PROJECT PROFILE

for

West Kowloon Reclamation

Contract No. WK30

Remaining Roadworks Stage 4

Link Roads G & L

Reference : **R148**
Client : **Kowloon Development Office, Territory Development Department**

Date : **March 2000**

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1. BASIC INFORMATION

1.1 Project Title

This Project Profile has been prepared for :

West Kowloon Reclamation
Contract No. WK30
Remaining Roadworks Stage 4
Link Roads G & L

1.2 Project Description

The West Kowloon Reclamation Planning and Urban Design Study (WKRPUDS) generated an Outline Development Plan (ODP) and a Master Landscape Plan for the overall West Kowloon Reclamation (WKR). The plan was prepared using the Metroplan Interim Development Statement for West Kowloon (MIDS) with the following objectives :

- to provide reserves for the Airport Railway, the West Kowloon Expressway, and the Western Harbour Crossing and to provide land for port back-up and container facilities as recommended by the Port and Airport Development Study (PADS);
- to provide land to meet new demand for public and private housing;
- to provide 'solution spaces' for Metroplan's renewal and thinning out objectives with respect to residential and industrial development;
- to provide a secondary office and hotel centre to take pressure off the Central Business District;
- to reprovision waterfront uses affected by the reclamation, including the substantial Cheung Sha Wan Wholesale Market; and
- to provide land to make up shortfalls in hinterland open space and G/IC provision.

The strategic planning context of the WKR has continued to evolve over the years and account of studies has been taken such as the Territorial Development Strategy Review (TDSR) when formulating development layouts and building plans which have used the most up-to-date information available.

As part of the Investigation Assignment for the "West Kowloon Reclamation" an Environmental Impact Assessment (EIA) was undertaken in accordance with the Environmental Impact Assessment Ordinance. A document was lodged in the register of Designated Projects under Register No. EIA-125/BC namely :

- West Kowloon Reclamation Comprehensive Traffic Analysis Review & Environmental Impact Assessment Final Report (July 1997)

The EIA was undertaken in accordance with the requirements of the EIAO and covered the following topics :

- Air Quality
- Noise
- Water Quality
- Waste Disposal
- Construction Phasing; and
- Environmental Monitoring and Audit

Environmental impacts associated with each of the Study Areas identified, including the existing residential areas such as Mei Foo, Nam Cheong Estate, Wong Tai Street and Man Cheong Street, were predicted and mitigation measures proposed.

1.3 Nature of the Project and Proposed Modification

As a result of modifications proposed during detailed design, submissions have been made to the Environmental Protection Department (EPD) substantiating the reasons for the changes and the effects in terms of the environmental implications. The proposed changes are as follows :

- Modification of Link Roads G & L (as shown in Figure 1.1).

The reason for the proposed modification is that the requirements now stated in Transport Planning & Design Manual (TPDM)-Volume 2, Link Roads G & L must have a minimum radius of 63m. The original layout had a critical radius of 44m and thus the wider "loop" which is now required has a greater area of influence than that previously designed.

1.4 Name of Project Proponent

The project proponent for the Assignment is :
The Government of Hong Kong Special Administrative Region,
Kowloon Development Office,
Territory Development Department.

1.5 Location and Scale of Project

The subject site is located within the West Kowloon Reclamation, refer to Figures 1.2 and 1.3, and is within the area of influence of residential developments at Mei Foo Sun Chuen, the Kowloon Motor Bus (KMB) Comprehensive Development Area, WKR sites 6, 7 and 10 and the proposed regional stadium which is close to the KMB Bus Depot.

1.6 Number and Types of Designated Projects to be Covered by This Project Profile

Only one Designated Project (DP) is covered by this project profile. In accordance with the definitions given in the EIAO Technical Memorandum, this project is a DP under Part 1 Schedule 2, A1. "Roads, Railways and Depots". Specifically the proposed remaining roadworks involves the detailed design and subsequent construction of new link roads G & L in the West Kowloon Reclamation.

1.7 Name and Telephone Number of Contact Person(s)

1.8 Timing of Modification

According to the implementation programme for WKR the construction of the modification of the works is scheduled to commence in June 2001.

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

An Environmental Impact Assessment (EIA) will be undertaken by Consultants acting on behalf of the project proponent to assess the impacts of the modifications on the receiving environment with particular emphasis given to operational noise and air quality impacts.

The detailed design is being carried out at present with the target date for commencement of construction being June 2001.

The design period for Contract WK30 started in October 1998. The design of Link Roads G and L should be finalized in July / August 2000. Gazetting of the works is critical to the project programme and should be carried out as soon as possible to minimise potential delays. The commencement of the construction contract is scheduled to be in June 2001 for completion in June 2003.

Contract WK30 is one contract of the whole West Kowloon Reclamation project. Link Roads G and L are parts of the scope of works under the Contract and Link Road G will be connected to the proposed re-aligned Road D3 being designed under the Route 9 project.

3. POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Environmental Changes

3.1.1 Conclusions from Previous Assessments

From the preliminary assessments undertaken it has been identified that the proposed modifications could have an effect on operational air quality and noise levels at the identified sensitive receivers.

The effects on the receiving environment may be reflected by an increase in vehicle emissions and background noise levels (which are already high in this area). In terms of the effects on sensitive receivers, the changes may result in modifications to the suite of mitigation measures proposed in the approved EIA Report. The EIA which was undertaken previously concluded that :

"the road layout around the PRT will be shielded from the Mei Foo Estate by the WKR and Kwai Chung viaduct structures. The impact of the WKR on Mei Foo and the increased traffic on the nearby roads is to bring about exceedances at points A, B and C at all levels (10% of all development) of about 4dB(A)".

For air quality assessments the EIA surmised that :

"the AQO are not predicted to be exceeded at the sensitive receivers in Mei Foo due to the environmental set-back from the WKR although roadside concentrations in this area will exceed the AQO due to the high proportion of heavy diesel fuelled vehicles".

No mitigation measures were proposed for this area in the approved EIA Report.

Mitigation measures for attenuation of vehicle related noise impacts which were however recommended were :

- Noise barriers (90% compliance with noise criteria)
- Low noise road surface (90% compliance with noise criteria)
- Acoustic windows (100% compliance with noise criteria)

Preliminary assessments to quantify the impacts of the proposed changes have been undertaken to determine the nature and extent of the impacts associated with the proposed modifications as discussed in the following sections.

3.1.2 Preliminary Impact Assessments

Traffic noise and traffic related air quality impact assessments have been undertaken to quantify the impacts associated with the revised layout of Link Roads G & L at captioned development with specific emphasis placed on assessing the effects of traffic noise at NSR Point C (1/F, 4/F, 7/F, 10/F, 13/F, 17/F, 21/F, 24/F, 27/F, 30/F) and of air quality at ASR Pont V1 (10m, 20m, 30m, 40m, 50m, 60m, 70m, 80m, 90m, 100m) for two different scenarios. The locations of corresponding traffic noise sensitive receivers and air quality sensitive receivers can be found in Appendix A (refer to Final EIA Report-Volume 2B (Figures 8.17 and 8.12)) respectively. The two scenarios are:

Case (i) Original Layout before changes (Forecast traffic flows at year 2011) as proposed in the Final EIA report by Acer Consultants Limited referred to in the foregoing section; and

Case (ii) Current Layout after changes (Forecast traffic flows at year 2011) as proposed by Mott Connell Limited.

3.1.3 Assessment Procedures

The traffic noise and traffic related air quality assessments were undertaken using the EPD approved software "*roadNoise*" and "*CALINE4*" respectively. The traffic flow parameters were extracted from the Final EIA Report-Volume 2B (Figure 6.5) referred to in section 1. Predicted traffic noise levels at each of the potentially affected NSR's are given in Tables 3.1 below with the results extracted from the Final EIA Report-Appendix B (N5) included for easy reference. The "*CALINE4*" modelling results are shown in the following Table 3.2 with the outputs taken from the Final EIA Report-Volume 2B (Figure 8.12) included for easy information. The modelling input files and computer plots of the "roadNoise" noise model can be found in Appendices B & C respectively. The emission factors and meteorological conditions extracted from the Final EIA Report-Appendix B(A3) have been used in the modelling and are presented in Appendix D. The "CALINE4" modelling output files are given in Appendix E.

3.2 Assessments

3.2.1 Traffic Noise Impact

The traffic noise at NSR Point C (1/F, 4/F, 7/F, 10/F, 13/F, 17/F, 21/F, 24/F, 27/F, 30/F) has been assessed for the proposed changes. In order to provide a conservative estimate of the traffic noise prediction, 30% of the heavy vehicles would be assigned for each traffic flow based on the data extracted from "WEST KOWLOON HIGHWAY (from SLIP RDS TO & FROM LIN CHEUNG RD to HING WAH ST W) at Core Station 3024 on Pages H1-30 & H1-31, The Annual Traffic Census 1998". This assumption is considered to give a reasonable indication of the traffic noise impacts affecting the sensitive receivers in the vicinity. Table 3.1 shows the predicted traffic noise levels for the scenarios of Case (i) and Case (ii) as outlined above.

Table 3.1 Predicted traffic noise levels for the scenarios of Case (i) and Case (ii)

NSR (Point C)	Predicted Noise Levels in the Final EIA report dB(A)	MCL Predicted Noise Levels of Case (i) dB(A)	MCL Predicted Noise Levels of Case (ii) dB(A)	Difference between Case(i) and Case (ii) dB(A)
1/F	73.4	70.1	70.7	0.6
4/F	73.4	70.3	70.8	0.5
7/F	73.5	70.6	71.4	0.8
10/F	73.6	70.9	71.6	0.7
13/F	73.8	71.2	71.9	0.7
17/F	74	71.8	72.4	0.6
21/F	74.1	72.4	72.9	0.5
24/F	74.1	72.7	73.1	0.4
27/F	74.2	73	73.4	0.4
30/F	74.3	73.2	73.6	0.4

Discrepancies between the results extracted from the Final EIA report and the current results are most probably due to the fact that input factors/functions vary slightly between models. Factors include the percentage of heavy vehicles assigned to the traffic flows in the noise prediction model. We assumed 30% however there is no information showing the percentage of heavy vehicles at the proposed changed area in the Final EIA report, referred to in section 1. It is noted that increases of 0.4 to 0.8 dB(A) at NSR Point C(1/F to 30/F) are predicted after modification of Link Roads G & L. Using the standard accepted practice, it has been summarized that the increase of noise level at NSR is found to be insignificant when the difference of noise prediction results is less than 1 dB(A) (0.4 to 0.8 dB(A)).

