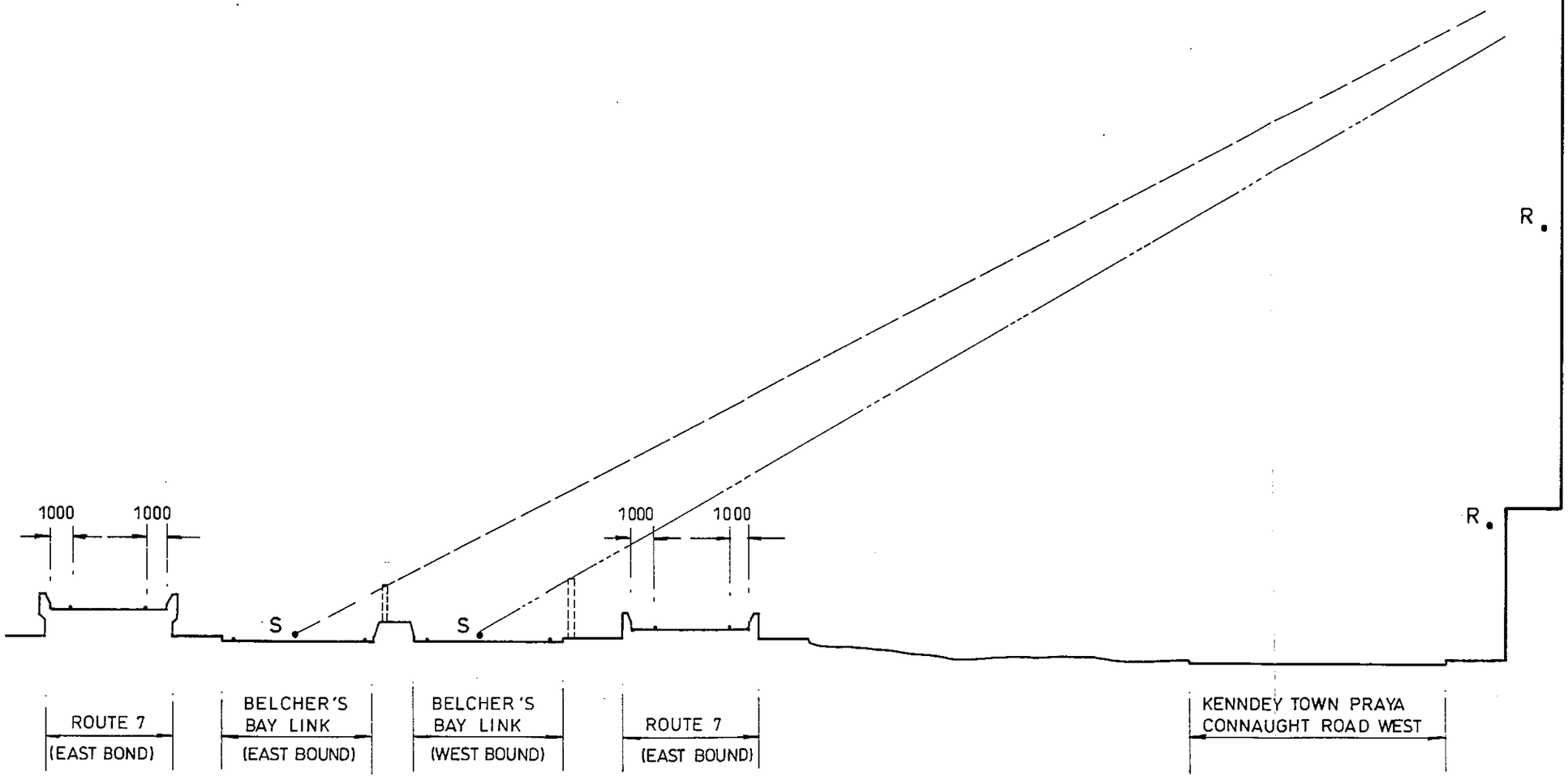
POSSIBLE POSITION OF NOISE BARRIER AT LOCATION A

THE MVA CONSULTANCY	DESIGNED	
	CHECKED	
	DRAWN	C.S. LUI
HONG KONG REGION HIGHWAYS DEPARTMENT	CHECKED	
	DATE	JUL. 91

Fig. 2.3 (A)

DIMENSIONS ARE IN
SCALE 1 : 250


R
No. 1 - 2
KTP
R
KENNDEY TOWN PRAYA
S
S
S
S
ROUTE 7
(EAST
BOUND)
BELCHER'S
BAY LINK
(EAST BOUND)
BELCHER'S
BAY LINK
(WEST BOUND)
ROUTE 7
(WEST
BOUND)
R RECEPTION POINT
S EFFECTIVE SOURCE
POSITION
SCALE 2 0 2 4 6 METRES
BELCHER'S BAY LINK
POSSIBLE POSITION OF
NOISE BARRIER AT
LOCATION B
THE MVA CONSULTANCY
HONG KONG REGION
HIGHWAYS DEPARTMENT
DESIGNED
CHECKED
DRAWN
C.S.LUI
CHECKED
DIMENSIONS ARE IN
Fig. 2.3 (B)



R RECEPTION POINT

S EFFECTIVE SOURCE POSITION

SCALE 2 0 2 4 6 METRES

No.468-470
DVRW

REV.	DESCRIPTION	DATE

GENERAL NOTES
1. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING
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BELCHER'S BAY LINK

PETER WILLIAMS PARTNERS
CONSULTING ENGINEERS

POSSIBLE POSITION OF NOISE BARRIER AT LOCATION C

THE MVA CONSULTANCY

HONG KONG REGION
HIGHWAYS DEPARTMENT

DESIGNED		Fig. 2.3 (C)
CHECKED		
DRAWN	C.S. LUI	
CHECKED		DIMENSIONS ARE IN
DATE	JUL. 91	SCALE 1 : 250

APPENDIX V

PROPOSED
TO BE CONSTRUCTED BY

PUBLIC CARGO WORKING AREA

PUBLIC CARGO WORKING AREA

ROUTE 7 UP RAMP

℄ OF BOX CULVERT

4000

4000

ROUTE 7 DOWN RAMP

8750

8750

BBL E/B

BBL W/B

10000

10000

DRAINAGE RESERVE

KENNEDY TOWN PRAYA

8000

EXISTING SEAWALL

DES VOEUX ROAD WEST

LOCATION A

HONG KONG INDUSTRIAL BUILDING

MEI SUN LAU

KWAN YICK BUILDING

RESERVE FOR
PROPOSED ROAD WIDENING
OF KENNEDY TOWN PRAYA

PROPOSED TRAMTRACK RELOCATION
TO BE CARRIED OUT BY OTHERS

WO FAT BUILDING

QUEEN'S ROAD WEST

SUN WAY MANSION

CHESTER COURT

SUN COURT

BELCHER'S STREET

YAT FU LANE

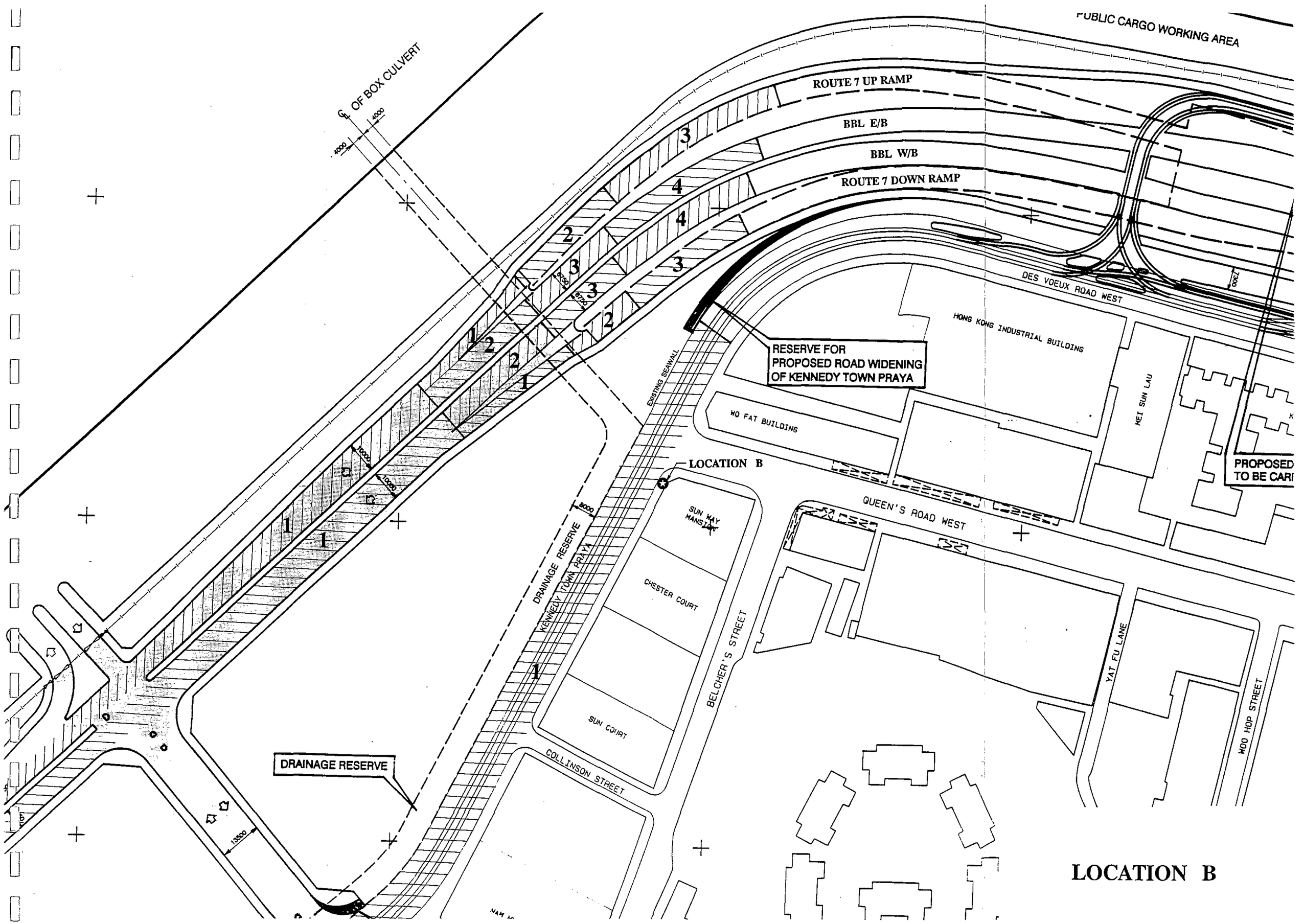
STREET

LOCATION A

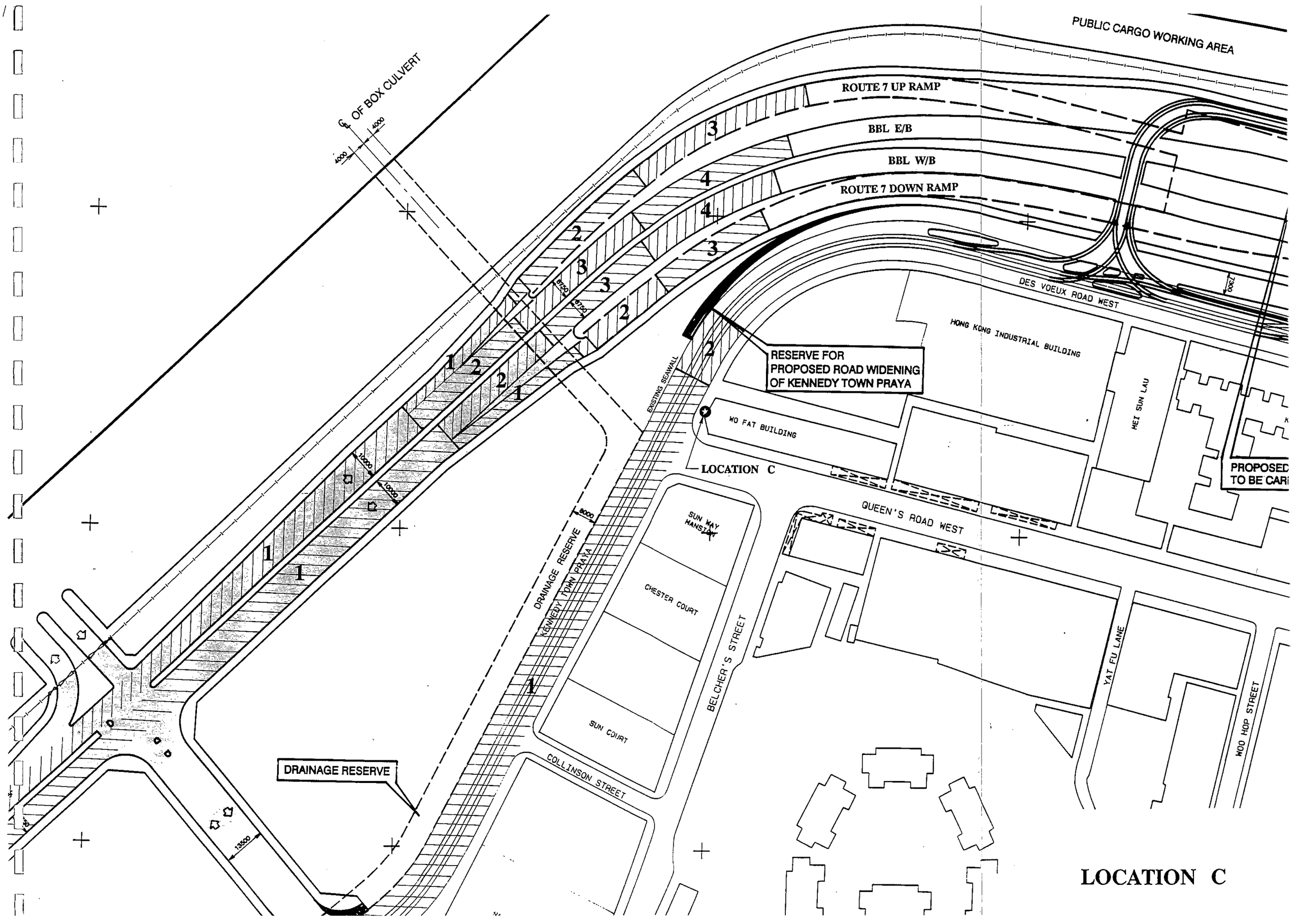
10000

8750

7300


PUBLIC CARGO WORKING AREA
ROUTE 7 UP RAMP
BBL E/B
BBL W/B
ROUTE 7 DOWN RAMP
DES VOEUX ROAD WEST
HONG KONG INDUSTRIAL BUILDING
MEI SUN LAU
RESERVE FOR
PROPOSED ROAD WIDENING
OF KENNEDY TOWN PRAYA
EXISTING SEAWALL
WO FAT BUILDING
LOCATION B
SUN WAY MANSION
CHESTER COURT
SUN COURT
DRAINAGE RESERVE
KENNEDY TOWN PRAYA
BELCHER'S STREET
COLLINSON STREET
QUEEN'S ROAD WEST
YAT FU LANE
WOO HOP STREET
DRAINAGE RESERVE
OF BOX CULVERT
4000
4000
8750
8750
10000
10000
13500
8000
7300

LOCATION B


PUBLIC CARGO WORKING AREA
ROUTE 7 UP RAMP
BBL E/B
BBL W/B
ROUTE 7 DOWN RAMP
DES VOEUX ROAD WEST
HONG KONG INDUSTRIAL BUILDING
HEI SUN LAU
RESERVE FOR
PROPOSED ROAD WIDENING
OF KENNEDY TOWN PRAYA
EXISTING SEAWALL
WO FAT BUILDING
LOCATION C
QUEEN'S ROAD WEST
SUN WAY MANSION
CHESTER COURT
SUN COURT
DRAINAGE RESERVE
KENNEDY TOWN PRAYA
BELCHER'S STREET
COLLINSON STREET
YAT FU LANE
WOO HOP STREET
DRAINAGE RESERVE
OF BOX CULVERT
4000
4000
10000
10000
8000
13500
7300
PROPOSED
TO BE CARI

LOCATION C

APPENDIX V : BASIC NOISE CALCULATION

Content

Location A (AM) (NSR is at 6m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (AM) (NSR is at 5m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location C (AM) (NSR is at 7.3m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location A (PM) (NSR is at 6m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (PM) (NSR is at 5m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location C (PM) (NSR is at 7.3m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location A (AM) (NSR is at 22m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (AM) (NSR is at 5m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location C (AM) (NSR is at 7.3m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location A (PM) (NSR is at 22m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (PM) (NSR is at 25m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location C (PM) (NSR is at 28m above ground)

1991	Kennedy Town Praya
1996	Kennedy Town Praya
2006	Route 7 down ramp
2006	Belcher's Bay Link Westbound
2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Noise Barrier at Central Reserve of BBL

Location A (PM) (NSR is at 22m above ground)

2006	Belcher's Bay Link Eastbound
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (PM) (NSR is at 25m above ground)

2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location C (PM) (NSR is at 28m above ground)

2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Noise Barrier at Central Reserve of BBL with Friction Course at BBL

Location A (PM) (NSR is at 22m above ground)

2006	Belcher's Bay Link Eastbound
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (PM) (NSR is at 25m above ground)

2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Location C (PM) (NSR is at 28m above ground)

2006	Belcher's Bay Link Eastbound
2006	Route 7 up ramp
2006	Kennedy Town Praya and COMBINED Noise Level

Noise Barrier at inner side of W/B of BBL

Location A (PM) (NSR is at 22m above ground)

2006	Belcher's Bay Link Westbound
2006	Kennedy Town Praya and COMBINED Noise Level

Location B (PM)	(NSR is at 25m above ground)	
	2006	Route 7 down ramp
	2006	Belcher's Bay Link Westbound
	2006	Kennedy Town Praya and COMBINED Noise Level
Location C (PM)	(NSR is at 28m above ground)	
	2006	Route 7 down ramp
	2006	Belcher's Bay Link Westbound
	2006	Kennedy Town Praya and COMBINED Noise Level

<u>Noise Barrier at inner side of W/B of BBL with Friction Course at BBL</u>

Location A (PM)	(NSR is at 22m above ground)	
	2006	Belcher's Bay Link Westbound
	2006	Kennedy Town Praya and COMBINED Noise Level
Location B (PM)	(NSR is at 25m above ground)	
	2006	Route 7 down ramp
	2006	Belcher's Bay Link Westbound
	2006	Kennedy Town Praya and COMBINED Noise Level
Location C (PM)	(NSR is at 28m above ground)	
	2006	Route 7 down ramp
	2006	Belcher's Bay Link Westbound
	2006	Kennedy Town Praya and COMBINED Noise Level

Remark : The calculation of road traffic noise after the introduction of friction course at BBL and KTP will not be duplicated as the calculation will be similar to the above.