Based on the results given in Table 3.1, it is observed that without any noise mitigation measures being applied, the traffic noise levels at NSR Point C (at all levels) will still exceed the traffic noise standard (L_{10}) 70 dB(A) after modification. Noise mitigation has been recommended in many areas (refer to Final EIA Report-Volume 1, Section 8.7) and many such measures are now in place. However the necessity of applying additional noise mitigation measures will be subject to further study.

3.2.2 Traffic Related Air Quality Impact

The air quality at ASR Point V1 (10m, 20m, 30m, 40m, 50m, 60m, 70m, 80m, 90m, 100m) has been assessed for the proposed changes. The sections of West Kowloon Expressway within 300 radius of site with respect to the ASR Point V1 are included in the *Caline 4* model. In order to calculate the emission factors to be used in the "CALINE4" model, a detailed breakdown of the vehicle type on the traffic forecast was estimated based on the traffic data extracted from "WEST KOWLOON HIGHWAY (from SLIP RDS TO & FROM LIN CHEUNG RD to HING WAH ST W) at Core Station 3024 on Pages H1-30 & H1-31, The Annual Traffic Census 1998". The percentage of vehicle breakdown was assumed to be Private Car(35%), Taxi(35%), Light Goods Vehicle(10%), Heavy Goods Vehicle(10%) and Public Bus(10%). This assumption is considered to give a reasonable indication of the traffic-related air quality impacts affecting the sensitive receivers in the vicinity. Annual average concentration levels of 71$\mu g/m^3$ (Sham Shui Po Air Quality Monitoring Station, data extracted from "Air Quality In Hong Kong 1997", EPD) are utilized for the background levels of Nitrogen Dioxide(NO_2). Table 3.2 shows the predicted results of NO_2 concentration for the scenarios of Case (i) and Case (ii).

Table 3.2 Predicted results of NO_2 concentration for the scenarios of Case (i) and Case(ii)

ASR (Point V1)	Predicted NO_2 Concentration in the Final EIA Report $\mu g/m^3$	MCL Predicted NO_2 Concentration of Case(i) $\mu g/m^3$	MCL Predicted NO_2 Concentration of Case (ii) $\mu g/m^3$	Change in Concentration Between Case (i) and Case (ii) $\mu g/m^3$
V1-10m	199	149.8	156.4	+6.6
V1-20m	3.1.2.1.1 187	3.1.2.1.2 140.4	145.1	+4.7
V1-30m	174	125.2	127.8	+2.6
V1-40m	163	109.6	110.5	+0.9
V1-50m	150	97.3	97.7	+0.4
V1-60m	138	88.1	88.1	0
V1-70m	129	81.5	81.5	0
V1-80m	120	77.2	77.2	0
V1-90m	114	74.6	74.6	0
V1-100m	106	73.1	72.9	-0.2

Discrepancies between the results extracted from the Final EIA report and the current results are most probably due to the fact that input factors/functions vary slightly between models such as background levels of Nitrogen Dioxide(NO_2).

The above table demonstrates that after modification of Link Roads G & L, the change in NO_2 concentration (0.4 to 6.6$\mu g/m^3$) at ASR V1(10m to 100m) is found to be insignificant when compared with the predicted NO_2 concentration (e.g. ASR at V1-10m is 156.4$\mu g/m^3$) and that full compliance with the Air Quality Objectives for hourly Nitrogen Dioxide is 300$\mu g/m^3$ can still be achieved.

3.2.3 Water Quality Impact

As the operation of the roads will not directly generate liquid wastes it may be surmised that there will be minimal impact on receiving water systems.

3.2.4 Solid Waste Management

No solid waste will be generated after construction of the roadworks.

3.2.5 Operational Phase Ecological Impacts

No operational ecological impacts will arise as a result of this project.

3.2.6 Visual Impact

The assessment of visual impacts is concerned with identifying the elements of the proposed roadworks, their visual compatibility with the surroundings and the visual obstruction created to the main centres of population (visually sensitive receivers). As the proposed modification is essentially of the same form the visual impact should not be different to that assessed in the EIA.

4. DESCRIPTION OF MITIGATION MEASURES

As the requirement stated in Transport Planning & Design Manual (TPDM)-Volume 2, the Link Roads G & L must have a minimum radius of 63m compared to the original layout which had a critical radius of 44m. As a result, further assessments have been carried out to identify the extent of the changes in terms of the environmental impacts and the extent of the mitigation measures required.

After modification of Link Roads G & L, it can be observed that the predicted traffic noise levels at NSR Point C (1/F to 30/F) increase from 0.4 to 0.8 dB(A) based on the provided results. Using the standard accepted practice, it has been summarized that the increase of noise level at NSR is found to be insignificant when the difference of noise prediction results is less than 1 dB(A) (0.4 to 0.8 dB(A)).

It can be also found that without any noise mitigation measures being applied, the traffic noise levels at NSR Point C (at all levels) will still exceed the traffic noise standard (L_{10}) 70 dB(A) after modification. Noise mitigation has been recommended in many areas (refer to Final EIA Report-Volume 1, Section 8.7) and many such measures are now in place. However the necessity of applying additional noise mitigation measures will be subject to further study.

Based on the predicted results, it can be observed that the increase in NO_2 concentration at ASR Point V1 (10m to 100m) is found to be insignificant (0.4 to 6.6$\mu g/m^3$) when compared with the predicted NO_2 concentration (e.g. ASR at V1-10m is 156.4$\mu g/m^3$) and that the Air Quality Objectives for hourly Nitrogen Dioxide is 300$\mu g/m^3$ can be complied with. No mitigation measures were proposed in the approved EIA.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FUTURE ENVIRONMENTAL IMPLICATIONS

5.1 Construction Phase Protection Measures

5.1.1 Air Quality Protection Measures

Practicable and cost-effective dust mitigation measures shall be formulated during the detailed design stage of the project for implementation through incorporation into contract documents. The requirements of the Air Pollution Control (Construction Dust) Regulation will apply to the construction phase.

5.1.2 Noise Mitigation Measures

Noise mitigation measures that have been preliminarily considered for this Project include:

- Application of properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds or shields, etc.;
- Erection of noise enclosures around noisy plant;
- Location of noise emitting plant at maximum distances from noise sensitive receivers;
- Inclusion of Conditions of Contract for environmental protection during construction;
- Use of appropriately powered equipment; and
- Regular maintenance of site plant/ equipment.

The effectiveness and continuous implementation of the noise mitigation measures would be checked through a noise monitoring and audit programme.

5.1.3 Construction Water Quality Mitigation Measures

Good site management practice should ensure that construction impacts on water quality are kept to a minimum. Prevention of surface water contamination during construction involves two basic elements:

(a) minimising the quantity of water which might become contaminated by high levels of suspended solids (silt) off exposed and disturbed ground surfaces; and

(b) collection and treatment of potentially contaminated water to appropriate standards.

The potential for water quality impacts should be mitigated by the following means:

(a) stormwater runoff from the study area during construction should be routed through oil/grit separator and/or sediment basin/trap where applicable before discharging to the nearby receiving waters; and

(b) storm catchbasins/inlets, if any, receiving storm runoff from construction areas should be covered with wire mesh filter on top of which should be placed with crushed stone on top in order to prevent sediment from entering the inlet structure and to reduce potential sediment loading to the receiving waters. In addition, advice should be sought from the EPD's ProPECC P/N 1/94 Construction Site Drainage.

5.1.4 Environmental Protection Measures for Construction Waste

Chemical and oily wastes generated from the construction activities, vehicle and plant maintenance and oil interceptors should be disposed of as chemical waste in strict compliance with the Waste Disposal (Chemical Waste) (General) Regulations.

5.2 Operational Phase

5.2.1 Noise Mitigation Measures

Further assessment of the noise levels at the identified sensitive receivers (existing and planned) will need to be undertaken to define the extent and location of noise barriers as well as acoustic windows.

5.2.2 Air Quality Measures

No additional mitigation measures are proposed.

5.3 Environmental Monitoring and Audit

This Project Profile has outlined the potential environmental impacts which would arise from the construction and operation of the proposed remaining roadworks and has introduced briefly some possible environmental mitigation measures that can be incorporated into the Project. The need to develop an environmental monitoring and audit programme, for the construction and/or operational phase of the project, will be reviewed after evaluation of the magnitude of various environmental impacts in the detailed EIA report.

6. USE OF PREVIOUSLY APPROVED EIA REPORTS

The only previously approved EIA report which has been referred to during the preparation of this Project Profile is :

- West Kowloon Reclamation Comprehensive Traffic Analysis Review and Environmental Impact Assessment Final Report, Acer Consultants (Far East) Limited, June 1997

The EIA was approved on September 1997. Environmental considerations which were addressed in the EIA include :-

- Air Quality
- Noise
- Water Quality
- Waste Management Strategy
- Construction Impacts, Construction Phasing and Environmental Monitoring & Audit

The assessments which were carried out are relevant to the current situation because :-

Vehicular emissions from the West Kowloon Expressway (WKE) dominated the air quality assessments. The impacts associated with the traffic on Link Roads is expected to be minor by comparison.

The Air Quality Objective (AQO is not predicted to the exceeded at the sensitive receivers in Mei Foo due to the environmental set-back from the WKE although roadside concentrations in this area will exceed the AQO due to the high proportion of heavy diesel fuelled vehicles.

The impact of vehicle traffic noise from the WKE on Mei Foo and the increased traffic on the nearby roads will bring about exceedances at the selected Noise Sensitive Receivers at all floor levels (10% of the developments) of about 4dB(A). The impact of the modification in the Link Roads is expected to be minor compared to the WKE.