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	911	911	911		Chart 2 L10 dB(A)	71.7	71.7	71.7	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	72.9	72.9	72.9	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	1.6	1.6	1.6	
Height relative to source h m	5.5	5.5	5.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.6	1.6	1.6	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.					reflection correction dB(A)	0	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.9	72.9	72.9	
Propagation Correction dB(A)	1.6	1.6	1.6	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	69.8	75.2	67.7	
Chart 11 Combined Noise Level dB(A)	76.9			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	1000	1000	1000		Chart 2 L10 dB(A)	72.2	72.2	72.2	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.4	73.4	73.4	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	1.6	1.6	1.6	
Height relative to source h m	5.5	5.5	5.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.6	1.6	1.6	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.					reflection correction dB(A)	0	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.4	73.4	73.4	
Propagation Correction dB(A)	1.6	1.6	1.6	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	70.3	75.7	68.2	
Chart 11 Combined Noise Level dB(A)		77.4		

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	777	777	777	777	Chart 2 L10 dB(A)	71.1	71.1	71.1	71.1
Traffic speed V km/h	60	60	60	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	3.2	3.2	3.2	3.2
Gradient G %	8 DOWN	8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	70.8	70.8	70.8	70.8

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	27	21	24.5	30	Chart 7	-3.5	-2.6	-3.1	-3.9
Height relative to source h m	-1.3	-2.1	-2.5	-4.8	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.03	.06	.06	.11	Chart 9 correction dB(A)	-7.6	-8.6	-8.6	-9.6
					Propagation Correction dB(A)	-11.1	-11.2	-11.7	-13.5

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	40	72	42	21	Chart 10 correction dB(A)	-6.5	-4.0	-6.3	-9.3
					Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	70.8	70.8	70.8	70.8
Propagation Correction dB(A)	-11.1	-11.2	-11.7	-13.5
Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8
Noise Contribution dB(A)	55.6	58.1	55.3	50.5
Chart 11 Combined Noise Level dB(A)	61.7			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	447	447	447	447
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	PREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	68.7	68.7	68.7	68.7
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	70.3	70.3	70.3	70.3

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	40	30.5	30	37
Height relative to source h m	4.5	4.5	4	4
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	.44	.01	.00	.00

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-5.1	-4	-3.9	-4.7
Chart 8 correction dB(A)	0	0	0	0
Chart 9 correction dB(A)	-12.8	-3.9	-4.3	-4.7
Propagation Correction dB(A)	-17.9	-7.9	-8.2	-9.4

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	35	33	0	0
Angle of view segment deg.	35	33	77	27

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	1.5	1.5	0	0
Chart 10 correction dB(A)	-7.1	-7.4	-3.7	-8.2
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	70.3	70.3	70.3	70.3
Propagation Correction dB(A)	-17.9	-7.9	-8.2	-9.4
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7
Noise Contribution dB(A)	49.3	59.0	61.0	55.2

Chart 11 Combined Noise Level dB(A): 63.9

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 64

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	758	758	758	758	Chart 2 L10 dB(A)	70.9	70.9	70.9	70.9
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	72.5	72.5	72.5	72.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50	41	41	45.5	Chart 7	-5.9	-5.2	-5.1	-5.6
Height relative to source h m	4.5	4.5	4	4	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.14	.00	.00	.00	Chart 9 correction dB(A)	-10.0	-4.6	-4.7	-5
					Propagation Correction dB(A)	-15.9	-9.8	-9.8	-10.6

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	70	25	Chart 10 correction dB(A)	-7.1	-7.4	-4.1	-8.6
					Site Layout Correction dB(A)	-3.1	-3.4	-1.6	-6.1

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.5	72.5	72.5	72.5
Propagation Correction dB(A)	-15.9	-9.8	-9.8	-10.6
Site Layout Correction dB(A)	-3.1	-3.4	-1.6	-6.1
Noise Contribution dB(A)	53.5	59.3	61.1	55.8
Chart 11 Combined Noise Level dB(A)	64.4			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 64

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	564	564	564	564	Chart 2 L10 dB(A)	69.7	69.7	69.7	69.7
Traffic speed V km/h	50.1	50.1	50.1	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	3.2
Gradient G %	8 UP	8 UP	8 UP		Chart 6 correction dB(A)	2.4	2.4	2.4	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	71.2	71.2	71.2	69.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	65	55	57	61	Chart 7	-7	-6.3	-6.5	-6.8
Height relative to source h m	3	-.9	-2.1	-4.8	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.00	.02	.02	.05	Chart 9 correction dB(A)	-4.9	-6.9	-7.3	-8.2
					Propagation Correction dB(A)	-11.9	-13.2	-13.8	-15.0

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	35	69	35	35	Chart 10 correction dB(A)	-7.1	-4.2	-7.1	-7.1
					Site Layout Correction dB(A)	-4.6	-1.7	-4.6	-4.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.2	71.2	71.2	69.4
Propagation Correction dB(A)	-11.9	-13.2	-13.8	-15.0
Site Layout Correction dB(A)	-4.6	-1.7	-4.6	-4.6
Noise Contribution dB(A)	54.7	56.3	52.7	49.8
Chart 11 Combined Noise Level dB(A)		60.0		

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 60

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	775	775	775		Chart 2 L10 dB(A)	71	71	71	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	72.2	72.2	72.2	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	1.6	1.6	1.6	
Height relative to source h m	5.5	5.5	5.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.6	1.6	1.6	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.2	72.2	72.2	
Propagation Correction dB(A)	1.6	1.6	1.6	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	70.3	74.5	67.0	

Chart 11 Combined Noise Level dB(A): 76.4

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	61.7 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	63.9 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	64.4 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.0 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	76.4 dB(A)

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	911				Chart 2 L10 dB(A)	71.7			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	72.9			

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	2				Chart 7 correction dB(A)	2.7			
Height relative to source h m	4.5								
Ave. height of propagation H m	n/a				Chart 8 correction dB(A)	0			
Absorbent ground cover I									
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	2.7			

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.9			
Propagation Correction dB(A)	2.7			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	77.9			
Chart 11 Combined Noise Level dB(A)	77.9			

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 78

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	1000				Chart 2 L10 dB(A)	72.2			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.4			

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	4				Chart 7	1.8			
Height relative to source h m	4.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.8			

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.4			
Propagation Correction dB(A)	1.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	77.5			
Chart 11 Combined Noise Level dB(A)	77.5			

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 78

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

CASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	777	777	777		Chart 2 L10 dB(A)	71.1	71.1	71.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	72.7	70.8	70.8	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	51.5	51.5	57		Chart 7 correction dB(A)	-6.1	-6.1	-6.5	
Height relative to source h m	3.5	3.2	1.3						
Ave. height of propagation H m	2.25	2.10	n/a		Chart 8	-2.58	-2.71	0	
Absorbent ground cover I	.75	.75			correction dB(A)				
Barrier path difference m		.00	.00		Chart 9 correction dB(A)		-5	-5	
					Propagation Correction dB(A)	-8.7	-11.1	-11.5	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	40	25	27		Chart 10 correction dB(A)	-6.5	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.0	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.7	70.8	70.8	
Propagation Correction dB(A)	-8.7	-11.1	-11.5	
Site Layout Correction dB(A)	-4.0	-6.1	-5.7	
Noise Contribution dB(A)	60.0	53.6	53.6	
Chart 11 Combined Noise Level dB(A)		61.6		

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1224	447	447	447
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	73	68.7	68.7	68.7
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	74.6	70.3	70.3	70.3

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	60	60	62	71
Height relative to source h m	3.5	3.5	3.5	3.5
Ave. height of propagation H m	2.25	2.25	n/a	n/a
Absorbent ground cover I	.75	.75		
Barrier path difference m			.04	.50

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-6.7	-6.7	-6.8	-7.4
Chart 8 correction dB(A)	-2.82	-2.82		
Chart 9 correction dB(A)			-7.8	-13.1
Propagation Correction dB(A)	-9.5	-9.5	-14.6	-20.5

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	10	24
Angle of view segment deg.	49	37	25	27

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	.6	1.3
Chart 10 correction dB(A)	-5.7	-6.9	-8.6	-8.2
Site Layout Correction dB(A)	-3.2	-4.4	-5.5	-4.4

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	74.6	70.3	70.3	70.3
Propagation Correction dB(A)	-9.5	-9.5	-14.6	-20.5
Site Layout Correction dB(A)	-3.2	-4.4	-5.5	-4.4
Noise Contribution dB(A)	61.9	56.4	50.2	45.4
Chart 11 Combined Noise Level dB(A)	63.3			

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1322	758	758	758
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	73.4	70.9	70.9	70.9
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	75	72.5	72.5	72.5

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	69	69	69	84
Height relative to source h m	3.5	3.5	3.5	3.5
Ave. height of propagation H m	2.25	2.25	n/a	n/a
Absorbent ground cover I	.75	.75		
Barrier path difference m	.00	.00	.00	.19

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-7.3	-7.3	-7.3	-8.1
Chart 8 correction dB(A)	-3.05	-3.05	0	0
Chart 9 correction dB(A)	-5	-5	-5.4	-10.6
Propagation Correction dB(A)	-12.3	-12.3	-12.7	-18.7

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	10	24
Angle of view segment deg.	53	33	24	28

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	.6	1.3
Chart 10 correction dB(A)	-5.3	-7.4	-8.8	-8.1
Site Layout Correction dB(A)	-2.8	-4.9	-5.6	-4.3

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75	72.5	72.5	72.5
Propagation Correction dB(A)	-12.3	-12.3	-12.7	-18.7
Site Layout Correction dB(A)	-2.8	-4.9	-5.6	-4.3
Noise Contribution dB(A)	59.9	55.3	54.1	49.5
Chart 11 Combined Noise Level dB(A)	62.2			

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	564	564	564		Chart 2 L10 dB(A)	69.7	69.7	69.7	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	71.3	71.2	71.2	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	77	79	97		Chart 7	-7.7	-7.8	-8.7	
Height relative to source h m	3.5	3.2	.2		correction dB(A)				
Ave. height of propagation H m	2.25	n/a	n/a		Chart 8	-2.15	0	0	
Absorbent ground cover I	.50				correction dB(A)				
Barrier path difference m	.00	.00	.01		Chart 9 correction dB(A)	-4.5	-5	-6.4	
					Propagation Correction dB(A)	-12.2	-12.8	-15.1	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	33	25	27		Chart 10 correction dB(A)	-7.4	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.9	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.3	71.2	71.2	
Propagation Correction dB(A)	-12.2	-12.8	-15.1	
Site Layout Correction dB(A)	-4.9	-6.1	-5.7	
Noise Contribution dB(A)	54.2	52.3	50.4	
Chart 11 Combined Noise Level dB(A)		57.4		

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 57

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM)

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	775				Chart 2 L10 dB(A)	71			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	72.2			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4				Chart 7	1.8			
Height relative to source h m	4.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.2			
Propagation Correction dB(A)	1.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	76.3			
Chart 11 Combined Noise Level dB(A)	76.3			

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	61.6 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	63.3 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	62.2 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	57.4 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	76.3 dB(A)

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	911	911		
Traffic speed V km/h	30	30		
Heavy vehicles p %	25	25		
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.7	71.7		
Chart 4 correction dB(A)	2.2	2.2		
Chart 6 correction dB(A)	0	0		
correction dB(A)	-1	-1		
Basic Noise Level dB(A)	72.9	72.9		

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4		
Height relative to source h m	6.8	6.8		
Ave. height of propagation H m	n/a	n/a		
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	1.2	1.2		
Chart 8 correction dB(A)	0	0		
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.2	1.2		

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	135	36		

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5		
reflection correction dB(A)	0	0		
Chart 10 correction dB(A)	-1.2	-7.0		
Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.9	72.9		
Propagation Correction dB(A)	1.2	1.2		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	75.4	69.6		
Chart 11 Combined Noise Level dB(A)	76.4			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	1000	1000		
Traffic speed V km/h	30	30		
Heavy vehicles p %	25	25		
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	72.2	72.2		
Chart 4 correction dB(A)	2.2	2.2		
Chart 6 correction dB(A)	0	0		
correction dB(A)	-1	-1		
Basic Noise Level dB(A)	73.4	73.4		

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4		
Height relative to source h m	6.8	6.8		
Ave. height of propagation H m	n/a	n/a		
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	1.2	1.2		
Chart 8 correction dB(A)	0	0		
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.2	1.2		

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	135	36		

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5		
reflection correction dB(A)	0	0		
Chart 10 correction dB(A)	-1.2	-7.0		
Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.4	73.4		
Propagation Correction dB(A)	1.2	1.2		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	75.9	70.1		

Chart 11 Combined Noise Level dB(A) 76.9

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	777	777	777		Chart 2 L10 dB(A)	71.1	71.1	71.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	72.7	70.8	70.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	38.5	38.5	40		Chart 7	-4.9	-4.9	-5	
Height relative to source h m	5.8	5	3.5		correction dB(A)				
Ave. height of propagation H m	3.40	5.50	n/a		Chart 8	-1.35	-.49	0	
Absorbent ground cover I	.75	.75			correction dB(A)				
Barrier path difference m		.01	.00		Chart 9 correction dB(A)		-3.8	-4.7	
					Propagation Correction dB(A)	-6.3	-8.7	-9.7	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	31	46	36		Chart 10 correction dB(A)	-7.6	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.1	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.7	70.8	70.8	
Propagation Correction dB(A)	-6.3	-8.7	-9.7	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	
Noise Contribution dB(A)	61.3	58.7	56.6	
Chart 11 Combined Noise Level dB(A)	64.1			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 64

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1224	447	447	447
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	73	68.7	68.7	68.7
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	74.6	70.3	70.3	70.3

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	47.5	47.5	47	52
Height relative to source h m	5.8	5.8	5.8	5.8
Ave. height of propagation H m	3.40	3.40	n/a	n/a
Absorbent ground cover I	.75	.75		
Barrier path difference m			.04	.39

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-5.8	-5.8	-5.7	-6.1
Chart 8 correction dB(A)	-1.68	-1.68		
Chart 9 correction dB(A)			-8.0	-12.4
Propagation Correction dB(A)	-7.5	-7.5	-13.7	-18.5

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	46	31
Angle of view segment deg.	30	31	46	36

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	1.5	1.3
Chart 10 correction dB(A)	-7.8	-7.6	-5.9	-7.0
Site Layout Correction dB(A)	-5.3	-5.1	-1.9	-3.2

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	74.6	70.3	70.3	70.3
Propagation Correction dB(A)	-7.5	-7.5	-13.7	-18.5
Site Layout Correction dB(A)	-5.3	-5.1	-1.9	-3.2
Noise Contribution dB(A)	61.8	57.7	54.7	48.6
Chart 11 Combined Noise Level dB(A)	63.9			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 64

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1322	758	758	758
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	73.4	70.9	70.9	70.9
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	75	72.5	72.5	72.5

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	58	58	57	63.5
Height relative to source h m	5.8	5.8	5.8	5.8
Ave. height of propagation H m	3.40	3.40	n/a	n/a
Absorbent ground cover I	.50	.50		
Barrier path difference m	.00	.00	.00	.10

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-6.6	-6.6	-6.5	-6.9
Chart 8 correction dB(A)	-1.33	-1.33	0	0
Chart 9 correction dB(A)	-4.7	-4.7	-5	-9.3
Propagation Correction dB(A)	-11.3	-11.3	-11.5	-16.2

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	46	31
Angle of view segment deg.	35	26	46	36

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	1.5	1.3
Chart 10 correction dB(A)	-7.1	-8.4	-5.9	-7.0
Site Layout Correction dB(A)	-4.6	-5.9	-1.9	-3.2

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75	72.5	72.5	72.5
Propagation Correction dB(A)	-11.3	-11.3	-11.5	-16.2
Site Layout Correction dB(A)	-4.6	-5.9	-1.9	-3.2
Noise Contribution dB(A)	59.1	55.3	59.1	53.1
Chart 11 Combined Noise Level dB(A)	63.4			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	564	564	564		Chart 2 L10 dB(A)	69.7	69.7	69.7	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	71.3	71.2	71.2	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	70	68	75.5		Chart 7	-7.3	-7.2	-7.6	
Height relative to source h m	5.8	4.3	3		correction dB(A)				
Ave. height of propagation H m	3.40	n/a	n/a		Chart 8	-.77	0	0	
Absorbent ground cover I	.25				correction dB(A)				
Barrier path difference m	.03	.00	.00		Chart 9 correction dB(A)	-2.4	-5	-5.0	
					Propagation Correction dB(A)	-9.7	-12.2	-12.6	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	30	46	36		Chart 10 correction dB(A)	-7.8	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.3	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.3	71.2	71.2	
Propagation Correction dB(A)	-9.7	-12.2	-12.6	
Site Layout Correction dB(A)	-5.3	-3.4	-4.5	
Noise Contribution dB(A)	56.3	55.6	54.2	
Chart 11 Combined Noise Level dB(A)	60.2			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 60

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	775	775		
Traffic speed V km/h	30	30		
Heavy vehicles p %	25	25		
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	71	71		
Chart 4 correction dB(A)	2.2	2.2		
Chart 6 correction dB(A)	0	0		
correction dB(A)	-1	-1		
Basic Noise Level dB(A)	72.2	72.2		

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	4	4		
Height relative to source h m	6.8	6.8		
Ave. height of propagation H m	n/a	n/a		
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	1.2	1.2		
Chart 8 correction dB(A)	0	0		
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.2	1.2		

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	36		
Angle of view segment deg.	135	36		

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5		
reflection correction dB(A)	0	1.5		
Chart 10 correction dB(A)	-1.2	-7.0		
Site Layout Correction dB(A)	1.3	-3.0		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.2	72.2		
Propagation Correction dB(A)	1.2	1.2		
Site Layout Correction dB(A)	1.3	-3.0		
Noise Contribution dB(A)	74.7	70.4		

Chart 11 Combined Noise Level dB(A) 76.0

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	64.1	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	63.9	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	63.4	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.2	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	76.0	dB(A)

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	700	700	700		Chart 2 L10 dB(A)	70.6	70.6	70.6	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	71.8	71.8	71.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	1.6	1.6	1.6	
Height relative to source h m	5.5	5.5	5.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.6	1.6	1.6	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.					reflection correction dB(A)	0	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8	71.8	71.8	
Propagation Correction dB(A)	1.6	1.6	1.6	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	68.7	74.1	66.6	
Chart 11 Combined Noise Level dB(A)	75.8			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	847	847	847	
Traffic speed V km/h	30	30	30	
Heavy vehicles p %	25	25	25	
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.4	71.4	71.4	
Chart 4 correction dB(A)	2.2	2.2	2.2	
Chart 6 correction dB(A)	0	0	0	
correction dB(A)	-1	-1	-1	
Basic Noise Level dB(A)	72.6	72.6	72.6	

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4	4	
Height relative to source h m	5.5	5.5	5.5	
Ave. height of propagation H m	n/a	n/a	n/a	
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	1.6	1.6	1.6	
Chart 8 correction dB(A)	0	0	0	
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.6	1.6	1.6	

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	34	120	21	

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5	2.5	
reflection correction dB(A)	0	0	0	
Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.6	72.6	72.6	
Propagation Correction dB(A)	1.6	1.6	1.6	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	69.5	74.9	67.4	
Chart 11 Combined Noise Level dB(A)	76.6			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	978	978	978	978
Traffic speed V km/h	60	60	60	60
Heavy vehicles p %	25	25	25	25
Gradient G %	8 DOWN	8 DOWN	8 DOWN	
Road surface	PRE.	PRE.	PRE.	PRE.

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	72.1	72.1	72.1	72.1
Chart 4 correction dB(A)	3.2	3.2	3.2	3.2
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-3.5	-3.5	-3.5	-3.5
Basic Noise Level dB(A)	71.8	71.8	71.8	71.8

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	27	21	24.5	30
Height relative to source h m	-1.3	-2.1	-2.5	-4.8
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	.03	.06	.06	.11

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	-3.5	-2.6	-3.1	-3.9
Chart 8 correction dB(A)	0	0	0	0
Chart 9 correction dB(A)	-7.6	-8.6	-8.6	-9.6
Propagation Correction dB(A)	-11.1	-11.2	-11.7	-13.5

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.	0	0	0	0
Angle of view segment deg.	40	72	42	21

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	0	0
Chart 10 correction dB(A)	-6.5	-4.0	-6.3	-9.3
Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	71.8	71.8	71.8	71.8
Propagation Correction dB(A)	-11.1	-11.2	-11.7	-13.5
Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8
Noise Contribution dB(A)	56.6	59.1	56.3	51.5

Chart 11 Combined Noise Level dB(A): 62.7

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	585	585	585	585	Chart 2 L10 dB(A)	69.8	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	71.4	71.4	71.4	71.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	40	30.5	30	37	Chart 7 correction dB(A)	-5.1	-4	-3.9	-4.7
Height relative to source h m	4.5	4.5	4	4					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8 correction dB(A)	0	0	0	0
Absorbent ground cover I									
Barrier path difference m	.44	.01	.00	.00	Chart 9 correction dB(A)	-12.8	-3.9	-4.3	-4.7
					Propagation Correction dB(A)	-17.9	-7.9	-8.2	-9.4

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	77	27	Chart 10 correction dB(A)	-7.1	-7.4	-3.7	-8.2
					Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.4	71.4	71.4	71.4
Propagation Correction dB(A)	-17.9	-7.9	-8.2	-9.4
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7
Noise Contribution dB(A)	50.4	60.1	62.1	56.3
Chart 11 Combined Noise Level dB(A)	65.0			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	532	532	532	532
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	69.4	69.4	69.4	69.4
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	71	71	71	71

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	50	41	41	45.5
Height relative to source h m	4.5	4.5	4	4
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	.14	.00	.00	.00

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-5.9	-5.2	-5.1	-5.6
Chart 8 correction dB(A)	0	0	0	0
Chart 9 correction dB(A)	-10.0	-4.6	-4.7	-5
Propagation Correction dB(A)	-15.9	-9.8	-9.8	-10.6

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	35	33	0	0
Angle of view segment deg.	35	33	70	25

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	1.5	1.5	0	0
Chart 10 correction dB(A)	-7.1	-7.4	-4.1	-8.6
Site Layout Correction dB(A)	-3.1	-3.4	-1.6	-6.1

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71	71	71	71
Propagation Correction dB(A)	-15.9	-9.8	-9.8	-10.6
Site Layout Correction dB(A)	-3.1	-3.4	-1.6	-6.1
Noise Contribution dB(A)	52.0	57.8	59.6	54.3

Chart 11 Combined Noise Level dB(A): 62.9

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	275	275	275	275	Chart 2 L10 dB(A)	66.5	66.5	66.5	66.5
Traffic speed V km/h	50.1	50.1	50.1	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	3.2
Gradient G %	8 UP	8 UP	8 UP		Chart 6 correction dB(A)	2.4	2.4	2.4	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68	68	68	66.2

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	65	55	57	61	Chart 7	-7	-6.3	-6.5	-6.8
Height relative to source h m	3	-.9	-2.1	-4.8	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.00	.02	.02	.05	Chart 9 correction dB(A)	-4.9	-6.9	-7.3	-8.2
					Propagation Correction dB(A)	-11.9	-13.2	-13.8	-15.0

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	35	69	35	35	Chart 10 correction dB(A)	-7.1	-4.2	-7.1	-7.1
					Site Layout Correction dB(A)	-4.6	-1.7	-4.6	-4.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68	68	68	66.2
Propagation Correction dB(A)	-11.9	-13.2	-13.8	-15.0
Site Layout Correction dB(A)	-4.6	-1.7	-4.6	-4.6
Noise Contribution dB(A)	51.5	53.1	49.5	46.6
Chart 11 Combined Noise Level dB(A)	56.8			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 57

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942	942		L10 dB(A)	71.9	71.9	71.9	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.1	73.1	73.1	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	1.6	1.6	1.6	
Height relative to source h m	5.5	5.5	5.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.6	1.6	1.6	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1	73.1	
Propagation Correction dB(A)	1.6	1.6	1.6	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	71.2	75.4	67.9	
Chart 11 Combined Noise Level dB(A)		77.3		

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	62.7 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	65.0 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	62.9 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	56.8 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	77.3 dB(A)

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 78

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	700				Chart 2 L10 dB(A)	70.6			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	71.8			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4				Chart 7	1.8			
Height relative to source h m	4.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8			
Propagation Correction dB(A)	1.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	75.9			
Chart 11 Combined Noise Level dB(A)	75.9			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	847				Chart 2 L10 dB(A)	71.4			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	72.6			

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	4				Chart 7	1.8			
Height relative to source h m	4.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.8			

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.6			
Propagation Correction dB(A)	1.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	76.7			
Chart 11 Combined Noise Level dB(A)	76.7			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 77

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

CASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	978	978	978		Chart 2 L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	73.7	71.8	71.8	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	51.5	51.5	57		Chart 7 correction dB(A)	-6.1	-6.1	-6.5	
Height relative to source h m	3.5	3.2	1.3						
Ave. height of propagation H m	2.25	2.10	n/a		Chart 8	-2.58	-2.71	0	
Absorbent ground cover I	.75	.75			correction dB(A)				
Barrier path difference m		.00	.00		Chart 9 correction dB(A)		-5	-5	
					Propagation Correction dB(A)	-8.7	-11.1	-11.5	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	40	25	27		Chart 10 correction dB(A)	-6.5	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.0	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.7	71.8	71.8	
Propagation Correction dB(A)	-8.7	-11.1	-11.5	
Site Layout Correction dB(A)	-4.0	-6.1	-5.7	
Noise Contribution dB(A)	61.0	54.6	54.6	
Chart 11 Combined Noise Level dB(A)		62.6		

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1563	585	585	585	Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	75.7	71.4	71.4	71.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	60	60	62	71	Chart 7	-6.7	-6.7	-6.8	-7.4
Height relative to source h m	3.5	3.5	3.5	3.5	correction dB(A)				
Ave. height of propagation H m	2.25	2.25	n/a	n/a	Chart 8	-2.82	-2.82		
Absorbent ground cover I	.75	.75			correction dB(A)				
Barrier path difference m			.04	.50	Chart 9 correction dB(A)			-7.8	-13.1
					Propagation Correction dB(A)	-9.5	-9.5	-14.6	-20.5

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	10	24	reflection correction dB(A)	0	0	.6	1.3
Angle of view segment deg.	49	37	25	27	Chart 10 correction dB(A)	-5.7	-6.9	-8.6	-8.2
					Site Layout Correction dB(A)	-3.2	-4.4	-5.5	-4.4

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4
Propagation Correction dB(A)	-9.5	-9.5	-14.6	-20.5
Site Layout Correction dB(A)	-3.2	-4.4	-5.5	-4.4
Noise Contribution dB(A)	63.0	57.5	51.3	46.5
Chart 11 Combined Noise Level dB(A)	64.4			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 64

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	807	532	532	532
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	72.8	71	71	71

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	69	69	69	84
Height relative to source h m	3.5	3.5	3.5	3.5
Ave. height of propagation H m	2.25	2.25	n/a	n/a
Absorbent ground cover I	.75	.75		
Barrier path difference m	.00	.00	.00	.19

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-7.3	-7.3	-7.3	-8.1
Chart 8 correction dB(A)	-3.05	-3.05	0	0
Chart 9 correction dB(A)	-5	-5	-5.4	-10.6
Propagation Correction dB(A)	-12.3	-12.3	-12.7	-18.7

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	10	24
Angle of view segment deg.	53	33	24	28

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	.6	1.3
Chart 10 correction dB(A)	-5.3	-7.4	-8.8	-8.1
Site Layout Correction dB(A)	-2.8	-4.9	-5.6	-4.3

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.8	71	71	71
Propagation Correction dB(A)	-12.3	-12.3	-12.7	-18.7
Site Layout Correction dB(A)	-2.8	-4.9	-5.6	-4.3
Noise Contribution dB(A)	57.7	53.8	52.6	48.0
Chart 11 Combined Noise Level dB(A)	60.3			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 60

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	275	275	275		Chart 2 L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68.1	68	68	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	77	79	97		Chart 7	-7.7	-7.8	-8.7	
Height relative to source h m	3.5	3.2	.2		correction dB(A)				
Ave. height of propagation H m	2.25	n/a	n/a		Chart 8	-2.15	0	0	
Absorbent ground cover I	.50				correction dB(A)				
Barrier path difference m	.00	.00	.01		Chart 9 correction dB(A)	-4.5	-5	-6.4	
					Propagation Correction dB(A)	-12.2	-12.8	-15.1	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	33	25	27		Chart 10 correction dB(A)	-7.4	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.9	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	68.1	68	68	
Propagation Correction dB(A)	-12.2	-12.8	-15.1	
Site Layout Correction dB(A)	-4.9	-6.1	-5.7	
Noise Contribution dB(A)	51.0	49.1	47.2	
Chart 11 Combined Noise Level dB(A)		54.2		

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 54

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM)

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	942			
Traffic speed V km/h	30			
Heavy vehicles p %	25			
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.9			
Chart 4 correction dB(A)	2.2			
Chart 6 correction dB(A)	0			
correction dB(A)	-1			
Basic Noise Level dB(A)	73.1			

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	4			
Height relative to source h m	4.5			
Ave. height of propagation H m	n/a			
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	1.8			
Chart 8 correction dB(A)	0			
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.8			

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.	0			
Angle of view segment deg.	173			

	SEGMENT 1	2	3	4
correction dB(A)	2.5			
reflection correction dB(A)	0			
Chart 10 correction dB(A)	-.2			
Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.1			
Propagation Correction dB(A)	1.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	77.2			
Chart 11 Combined Noise Level dB(A)	77.2			

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	62.6 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	64.4 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	60.3 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	54.2 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	77.2 dB(A)

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 78

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	700	700			Chart 2 L10 dB(A)	70.6	70.6		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	71.8	71.8		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4			Chart 7	1.2	1.2		
Height relative to source h m	6.8	6.8			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.2	1.2		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)	0	0		
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8	71.8		
Propagation Correction dB(A)	1.2	1.2		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	74.3	68.5		
Chart 11 Combined Noise Level dB(A)	75.3			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 75

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	847	847			Chart 2 L10 dB(A)	71.4	71.4		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	72.6	72.6		

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4			Chart 7	1.2	1.2		
Height relative to source h m	6.8	6.8			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	1.2	1.2		

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)	0	0		
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.6	72.6		
Propagation Correction dB(A)	1.2	1.2		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	75.1	69.3		
Chart 11 Combined Noise Level dB(A)	76.1			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	978	978	978		Chart 2 L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	73.7	71.8	71.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	38.5	38.5	40		Chart 7 correction dB(A)	-4.9	-4.9	-5	
Height relative to source h m	5.8	5	3.5						
Ave. height of propagation H m	3.40	5.50	n/a		Chart 8 correction dB(A)	-1.35	-.49	0	
Absorbent ground cover I	.75	.75							
Barrier path difference m		.01	.00		Chart 9 correction dB(A)		-3.8	-4.7	
					Propagation Correction dB(A)	-6.3	-8.7	-9.7	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	31	46	36		Chart 10 correction dB(A)	-7.6	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.1	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.7	71.8	71.8	
Propagation Correction dB(A)	-6.3	-8.7	-9.7	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	
Noise Contribution dB(A)	62.3	59.7	57.6	
Chart 11 Combined Noise Level dB(A)	65.1			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1563	585	585	585
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	47.5	47.5	47	52
Height relative to source h m	5.8	5.8	5.8	5.8
Ave. height of propagation H m	3.40	3.40	n/a	n/a
Absorbent ground cover I	.75	.75		
Barrier path difference m			.04	.39

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-5.8	-5.8	-5.7	-6.1
Chart 8 correction dB(A)	-1.68	-1.68		
Chart 9 correction dB(A)			-8.0	-12.4
Propagation Correction dB(A)	-7.5	-7.5	-13.7	-18.5

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	46	31
Angle of view segment deg.	30	31	46	36

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	1.5	1.3
Chart 10 correction dB(A)	-7.8	-7.6	-5.9	-7.0
Site Layout Correction dB(A)	-5.3	-5.1	-1.9	-3.2

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4
Propagation Correction dB(A)	-7.5	-7.5	-13.7	-18.5
Site Layout Correction dB(A)	-5.3	-5.1	-1.9	-3.2
Noise Contribution dB(A)	62.9	58.8	55.8	49.7

Chart 11 Combined Noise Level dB(A): 65.0

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	807	532	532	532	Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	72.8	71	71	71

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	58	58	57	63.5	Chart 7 correction dB(A)	-6.6	-6.6	-6.5	-6.9
Height relative to source h m	5.8	5.8	5.8	5.8					
Ave. height of propagation H m	3.40	3.40	n/a	n/a	Chart 8	-1.33	-1.33	0	0
Absorbent ground cover I	.50	.50			correction dB(A)				
Barrier path difference m	.00	.00	.00	.10	Chart 9 correction dB(A)	-4.7	-4.7	-5	-9.3
					Propagation Correction dB(A)	-11.3	-11.3	-11.5	-16.2

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	46	31	reflection correction dB(A)	0	0	1.5	1.3
Angle of view segment deg.	35	26	46	36	Chart 10 correction dB(A)	-7.1	-8.4	-5.9	-7.0
					Site Layout Correction dB(A)	-4.6	-5.9	-1.9	-3.2

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.8	71	71	71
Propagation Correction dB(A)	-11.3	-11.3	-11.5	-16.2
Site Layout Correction dB(A)	-4.6	-5.9	-1.9	-3.2
Noise Contribution dB(A)	56.9	53.8	57.6	51.6
Chart 11 Combined Noise Level dB(A)	61.6			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	275	275	275		Chart 2 L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68.1	68	68	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	70	68	75.5		Chart 7	-7.3	-7.2	-7.6	
Height relative to source h m	5.8	4.3	3		correction dB(A)				
Ave. height of propagation H m	3.40	n/a	n/a		Chart 8	-.77	0	0	
Absorbent ground cover I	.25				correction dB(A)				
Barrier path difference m	.03	.00	.00		Chart 9 correction dB(A)	-2.4	-5	-5.0	
					Propagation Correction dB(A)	-9.7	-12.2	-12.6	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	30	46	36		Chart 10 correction dB(A)	-7.8	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.3	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68.1	68	68	
Propagation Correction dB(A)	-9.7	-12.2	-12.6	
Site Layout Correction dB(A)	-5.3	-3.4	-4.5	
Noise Contribution dB(A)	53.1	52.4	51.0	
Chart 11 Combined Noise Level dB(A)		57.0		