Data from the previously approved EIA which was used in the preparation of this Project Profile includes the traffic flow parameters which were extracted from the aforementioned Final EIA Report – Volume 2B (Figure 6.5) and shown in following table :

Table 6.1 : Traffic Flow Parameter

Number	Road Segment	Direction	Traffic Flow (pcu/hr)
1	WKE (before merge)	EB	4840
2	WKE - slip road (before merge)	EB	1960
3	WKE – slip road (before diverge)	WB	3900
4	WKE – slip road (after diverge)	WB	2880

The emission factors and meteorological conditions extracted from the aforementioned Final EIA Report – Appendix B(A3) and shown in following Tables :

Table 6.2 : Emission Factor (gm/km)

Pollutant	P/C-p	Taxi	LGV-d	HGV	PuBus
Nox	1.321	0.799	1.54	7.061	8.578

Table 6.3 : Meteorology conditions
(Typical worst-case parameters were used)

Wind speed :	1 m/s
Wind direction :	Worse-case
Stability class :	D
Temperature :	25°C
Wind direction variation :	18°

The measures which were recommended in the previously approved EIA for mitigation of the impacts were :

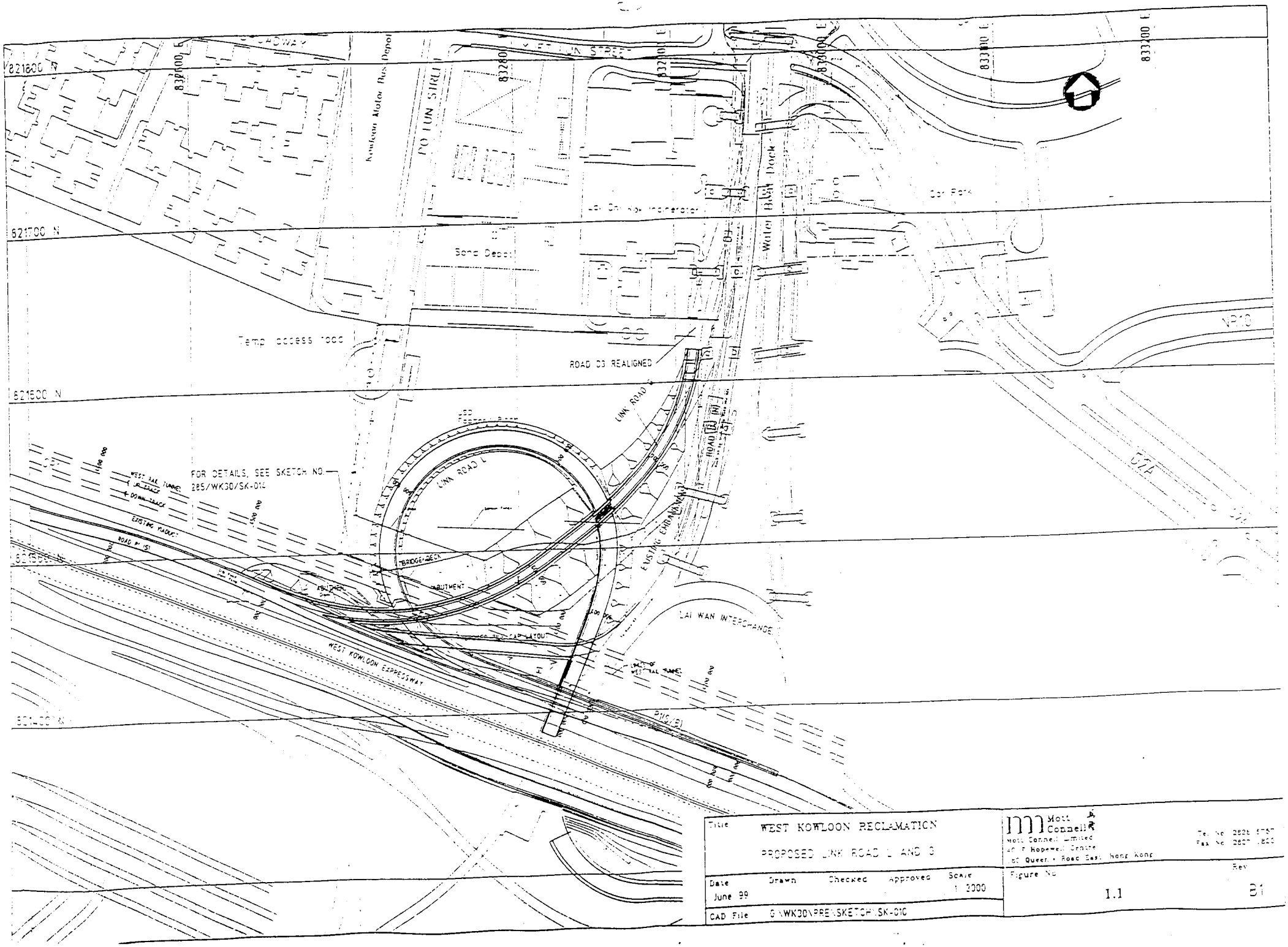
<u>Air</u>

No Air Quality mitigation was recommended other than setbacks.

Noise

Roadside barriers and low noise surfacing was recommended. These measures have already been installed on northern WKE. The only alternative is to install acoustic windows to the affected units in Mei Foo Sun Chuen.

Although reference has been made to the aforementioned report the information was only used to provide guidelines for assessing the scale of the potential impacts. It is proposed that the current EIA is carried out without reference to the previous report to ensure the latest traffic data and forecasts are used which will reflect a more accurate situation.



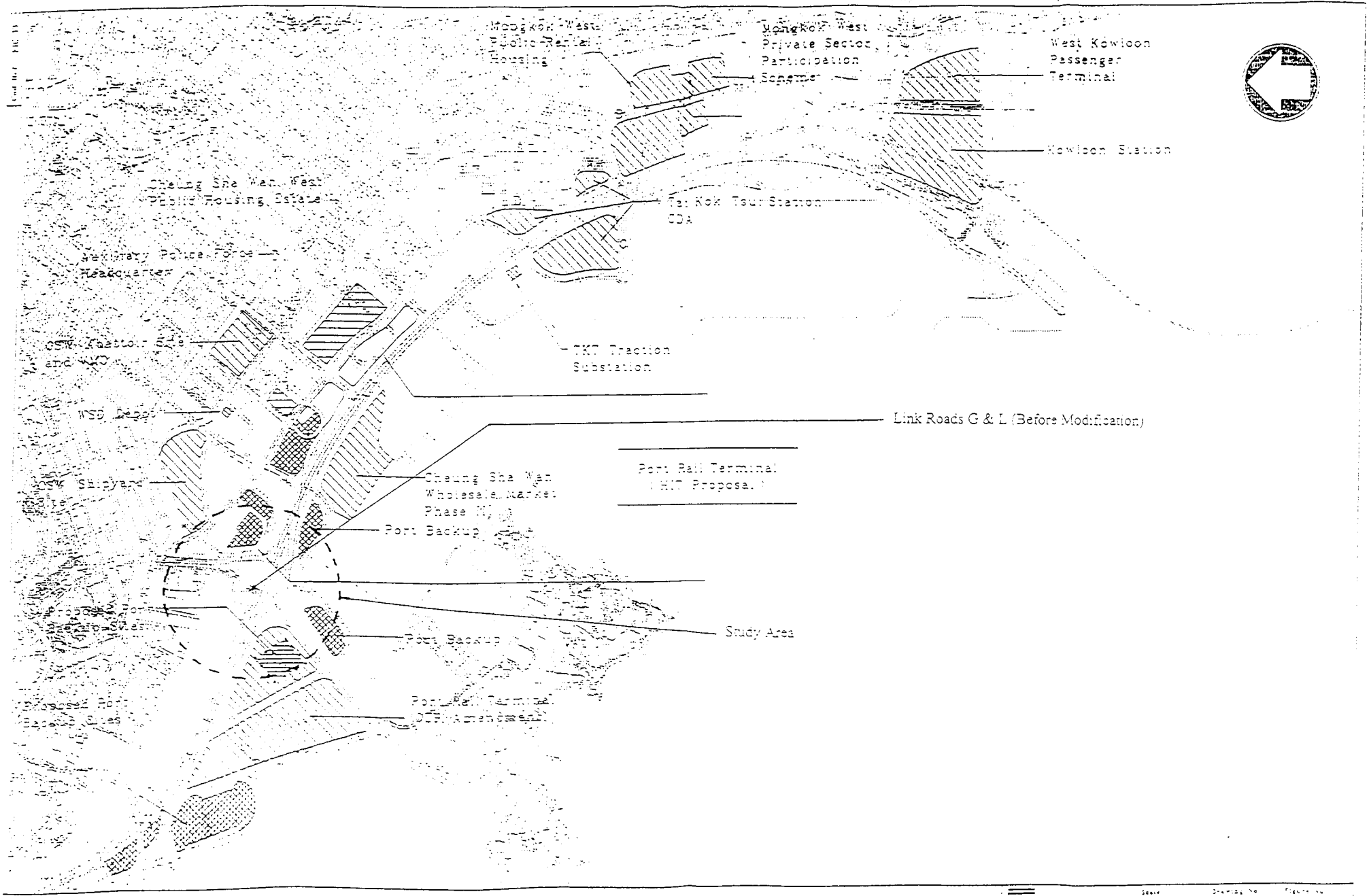
Title	WEST KOWLOON RECLAMATION				
	PROPOSED LINK ROAD L AND D				
Date	Drawn	Checked	Approved	Scale	
June 99				1:2000	
CAD File	G:\WK30\PRE\SKETCH\SK-010				

Mott Connell Limited
Mott Connell
22/F Hopewell Centre
183 Queen's Road East, Hong Kong