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 57

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM)

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	942	942		
Traffic speed V km/h	30	30		
Heavy vehicles p %	25	25		
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.9	71.9		
Chart 4 correction dB(A)	2.2	2.2		
Chart 6 correction dB(A)	0	0		
correction dB(A)	-1	-1		
Basic Noise Level dB(A)	73.1	73.1		

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4		
Height relative to source h m	6.8	6.8		
Ave. height of propagation H m	n/a	n/a		
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	1.2	1.2		
Chart 8 correction dB(A)	0	0		
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.2	1.2		

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.	0	36		
Angle of view segment deg.	135	36		

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5		
reflection correction dB(A)	0	1.5		
Chart 10 correction dB(A)	-1.2	-7.0		
Site Layout Correction dB(A)	1.3	-3.0		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.1	73.1		
Propagation Correction dB(A)	1.2	1.2		
Site Layout Correction dB(A)	1.3	-3.0		
Noise Contribution dB(A)	75.6	71.3		
Chart 11 Combined Noise Level dB(A)	76.9			

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	65.1	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	65.0	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	61.6	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	57.0	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	76.9	dB(A)

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 78

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	911	911	911		Chart 2 L10 dB(A)	71.7	71.7	71.7	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	72.9	72.9	72.9	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.					reflection correction dB(A)	0	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.9	72.9	72.9	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	66.0	71.4	63.9	
Chart 11 Combined Noise Level dB(A)	73.1			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 73

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q					Chart 2				
veh/hour	1000	1000	1000		L10 dB(A)	72.2	72.2	72.2	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.4	73.4	73.4	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7 correction dB(A)	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8 correction dB(A)	0	0	0	
Absorbent ground cover I									
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.					reflection correction dB(A)	0	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.4	73.4	73.4	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	66.5	71.9	64.4	
Chart 11 Combined Noise Level dB(A)	73.6			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	777	777	777	777	Chart 2 L10 dB(A)	71.1	71.1	71.1	71.1
Traffic speed V km/h	60	60	60	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	3.2	3.2	3.2	3.2
Gradient G %	8 DOWN	8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	70.8	70.8	70.8	70.8

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	27	21	24.5	30	Chart 7	-3.9	-3.1	-3.6	-4.1
Height relative to source h m	14.7	13.9	13.5	11.2	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.37	.53	.38	.17	Chart 9 correction dB(A)	-.2	-.1	-.2	-.7
					Propagation Correction dB(A)	-4.1	-3.2	-3.8	-4.8

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	40	72	42	21	Chart 10 correction dB(A)	-6.5	-4.0	-6.3	-9.3
					Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	70.8	70.8	70.8	70.8
Propagation Correction dB(A)	-4.1	-3.2	-3.8	-4.8
Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8
Noise Contribution dB(A)	62.6	66.1	63.2	59.2
Chart 11 Combined Noise Level dB(A)	69.5			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 69

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	447	447	447	447
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	68.7	68.7	68.7	68.7
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	70.3	70.3	70.3	70.3

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	40	30.5	30	37
Height relative to source h m	20.5	20.5	20	20
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	.01	.44	.44	.30

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-5.5	-4.6	-4.6	-5.2
Chart 8 correction dB(A)	0	0	0	0
Chart 9 correction dB(A)	-6.7	-.2	-.2	-.3
Propagation Correction dB(A)	-12.2	-4.8	-4.8	-5.5

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	35	33	0	0
Angle of view segment deg.	35	33	77	27

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	1.5	1.5	0	0
Chart 10 correction dB(A)	-7.1	-7.4	-3.7	-8.2
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	70.3	70.3	70.3	70.3
Propagation Correction dB(A)	-12.2	-4.8	-4.8	-5.5
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7
Noise Contribution dB(A)	55.0	62.2	64.3	59.0
Chart 11 Combined Noise Level dB(A)	67.4			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	758	758	758	758	Chart 2 L10 dB(A)	70.9	70.9	70.9	70.9
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	72.5	72.5	72.5	72.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50	41	41	45.5	Chart 7	-6.2	-5.5	-5.5	-5.9
Height relative to source h m	20.5	20.5	20	20	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.17	.25	.24	.19	Chart 9 correction dB(A)	-.7	-.4	-.4	-.6
					Propagation Correction dB(A)	-6.9	-5.9	-5.9	-6.5

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	70	25	Chart 10 correction dB(A)	-7.4	-7.4	-4.1	-8.6
					Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.5	72.5	72.5	72.5
Propagation Correction dB(A)	-6.9	-5.9	-5.9	-6.5
Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1
Noise Contribution dB(A)	62.2	63.2	65.0	59.9
Chart 11 Combined Noise Level dB(A)	69.0			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 69

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	564	564	564	564	Chart 2 L10 dB(A)	69.7	69.7	69.7	69.7
Traffic speed V km/h	50.1	50.1	50.1	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	3.2
Gradient G %	8 UP	8 UP	8 UP		Chart 6 correction dB(A)	2.4	2.4	2.4	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	71.2	71.2	71.2	69.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	65	55	57	61	Chart 7	-7.1	-6.5	-6.6	-6.8
Height relative to source h m	16.2	14.7	13.5	11.2	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.07	.08	.06	.03	Chart 9 correction dB(A)	-1.5	-1.3	-1.7	-2.5
					Propagation Correction dB(A)	-8.6	-7.8	-8.3	-9.3

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	35	69	33	35	Chart 10 correction dB(A)	-7.1	-4.2	-7.4	-7.1
					Site Layout Correction dB(A)	-4.6	-1.7	-4.9	-4.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.2	71.2	71.2	69.4
Propagation Correction dB(A)	-8.6	-7.8	-8.3	-9.3
Site Layout Correction dB(A)	-4.6	-1.7	-4.9	-4.6
Noise Contribution dB(A)	58.0	61.7	58.1	55.5
Chart 11 Combined Noise Level dB(A)	64.9			

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (AM) 22m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	775	775	775		Chart 2 L10 dB(A)	71	71	71	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	72.2	72.2	72.2	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.2	72.2	72.2	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	66.5	70.7	63.2	
Chart 11 Combined Noise Level dB(A)		72.6		

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	69.5	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	67.4	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	69.0	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	64.9	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.6	dB(A)

Rounding to the nearest whole number:

LOCATION A (AM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	911			
Traffic speed V km/h	30			
Heavy vehicles p %	25			
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.7			
Chart 4 correction dB(A)	2.2			
Chart 6 correction dB(A)	0			
correction dB(A)	-1			
Basic Noise Level dB(A)	72.9			

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	5			
Height relative to source h m	24.5			
Ave. height of propagation H m	n/a			
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	-2.8			
Chart 8 correction dB(A)	0			
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.	0			
Angle of view segment deg.	173			

	SEGMENT 1	2	3	4
correction dB(A)	2.5			
reflection correction dB(A)	0			
Chart 10 correction dB(A)	-.2			
Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.9			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.4			

Chart 11 Combined Noise Level dB(A): 72.4

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 72

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1000				Chart 2 L10 dB(A)	72.2			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.4			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7 correction dB(A)	-2.8			
Height relative to source h m	24.5								
Ave. height of propagation H m	n/a				Chart 8 correction dB(A)	0			
Absorbent ground cover I									
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.4			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.9			
Chart 11 Combined Noise Level dB(A)	72.9			

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 73

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

CASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	777	777	777		Chart 2 L10 dB(A)	71.1	71.1	71.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	72.7	70.8	70.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	54.5	54.5	60		Chart 7	-6.6	-6.6	-6.9	
Height relative to source h m	23.5	23.2	21.3		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-6.6	-6.6	-6.9	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	40	25	27		Chart 10 correction dB(A)	-6.5	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.0	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.7	70.8	70.8	
Propagation Correction dB(A)	-6.6	-6.6	-6.9	
Site Layout Correction dB(A)	-4.0	-6.1	-5.7	
Noise Contribution dB(A)	62.1	58.1	58.2	
Chart 11 Combined Noise Level dB(A)		64.6		

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1224	447	447	447
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	73	68.7	68.7	68.7
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	74.6	70.3	70.3	70.3

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	63	63	65	74
Height relative to source h m	23.5	23.5	23.5	23.5
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-7.1	-7.1	-7.2	-7.7
Chart 8 correction dB(A)				
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-7.1	-7.1	-7.2	-7.7

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	49	37	25	27

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)				
Chart 10 correction dB(A)	-5.7	-6.9	-8.6	-8.2
Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	74.6	70.3	70.3	70.3
Propagation Correction dB(A)	-7.1	-7.1	-7.2	-7.7
Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7
Noise Contribution dB(A)	64.3	58.8	57.0	56.9

Chart 11 Combined Noise Level dB(A): 66.5

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1322	758	758	758	Chart 2 L10 dB(A)	73.4	70.9	70.9	70.9
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	M PREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	75	72.5	72.5	72.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	69	69	69	84	Chart 7	-7.5	-7.5	-7.5	-8.2
Height relative to source h m	23.5	23.5	23.5	23.5	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-7.5	-7.5	-7.5	-8.2

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	53	33	24	28	Chart 10 correction dB(A)	-5.3	-7.4	-8.8	-8.1
					Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75	72.5	72.5	72.5
Propagation Correction dB(A)	-7.5	-7.5	-7.5	-8.2
Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6
Noise Contribution dB(A)	64.7	60.1	58.7	58.7
Chart 11 Combined Noise Level dB(A)	67.4			

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

CASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	564	564	564		Chart 2 L10 dB(A)	69.7	69.7	69.7	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	71.3	71.2	71.2	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	80	82	99		Chart 7 correction dB(A)	-8	-8.1	-8.8	
Height relative to source h m	23.5	23.2	20.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-8	-8.1	-8.8	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	33	25	27		Chart 10 correction dB(A)	-7.4	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.9	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	71.3	71.2	71.2	
Propagation Correction dB(A)	-8	-8.1	-8.8	
Site Layout Correction dB(A)	-4.9	-6.1	-5.7	
Noise Contribution dB(A)	58.4	57.0	56.7	
Chart 11 Combined Noise Level dB(A)		62.2		

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (AM) 25m above ground

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	775			
Traffic speed V km/h	30			
Heavy vehicles p %	25			
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71			
Chart 4 correction dB(A)	2.2			
Chart 6 correction dB(A)	0			
correction dB(A)	-1			
Basic Noise Level dB(A)	72.2			

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	5			
Height relative to source h m	24.5			
Ave. height of propagation H m	n/a			
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	-2.8			
Chart 8 correction dB(A)	0			
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.	0			
Angle of view segment deg.	173			

	SEGMENT 1	2	3	4
correction dB(A)	2.5			
reflection correction dB(A)	0			
Chart 10 correction dB(A)	-.2			
Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.2			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	71.7			
Chart 11 Combined Noise Level dB(A)	71.7			

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	64.6 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	66.5 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	67.4 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	62.2 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	71.7 dB(A)

Rounding to the nearest whole number:

LOCATION B (AM) : Predicted value of L10 (1-hour) dB(A) is 75

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	911	911		
Traffic speed V km/h	30	30		
Heavy vehicles p %	25	25		
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.7	71.7		
Chart 4 correction dB(A)	2.2	2.2		
Chart 6 correction dB(A)	0	0		
correction dB(A)	-1	-1		
Basic Noise Level dB(A)	72.9	72.9		

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	6	6.5		
Height relative to source h m	27.5	27.5		
Ave. height of propagation H m	n/a	n/a		
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	-3.3	-3.3		
Chart 8 correction dB(A)	0	0		
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	135	36		

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5		
reflection correction dB(A)	0	0		
Chart 10 correction dB(A)	-1.2	-7.0		
Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.9	72.9		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	70.9	65.1		
Chart 11 Combined Noise Level dB(A)	71.9			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 72

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q					Chart 2				
veh/hour	1000	1000			L10 dB(A)	72.2	72.2		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	73.4	73.4		

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)	0	0		
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.4	73.4		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	71.4	65.6		
Chart 11 Combined Noise Level dB(A)	72.4			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 72

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	564	564	564		Chart 2 L10 dB(A)	69.7	69.7	69.7	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	71.3	71.2	71.2	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	73	71	78.5		Chart 7 correction dB(A)	-7.7	-7.6	-8	
Height relative to source h m	26.5	25	23.7						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-7.7	-7.6	-8	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	30	46	36		Chart 10 correction dB(A)	-7.8	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.3	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	71.3	71.2	71.2	
Propagation Correction dB(A)	-7.7	-7.6	-8	
Site Layout Correction dB(A)	-5.3	-3.4	-4.5	
Noise Contribution dB(A)	58.3	60.2	58.7	
Chart 11 Combined Noise Level dB(A)		63.9		

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 64

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1322	758	758	758
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	73.4	70.9	70.9	70.9
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	75	72.5	72.5	72.5

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	61	61	60	66.5
Height relative to source h m	26.5	26.5	26.5	26.5
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-7.1	-7.1	-7	-7.4
Chart 8 correction dB(A)				
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-7.1	-7.1	-7	-7.4

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	26	26	46	36

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)				
Chart 10 correction dB(A)	-8.4	-8.4	-5.9	-7.0
Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75	72.5	72.5	72.5
Propagation Correction dB(A)	-7.1	-7.1	-7	-7.4
Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5
Noise Contribution dB(A)	62.0	59.5	62.1	60.6

Chart 11 Combined Noise Level dB(A): 66.1

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 66

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1322	758	758	758	Chart 2 L10 dB(A)	73.4	70.9	70.9	70.9
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	75	72.5	72.5	72.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	61	61	60	66.5	Chart 7	-7.1	-7.1	-7	-7.4
Height relative to source h m	26.5	26.5	26.5	26.5	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-7.1	-7.1	-7	-7.4

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	26	26	46	36	Chart 10 correction dB(A)	-8.4	-8.4	-5.9	-7.0
					Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75	72.5	72.5	72.5
Propagation Correction dB(A)	-7.1	-7.1	-7	-7.4
Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5
Noise Contribution dB(A)	62.0	59.5	62.1	60.6
Chart 11 Combined Noise Level dB(A)	67.2			

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT 1	2	3	4
Traffic flow q veh/hour	777	777	777	
Traffic speed V km/h	50	60	60	
Heavy vehicles p %	25	25	25	
Gradient G %		8 DOWN	8 DOWN	
Road surface	IMPRE.	PRE.	PRE.	

	SEGMENT 1	2	3	4
Chart 2 L10 dB(A)	71.1	71.1	71.1	
Chart 4 correction dB(A)	2.6	3.2	3.2	
Chart 6 correction dB(A)	0	0	0	
correction dB(A)	-1	-3.5	-3.5	
Basic Noise Level dB(A)	72.7	70.8	70.8	

PROPAGATION

	SEGMENT 1	2	3	4
Shortest horizontal distance d m	41.5	41.5	43	
Height relative to source h m	26.5	25.7	24.2	
Ave. height of propagation H m	n/a	n/a	n/a	
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT 1	2	3	4
Chart 7 correction dB(A)	-5.8	-5.8	-5.8	
Chart 8 correction dB(A)				
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-5.8	-5.8	-5.8	

SITE LAYOUT

	SEGMENT 1	2	3	4
Facade				
Opposite facade angle deg.	0	0	0	
Angle of view segment deg.	31	46	36	

	SEGMENT 1	2	3	4
correction dB(A)	2.5	2.5	2.5	
reflection correction dB(A)	0	0	0	
Chart 10 correction dB(A)	-7.6	-5.9	-7.0	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	72.7	70.8	70.8	
Propagation Correction dB(A)	-5.8	-5.8	-5.8	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	
Noise Contribution dB(A)	61.8	61.6	60.5	

Chart 11 Combined Noise Level dB(A): 66.1

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 66

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (AM) 28m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	775	775			Chart 2 L10 dB(A)	71	71		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	72.2	72.2		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.2	72.2		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	70.2	64.4		
Chart 11 Combined Noise Level dB(A)	71.2			

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	66.1 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	66.1 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	67.2 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	63.9 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	71.2 dB(A)

Rounding to the nearest whole number:

LOCATION C (AM) : Predicted value of L10 (1-hour) dB(A) is 75

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	700	700	700	
Traffic speed V km/h	30	30	30	
Heavy vehicles p %	25	25	25	
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	70.6	70.6	70.6	
Chart 4 correction dB(A)	2.2	2.2	2.2	
Chart 6 correction dB(A)	0	0	0	
correction dB(A)	-1	-1	-1	
Basic Noise Level dB(A)	71.8	71.8	71.8	

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	4	4	4	
Height relative to source h m	21.5	21.5	21.5	
Ave. height of propagation H m	n/a	n/a	n/a	
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-2.2	-2.2	-2.2	
Chart 8 correction dB(A)	0	0	0	
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	34	120	21	

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	
reflection correction dB(A)	0	0	0	
Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8	71.8	71.8	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	64.9	70.3	62.8	

Chart 11 Combined Noise Level dB(A) 72.0

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 72

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	847	847	847	
Traffic speed V km/h	30	30	30	
Heavy vehicles p %	25	25	25	
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	71.4	71.4	71.4	
Chart 4 correction dB(A)	2.2	2.2	2.2	
Chart 6 correction dB(A)	0	0	0	
correction dB(A)	-1	-1	-1	
Basic Noise Level dB(A)	72.6	72.6	72.6	

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	4	4	4	
Height relative to source h m	21.5	21.5	21.5	
Ave. height of propagation H m	n/a	n/a	n/a	
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-2.2	-2.2	-2.2	
Chart 8 correction dB(A)	0	0	0	
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	34	120	21	

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	
reflection correction dB(A)	0	0	0	
Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
Site Layout Correction dB(A)	-4.7	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.6	72.6	72.6	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-4.7	.7	-6.8	
Noise Contribution dB(A)	65.7	71.1	63.6	

Chart 11 Combined Noise Level dB(A) 72.8

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 73

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	978	978	978	978	Chart 2 L10 dB(A)	72.1	72.1	72.1	72.1
Traffic speed V km/h	60	60	60	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	3.2	3.2	3.2	3.2
Gradient G %	8 DOWN	8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	71.8	71.8	71.8	71.8

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	27	21	24.5	30	Chart 7	-3.9	-3.1	-3.6	-4.1
Height relative to source h m	14.7	13.9	13.5	11.2	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.37	.53	.38	.17	Chart 9 correction dB(A)	-.2	-.1	-.2	-.7
					Propagation Correction dB(A)	-4.1	-3.2	-3.8	-4.8

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	40	72	42	21	Chart 10 correction dB(A)	-6.5	-4.0	-6.3	-9.3
					Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8	71.8	71.8	71.8
Propagation Correction dB(A)	-4.1	-3.2	-3.8	-4.8
Site Layout Correction dB(A)	-4.0	-1.5	-3.8	-6.8
Noise Contribution dB(A)	63.6	67.1	64.2	60.2
Chart 11 Combined Noise Level dB(A)	70.46			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 70

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	585	585	585	585
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	69.8	69.8	69.8	69.8
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	71.4	71.4	71.4	71.4

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	40	30.5	30	37
Height relative to source h m	20.5	20.5	20	20
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	.01	.44	.44	.30

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-5.5	-4.6	-4.6	-5.2
Chart 8 correction dB(A)	0	0	0	0
Chart 9 correction dB(A)	-6.7	-.2	-.2	-.3
Propagation Correction dB(A)	-12.2	-4.8	-4.8	-5.5

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	35	33	0	0
Angle of view segment deg.	35	33	77	27

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	1.5	1.5	0	0
Chart 10 correction dB(A)	-7.1	-7.4	-3.7	-8.2
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.4	71.4	71.4	71.4
Propagation Correction dB(A)	-12.2	-4.8	-4.8	-5.5
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7
Noise Contribution dB(A)	56.1	63.3	65.4	60.1

Chart 11 Combined Noise Level dB(A): 68.5

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 68

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	532	532	532	532	L10 dB(A)	69.4	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	71	71	71	71

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50	41	41	45.5	Chart 7 correction dB(A)	-6.2	-5.5	-5.5	-5.9
Height relative to source h m	20.5	20.5	20	20					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8 correction dB(A)	0	0	0	0
Absorbent ground cover I									
Barrier path difference m	.17	.25	.24	.19	Chart 9 correction dB(A)	-.7	-.4	-.4	-.6
					Propagation Correction dB(A)	-6.9	-5.9	-5.9	-6.5

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	70	25	Chart 10 correction dB(A)	-7.4	-7.4	-4.1	-8.6
					Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71	71	71	71
Propagation Correction dB(A)	-6.9	-5.9	-5.9	-6.5
Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1
Noise Contribution dB(A)	60.7	61.7	63.5	58.4

Chart 11 Combined Noise Level dB(A): 67.5

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	275	275	275	275	Chart 2 L10 dB(A)	66.5	66.5	66.5	66.5
Traffic speed V km/h	50.1	50.1	50.1	60	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	3.2
Gradient G %	8 UP	8 UP	8 UP		Chart 6 correction dB(A)	2.4	2.4	2.4	0
Road surface	PRE.	PRE.	PRE.	PRE.	correction dB(A)	-3.5	-3.5	-3.5	-3.5
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68	68	68	66.2

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	65	55	57	61	Chart 7	-7.1	-6.5	-6.6	-6.8
Height relative to source h m	16.2	14.7	13.5	11.2	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.07	.08	.06	.03	Chart 9 correction dB(A)	-1.5	-1.3	-1.7	-2.5
					Propagation Correction dB(A)	-8.6	-7.8	-8.3	-9.3

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	0	0	0	0	reflection correction dB(A)	0	0	0	0
Angle of view segment deg.	35	69	33	35	Chart 10 correction dB(A)	-7.1	-4.2	-7.4	-7.1
					Site Layout Correction dB(A)	-4.6	-1.7	-4.9	-4.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68	68	68	66.2
Propagation Correction dB(A)	-8.6	-7.8	-8.3	-9.3
Site Layout Correction dB(A)	-4.6	-1.7	-4.9	-4.6
Noise Contribution dB(A)	54.8	58.5	54.9	52.3
Chart 11 Combined Noise Level dB(A)	61.7			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942	942	942		Chart 2 L10 dB(A)	71.9	71.9	71.9	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.1	73.1	73.1	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1	73.1	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	67.4	71.6	64.1	
Chart 11 Combined Noise Level dB(A)	73.5			

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	70.5 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	68.5 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	67.5 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	61.7 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	73.5 dB(A)

Rounding to the nearest whole number:

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	700				Chart 2 L10 dB(A)	70.6			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	71.8			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7 correction dB(A)	-2.8			
Height relative to source h m	24.5								
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	71.3			
Chart 11 Combined Noise Level dB(A)	71.3			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 71

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

CASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	847				Chart 2 L10 dB(A)	71.4			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	72.6			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7 correction dB(A)	-2.8			
Height relative to source h m	24.5								
Ave. height of propagation H m	n/a				Chart 8 correction dB(A)	0			
Absorbent ground cover I									
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.6			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.1			
Chart 11 Combined Noise Level dB(A)	72.1			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 72

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

CASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	978	978	978		Chart 2 L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	73.7	71.8	71.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	54.5	54.5	60		Chart 7	-6.6	-6.6	-6.9	
Height relative to source h m	23.5	23.2	21.3		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-6.6	-6.6	-6.9	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	40	25	27		Chart 10 correction dB(A)	-6.5	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.0	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.7	71.8	71.8	
Propagation Correction dB(A)	-6.6	-6.6	-6.9	
Site Layout Correction dB(A)	-4.0	-6.1	-5.7	
Noise Contribution dB(A)	63.1	59.1	59.2	

Chart 11 Combined Noise Level dB(A): 65.6

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 66

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1563	585	585	585
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	63	63	65	74
Height relative to source h m	23.5	23.5	23.5	23.5
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-7.1	-7.1	-7.2	-7.7
Chart 8 correction dB(A)				
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-7.1	-7.1	-7.2	-7.7

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	49	37	25	27

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)				
Chart 10 correction dB(A)	-5.7	-6.9	-8.6	-8.2
Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4
Propagation Correction dB(A)	-7.1	-7.1	-7.2	-7.7
Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7
Noise Contribution dB(A)	65.4	59.9	58.1	58.0
Chart 11 Combined Noise Level dB(A)	67.6			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 68

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	807	532	532	532	Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IM PREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	72.8	71	71	71

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	69	69	69	84	Chart 7 correction dB(A)	-7.5	-7.5	-7.5	-8.2
Height relative to source h m	23.5	23.5	23.5	23.5					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-7.5	-7.5	-7.5	-8.2

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	53	33	24	28	Chart 10 correction dB(A)	-5.3	-7.4	-8.8	-8.1
					Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.8	71	71	71
Propagation Correction dB(A)	-7.5	-7.5	-7.5	-8.2
Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6
Noise Contribution dB(A)	62.5	58.6	57.2	57.2
Chart 11 Combined Noise Level dB(A)	65.5			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 66

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

CASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	275	275	275		L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68.1	68	68	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	80	82	99		Chart 7 correction dB(A)	-8	-8.1	-8.8	
Height relative to source h m	23.5	23.2	20.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-8	-8.1	-8.8	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	33	25	27		Chart 10 correction dB(A)	-7.4	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.9	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68.1	68	68	
Propagation Correction dB(A)	-8	-8.1	-8.8	
Site Layout Correction dB(A)	-4.9	-6.1	-5.7	
Noise Contribution dB(A)	55.2	53.8	53.5	
Chart 11 Combined Noise Level dB(A)		59.0		

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 59

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942				Chart 2 L10 dB(A)	71.9			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.1			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7 correction dB(A)	-2.8			
Height relative to source h m	24.5								
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.6			
Chart 11 Combined Noise Level dB(A)	72.6			

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	65.6 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	67.6 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	65.5 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	59.0 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.6 dB(A)

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 75

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1991

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	700	700			L10 dB(A)	70.6	70.6		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	71.8	71.8		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)	0	0		
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.8	71.8		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	69.8	64.0		
Chart 11 Combined Noise Level dB(A)	70.8			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 71

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA 1996

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	847	847			Chart 2 L10 dB(A)	71.4	71.4		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	72.6	72.6		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7 correction dB(A)	-3.3	-3.3		
Height relative to source h m	27.5	27.5							
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)	0	0		
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.6	72.6		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	70.6	64.8		
Chart 11 Combined Noise Level dB(A)	71.6			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 72

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	978	978	978		Chart 2 L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	73.7	71.8	71.8	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	41.5	41.5	43		Chart 7 correction dB(A)	-5.8	-5.8	-5.8	
Height relative to source h m	26.5	25.7	24.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-5.8	-5.8	-5.8	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	31	46	36		Chart 10 correction dB(A)	-7.6	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.1	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.7	71.8	71.8	
Propagation Correction dB(A)	-5.8	-5.8	-5.8	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	
Noise Contribution dB(A)	62.8	62.6	61.5	
Chart 11 Combined Noise Level dB(A)	67.1			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	1563	585	585	585
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	50.5	50.5	50	55
Height relative to source h m	26.5	26.5	26.5	26.5
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	n/a	n/a	n/a	n/a

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-6.4	-6.4	-6.4	-6.7
Chart 8 correction dB(A)				
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-6.4	-6.4	-6.4	-6.7

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	21	31	46	36

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)				
Chart 10 correction dB(A)	-9.3	-7.6	-5.9	-7.0
Site Layout Correction dB(A)	-6.8	-5.1	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4
Propagation Correction dB(A)	-6.4	-6.4	-6.4	-6.7
Site Layout Correction dB(A)	-6.8	-5.1	-3.4	-4.5
Noise Contribution dB(A)	62.5	59.9	61.6	60.2
Chart 11 Combined Noise Level dB(A)	67.2			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 67

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	807	532	532	532	Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	72.8	71	71	71

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	61	61	60	66.5	Chart 7 correction dB(A)	-7.1	-7.1	-7	-7.4
Height relative to source h m	26.5	26.5	26.5	26.5					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-7.1	-7.1	-7	-7.4

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	26	26	46	36	Chart 10 correction dB(A)	-8.4	-8.4	-5.9	-7.0
					Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.8	71	71	71
Propagation Correction dB(A)	-7.1	-7.1	-7	-7.4
Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5
Noise Contribution dB(A)	59.8	58.0	60.6	59.1

Chart 11 Combined Noise Level dB(A): 65.49

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	275	275	275		Chart 2 L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68.1	68	68	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	73	71	78.5		Chart 7	-7.7	-7.6	-8	
Height relative to source h m	26.5	25	23.7		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-7.7	-7.6	-8	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	30	46	36		Chart 10 correction dB(A)	-7.8	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.3	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68.1	68	68	
Propagation Correction dB(A)	-7.7	-7.6	-8	
Site Layout Correction dB(A)	-5.3	-3.4	-4.5	
Noise Contribution dB(A)	55.1	57.0	55.5	
Chart 11 Combined Noise Level dB(A)	60.7			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 61

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942			L10 dB(A)	71.9	71.9		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	73.1	73.1		

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.1	73.1		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	71.1	65.3		
Chart 11 Combined Noise Level dB(A)	72.1			

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	67.1 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	67.2 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	65.5 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.7 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.1 dB(A)

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 75

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND - NOISE BARRIER AT CENTRAL RESERVE 3m HEIGHT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	532	532	532	532	Chart 2 L10 dB(A)	69.4	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	71	71	71	71

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50	41	41	45.5	Chart 7 correction dB(A)	-6.2	-5.5	-5.5	-5.9
Height relative to source h m	20.5	20.5	20	20					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8 correction dB(A)	0	0	0	0
Absorbent ground cover I									
Barrier path difference m	.17	.09	.10	.14	Chart 9 correction dB(A)	-10.4	-9.2	-9.4	-10.0
					Propagation Correction dB(A)	-16.6	-14.7	-14.9	-15.9

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	70	25	Chart 10 correction dB(A)	-7.4	-7.4	-4.1	-8.6
					Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71	71	71	71
Propagation Correction dB(A)	-16.6	-14.7	-14.9	-15.9
Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1
Noise Contribution dB(A)	51.0	52.9	54.5	49.0

Chart 11 Combined Noise Level dB(A) 58.4

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 58

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground - 3m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942	942		L10 dB(A)	71.9	71.9	71.9	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.1	73.1	73.1	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1	73.1	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	67.4	71.6	64.1	
Chart 11 Combined Noise Level dB(A)	73.5			

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	70.5	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	68.5	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	58.4	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	61.7	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	73.5	dB(A)

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF B8L

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	807	532	532	532
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	72.8	71	71	71

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	69	69	69	84
Height relative to source h m	23.5	23.5	23.5	23.5
Ave. height of propagation H m	n/a	n/a	n/a	n/a
Absorbent ground cover I				
Barrier path difference m	.24	.24	.24	.33

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-7.5	-7.5	-7.5	-8.2
Chart 8 correction dB(A)				
Chart 9 correction dB(A)	-11.2	-11.2	-11.2	-12.0
Propagation Correction dB(A)	-18.7	-18.7	-18.7	-20.2

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.				
Angle of view segment deg.	53	33	24	28

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)				
Chart 10 correction dB(A)	-5.3	-7.4	-8.8	-8.1
Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.8	71	71	71
Propagation Correction dB(A)	-18.7	-18.7	-18.7	-20.2
Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6
Noise Contribution dB(A)	51.3	47.4	46.0	45.2
Chart 11 Combined Noise Level dB(A)	54.2			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 54

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF 8BL

CASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	275	275	275		L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68.1	68	68	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	80	82	99		Chart 7 correction dB(A)	-8	-8.1	-8.8	
Height relative to source h m	23.5	23.2	20.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8 correction dB(A)				
Absorbent ground cover I									
Barrier path difference m	.02				Chart 9 correction dB(A)	-3.1			
					Propagation Correction dB(A)	-11.1	-8.1	-8.8	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	33	25	27		Chart 10 correction dB(A)	-7.4	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.9	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68.1	68	68	
Propagation Correction dB(A)	-11.1	-8.1	-8.8	
Site Layout Correction dB(A)	-4.9	-6.1	-5.7	
Noise Contribution dB(A)	52.2	53.8	53.5	
Chart 11 Combined Noise Level dB(A)	58.0			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 58

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942				Chart 2 L10 dB(A)	71.9			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.1			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7	-2.8			
Height relative to source h m	24.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.6			
Chart 11 Combined Noise Level dB(A)	72.6			

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	65.6	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	67.6	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	54.2	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	58.0	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.6	dB(A)

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 75

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	807	532	532	532	Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	72.8	71	71	71

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	61	61	60	66.5	Chart 7 correction dB(A)	-7.1	-7.1	-7	-7.4
Height relative to source h m	26.5	26.5	26.5	26.5					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.14	.14	.13	.17	Chart 9 correction dB(A)	-9.9	-9.9	-9.8	-10.4
					Propagation Correction dB(A)	-17.0	-17.0	-16.8	-17.8

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	26	26	46	36	Chart 10 correction dB(A)	-8.4	-8.4	-5.9	-7.0
					Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	72.8	71	71	71
Propagation Correction dB(A)	-17.0	-17.0	-16.8	-17.8
Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5
Noise Contribution dB(A)	49.9	48.1	50.7	48.7

Chart 11 Combined Noise Level dB(A) 55.48

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 55

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	275	275	275		Chart 2 L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	68.1	68	68	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	73	71	78.5		Chart 7	-7.7	-7.6	-8	
Height relative to source h m	26.5	25	23.7		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.08				Chart 9 correction dB(A)	-1.3			
					Propagation Correction dB(A)	-9.0	-7.6	-8	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	30	46	36		Chart 10 correction dB(A)	-7.8	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.3	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	68.1	68	68	
Propagation Correction dB(A)	-9.0	-7.6	-8	
Site Layout Correction dB(A)	-5.3	-3.4	-4.5	
Noise Contribution dB(A)	53.8	57.0	55.5	
Chart 11 Combined Noise Level dB(A)		60.4		

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 60

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942			L10 dB(A)	71.9	71.9		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	73.1	73.1		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	71.1	65.3		
Chart 11 Combined Noise Level dB(A)	72.1			

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	67.1	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	67.2	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	55.5	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.4	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.1	dB(A)

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - GROUND LINK EASTBOUND - NOISE BARRIER AT CENTRAL RESERVE 3m HEIGHT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	532	532	532	532	Chart 2 L10 dB(A)	69.4	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	PREVIOUS				correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	68.5	68.5	68.5	68.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50	41	41	45.5	Chart 7	-6.2	-5.5	-5.5	-5.9
Height relative to source h m	20.5	20.5	20	20	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.17	.09	.10	.14	Chart 9 correction dB(A)	-10.4	-9.2	-9.4	-10.0
					Propagation Correction dB(A)	-16.6	-14.7	-14.9	-15.9

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	70	25	Chart 10 correction dB(A)	-7.4	-7.4	-4.1	-8.6
					Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68.5	68.5	68.5	68.5
Propagation Correction dB(A)	-16.6	-14.7	-14.9	-15.9
Site Layout Correction dB(A)	-3.4	-3.4	-1.6	-6.1
Noise Contribution dB(A)	48.5	50.4	52.0	46.5

Chart 11 Combined Noise Level dB(A): 55.9

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 56

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground - 3m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942	942	942		Chart 2 L10 dB(A)	71.9	71.9	71.9	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.1	73.1	73.1	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1	73.1	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	67.4	71.6	64.1	
Chart 11 Combined Noise Level dB(A)		73.5		