Tel No 2823 8787
Fax No 2827 1823

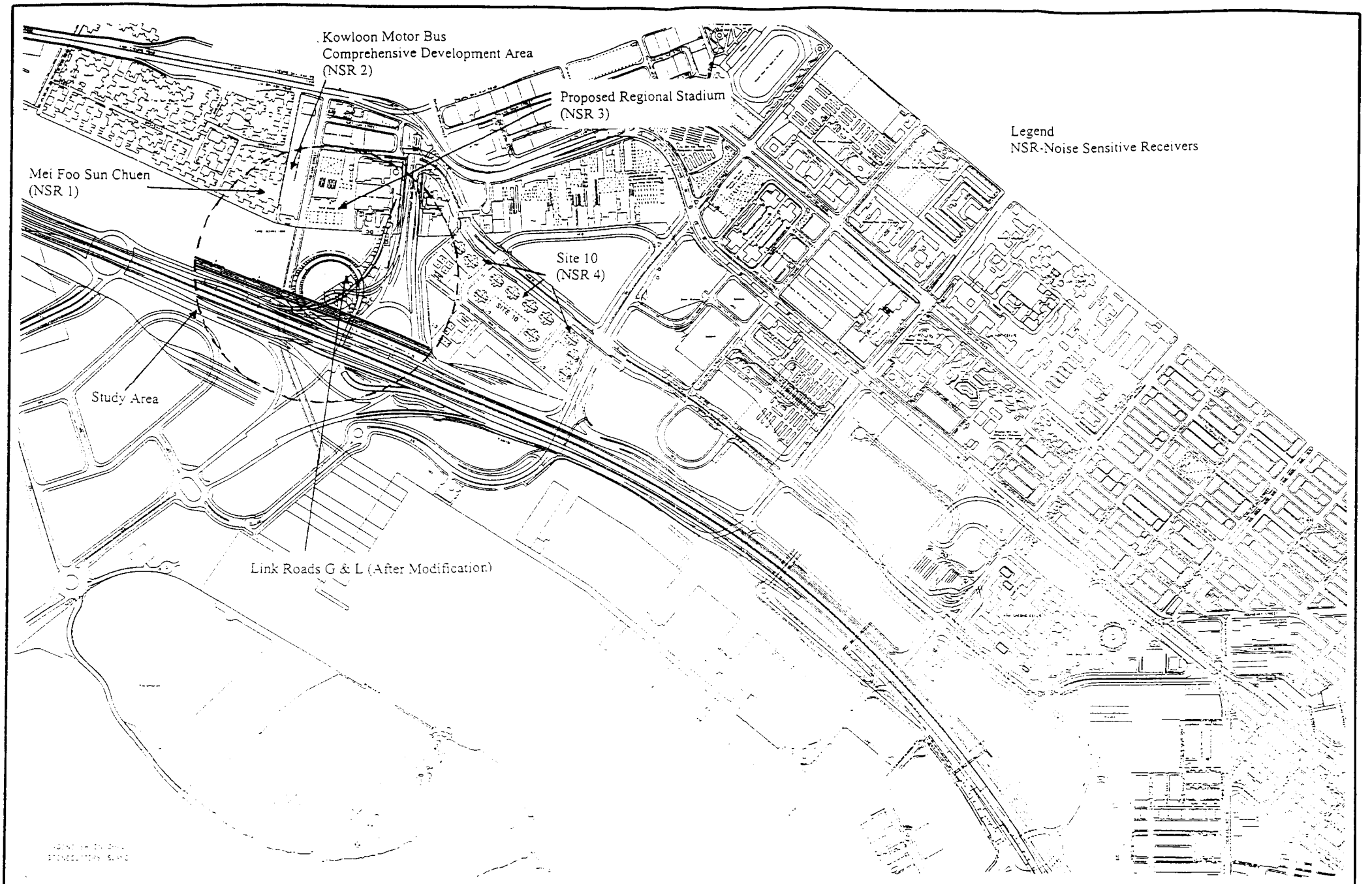
Figure No 1.1

Rev B1



Location of the Subject Site within the West Kowloon Reclamation

KOWLOON DEVELOPMENT OFFICE



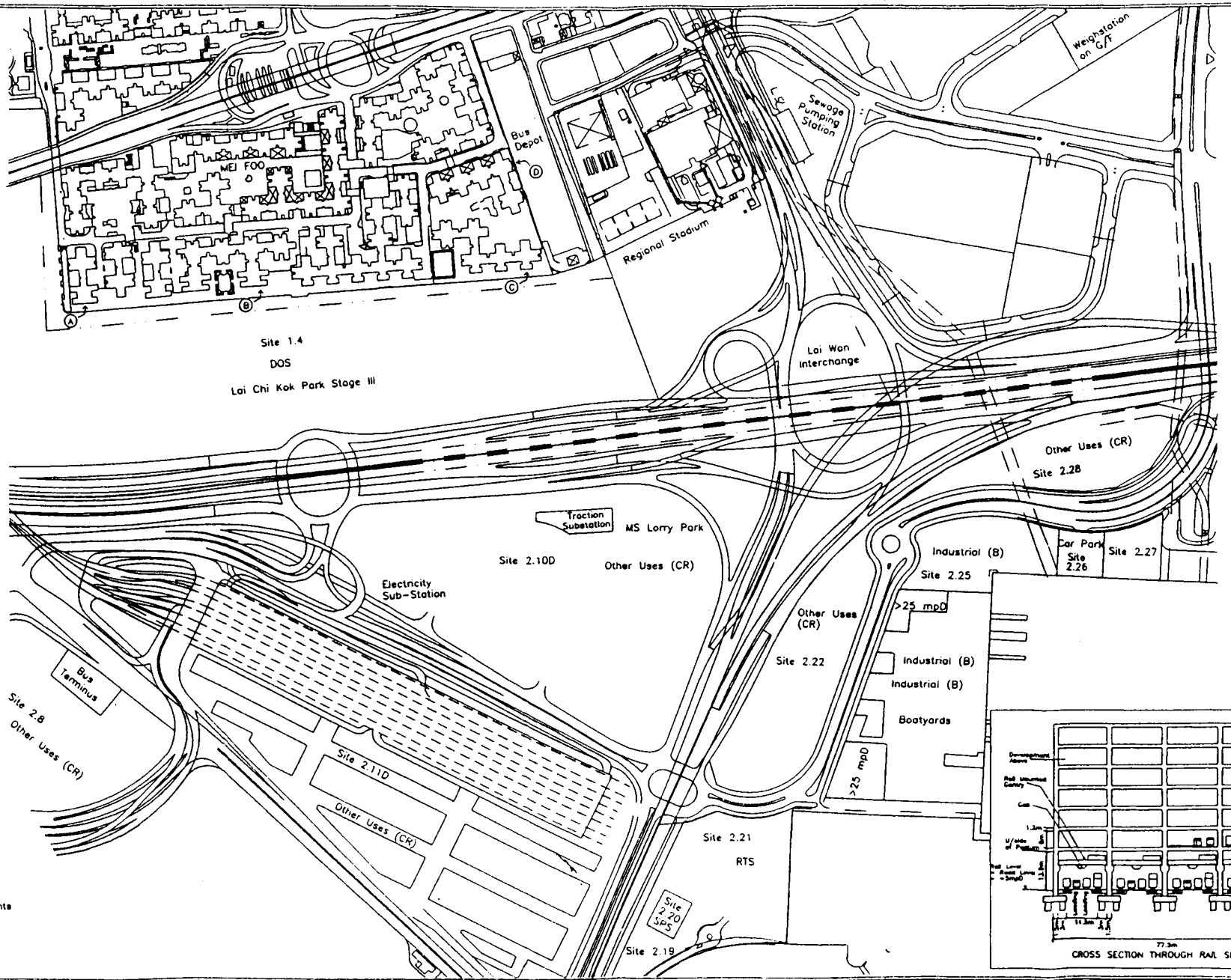
Mott Connell	**Location of the Noise Sensitive Receivers**	TERRITORY DEVELOPMENT DEPARTMENT HONG KONG KOWLOON DEVELOPMENT OFFICE	Scale Not to Scale	Drawing No	Figure No. 1.3

APPENDIX A

TRAFFIC NOISE AND AIR QUALITY PREDICTION LOCATIONS

Fig 8.17

CAD REF



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Acer Consultants (Far East) Ltd.

Layout and Noise Modeling Points - Port Rail Terminal at Mei Foo

TERRITORY DEVELOPMENT DEPARTMENT HONG KONG
KOWLOON DEVELOPMENT OFFICE

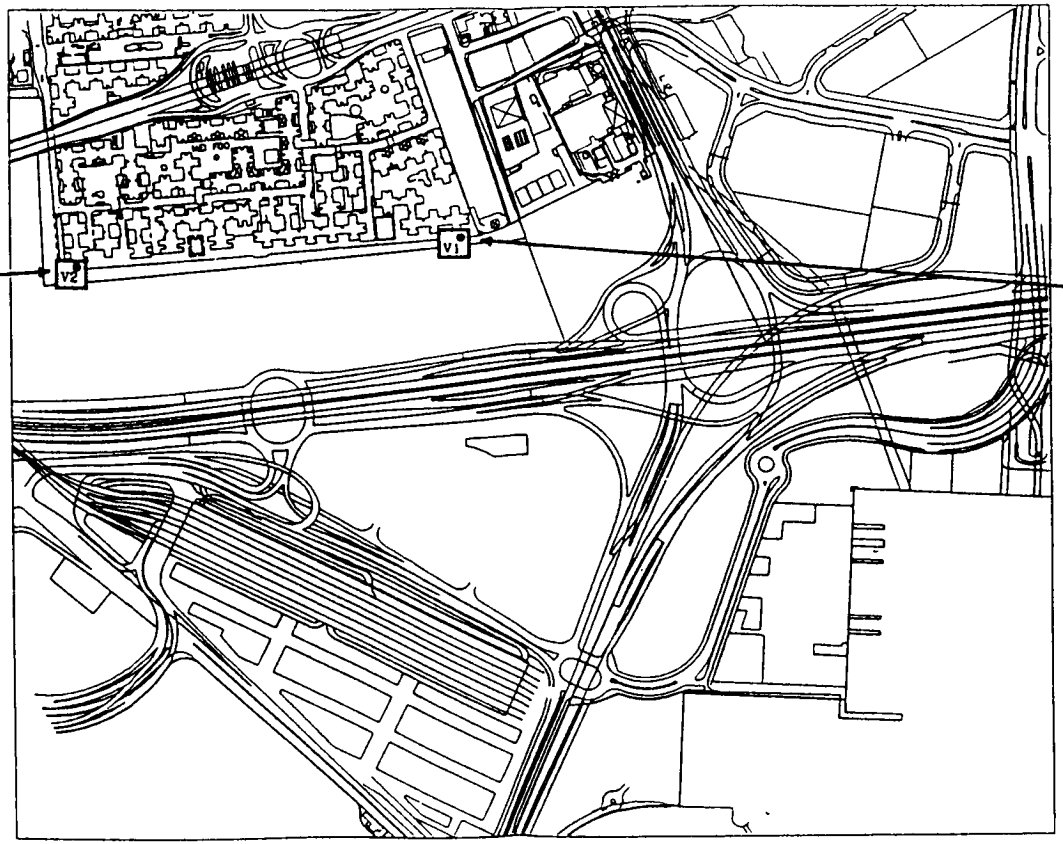
Scale 0 25 50 100 METRES

Drawing No.