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	70.5 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	65.0 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	56.0 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	61.7 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	73.5 dB(A)

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	807	532	532	532	Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	PREVIOUS				correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	70.3	68.5	68.5	68.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	69	69	69	84	Chart 7	-7.5	-7.5	-7.5	-8.2
Height relative to source h m	23.5	23.5	23.5	23.5	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.24	.24	.24	.33	Chart 9 correction dB(A)	-11.2	-11.2	-11.2	-12.0
					Propagation Correction dB(A)	-18.7	-18.7	-18.7	-20.2

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	53	33	24	28	Chart 10 correction dB(A)	-5.3	-7.4	-8.8	-8.1
					Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	70.3	68.5	68.5	68.5
Propagation Correction dB(A)	-18.7	-18.7	-18.7	-20.2
Site Layout Correction dB(A)	-2.8	-4.9	-6.3	-5.6
Noise Contribution dB(A)	48.8	44.9	43.5	42.7
Chart 11 Combined Noise Level dB(A)	51.7			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 52

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

CASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	275	275	275		Chart 2 L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	PRE.	PRE.	PRE.		correction dB(A)	-3.5	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	65.6	68	68	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	80	82	99		Chart 7 correction dB(A)	-8	-8.1	-8.8	
Height relative to source h m	23.5	23.2	20.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.02				Chart 9 correction dB(A)	-3.1			
					Propagation Correction dB(A)	-11.1	-8.1	-8.8	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	33	25	27		Chart 10 correction dB(A)	-7.4	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.9	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	65.6	68	68	
Propagation Correction dB(A)	-11.1	-8.1	-8.8	
Site Layout Correction dB(A)	-4.9	-6.1	-5.7	
Noise Contribution dB(A)	49.7	53.8	53.5	
Chart 11 Combined Noise Level dB(A)		57.5		

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 57

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942				Chart 2 L10 dB(A)	71.9			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.1			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7	-2.8			
Height relative to source h m	24.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.6			
Chart 11 Combined Noise Level dB(A)	72.6			

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	64.4	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	65.1	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	51.7	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	57.5	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.6	dB(A)

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - GROUND LINK EASTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	807	532	532	532	Chart 2 L10 dB(A)	71.2	69.4	69.4	69.4
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	PREVIOUS				correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	70.3	68.5	68.5	68.5

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	61	61	60	66.5	Chart 7	-7.1	-7.1	-7	-7.4
Height relative to source h m	26.5	26.5	26.5	26.5	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.14	.14	.13	.17	Chart 9 correction dB(A)	-9.9	-9.9	-9.8	-10.4
					Propagation Correction dB(A)	-17.0	-17.0	-16.8	-17.8

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	26	26	46	36	Chart 10 correction dB(A)	-8.4	-8.4	-5.9	-7.0
					Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	70.3	68.5	68.5	68.5
Propagation Correction dB(A)	-17.0	-17.0	-16.8	-17.8
Site Layout Correction dB(A)	-5.9	-5.9	-3.4	-4.5
Noise Contribution dB(A)	47.4	45.6	48.2	46.2
Chart 11 Combined Noise Level dB(A)	52.98			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 53

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - ROUTE 7 UP RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	275	275	275		Chart 2 L10 dB(A)	66.5	66.5	66.5	
Traffic speed V km/h	50	50.1	50.1		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	2.6	2.6	
Gradient G %		8 UP	8 UP		Chart 6 correction dB(A)	0	2.4	2.4	
Road surface	PRE.	PRE.	PRE.		correction dB(A)	-3.5	-3.5	-3.5	
Chart 5 (up ramp) V = 9.9 km/h					Basic Noise Level dB(A)	65.6	68	68	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	73	71	78.5		Chart 7 correction dB(A)	-7.7	-7.6	-8	
Height relative to source h m	26.5	25	23.7						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.08				Chart 9 correction dB(A)	-1.3			
					Propagation Correction dB(A)	-9.0	-7.6	-8	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	30	46	36		Chart 10 correction dB(A)	-7.8	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.3	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	65.6	68	68	
Propagation Correction dB(A)	-9.0	-7.6	-8	
Site Layout Correction dB(A)	-5.3	-3.4	-4.5	
Noise Contribution dB(A)	51.3	57.0	55.5	
Chart 11 Combined Noise Level dB(A)		60.0		

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 60

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT CENTRAL RESERVE OF BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942			L10 dB(A)	71.9	71.9		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	73.1	73.1		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	71.1	65.3		
Chart 11 Combined Noise Level dB(A)	72.1			

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	66.3 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	64.7 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	53.0 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.0 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.1 dB(A)

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND - 3M HEIGHT NOISE BARRIER AT INNER SIDE

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	585	585	585	585	Chart 2 L10 dB(A)	69.8	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	71.4	71.4	71.4	71.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	40	30.5	30	37	Chart 7 correction dB(A)	-5.5	-4.6	-4.6	-5.2
Height relative to source h m	20.5	20.5	20	20					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8 correction dB(A)	0	0	0	0
Absorbent ground cover I									
Barrier path difference m	.01	.01	.02	.07	Chart 9 correction dB(A)	-6.7	-6.7	-6.8	-8.7
					Propagation Correction dB(A)	-12.2	-11.3	-11.4	-13.9

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	77	27	Chart 10 correction dB(A)	-7.1	-7.4	-3.7	-8.2
					Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.4	71.4	71.4	71.4
Propagation Correction dB(A)	-12.2	-11.3	-11.4	-13.9
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7
Noise Contribution dB(A)	56.1	56.7	58.8	51.8
Chart 11 Combined Noise Level dB(A)	62.5			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground - 3m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B AT BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942	942		L10 dB(A)	71.9	71.9	71.9	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.1	73.1	73.1	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1	73.1	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	67.4	71.6	64.1	

Chart 11 Combined Noise Level dB(A): 73.5

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	70.5 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	62.5 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	67.8 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	61.7 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	73.5 dB(A)

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1563	585	585	585	Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	75.7	71.4	71.4	71.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	63	63	65	74	Chart 7 correction dB(A)	-7.1	-7.1	-7.2	-7.7
Height relative to source h m	23.5	23.5	23.5	23.5					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.10	.10	.22	.27	Chart 9 correction dB(A)	-1.1	-1.1	-11.0	-11.5
					Propagation Correction dB(A)	-8.2	-8.2	-18.2	-19.2

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	49	37	25	27	Chart 10 correction dB(A)	-5.7	-6.9	-8.6	-8.2
					Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4
Propagation Correction dB(A)	-8.2	-8.2	-18.2	-19.2
Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7
Noise Contribution dB(A)	64.3	58.8	47.2	46.4
Chart 11 Combined Noise Level dB(A)	65.5			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

CASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Traffic flow q veh/hour	978	978	978		Chart 2 L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	73.7	71.8	71.8	

PROPAGATION

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Shortest horizontal distance d m	54.5	54.5	60		Chart 7 correction dB(A)	-6.6	-6.6	-6.9	
Height relative to source h m	23.5	23.2	21.3						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.14				Chart 9 correction dB(A)	-10.0			
					Propagation Correction dB(A)	-16.6	-6.6	-6.9	

SITE LAYOUT

	SEGMENT 1	2	3	4		SEGMENT 1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	40	25	27		Chart 10 correction dB(A)	-6.5	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.0	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT 1	2	3	4
Basic Noise Level dB(A)	73.7	71.8	71.8	
Propagation Correction dB(A)	-16.6	-6.6	-6.9	
Site Layout Correction dB(A)	-4.0	-6.1	-5.7	
Noise Contribution dB(A)	53.0	59.1	59.2	
Chart 11 Combined Noise Level dB(A)		62.7		

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942				Chart 2 L10 dB(A)	71.9			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.1			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7	-2.8			
Height relative to source h m	24.5				correction dB(A)				
Ave. height of propagation H m	n/a				Chart 8	0			
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.6			
Chart 11 Combined Noise Level dB(A)	72.6			

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	62.7	dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	65.5	dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	63.0	dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	58.1	dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.6	dB(A)

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	1563	585	585	585	L10 dB(A)	74.1	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	-1
					Basic Noise Level dB(A)	75.7	71.4	71.4	71.4

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50.5	50.5	50	55	Chart 7 correction dB(A)	-6.4	-6.4	-6.4	-6.7
Height relative to source h m	26.5	26.5	26.5	26.5					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.43	.43	.06	.10	Chart 9 correction dB(A)	-.2	-.2	-8.6	-9.3
					Propagation Correction dB(A)	-6.6	-6.6	-15.0	-16.0

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	21	31	46	36	Chart 10 correction dB(A)	-9.3	-7.6	-5.9	-7.0
					Site Layout Correction dB(A)	-6.8	-5.1	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	75.7	71.4	71.4	71.4
Propagation Correction dB(A)	-6.6	-6.6	-15.0	-16.0
Site Layout Correction dB(A)	-6.8	-5.1	-3.4	-4.5
Noise Contribution dB(A)	62.3	59.7	53.0	50.9

Chart 11 Combined Noise Level dB(A): 64.7

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	978	978	978		L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	IMPRE.	PRE.	PRE.		correction dB(A)	-1	-3.5	-3.5	
					Basic Noise Level dB(A)	73.7	71.8	71.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	41.5	41.5	43		Chart 7 correction dB(A)	-5.8	-5.8	-5.8	
Height relative to source h m	26.5	25.7	24.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8 correction dB(A)				
Absorbent ground cover I									
Barrier path difference m	.02				Chart 9 correction dB(A)	-7.0			
					Propagation Correction dB(A)	-12.8	-5.8	-5.8	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	31	46	36		Chart 10 correction dB(A)	-7.6	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.1	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.7	71.8	71.8	
Propagation Correction dB(A)	-12.8	-5.8	-5.8	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	
Noise Contribution dB(A)	55.8	62.6	61.5	

Chart 11 Combined Noise Level dB(A): 65.6

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 66

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	942	942			L10 dB(A)	71.9	71.9		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	73.1	73.1		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7	-3.3	-3.3		
Height relative to source h m	27.5	27.5			correction dB(A)				
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	71.1	65.3		
Chart 11 Combined Noise Level dB(A)	72.1			

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	65.6 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	64.7 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	65.5 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.7 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.1 dB(A)

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground

BASE NOISE LEVEL - GROUND LINK WESTBOUND - 3M HEIGHT NOISE BARRIER AT INNER SIDE

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	585	585	585	585	Chart 2 L10 dB(A)	69.8	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	PREVIOUS				correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	68.9	68.9	68.9	68.9

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	40	30.5	30	37	Chart 7	-5.5	-4.6	-4.6	-5.2
Height relative to source h m	20.5	20.5	20	20	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8	0	0	0	0
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.01	.01	.02	.07	Chart 9 correction dB(A)	-6.7	-6.7	-6.8	-8.7
					Propagation Correction dB(A)	-12.2	-11.3	-11.4	-13.9

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.	35	33	0	0	reflection correction dB(A)	1.5	1.5	0	0
Angle of view segment deg.	35	33	77	27	Chart 10 correction dB(A)	-7.1	-7.4	-3.7	-8.2
					Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	68.9	68.9	68.9	68.9
Propagation Correction dB(A)	-12.2	-11.3	-11.4	-13.9
Site Layout Correction dB(A)	-3.1	-3.4	-1.2	-5.7
Noise Contribution dB(A)	53.6	54.2	56.3	49.3
Chart 11 Combined Noise Level dB(A)	60.0			

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 60

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION A (PM) 22m above ground - 3m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B AT BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942	942	942		Chart 2 L10 dB(A)	71.9	71.9	71.9	
Traffic speed V km/h	30	30	30		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.2	2.2	2.2	
Gradient G %					Chart 6 correction dB(A)	0	0	0	
Road surface	IMPREVIOUS				correction dB(A)	-1	-1	-1	
					Basic Noise Level dB(A)	73.1	73.1	73.1	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	4	4	4		Chart 7	-2.2	-2.2	-2.2	
Height relative to source h m	21.5	21.5	21.5		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8	0	0	0	
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.2	-2.2	-2.2	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	27	0	0		reflection correction dB(A)	1.2	0	0	
Angle of view segment deg.	34	120	21		Chart 10 correction dB(A)	-7.2	-1.8	-9.3	
					Site Layout Correction dB(A)	-3.5	.7	-6.8	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1	73.1	
Propagation Correction dB(A)	-2.2	-2.2	-2.2	
Site Layout Correction dB(A)	-3.5	.7	-6.8	
Noise Contribution dB(A)	67.4	71.6	64.1	
Chart 11 Combined Noise Level dB(A)		73.5		

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	70.5 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	60.0 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	65.0 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	61.7 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	73.5 dB(A)

Rounding to the nearest whole number:

LOCATION A (PM) : Predicted value of L10 (1-hour) dB(A) is 76

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1563	585	585	585	Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	PREVIOUS				correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	73.2	68.9	68.9	68.9

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	63	63	65	74	Chart 7 correction dB(A)	-7.1	-7.1	-7.2	-7.7
Height relative to source h m	23.5	23.5	23.5	23.5					
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.10	.10	.22	.27	Chart 9 correction dB(A)	-1.1	-1.1	-11.0	-11.5
					Propagation Correction dB(A)	-8.2	-8.2	-18.2	-19.2

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	49	37	25	27	Chart 10 correction dB(A)	-5.7	-6.9	-8.6	-8.2
					Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.2	68.9	68.9	68.9
Propagation Correction dB(A)	-8.2	-8.2	-18.2	-19.2
Site Layout Correction dB(A)	-3.2	-4.4	-6.1	-5.7
Noise Contribution dB(A)	61.8	56.3	44.7	43.9
Chart 11 Combined Noise Level dB(A)	63.0			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 63

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

CASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q					Chart 2				
veh/hour	978	978	978		L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	PRE.	PRE.	PRE.		correction dB(A)	-3.5	-3.5	-3.5	
					Basic Noise Level dB(A)	71.2	71.8	71.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	54.5	54.5	60		Chart 7	-6.6	-6.6	-6.9	
Height relative to source h m	23.5	23.2	21.3		correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.14				Chart 9 correction dB(A)	-10.0			
					Propagation Correction dB(A)	-16.6	-6.6	-6.9	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	40	25	27		Chart 10 correction dB(A)	-6.5	-8.6	-8.2	
					Site Layout Correction dB(A)	-4.0	-6.1	-5.7	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.2	71.8	71.8	
Propagation Correction dB(A)	-16.6	-6.6	-6.9	
Site Layout Correction dB(A)	-4.0	-6.1	-5.7	
Noise Contribution dB(A)	50.5	59.1	59.2	
Chart 11 Combined Noise Level dB(A)	62.4			

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION B (PM) 25m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

CASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942				Chart 2 L10 dB(A)	71.9			
Traffic speed V km/h	30				Chart 4				
Heavy vehicles p %	25				correction dB(A)	2.2			
Gradient G %					Chart 6 correction dB(A)	0			
Road surface	IMPREVIOUS				correction dB(A)	-1			
					Basic Noise Level dB(A)	73.1			

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	5				Chart 7 correction dB(A)	-2.8			
Height relative to source h m	24.5								
Ave. height of propagation H m	n/a				Chart 8 correction dB(A)	0			
Absorbent ground cover I									
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-2.8			

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5			
Opposite facade angle deg.	0				reflection correction dB(A)	0			
Angle of view segment deg.	173				Chart 10 correction dB(A)	-.2			
					Site Layout Correction dB(A)	2.3			

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1			
Propagation Correction dB(A)	-2.8			
Site Layout Correction dB(A)	2.3			
Noise Contribution dB(A)	72.6			
Chart 11 Combined Noise Level dB(A)	72.6			

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	62.4 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	63.0 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	63.0 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	58.1 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.6 dB(A)

Rounding to the nearest whole number:

LOCATION B (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - GROUND LINK WESTBOUND

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	1563	585	585	585	Chart 2 L10 dB(A)	74.1	69.8	69.8	69.8
Traffic speed V km/h	50	50	50	50	Chart 4				
Heavy vehicles p %	25	25	25	25	correction dB(A)	2.6	2.6	2.6	2.6
Gradient G %					Chart 6 correction dB(A)	0	0	0	0
Road surface	PREVIOUS				correction dB(A)	-3.5	-3.5	-3.5	-3.5
					Basic Noise Level dB(A)	73.2	68.9	68.9	68.9

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	50.5	50.5	50	55	Chart 7	-6.4	-6.4	-6.4	-6.7
Height relative to source h m	26.5	26.5	26.5	26.5	correction dB(A)				
Ave. height of propagation H m	n/a	n/a	n/a	n/a	Chart 8				
Absorbent ground cover I					correction dB(A)				
Barrier path difference m	.43	.43	.06	.10	Chart 9 correction dB(A)	-.2	-.2	-8.6	-9.3
					Propagation Correction dB(A)	-6.6	-6.6	-15.0	-16.0

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	2.5
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	21	31	46	36	Chart 10 correction dB(A)	-9.3	-7.6	-5.9	-7.0
					Site Layout Correction dB(A)	-6.8	-5.1	-3.4	-4.5

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.2	68.9	68.9	68.9
Propagation Correction dB(A)	-6.6	-6.6	-15.0	-16.0
Site Layout Correction dB(A)	-6.8	-5.1	-3.4	-4.5
Noise Contribution dB(A)	59.8	57.2	50.5	48.4
Chart 11 Combined Noise Level dB(A)	62.2			

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 62

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	978	978	978		Chart 2 L10 dB(A)	72.1	72.1	72.1	
Traffic speed V km/h	50	60	60		Chart 4				
Heavy vehicles p %	25	25	25		correction dB(A)	2.6	3.2	3.2	
Gradient G %		8 DOWN	8 DOWN		Chart 6 correction dB(A)	0	0	0	
Road surface	PRE.	PRE.	PRE.		correction dB(A)	-3.5	-3.5	-3.5	
					Basic Noise Level dB(A)	71.2	71.8	71.8	

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	41.5	41.5	43		Chart 7 correction dB(A)	-5.8	-5.8	-5.8	
Height relative to source h m	26.5	25.7	24.2						
Ave. height of propagation H m	n/a	n/a	n/a		Chart 8 correction dB(A)				
Absorbent ground cover I									
Barrier path difference m	.02				Chart 9 correction dB(A)	-7.0			
					Propagation Correction dB(A)	-12.8	-5.8	-5.8	

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5	2.5	
Opposite facade angle deg.	0	0	0		reflection correction dB(A)	0	0	0	
Angle of view segment deg.	31	46	36		Chart 10 correction dB(A)	-7.6	-5.9	-7.0	
					Site Layout Correction dB(A)	-5.1	-3.4	-4.5	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	71.2	71.8	71.8	
Propagation Correction dB(A)	-12.8	-5.8	-5.8	
Site Layout Correction dB(A)	-5.1	-3.4	-4.5	
Noise Contribution dB(A)	53.3	62.6	61.5	
Chart 11 Combined Noise Level dB(A)		65.4		

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 65

CALCULATION OF ROAD TRAFFIC NOISE - LOCATION C (PM) 28m above ground - 3 m HEIGHT NOISE BARRIER AT INNER SIDE OF W/B OF BBL

BASE NOISE LEVEL - KENNEDY TOWN PRAYA

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Traffic flow q veh/hour	942	942			Chart 2 L10 dB(A)	71.9	71.9		
Traffic speed V km/h	30	30			Chart 4				
Heavy vehicles p %	25	25			correction dB(A)	2.2	2.2		
Gradient G %					Chart 6 correction dB(A)	0	0		
Road surface	IMPREVIOUS				correction dB(A)	-1	-1		
					Basic Noise Level dB(A)	73.1	73.1		

PROPAGATION

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Shortest horizontal distance d m	6	6.5			Chart 7 correction dB(A)	-3.3	-3.3		
Height relative to source h m	27.5	27.5							
Ave. height of propagation H m	n/a	n/a			Chart 8	0	0		
Absorbent ground cover I					correction dB(A)				
Barrier path difference m					Chart 9 correction dB(A)				
					Propagation Correction dB(A)	-3.3	-3.3		

SITE LAYOUT

	SEGMENT					SEGMENT			
	1	2	3	4		1	2	3	4
Facade					correction dB(A)	2.5	2.5		
Opposite facade angle deg.					reflection correction dB(A)				
Angle of view segment deg.	135	36			Chart 10 correction dB(A)	-1.2	-7.0		
					Site Layout Correction dB(A)	1.3	-4.5		

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	73.1		
Propagation Correction dB(A)	-3.3	-3.3		
Site Layout Correction dB(A)	1.3	-4.5		
Noise Contribution dB(A)	71.1	65.3		
Chart 11 Combined Noise Level dB(A)	72.1			

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is

BASE NOISE LEVEL - ROUTE 7 DOWN RAMP	65.4 dB(A)
BASE NOISE LEVEL - GROUND LINK WESTBOUND	62.2 dB(A)
BASE NOISE LEVEL - GROUND LINK EASTBOUND	63.0 dB(A)
BASE NOISE LEVEL - ROUTE 7 UP RAMP	60.2 dB(A)
BASE NOISE LEVEL - KENNEDY TOWN PRAYA	72.1 dB(A)

Rounding to the nearest whole number:

LOCATION C (PM) : Predicted value of L10 (1-hour) dB(A) is 74

CALCULATION OF ROAD TRAFFIC NOISE - NEW FORTUNE HOUSE

CASE NOISE LEVEL - YEAR 2006

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	219	807	807	1563
Traffic speed V km/h	50	50	50	50
Heavy vehicles p %	25	25	25	25
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	65.6	71.2	71.2	74.1
Chart 4 correction dB(A)	2.6	2.6	2.6	2.6
Chart 6 correction dB(A)	0	0	0	0
correction dB(A)	-1	-1	-1	-1
Basic Noise Level dB(A)	67.2	72.8	72.8	75.7

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	15	36	16	57
Height relative to source h m	4.5	4.5	4.5	4.5
Ave. height of propagation H m	n/a	2.75	2.75	2.75
Absorbent ground cover I		.25	.25	.25
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	-1.4	-4.6	-1.7	-6.5
Chart 8 correction dB(A)	0	-.55	-.15	-.79
Chart 9 correction dB(A)				
Propagation Correction dB(A)	-1.4	-5.1	-1.8	-7.3

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	0	0
Angle of view segment deg.	159	100	18	19

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	2.5
reflection correction dB(A)	0	0	0	0
Chart 10 correction dB(A)	-.5	-2.6	-10	-9.8
Site Layout Correction dB(A)	2.0	-.1	-7.5	-7.3

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	67.2	72.8	72.8	75.7
Propagation Correction dB(A)	-1.4	-5.1	-1.8	-7.3
Site Layout Correction dB(A)	2.0	-.1	-7.5	-7.3
Noise Contribution dB(A)	67.8	67.6	63.5	61.1
Chart 11 Combined Noise Level dB(A)	71.8			

Rounding to the nearest whole number:

NEW FORTUNE HSE (PM) : Predicted value of L10 (1-hour) dB(A) is 72

SEGMENT 1 : KENNEDY TOWN NEW PRAYA
SEGMENT 2 & 3 : BELCHER'S BAY EASTBOUND
SEGMENT 4 : BELCHER'S BAY WESTBOUND

CALCULATION OF ROAD TRAFFIC NOISE - PEARL COURT

CASE NOISE LEVEL - YEAR 2006

	SEGMENT			
	1	2	3	4
Traffic flow q veh/hour	942	2370	607	
Traffic speed V km/h	30	50	50	
Heavy vehicles p %	25	25	25	
Gradient G %				
Road surface	IMPREVIOUS			

	SEGMENT			
	1	2	3	4
Chart 2 L10 dB(A)	71.9	75.9	70	
Chart 4 correction dB(A)	2.2	2.6	2.6	
Chart 6 correction dB(A)	0	0	0	
correction dB(A)	-1	-1	-1	
Basic Noise Level dB(A)	73.1	77.5	71.6	

PROPAGATION

	SEGMENT			
	1	2	3	4
Shortest horizontal distance d m	4	113	78	
Height relative to source h m	4.5	4.5	4.5	
Ave. height of propagation H m	n/a	2.75	2.75	
Absorbent ground cover I		.75	.50	
Barrier path difference m				

	SEGMENT			
	1	2	3	4
Chart 7 correction dB(A)	1.8	-9.3	-7.8	
Chart 8 correction dB(A)	0	-3.47	-1.91	
Chart 9 correction dB(A)				
Propagation Correction dB(A)	1.8	-12.8	-9.7	

SITE LAYOUT

	SEGMENT			
	1	2	3	4
Facade				
Opposite facade angle deg.	0	0	0	
Angle of view segment deg.	180	141	37	

	SEGMENT			
	1	2	3	4
correction dB(A)	2.5	2.5	2.5	
reflection correction dB(A)	0	0	0	
Chart 10 correction dB(A)	0	-1.1	-6.9	
Site Layout Correction dB(A)	2.5	1.4	-4.4	

COMBINING NOISE LEVELS

	SEGMENT			
	1	2	3	4
Basic Noise Level dB(A)	73.1	77.5	71.6	
Propagation Correction dB(A)	1.8	-12.8	-9.7	
Site Layout Correction dB(A)	2.5	1.4	-4.4	
Noise Contribution dB(A)	77.4	66.2	57.5	

Chart 11 Combined Noise Level dB(A): 77.8

Rounding to the nearest whole number:

PEARL COURT (PM) : Predicted value of L10 (1-hour) dB(A) is 78

SEGMENT 1 : KENNEDY TOWN PRAYA
SEGMENT 2 : BELCHER'S BAY LINK
SEGMENT 3 : SAI CHEUNG STREET EXTENSION

APPENDIX VI

2.7 Noise Measurement Locations

2.7.1 The noise measurement locations are identified on Figure 2 and are described below in Table 2. The locations marked with an asterisk are those where a 24-hour continuous survey was conducted.

TABLE 2

NOISE MEASUREMENT LOCATIONS

LOCATION	DESCRIPTION
1	347-349 Des Voeux Rd West, 2/F podium
2	10m from Des Voeux Rd West opposite Kwan Yick Building
3	Junction Queen's Rd West/Hill Rd, pavement level
4	Pearl Court, Holland St, 2/F podium level
5	Junction Holland Rd/Belcher's St, street level
6	Junction Kennedy Town Praya/North St, street level
7	Junction Catchick St/North St, street level
8	Junction Belcher's St/North St, street level
* 9	7 Smithfield Rd Flat 5L, near Green Island Cement
10	Junction Kennedy Town Praya/Davis St, street level
11	Junction Catchick St/Davis St, street level
12	Junction Belcher's St/Davis St, street level
* 13	25 Cadogan St 2/F
14	Junction Cadogan St/Forse St, street level
15	Junction Sai Ning St/ Victoria Rd, street level
* 16	Flat 24A Regents Height, 80 Victoria Rd
17	Cottage Area 1, Kung Man Tsuen (Community Centre)
18	Cottage Area 2, Kung Man Tsuen (Unit 213)
19	Cottage Area 3, Kung Man Tsuen (Unit 283)
20	Cottage Area 4, Kung Man Tsuen (near Kit Sum Kindergarten)

PLANT ITEMS CONTRIBUTION TO NOISE LEVELS AT BELCHER'S BAY LINK

Case 1 : Dredging

Item	Basic Noise Level dB(A)	Number on Site	Distance from Receiver (m)	Noise Contribution dB(A)
Dredger	118	1	37	79
Barge & Tug Boat	110	1	37	71

Total Noise Level to the NSR is 83 dB(A)

Case 2 : Sand Filling

Item	Basic Noise Level dB(A)	Number on Site	Distance from Receiver (m)	Noise Contribution dB(A)
Barge & Tug Boat	110	1	12	80

Total Noise Level to the NSR is 83 dB(A)

Case 3 : Land Fill

Item	Basic Noise Level dB(A)	Number on Site	Distance from Receiver (m)	Noise Contribution dB(A)
Truck	117	1	12	87
Excavator	112	1	12	82
Roller	108	1	12	78

Total Noise Level to the NSR is 92 dB(A)

Case 4 : Piling - Daido Pill

Item	Basic Noise Level dB(A)	Number on Site	Distance from Receiver (m)	Noise Contribution dB(A)
Drop hammer driving concrete pile	116	1	12	86

Total Noise Level to the NSR is 86 dB(A)

Case 5 : Piling - H Pile

Item	Basic Noise Level dB(A)	Number on Site	Distance from Receiver (m)	Noise Contribution dB(A)
Drop hammer driving steel pile	126	1	24	89

Total Noise Level to the NSR is 92 dB(A)

APPENDIX VII

ence	Comments	Consultant's Responses
olicy Group		
5, Table 2	The daily AQO for the Total Suspended Particulates should be 260 ug/m^3 instead of 360 ug/m^3. The consultant should confirm that the predicted dust impacts have been compared with the corrected AQO.	This is a typographical error, the consultants can confirm predicted dust impacts were compared against the correct figure of 260 ug/m^3.
9, 1st para. S.3.3	Please give reference of the studies that showed AQO are exceeded in the Belcher Bay Street area.	The study referred to is Green Island Reclamation Feasibility Study and refers to the general situation rather than any particular location.
11, 1st para. S.4.0	It's agreed that the development of the 90m buffer south of the roadway should be considered in other project (probably the Belcher Bay Reclamation). However, the consultant should set up a guideline of buffer requirement with reference to the HKPSG so that future development along the BBL would not be subjected to bad traffic or air quality.	The guidelines given in HKPSG would be suggested as the basis for planning land use in this area. Sensitive uses such as nurseries, or schools should not be considered for the entire zone, but it may be possible to develop the area further than say 30m from the road edge for residential use or recreational activities.
24 to 26, S.5.3	The consultant should have included in the report the prediction method of the dust impacts of the reclamation including details such as model, the meteorological conditions, the location of the receptors, emission factors, modelling parameters and etc. Explanations should also be provided for the choice of the meteorological conditions and the model.	The prediction of potential dust impact is not a precise science and the methodology use should only be used to indicate the potential scale of the problem. At this stage of the project it is necessary to make several assumptions to predict the potential for dust production. The section indicates that quite broad generalisations have been used to identify the potential for problems but "worst case" situations are looked at. In this instance this means high dust loads, short source length and a sensitive receiver closest to the potential source. Worst case meteorological conditions include low wind speeds and winds blowing directly form the source to the receiver. The section does not set out to predict the precise nature of the potential dust impact but to indicate whether or not the potential exists. In this instance the potential for adverse effects on air quality objectives and on the nuisance capacity of dust fall exists and so it is justifiable to require dust controls to be implemented as part of the environmental management of the site.

ence	Comments	Consultant's Responses
		A very simple box model was used to predict the scale of impacts, based on source strength (from Emission Factor Calculation) source length cloud mixing patterns downwind from a ground level source, deposition velocity speeds were used and calculations referred to 'dry day' (i.e. no rainfall) uncontrolled situations.
26, 2nd para. 1	What's the composition of proposed additives that would be used for dust suppression? Would these kinds of chemicals cause other environmental problems? Also, how long can it stay and what is the cost?	Surface coatings that can be used to control fugitive dust include coatings based on either bitumen, salts or adhesives. Table 1 lists these chemicals depends on the degree of disturbance the treated area is subject to. Application rates may vary and the initial dilution rate of the stabilizer in water for application purposes may also vary. Guidance from the manufacturers for rate of application, cost and duration are being sought. In general terms the likely excess environmental impact from utilizing such stabilisation techniques is unlikely to be significant.
26, 3rd para. 1	At what vehicle speed should construction vehicles be controlled in order to prevent significant dust emissions?	The quantity of dust produced by vehicles travelling over unpaved surfaces is directly proportional to vehicle speed. Therefore, the lower the speed, the smaller the quantity of dust produced. If possible vehicle speeds should be controlled to those as low as can be reasonably enforced. Speeds of 25-30 mph or below are to be preferred.
licy Group		
6, 2nd para. 2	The consultant should give the source for the proposed dust emission factor of 500 kg/ha/month. Also, according to the USEPA AP-42, a figure for of 1.2 ton/acre/month (which is equivalent to about 2965 kg/ha/month) is used for construction activities with medium activity level only. Thus, the consultant should justify the above dust emission factor for the assessment.	Agreed, the emission factor should read approximately 3000 kg/ha/month. However, the statements concerning the potential for adverse impact to be caused by construction activity remain valid.

ence	Comments	Consultant's Responses
26, 3rd para. .2	The consultant should further elaborate the best practice dry material storage and best practice dry material handling.	Dry material storage methods to minimise the dust potential would include the use of covered areas for small particle sized material, orienting the piles to minimise the action of wind, providing dust filters and local extraction systems where fine particles are handled, providing wind shields for medium sized particles etc. Best practice dry material handling methods, include, but are not limited to, for example: o minimisation of drop height o use of dedicated handling areas with paved surfaces to aid clean up o handling areas to be kerbed also to aid clean up o handling areas to have boards or enclosure arrangements to maximise efficient transfer o maintenance of equipment to ensure efficient closure of grab jaws and bucket transfer efficiency.
30, 1st para.	The consultant has suggested that the averaging time of the prediction is 10 minutes. However, for the CALINE4, the averaging time of the prediction depends on the input of the fluctuation of horizontal wind direction to the model. The consultant should submit the value of this parameters for our agreement.	In modelling the predicted emissions from the development, the worst case situation has been utilised to give an indication of the worst air quality conditions that might occur. In practice this may occur only for very short periods when all worst case assumptions combine. We have used a combination of worst case meteorological factors and peak hourly traffic figures and hence the real time horizontal fluctuation of wind direction has not been included in our use of the model. We are unsure as to whether the meteorological data available for the area would provide a good indication of the fluctuation that might be experienced at the location of the development. The predictions referred to in the report are worst case average hourly concentrations with no reduction in value that might occur if wind fluctuations were taken into account. They are thus likely to be conservative.
30, 2nd and 3rd S.6.2	The consultant should provide us with the details of the modelling results for the vehicle speed of 50 kph for BEL and 70 kph for Route 7 as stated in the text (2nd para), and with wind speed of 1m/s (3rd para).	(see response to comments on Page 30, 4th para. S.6.2)

rence	Comments	Consultant's Responses
30, 4th para. 2	What is the suggested buffer between the pedestrian footways and the roadside.	The values calculated are presented below :

Table 2 : Air Quality Predictions

Year	Receptor Position	Vehicle Speed	Wind Speed	Distance from Roadside	CO ugm^{-3}	HC ugm^{-3}	NO_x ugm^{-3}
1996	20m west intersection	70kph Rt.7 50kph BBL	$1ms^{-1}$	1m	1980	219	763
				6m	1398	154	538
				11m	1281	142	493
	At Inter-section			1m	1630	176	846
	30m east of Intersection			1m	1514	163	786
2006	20m west of Intersection			1m	2795	309	1076
				6m	1980	219	763
				11m	1747	193	673
	At Inter-section			1m	2096	226	1133
	30m east of Intersection			1m	2213	239	1150

Rt7 = Route 7
BBL = Belcher Bay Link

At distances from the carriageway greater than 6m the modelling indicates levels of pollutants are diluted to acceptable levels. It would appear that the buffer could be set at 6m. However, it must be recognised that the modelling predicts worst case situations from a combination of conditions that only infrequently occur and also only for short periods when all the worst case assumptions combine. The absence of a footway adjacent to the road in an urban situation means a loss of benefits. The benefits in an urban situation outweigh the risks predicted by this conservative modelling. It is recommended that footways of 2.75m to 3.0m as required by the Traffic Planning and Design Manual (TPDM) are to be constructed. This represents a 1m buffer and the remaining width provides opportunity for pedestrians to increase the distance between himself and the source.

rence	Comments	Consultant's Responses
r Policy Group		
7, Table 3	Surface Do % in Harbour West is (38.6 - 130.9).	Noted this is a typographical error.
8, S.3.2	The consultant has measured the velocity of current in that area. More details of the measurements are needed. e.g. depth, equipments used.	The results discussed in this section refer to current measurements extracted from the WAHMO physical model and provided to the present study team by Civil Engineering Office.
r Policy group		
10, S.4.0	Phase 3 reclamation is an embayment which would trap all coastal discharges and filled materials during the phase 1 reclamation stage. How long does it last? Any mitigating measures would be taken in that period?	Noted. This condition would last for about 12 months. However, while the cargo handling activities along the existing Kennedy Praya are maintained, it is expected that the resulting frequent vessel movements will help in providing water exchange. This issue has been addressed in S.5.1.5 with relevant mitigating measures elaborated.
15. S.5.1.4	Temporary site drainage at the perimeter of the reclamation site should be connected to special settling tanks/grease traps/interceptors so as to control silty/oil spilt contaminated water being wash into the stormdrain/foul sewers.	Noted. It is stressed that the phases I and II reclamation will be paved up as soon as practicable. The Phase I reclamation will be paved up to form the Public Cargo Working Area and the access road while the Phase II also have similar arrangements. It is believed that the possibility of getting silty water after the reclamation has reach the proposed formation level of 4.0 mPD is limited to the very edge of the reclamation. In this case the water will seep through the riprap protection along the perimeter of the reclamation but filtered by the marine sand which is being used as filling material. Phase III will complete the reclamation and by then the proper reclamation drainage system will be provided. It would be more effective to minimise the possibility of oil spilt by restricting the oil storage and filling point to designated area with impervious surface and bunded to prevent spills. The Contractor shall be required to provide a perimeter drainage for the designated area with grease trap for discharging.
16 Last para. 5.1.6	The report indicates that predictions of flow patterns were made by the consultants. Could they supply more details?	WAHMO predictions have not been made for the Belcher Bay Link. The studies referred to in the final paragraph of this section refer to work carried out in connection with GIRFS and Port Peninsula Development which indicate that these much more extensive development projects do not generally affect the main flow regime in the harbour waters.