Figure No 8.17

CAD REF Fig 0.12

Port Rail Terminal at Mei Foo Vertical NO_2 Concentration at V2	
Height	Conc ($\mu g/m^3$)
10m	197
20m	189
30m	178
40m	167
50m	153
60m	142
70m	131
80m	121
90m	114
100m	108



Port Rail Terminal at Mei Foo Vertical NO_2 Concentration at V1	
Height	Conc ($\mu g/m^3$)
10m	199
20m	187
30m	174
40m	163
50m	150
60m	138
70m	129
80m	120
90m	114
100m	106

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Decrease in Traffic Emissions with Height - Port Rail Terminal at Mei Foo

TERRITORY DEVELOPMENT DEPARTMENT HONG KONG
KOWLOON DEVELOPMENT OFFICE

Drawing No

Figure No 8.12

APPENDIX B

"ROADNOISE" INPUT DATA FILE SAMPLE

"roadNoise" Input Data File Sample

```
WKR-L.MAS
TEXT
COA=      1.0COD=   1000.0COR=     20.0
READ
WKR.FLO
READ
WKR-L.SEG
READ
WKR.SEG
READ
WKR.BAR
READ
WKR.HSE
LINK
All
1,
READ
WKR.REC
READ
WKR1.REC
READ
WKR2.REC
END

WKR-S.MAS
TEXT
COA=      1.0COD=   1000.0COR=     20.0
READ
WKR.FLO
READ
WKR-S.SEG
READ
WKR.SEG
READ
WKR.BAR
READ
WKR.HSE
LINK
All
1,
READ
WKR.REC
READ
WKR1.REC
READ
WKR2.REC
END

WKR.FLO
TEXT
WKE-EB (SEG 1-3)
FLO= -3723.0PHV=     30.0SPD=    100.0BAS=      2.0FNO=      1.0
TEXT
WKE-WB (SEG 4-6)
FLO= -3000.0PHV=     30.0SPD=    100.0BAS=      2.0FNO=      2.0
TEXT
SLIP1-EB (SEG 7-9)
FLO= -1562.0PHV=     30.0SPD=     50.0BAS=      2.0FNO=      3.0
TEXT
```

"roadNoise" Input Data File Sample

```
SLIP1-WB (SEG 10-14)
FLO= -1562.0PHV=     30.0SPD=     50.0BAS=      2.0FNO=      4.0
TEXT
SLIP2-EB (SEG 15-17)
FLO= -1508.0PHV=     30.0SPD=     50.0BAS=      2.0FNO=      5.0
TEXT
SLIP2-WB (SEG 18-20)
FLO= -2215.0PHV=     30.0SPD=     50.0BAS=      2.0FNO=      6.0
TEXT
LINK ROAD  L
FLO= -1562.0PHV=     30.0SPD=     50.0BAS=      2.0FNO=      7.0
TEXT
LINK ROAD G
FLO= -1562.0PHV=     30.0SPD=     50.0BAS=      2.0FNO=      8.0
RETN      0.0
```

WKR.SEG

```
TEXT
WKE-EB (SEG 1-3)
UFN=      1.0CAT=      1.0RSX=832368.4RSY=821574.1HCS=     18.6HCG=      0.0
SEG=      1.0NCY=      1.0WCY=      7.0DCY=      0.0HCY=      0.0
RST=      0.0RTD=      1.5GND=      0.0NBA=     -1.0RCT=      0.0
REX=832562.6REY=821492.7HCE=     18.8SEND       .0
REX=832747.8REY=821417.3HCE=     19.5SEND       .0
REX=832947.8REY=821335.7HCE=     20.9SEND       .0
TEXT
WKE-WB (SEG 4-6)
UFN=      2.0RSX=832941.3RSY=821320.1HCS=     20.9
REX=832742.0REY=821402.8HCE=     19.5SEND       .0
REX=832556.6REY=821478.6HCE=     18.8SEND       .0
REX=832361.9REY=821559.0HCE=     18.6SEND       .0
TEXT
SLIP1-EB (SEG 7-9)
UFN=      3.0RSX=832373.0RSY=821584.9HCS=     18.6
WCY=      4.0
REX=832513.6REY=821528.6HCE=     15.5SEND       .0
REX=832571.4REY=821509.6HCE=     13.0SEND       .0
REX=832619.7REY=821489.6HCE=     13.0SEND       .0
TEXT
SLIP1-WB (SEG 10-14)
UFN=      4.0RSX=832934.8RSY=821305.9HCS=      5.0
REX=832798.4REY=821356.6HCE=      5.0SEND       .0
REX=832711.3REY=821398.0HCE=      9.0SEND       .0
REX=832606.1REY=821437.4HCE=     12.0SEND       .0
REX=832502.4REY=821485.8HCE=     18.5SEND       .0
REX=832358.3REY=821550.1HCE=     18.5SEND       .0
TEXT
SLIP2-EB (SEG 15-17)
UFN=      5.0RSX=832372.6RSY=821602.4HCS=     18.8
REX=832424.9REY=821576.9HCE=     18.8SEND       .0
REX=832631.5REY=821497.7HCE=     19.3SEND       .0
REX=832834.2REY=821389.8HCE=     19.5SEND       .0
TEXT
SLIP2-WB (SEG 18-20)
UFN=      6.0RSX=832779.9RSY=821379.2HCS=     19.5
REX=832668.5REY=821402.5HCE=     19.0SEND       .0
REX=832541.7REY=821448.1HCE=     10.0SEND       .0
REX=832347.3REY=821534.0HCE=      8.6SEND       .0
RETN      0.0
```

"roadNoise" Input Data File Sample

WKR-L.SEG

```
TEXT
LINK ROAD G (SEG 1-6)
UFN=      8.0CAT=      1.0RSX=832619.6RSY=821489.8HCS=     13.0HCG=      0.0
SEG=      1.0NCY=      1.0WCY=      4.0DCY=      0.0HCY=      0.0
RST=      0.0RTD=      1.5GND=      0.0NBA=     -1.0RCT=      0.0
REX=832686.4REY=821462.9HCE=     13.0SEND       .0
REX=832760.6REY=821464.5HCE=     12.9SEND       .0
REX=832828.6REY=821497.3HCE=     15.7SEND       .0
REX=832906.4REY=821585.9HCE=      6.7SEND       .0
REX=832933.1REY=821650.0HCE=      5.3SEND       .0
REX=832941.8REY=821742.8HCE=      4.6SEND       .0
TEXT
LINK ROAD L (SEG 7-15)
UFN=      7.0RSX=832819.0RSY=821386.0HCS=     11.1
REX=832857.2REY=821482.9HCE=      8.1SEND       .0
REX=832854.8REY=821533.4HCE=      6.5SEND       .0
REX=832825.1REY=821567.6HCE=      5.0SEND       .0
REX=832781.7REY=821576.7HCE=      5.0SEND       .0
REX=832738.8REY=821551.2HCE=      6.3SEND       .0
REX=832722.9REY=821508.3HCE=      6.0SEND       .0
REX=832739.4REY=821457.6HCE=      4.9SEND       .0
REX=832845.9REY=821397.5HCE=      4.4SEND       .0
REX=832957.3REY=821355.1HCE=      4.4SEND       .0
RETN      0.0
```

WKR-S.SEG

```
TEXT
LINK ROAD G (SEG 1-7)
UFN=      8.0CAT=      1.0RSX=832619.8RSY=821489.6HCS=     13.0HCG=      0.0
SEG=      1.0NCY=      1.0WCY=      4.0DCY=      0.0HCY=      0.0
RST=      0.0RTD=      1.5GND=      0.0NBA=     -1.0RCT=      0.0
REX=832678.8REY=821463.8HCE=     13.0SEND       .0
REX=832733.9REY=821465.1HCE=     11.2SEND       .0
REX=832794.8REY=821498.8HCE=     10.0SEND       .0
REX=832864.2REY=821498.4HCE=      8.6SEND       .0
REX=832910.8REY=821522.3HCE=      7.4SEND       .0
REX=832936.8REY=821630.6HCE=      5.3SEND       .0
REX=832951.9REY=821749.7HCE=      4.6SEND       .0
TEXT
LINK ROAD L (SEG 8-13)
UFN=      7.0RSX=832818.7RSY=821390.3HCS=     11.1
REX=832842.0REY=821451.9HCE=      9.3SEND       .0
REX=832831.3REY=821479.9HCE=      8.4SEND       .0
REX=832798.4REY=821485.9HCE=      7.5SEND       .0
REX=832768.8REY=821460.4HCE=      5.7SEND       .0
REX=832784.3REY=821418.9HCE=      3.9SEND       .0
REX=832957.4REY=821355.1HCE=      4.4SEND       .0
RETN      0.0
```