·ence	Comments	Consultant's Responses
17, 1st para. tem 5, 5.2.1.	Besides Dissolved Oxygen, the contractor should also prevent an unacceptable level of turbidity generation.	Turbidity should be taken as read from sub items 1, 2, 3, 4, 6.
18, sub-item (a), .2.	This item should be replaced by the attached sheet App. I for turbidity measurements.	Noted.
18. sub-item (c), .2	This item should be replaced by the attached sheet App. II for suspended solids measurements.	Noted.
20, para. 4	All monitoring instruments shall be recalibrated at bi-monthly interval.	Noted.
e Management Group		
13, S.5.1.2	Special requirements may be imposed on the mud disposal works if the marine mud is found to be contaminated.	Noted.

TABLE 1 : DUST SUPPRESSION CHEMICALS

A. Type : Bitumens

Product	Manufacturer
AMS 2200, 2300	Arco Mine Sciences
Coherex	Witco Chemical
Docal 1002	Douglas Oil Comapny
Pencprime	Utan Emulsions
Pecro Tac p	Syntech Proudcts Corporation
Resinex	Neyrs Industrie, Inc.
Retain	Dubois Chemical Company

B. Type : Salts

Product	Manufacturer
Calcium chloride	Allied Chemical Corporation
Dowflake, Liquid Dow	Dow Chemical
OP-10	Wen-Don Corporation
Dust Ban 8806	Nalco Chemical Company
Dustgard	G.S.L. Minerals and Chemicals Corporation
Sodium silicate	The PQ Corporation

C. Type : Adhesives

Product	Manufacturer
Acrylic DLR-MS	Ronm and Haas Company
Bio Cat 300-1	Applied Natural Systems, Inc.
CPB-12	Wen-Don Corporation
Curasal AK	American Hoechst Corporation
OCL-40A, 1801, 1803	Caigon Corporation
OC-859, 857	Betz Laboratories, Inc.
Dust Ban	Nalco Chemical Company
Flamoinder	Flambeau Paper Company
Lignosite	Georgia Pacific Corporation
Norlig A, 12	Reed Lignin. Inc.
Orzan Series	Crown Zellerbach Corporation
Soil Gard	Walsh Chemical

Reference	Comments	Consultant's Responses
Volume I - Noise	No comment.	
Volume II		
Air Quality	Some typographical errors have not been amended:	
Table 2, page 5	The daily AQO for the Total Suspended Particulates should be 260 $\mu g/m^3$ instead of 360 $\mu g/m^3$.	Noted.
Page 26, S.5.3.2	The dust emission factor proposed by USEPA AP-42 should be about 3000 kg/ha/month instead of 500 kg/ha/month.	Noted.
Water Quality		
Item 2.1, 2nd para.	Should be : The Victoria Harbour zone is scheduled to be gazetted in 1993	Noted.
	Leachate from public dumping ground in Phase III which would affect the water quality was not addressed in the report.	The Phase III reclamation will be constructed with marine sand and CDG topping.
Table 5 A	2 lots of 5 consecutive days sampling is not sufficient to provide 'baseline' for the subsequent monitoring works.	Noted, the sampling frequency is revised to 4 sampling per week, at mid-flood and mid-ebb, for 4 consecutive weeks within 6 weeks of commencement of works.

1.0 INTRODUCTION

This report consists of an assessment of the environmental impacts caused by the proposed Belcher's Bay reclamation. The impacts covered by this report are limited to water and air quality.

The report considers the existing situation, provides a brief description of the proposals and then considers the effects of the proposals. Mitigation measures that need to be included in the contract conditions are described.

A water quality monitoring programme and methodology that should be implemented by the Contractor is also included.

2.0 LEGISLATIVE CONTROLS

2.1 Water Quality

The Environmental Protection Department have designated ten Water Quality Control Zones. The reclamation works are located within the Victoria Harbour Zone.

The Victoria Harbour Zone is due to be gazetted in 1993 and so at the present time there are no formal Water Quality Objectives that can be applied. However, it can be assumed that water quality within the harbour should be sufficient to maintain the beneficial uses identified for the harbour. These are:

- o a habitat for marine life generally
- o domestic and industrial supply
- o navigation and shipping
- o aesthetic

It may further be assumed that the water quality objectives eventually set for the Victoria Harbour Zones will be similar to those objectives that have been set for the nearby southern waters which have been formalised by gazetting. These objectives are shown in Table 1.

2.2 Air Quality

The Hong Kong Planning Standards and Guidelines provide ambient air quality objectives. These objectives form part of the Air Pollution Control Ordnance which is designed to safeguard the health and well being of the community. The Air Quality Objectives, shown in Table 2 are to be reached throughout Hong Kong.

TABLE 2 : HONG KONG AIR QUALITY OBJECTIVES

Pollutant	Concentrations in micrograms per cubic metre (i) Averaging Time					Health effects of pollutant at elevated ambient levels
	1hr (ii)	8hrs (iii)	24hrs (iii)	3mths (iv)	1yr (iv)	
Sulphur Dioxide	800		350		80	Respiratory illness; reduced lung function; morbidity and mortality rates increase at higher levels.
Total suspended particulates			260		80	Respirable fraction has effects on health.
Respirable (v) suspended particulates			180		55	Respiratory illness; reduced lung function; cancer risk for certain particles; morbidity and mortality rates increase at higher levels.
Nitrogen Dioxide	300		150		80	Respiratory irritation; increased susceptibility to respiratory intention; lung development impairment.
Carbon Monoxide	30,000	10,000				Impairment of coordination deleterious to pregnant women and those with heart and circulatory conditions
Photochemical oxidants (as ozone (vi)	240					Eye irritation; cough; reduced athletic performance; possible chromosome change.
Lead				1.5		Affects cell and body processes; likely neuro-psychological effects, particularly in children likely effects on rates of incidents of heart attacks, strokes and hypertension.

(i) Measured at 298°K (25°C) and 101.325 kPa (one atmosphere)
(ii) Not to be exceeded more than three times per year
(iii) Not to be exceeded more than once per year
(iv) Arithmetic means
(v) Respirable suspended particulates means suspended particulates in in air with a nominal aerodynamic diameter of 10 micrometres and smaller
(vi) Photochemical oxidants are determined by measured of ozone only.

The analysis shows that there is benefit to be derived by controlling dust emissions from the new land surface.

This would be particularly important once the surface had dried out and during the months October to March when there is a natural rainfall v evaporation deficit. Ensuring that the surface does not completely dry out will prevent the majority of fugitive emissions from this source. This can be achieved by water sprays alone but a more stable surface can be achieved by proprietary additives. Once such a surface coating is applied site management should ensure that the area remains undisturbed. Any disturbance that does occur will require the reapplication of the sealing coat.

Assuming that surface treatment is effective in suppressing dust from open areas - the road source becomes potentially significant. Road emissions can be successfully reduced by about 50% by frequent application of water (by spray bowser or pipeline) but vehicle speed and routes must be well controlled. Contract conditions will be needed to enforce this.

5.3.2 Construction

Construction activity (i.e. associated with construction of the pcwa and road infrastructure) will be a source of fugitive dust emissions.

Construction activities can have substantial temporary impact. Estimates (from the US) suggest that a figure of 3000 kg/ha/month may be generated by various activities related to a period of heavy construction activity. This is a general figure based on the types of activities that are associated with heavy construction. This figure suggests that for the Belcher's Bay Link, uncontrolled construction activities could produce dust levels that would exceed the Air Quality Objectives at the nearest sensitive receiver.

Control measures will need to be included in construction contracts. These control measures will need to include:

- good housekeeping - rapid spill cleanup
- best practice dry material storage
- best practice dry material handling
- water available for damping down dusty areas
- specific controls for specific dusty activities (e.g. cement batching).

It may also be necessary to be able to implement controls as the situation demands on a day-to-day basis. The most important feature in the control of fugitive emissions is awareness amongst contractors and management of the potential for problems.

Reference	Comments	Consultant's Responses
Chief Engineer/Planning Water Supplies Department		
WWO(HK) 440/1743/88 T.J.(1) 28 February 1992	No comment in respect of the Volume I of the captioned report.	Noted.
	Volume II on water quality and air quality, the monitoring point should be established adjacent to Kennedy Town Salt Water Pumping Station to ensure that the sea water quality at our intake is not adversely affected. Therefore suggest the sampling locations during the course of the work be revised as shown in the returned Figure 8A. For the moonitoring purpose we also enclose a copy of our provisional water quality objectives for your reference.	The drawing showing the water quality monitoring stations will be amended accordingly. In order to follow the provisional water quality objectives, it will be important to establish baseline conditions at the intake well in advance of work commencing. Our current proposal of sampling for 4 consecutive weeks within the first 6 weeks of project commencement is sufficient.
TE Div./HK Transport Department		
HR146/180/197 TH 2 March 1992	The BBL Consultant should be asked to address the noise problem resulting from the provision of tram loop leading to the tram depot in Sai Ying Pun. There is concern about the effect of changes in the operation of tram traffic on the design of junctions in the vicinity of the tram depot, should changes be necessary on environmental ground.	Noted.

Reference	Comments	Consultant's Responses
Environmental Protection Department		
(60) EP 1/H1/11 (II) 6 March 1992	(i) The 3 monitoring stations should move parallel to the proposed reclamation limit (i.e. about 100 - 150m).	Noted. The relevant drawing showing the location of monitoring stations will be amended accordingly taking into account the comments by WSD.
	(ii) The control station should be relocated southwards to nearly 1000m from the reclamation limit.	Noted. The relevant drawing showing the location of monitoring stations will be amended accordingly.
	(iii) Longer period of baseline monitoring is required and mitigation measures should be indicated on the drawing for the contractor to follow.	The revised period for baseline monitoring is now 4 consecutive weeks within the first 6 weeks of project commencement and will be shown on the drawing.
District Planning Officer/ Hong Kong		
(20) in HK-1/16 II 26 February 1992	**Volume I – Noise**	
	(a) Section 2.1.1 d, I understand that in the Green Island Link Preliminary Feasibility Study, the highway network in the area in year 2006 includes Western Harbour Crossing, Central & Wanchai Bypass, Green Island Link and Route 7 (Sai Ying Pun to Aberdeen), surely AC for T/U will be in a better position to advise on the anticipated traffic flow in the design year.	The proposed Belcher Bay Link layout is only a temporary road configuration until it is relocated to form the eastern section of the primary distributor PD1 of the long term strategic highway network indicated in Section 2.1.1 d. of the Green Island Link Preliminary Feasibility Study. Traffic flow for design year 2006 for the long term highway network will not be appropriate to the present temporary configuration.

Reference	Comments	Consultant's Responses
	(b) Section 2.2.2, it is noted that only the existing NSRs located at the eastern end nearest to the horizontal alignment of the BBL have been selected for assessment. The noise impact near the western end of the proposed road link should also be addressed. Moreover, PM/UA should be asked to liaise with the Consultants for the Green Island Reclamation Feasibility Study on the proposed permanent land use arrangement in the area bounded by the present Belcher's Bay Reclamation limit. I recall that in the draft recommended ODP previously prepared by the Consultants, residential developments are proposed in the area between the permanent Route 7 and the existing Kennedy Town Praya. The assessment of the noise impact during the operation stage without making reference to the permanent land use arrangement may not be meaningful.	NSRs located near the west end of the BBL including the Pearl Court and New Fortune House have been included. As above, BBL will be relocated to follow the permanent Route 7 alignment. It is therefore not appropriate for BBL to assess the noise impact making reference to the permanent land use in which case the noise source location will be changed.

Reference	Comments	Consultant's Responses
	(c) Moreover, it appears that the noise assessment has been confined to the impact to be generated by the proposed BBL. One example would be the use of the retaining structure of another noise source, The Route 7, as the noise barrier of BBL. Whilst it can be argued that the noise level to be generated from Route 7 may be higher than the latter, information on the overall noise impact should be given. EDP will be in a better position to advise whether the assessment approach is acceptable.	The Route 7 down ramp has been identified as a major noise contributor and mitigating measures to be carried out in Route 7 is outside the scope of work of this project. However, EPD was aware of this and had commented on the conclusions drawn. It is now recommended in section 2.6.3, "that suitable mitigating measures should, whenever possible, be incorporated into works associated with these major contributors."
	Volume II – Water Quality & Air Quality	
	(d) Section 5.1.3, in view of the proximity of the reclamation area to the existing residential development, any necessary public dumping work will need to be carefully monitored.	There will be no public dumping in the proposed reclamation.
	(e) Para 28, line 4 of first paragraph, presumably Queens Road East should read Queens Road West.	Yes.
	(f) Page 30, 4th paragraph, the proposed pedestrian walkway system and arrangement should be indicated for easy reference.	Noted.

Reference	Comments	Consultant's Responses
District Officer Central & Western		
(65) C&WDO 820/18 III 26 February 1992	**2.4 Traffic Noise Level** 2. Belcher's Bay Link and Route 7 down ramps in place, traffic noise levels along Des Voeux Road West and Kennedy Town Praya will reach a high level of 75/76 dBA to 77/78 dBA which would exceed the maximum acceptable noise level of 70 dB(A) contained in the HKPSG, adversely affecting the residents in the vicinity. As illustrated in Appendix III, mitigating measures such as friction course and installation of noise barriers cannot reduce the noise level effectively; consultant should explore other forms of direct technical remedies, or otherwise, indirect technical remedies - such as noise insulation should be provided. It is essential that mitigation measures should; as suggested in para 2.6.3; whenever possible, be incorporated into works associated with BBL, especially during construction of Route 7 of which its traffic noise impact had not been addressed fully (ie of route 7 down ramps) in it's preliminary report issued at May 91.	Investigation of indirect technical remedies is outside the Project Brief.

Reference	Comments	Consultant's Responses
	5.2 Water Quality Monitoring	
	3. I am in support of a water quality monitoring programme which will ensure water quality within the area to be maintained. Contractors should be required to carry out works in the manner as stipulated in para 5.2.1 and to undertake pollution avoidance measures if required.	This is a part of the Contractor's contractual responsibilities. The Contractor's works will be supervised by the Resident Engineer.
	5.3 Air Quality	
	4. I agree that control measures such as good housekeeping, best practice dry material storage etc (as elaborated by the consultant in response to Air Policy Group) should be included in construction contracts for effective dust control.	Noted.
	5. Apart from water quality monitoring, consultant should also consider setting up other monitoring groups on air quality and noise impact (especially during construction period) with a view to avoid significant deterioration of living environment in the Sai Ying Pun Area and the Kennedy Town Area. Such monitoring groups are advised to forward progress reports to the Central & Western District Board which had shown it's concern about environmental impacts of Belcher's Bay Link, Route 7 and Western Harbour Crossing on local residents.	No comments.

Reference	Comments	Consultant's Responses
Environmental Protection Department		
(44) in EP 1/H1/11 (II) 26 February 1992	In addition to the pollution avoidance measures at section 5.2.1, I would like to add the following mitigation clauses into the contract documents.	
	1. Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be reused and changed at frequent intervals and sediments shall also be removed regularly.	This is a standard requirement.
	2. If any office, site canteen or toilet facilities is erected, foul water effluent shall be directed to a foul sewer or to a sewage treatment facility approved by the Engineer.	This is covered by the engineering conditions of land allocation for works area. Relevant Government Departments are invited to impose their requirements when the draft engineering conditions is circulated for comments.

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Signature :

Subject SEPO / EPO EC(A)24

Date : 10.10.95