WKR.HSE

```
TEXT
BUS DEPOT (1-2)
NBA=      1.0BSX=832672.2BSY=821649.8HBS=     25.0FOA=      0.0WBA=      0.0
             BEX=832752.8BEY=821874.5HBE=     25.0
TEXT
BUS DEPOT (1-2)
```

"roadNoise" Input Data File Sample

```
NBA=      2.0BSX=832716.7BSY=821644.8HBS=     25.0
             BEX=832716.6BEY=821875.3HBE=     25.0
RETN      0.0

WKR.BAR
TEXT
BARRIER 1
NBA=      1.0BSX=832365.6BSY=821566.5HBS=     23.6FOA=      0.0WBA=      0.0
             BEX=832944.1BEY=821327.4HBE=     25.9
TEXT
BARRIER 2
NBA=      2.0BSX=832374.6BSY=821589.4HBS=     23.6
             BEX=832532.1BEY=821527.1HBE=     20.5
TEXT
BARRIER 3
NBA=      3.0BSX=832514.6BSY=821521.8HBS=     23.6
             BEX=832748.4BEY=821425.3HBE=     24.5
TEXT
BARRIER 4
NBA=      4.0BSX=832720.6BSY=821455.7HBS=     24.3
             BEX=832837.6BEY=821393.7HBE=     25.2
TEXT
BARRIER 4
NBA=      5.0BSX=832835.9BSY=821390.6HBS=     25.2
             BEX=832952.9BEY=821343.2HBE=     25.9
TEXT
PODIUM (6-8)
NBA=      6.0BSX=832675.3BSY=821682.9HBS=     15.0
             BEX=832696.9BEY=821802.5HBE=     15.0
NBA=      7.0BEX=832599.8BEY=821820.4HBE=     15.0
NBA=      8.0BEX=832573.3BEY=821763.8HBE=     15.0
TEXT
BUILDINGS (9-14)
NBA=      9.0BSX=832670.5BSY=821677.8HBS=     99.0
             BEX=832586.6BEY=821716.8HBE=     99.0
TEXT
BUILDINGS (9-14)
NBA=     10.0BSX=832663.1BSY=821702.6HBS=     99.0
             BEX=832649.6BEY=821672.3HBE=     99.0
TEXT
BUILDINGS (9-14)
NBA=     11.0BSX=832634.4BSY=821711.9HBS=     99.0
             BEX=832621.6BEY=821683.4HBE=     99.0
TEXT
BUILDINGS (9-14)
NBA=     12.0BSX=832621.6BSY=821752.3HBS=     99.0
             BEX=832595.1BEY=821695.9HBE=     99.0
TEXT
BUILDINGS (9-14)
NBA=     13.0BSX=832570.6BSY=821758.8HBS=     99.0
             BEX=832630.1BEY=821730.6HBE=     99.0
TEXT
BUILDINGS (9-14)
NBA=     14.0BSX=832593.1BSY=821765.3HBS=     99.0
             BEX=832579.4BEY=821737.2HBE=     99.0
RETN      0.0

WKR.REC
TEXT
```

"roadNoise" Input Data File Sample

```
1     PT-C
HRA=     16.2HRG=     11.2OPX=832647.3OPY=821669.3AN1=     90.0AN2=    315.0
REF=      1.0GO          .0
HPF=      2.8RPT=       9.0
RETN      0.0

WKR1.REC
TEXT
1     PT-C
HRA=     44.2HRG=     39.2OPX=832647.3OPY=821669.3AN1=     90.0AN2=    315.0
REF=      1.0GO          .0
HPF=      2.8RPT=       9.0
RETN      0.0

WKR2.REC
TEXT
1     PT-C
HRA=     72.2HRG=     67.2OPX=832647.3OPY=821669.3AN1=     90.0AN2=    315.0
REF=      1.0GO          .0
HPF=      2.8RPT=       9.0
RETN      0.0
```

APPENDIX C

COMPUTER PLOT OF "ROADNOISE" NOISE MODEL

Figure 1 Case (i) Original Layout before Changes

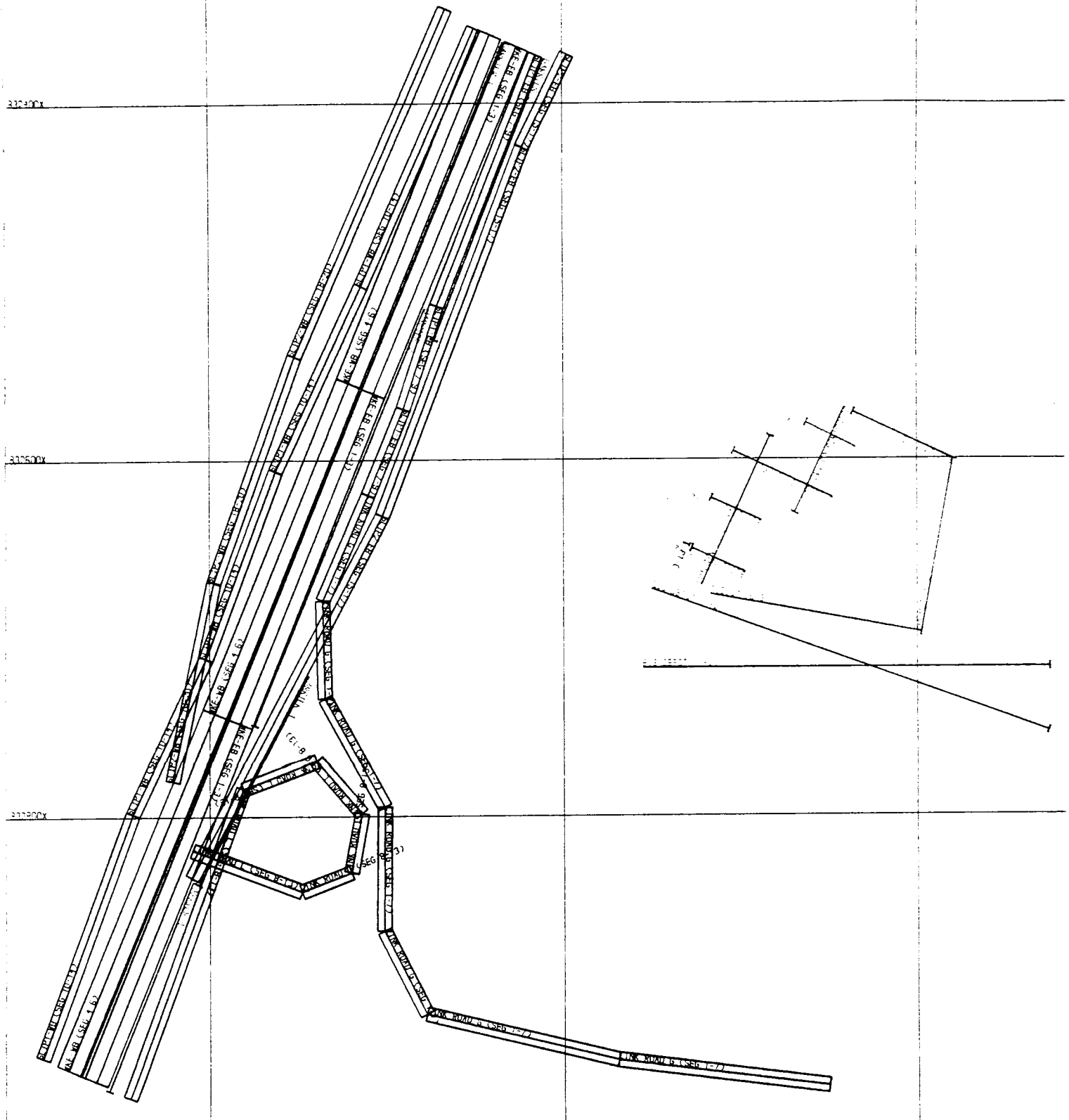
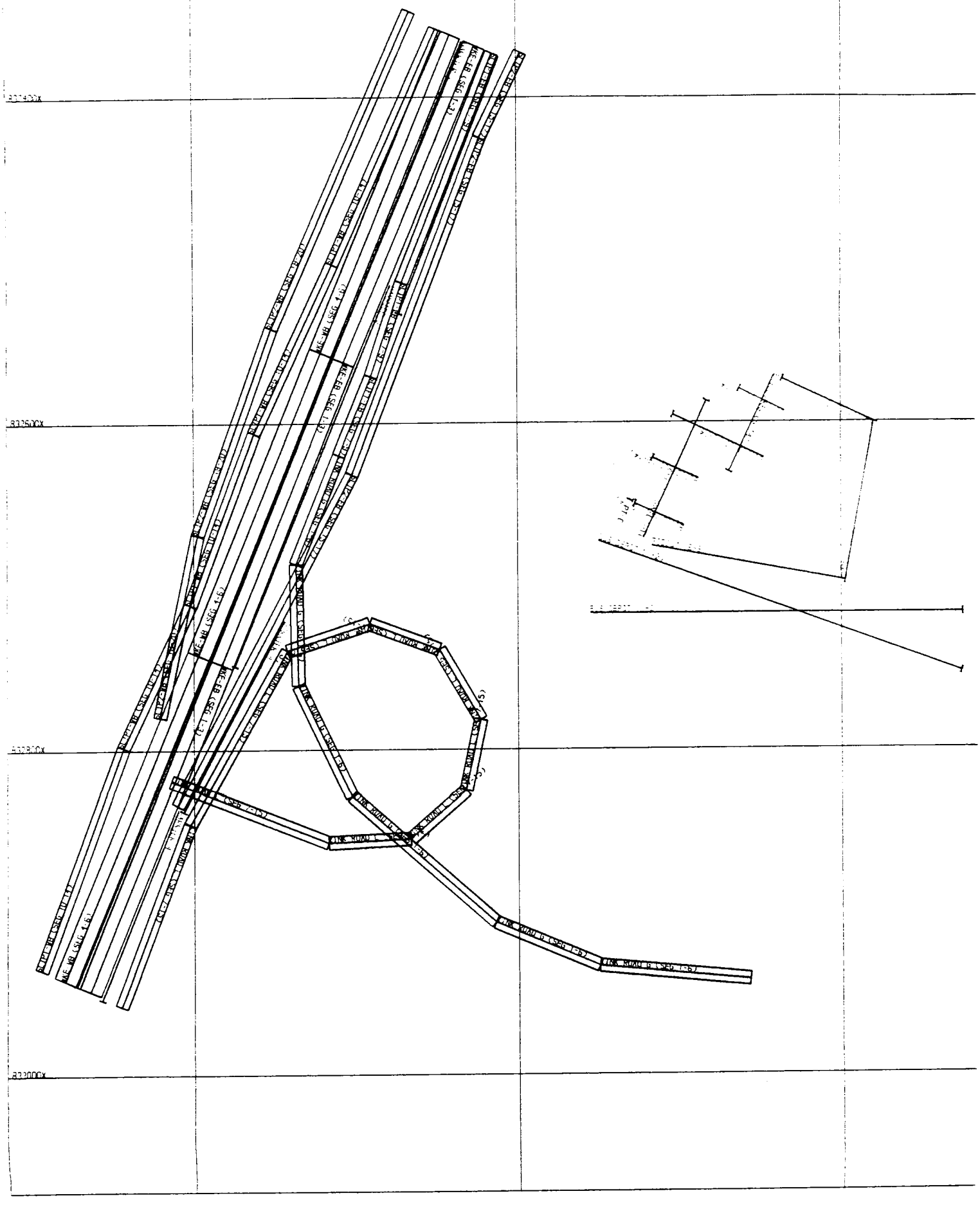


Figure 2 Case (ii) Current Layout after Changes



APPENDIX D

EMISSION FACTORS ADOPTED IN "CALINE4" MODEL

Project: West Kowloon Reclamation (Link Roads L & G)
Subject: Traffic Related Air Quality Modelling ("CALINE4")
Design Year: 2011
Peak Flow (AM)

1 mi = 1.6093 km

Emission Factor (gm/km)

Pollutant	P/C-p	Taxi	LGV-d	HGV	PuBus
NOx	1.321	0.799	1.54	7.061	8.578

Vehicle Composition by Percantage (%)

Flow	P/C-p	Taxi	LGV-d	HGV	PuBus
Flo 1	35.0	35.0	10.0	10.0	10.0
Flo 2	35.0	35.0	10.0	10.0	10.0
Flo 3	35.0	35.0	10.0	10.0	10.0
Flo 4	35.0	35.0	10.0	10.0	10.0
Flo 5	35.0	35.0	10.0	10.0	10.0
Flo 6	35.0	35.0	10.0	10.0	10.0
Flo 7	35.0	35.0	10.0	10.0	10.0
Flo 8	35.0	35.0	10.0	10.0	10.0

Vehicle Composite Emission Factor (gm/km)

Flow		P/C-p	Taxi	LGV-d	HGV	PuBus
Flo 1	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 2	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 3	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 4	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 5	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 6	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 7	NOx	0.4624	0.2797	0.1540	0.7061	0.8578
Flo 8	NOx	0.4624	0.2797	0.1540	0.7061	0.8578

Composite E.F. for NO_2 is approximately 1/5 of the Nox E.F.

	Pollutant	E.F. (gm/km)	E.F. (gm/mi)
Flo 1	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 2	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 3	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 4	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 5	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 6	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 7	NOx	2.460	3.959
	NO_2	0.492	**0.792**
Flo 8	NOx	2.460	3.959
	NO_2	0.492	**0.792**

APPENDIX EA3 TRAFFIC EMISSION AIR QUALITY MODELLING

AIR QUALITY MODELLING

Parameters

NO_2 impacts were studied

Criteria

The Hong Kong Air Quality Objectives are used as the guidelines.

Methodology

The traffic-related air pollution concentration were predicted using CALINE 4 model which is a line source model developed by the California Department of Transportation.

The following inputs to the model were assumed:

(a) Meteorology conditions
Typical worst -case parameters were used

Wind speed:	1m/s
Wind direction:	worse-case
Stability class:	D
Temperature:	25°C
Wind direction variation:	18°

(b) Line sources

Parameters of road configuration were estimated as follows:

Surface roughness:	100 cm
Mixing width:	road width + 3m per side
Source height:	road elevation

Emission factors for Nox were based on values form EPD's 2011 fleet average emission factors. A 20% of NOx to NO_2 conversion was used instead of the Discrete Parcel Method

APPENDIX E

"CALINE4" MODEL OUTPUT FILE SAMPLE

WKR-AM.LST

```
1                        IBM-PC VERSION 1.60
                  (C) COPYRIGHT 1987 , TRINITY CONSULTANTS, INC.
                  SERIAL NUMBER 6949
                  SOLD TO MOTT MACDONALD
                  RUN BEGAN ON 11-09-99 AT 14:26:55

          CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                   JUNE 1989 VERSION
                   PAGE   1

              JOB: WKR(unaltered roads)  set 11mPD=0
              RUN: NO2                (WORST CASE ANGLE)
       POLLUTANT:      NO2


   I.  SITE VARIABLES

         U=   1.0 M/S              Z0=  50. CM              ALT=     0. (M)
       BRG= WORST CASE             VD=   .0 CM/S
      CLAS=     4 (D)              VS=   .0 CM/S
      MIXH=  500. M                AMB=  .0 PPM
     SIGTH=   18. DEGREES          TEMP= 25.0 DEGREE (C)


   II.  LINK VARIABLES

        LINK       *  LINK COORDINATES (M)    *                  EF      H      W
     DESCRIPTION   *   X1     Y1     X2     Y2  * TYPE  VPH   (G/MI)   (M)    (M)
-----------------*-------------------------------*-------------------------------
A. 1             * ***** ***** ***** *****  *  AG    3723  792.0     7.7   20.0
B. 2             * ***** ***** ***** *****  *  AG    3723  792.0     8.1   20.0
C. 3             * ***** ***** ***** *****  *  AG    3723  792.0     9.2   20.0
D. 4             * ***** ***** ***** *****  *  AG    3000  792.0     9.2   20.0
E. 5             * ***** ***** ***** *****  *  AG    3000  792.0     8.1   20.0
F. 6             * ***** ***** ***** *****  *  AG    3000  792.0     7.7   20.0
G. 7             * ***** ***** ***** *****  *  AG    1562  792.0     6.1   14.0
H. 8             * ***** ***** ***** *****  *  AG    1562  792.0     3.3   14.0
I. 9             * ***** ***** ***** *****  *  AG    1562  792.0     2.0   14.0
J. 10            * ***** ***** ***** *****  *  AG    1562  792.0    -6.0   14.0
K. 11            * ***** ***** ***** *****  *  AG    1562  792.0    -4.0   14.0
L. 12            * ***** ***** ***** *****  *  AG    1562  792.0     -.5   14.0
M. 13            * ***** ***** ***** *****  *  AG    1562  792.0     4.3   14.0
N. 14            * ***** ***** ***** *****  *  AG    1562  792.0     7.5   14.0
O. 15            * ***** ***** ***** *****  *  AG    1508  792.0     7.8   14.0
P. 16            * ***** ***** ***** *****  *  AG    1508  792.0     8.1   14.0
Q. 17            * ***** ***** ***** *****  *  AG    1508  792.0     8.4   14.0
R. 18            * ***** ***** ***** *****  *  AG    2215  792.0     8.3   14.0
S. 19            * ***** ***** ***** *****  *  AG    2215  792.0     3.5   14.0
T. 20            * ***** ***** ***** *****  *  AG    2215  792.0    -1.7   14.0


1

          CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                   JUNE 1989 VERSION
                   PAGE   2

              JOB: WKR(unaltered roads)  set 11mPD=0
              RUN: NO2                (WORST CASE ANGLE)
```

POLLUTANT: NO2

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. V1-10m	832647	821669	4.0
2. V1-20m	832647	821669	14.0
3. V1-30m	832647	821669	24.0
4. V1-40m	832647	821669	34.0
5. V1-50m	832647	821669	44.0
6. V1-60m	832647	821669	54.0
7. V1-70m	832647	821669	64.0
8. V1-80m	832647	821669	74.0
9. V1-90m	832647	821669	84.0
10. V1-100m	832647	821669	94.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. V1-10m	229.	30.9	8.4	.1	.0	.0	.0	6.7	2.8	1.3
2. V1-20m	230.	27.4	7.5	.0	.0	.0	.0	6.0	2.6	1.0
3. V1-30m	231.	21.4	5.9	.0	.0	.0	.0	4.7	2.0	.6
4. V1-40m	156.	15.3	.0	2.0	3.4	3.1	1.2	.0	.0	.0
5. V1-50m	154.	10.7	.0	1.0	2.9	2.5	.6	.0	.0	.0
6. V1-60m	151.	7.1	.0	.4	2.3	1.9	.2	.0	.0	.0
7. V1-70m	150.	4.5	.0	.2	1.5	1.2	.1	.0	.0	.0
8. V1-80m	147.	2.7	.0	.1	1.1	.8	.0	.0	.0	.0
9. V1-90m	146.	1.6	.0	.0	.6	.4	.0	.0	.0	.0
10. V1-100m	146.	.9	.0	.0	.3	.2	.0	.0	.0	.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: WKR(unaltered roads) set 11mPD=0
RUN: NO2 (WORST CASE ANGLE)
POLLUTANT: NO2

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. V1-10m	.0	.0	.0	.0	.5	2.9	.1	3.9	.0	.0	.0	4.2
2. V1-20m	.0	.0	.0	.0	.4	2.6	.1	3.3	.0	.0	.0	3.9
3. V1-30m	.0	.0	.0	.0	.2	2.2	.1	2.4	.0	.0	.0	3.2
4. V1-40m	.0	.9	1.0	.2	.0	.0	.0	.0	2.0	1.3	.0	.0
5. V1-50m	.0	.8	.7	.1	.0	.0	.0	.0	1.2	.8	.0	.0
6. V1-60m	.0	.8	.4	.0	.0	.0	.0	.0	.6	.4	.0	.0
7. V1-70m	.0	.7	.3	.0	.0	.0	.0	.0	.3	.2	.0	.0

8. V1-80m	*	.0	.5	.1	.0	.0	.0	.0	.0	.1	.1	.0	.0
9. V1-90m	*	.0	.4	.1	.0	.0	.0	.0	.0	.1	.0	.0	.0
10. V1-100m	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

1

RUN ENDED ON 11-09-99 AT 14:26:59

WKR-AMS

1

IBM-PC VERSION 1.60
(C) COPYRIGHT 1987 , TRINITY CONSULTANTS, INC.
SERIAL NUMBER 6949
SOLD TO MOTT MACDONALD
RUN BEGAN ON 11-09-99 AT 14:27:45

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: WKR(Roads proposed by HYDER) set 7mPD=0
RUN: NO2 (WORST CASE ANGLE)
POLLUTANT: NO2

I. SITE VARIABLES

U=	1.0 M/S	Z0=	50. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	4 (D)	VS=	.0 CM/S		
MIXH=	500. M	AMB=	.0 PPM		
SIGTH=	18. DEGREES	TEMP=	25.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. 1	*	*****	*****	*****	*****	* AG	1562	792.0	6.0	14.0
B. 2	*	*****	*****	*****	*****	* AG	1562	792.0	5.1	14.0
C. 3	*	*****	*****	*****	*****	* AG	1562	792.0	3.6	14.0
D. 4	*	*****	*****	*****	*****	* AG	1562	792.0	2.3	14.0
E. 5	*	*****	*****	*****	*****	* AG	1562	792.0	1.0	14.0
F. 6	*	*****	*****	*****	*****	* AG	1562	792.0	-.7	14.0
G. 7	*	*****	*****	*****	*****	* AG	1562	792.0	-2.1	14.0
H. 8	*	*****	*****	*****	*****	* AG	1562	792.0	3.2	14.0
I. 9	*	*****	*****	*****	*****	* AG	1562	792.0	1.9	14.0
J. 10	*	*****	*****	*****	*****	* AG	1562	792.0	.9	14.0
K. 11	*	*****	*****	*****	*****	* AG	1562	792.0	-.4	14.0
L. 12	*	*****	*****	*****	*****	* AG	1562	792.0	-2.2	14.0
M. 13	*	*****	*****	*****	*****	* AG	1562	792.0	-2.9	14.0

1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: WKR(Roads proposed by HYDER) set 7mPD=0
RUN: NO2 (WORST CASE ANGLE)
POLLUTANT: NO2

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. V1-10m	832647	821669	8.0
2. V1-20m	832647	821669	18.0
3. V1-30m	832647	821669	28.0
4. V1-40m	832647	821669	38.0
5. V1-50m	832647	821669	48.0
6. V1-60m	832647	821669	58.0
7. V1-70m	832647	821669	68.0
8. V1-80m	832647	821669	78.0
9. V1-90m	832647	821669	88.0
10. V1-100m	832647	821669	98.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. V1-10m	142.	11.0	.0	.2	1.8	1.4	.2	.0	.0	1.3
2. V1-20m	142.	9.5	.0	.2	1.5	1.2	.2	.0	.0	1.2
3. V1-30m	142.	7.4	.0	.1	1.1	.9	.1	.0	.0	.9
4. V1-40m	142.	5.2	.0	.1	.7	.5	.1	.0	.0	.7
5. V1-50m	142.	3.3	.0	.0	.4	.3	.1	.0	.0	.4
6. V1-60m	142.	2.0	.0	.0	.2	.1	.0	.0	.0	.3
7. V1-70m	142.	1.1	.0	.0	.1	.1	.0	.0	.0	.1
8. V1-80m	142.	.6	.0	.0	.0	.0	.0	.0	.0	.1
9. V1-90m	141.	.3	.0	.0	.0	.0	.0	.0	.0	.0
10. V1-100m	140.	.2	.0	.0	.0	.0	.0	.0	.0	.0

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CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: WKR(Roads proposed by HYDER) set 7mPD=0
RUN: NO2 (WORST CASE ANGLE)
POLLUTANT: NO2

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M
1. V1-10m	.6	.9	1.1	.8	2.6
2. V1-20m	.6	.8	.9	.7	2.4
3. V1-30m	.4	.6	.7	.5	2.1
4. V1-40m	.3	.3	.4	.4	1.7

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  5. V1-50m    *    .2    .2    .2    .2   1.2
  6. V1-60m    *    .1    .1    .1    .1    .9
  7. V1-70m    *    .1    .0    .1    .1    .6
  8. V1-80m    *    .0    .0    .0    .0    .4
  9. V1-90m    *    .0    .0    .0    .0    .2
 10. V1-100m   *    .0    .0    .0    .0    .1

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 RUN ENDED ON 11-09-99 AT 14:27:47
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WKR-AML.LST

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1                          IBM-PC VERSION 1.60
                      (C) COPYRIGHT 1987 , TRINITY CONSULTANTS, INC.
                      SERIAL NUMBER 6949
                      SOLD TO MOTT MACDONALD
                      RUN BEGAN ON 11-09-99 AT 14:27:47

             CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                      JUNE 1989 VERSION
                      PAGE   1

                 JOB: WKR(Roads proposed by MCL) set 7mPD=0
                 RUN: NO2                (WORST CASE ANGLE)
          POLLUTANT:       NO2


    I.  SITE VARIABLES

          U=    1.0 M/S              Z0=  50. CM              ALT=      0. (M)
        BRG= WORST CASE              VD=    .0 CM/S
       CLAS=      4 (D)              VS=    .0 CM/S
       MIXH=   500. M                AMB=   .0 PPM
      SIGTH=    18. DEGREES         TEMP= 25.0 DEGREE (C)


    II.  LINK VARIABLES

         LINK        *  LINK COORDINATES (M)    *                EF      H      W
      DESCRIPTION    *   X1     Y1     X2     Y2  * TYPE  VPH  (G/MI)   (M)    (M)
  ----------------*-------------------------------*-----------------------------
  A. 1            * ***** ***** ***** *****  *  AG    1562 792.0     6.0   14.0
  B. 2            * ***** ***** ***** *****  *  AG    1562 792.0     5.9   14.0
  C. 3            * ***** ***** ***** *****  *  AG    1562 792.0     7.3   14.0
  D. 4            * ***** ***** ***** *****  *  AG    1562 792.0     4.2   14.0
  E. 5            * ***** ***** ***** *****  *  AG    1562 792.0    -1.0   14.0
  F. 6            * ***** ***** ***** *****  *  AG    1562 792.0    -2.1   14.0
  G. 7            * ***** ***** ***** *****  *  AG    1562 792.0     2.6   14.0
  H. 8            * ***** ***** ***** *****  *  AG    1562 792.0      .3   14.0
  I. 9            * ***** ***** ***** *****  *  AG    1562 792.0    -1.3   14.0
  J. 10           * ***** ***** ***** *****  *  AG    1562 792.0    -2.0   14.0
  K. 11           * ***** ***** ***** *****  *  AG    1562 792.0    -1.4   14.0
  L. 12           * ***** ***** ***** *****  *  AG    1562 792.0     -.9   14.0
  M. 13           * ***** ***** ***** *****  *  AG    1562 792.0    -1.6   14.0
  N. 14           * ***** ***** ***** *****  *  AG    1562 792.0    -2.4   14.0
  O. 15           * ***** ***** ***** *****  *  AG    1562 792.0    -2.6   14.0

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CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: WKR(Roads proposed by MCL) set 7mPD=0
RUN: NO2 (WORST CASE ANGLE)
POLLUTANT: NO2

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. V1-10m	832647	821669	8.0
2. V1-20m	832647	821669	18.0
3. V1-30m	832647	821669	28.0
4. V1-40m	832647	821669	38.0
5. V1-50m	832647	821669	48.0
6. V1-60m	832647	821669	58.0
7. V1-70m	832647	821669	68.0
8. V1-80m	832647	821669	78.0
9. V1-90m	832647	821669	88.0
10. V1-100m	832647	821669	98.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. V1-10m	141.	14.5	.0	.6	2.0	.7	.0	.0	2.0	.6
2. V1-20m	141.	12.0	.0	.5	1.7	.6	.0	.0	1.8	.5
3. V1-30m	141.	8.8	.0	.3	1.2	.4	.0	.0	1.4	.3
4. V1-40m	141.	5.7	.0	.2	.8	.3	.0	.0	1.0	.2
5. V1-50m	141.	3.5	.0	.1	.5	.2	.0	.0	.7	.1
6. V1-60m	141.	2.0	.0	.0	.3	.1	.0	.0	.4	.1
7. V1-70m	141.	1.1	.0	.0	.1	.0	.0	.0	.2	.0
8. V1-80m	140.	.6	.0	.0	.0	.0	.0	.0	.1	.0
9. V1-90m	140.	.3	.0	.0	.0	.0	.0	.0	.0	.0
10. V1-100m	139.	.1	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: WKR(Roads proposed by MCL) set 7mPD=0
RUN: NO2 (WORST CASE ANGLE)
POLLUTANT: NO2

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O

1.	V1-10m	*	.2	.4	2.0	1.8	.8	1.8	1.6
2.	V1-20m	*	.2	.3	1.5	1.3	.6	1.6	1.5
3.	V1-30m	*	.1	.2	.9	.8	.4	1.3	1.3
4.	V1-40m	*	.1	.1	.4	.3	.2	1.0	1.1
5.	V1-50m	*	.0	.0	.1	.1	.1	.7	.8
6.	V1-60m	*	.0	.0	.0	.0	.0	.4	.6
7.	V1-70m	*	.0	.0	.0	.0	.0	.2	.4
8.	V1-80m	*	.0	.0	.0	.0	.0	.1	.3
9.	V1-90m	*	.0	.0	.0	.0	.0	.1	.2
10.	V1-100m	*	.0	.0	.0	.0	.0	.0	.1

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RUN ENDED ON 11-09-99 AT 14:27:49