

Hong Kong Housing Authority

**TERM TRAFFIC ENGINEERING  
CONSULTANCY 1996 - 1999**

**EIA OF  
PUBLIC ROADS AT TIU KENG LENG  
VOLUME III**

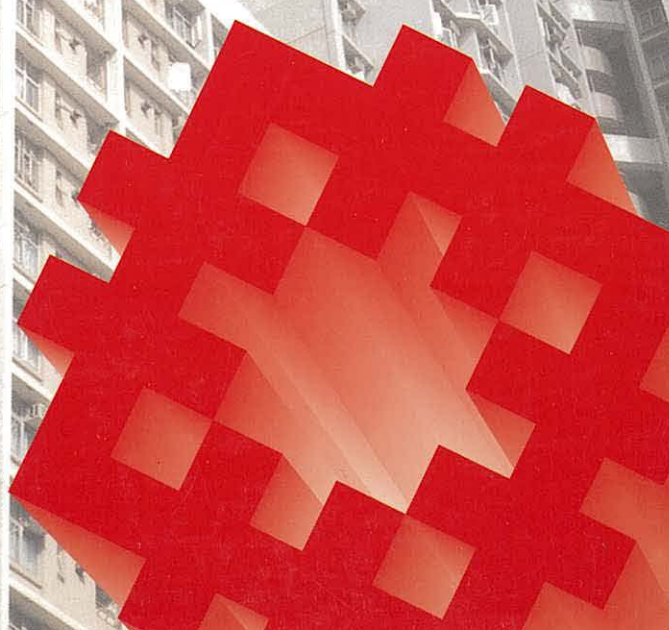
**EXECUTIVE SUMMARY  
FINAL**



MVA ASIA Limited

EIA-146.2/  
BC

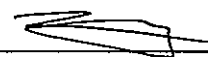
EIA-146.2/BC



**EIA OF  
PUBLIC ROADS AT TIU KENG LENG  
VOLUME III**

**EXECUTIVE SUMMARY  
FINAL**

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	<b>Name</b>	<b>Title</b>	<b>Signature</b>	<b>Date</b>
<b>Prepared by</b>	Kent Liang	Asst. Traffic Engineer		28 March 1998
<b>Checked by</b>	Kelvin Leung	Director	KL	28 March 1998
<b>Approved by</b>	Kelvin Leung	Director	KL	28 March 1998

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**MVA ASIA LIMITED**

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# HOUSING AUTHORITY

## EIA of Public Roads at Tiu Keng Leng Volume III

Executive Summary  
Final  
March 1998

CES (Asia) Ltd.  
Room 1201, Tai Yau Building  
181 Johnston Road, Wanchai, Hong Kong  
Tel: (852) 2893 1551 Fax: (852) 2891 0305  
Email: CESAL@CEnvSci.com



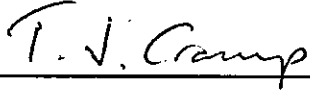
## QUALITY ASSURANCE POLICY STATEMENT

CES (Asia) Ltd is committed to provide to our clients the most responsive and professional environmental consulting services in Asia.

It is the Company's objective to provide services which meet the required specification and are produced on time in a cost-effective manner.

In pursuit of these objectives, the Directors have implemented Quality Systems which have achieved Third Party Certification to BS EN ISO 9001:1994 Standard. All employees of the Company have a responsibility for quality.

The quality procedures are under continual review by Senior Management to ensure that the changing needs of the Company's Clients are met.

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STATUS	Final
DATE OF ISSUE	27 March 1998
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## 1 INTRODUCTION

### 1.1 Background

CES (Asia) Ltd were appointed by MVA to carry out the Environmental Impact Assessment (EIA) of for the construction of public roads at Tiu Keng Leng on behalf of the Hong Kong Housing Authority (HKHA). The general location plan of this project is shown in Figure 1.1 and Figure 1.2 (which also shows phasing of the roads construction programme).

### 1.2 EIA Study Area

The boundary of the study area for the purpose of this EIA was taken as 300m from either side and along the full stretch of the proposed road alignments (see Figure 1.1). However, for the visual impact assessment the study area was taken as the furthest distance of visibility.

### 1.3 Scope of EIA

The scope of this EIA study was to provide information on the nature and extent of impacts arising from the construction and operation of Roads D4, D8, L731 and L732 at Tiu Keng Leng, Kowloon. The objective was to establish whether residual impacts are predicted to be within the established standards/guidelines after any mitigation proposals are implemented.

This EIA examined construction phase noise impacts, operation phase traffic noise and visual/landscape impacts from the new roadworks on existing and future sensitive receivers. The EIA also included the specification of monitoring/audit requirements.

## 2 DESCRIPTION OF THE SITE

The Tiu Keng Leng area will be developed largely for residential use. The range of developments will include private housing, public housing, private sector participation schemes (PSPS), Home Ownership Scheme (HOS), Sandwich Class housing, and supporting services such as commercial centres, schools and recreational facilities.

The works, to be completed under this HKHA contract, will also comprise the construction of drainage facilities and pavements. The roadworks are scheduled for commencement in February 1999 and completion by August 2002. The estimated completion dates of the various roads are shown in Figure 1.2.

## 3 SENSITIVE RECEIVERS

Sensitive receivers were categorised as noise sensitive receivers, visual sensitive receivers and land use sensitive receivers.

Representative noise sensitive receivers were selected for assessment purposes.

Visual sensitive receivers included the future residents in the immediate area and people located in, or travelling through, public land: such as travelling along roads or walking in hilly areas.

There are no land use sensitive receivers affected by the construction of the new roads. This is because all land required for the construction of the new roads has to be created to accommodate the development.

#### 4 POTENTIAL ENVIRONMENTAL IMPACTS

##### 4.1 Construction Phase Noise Impacts

There is concern that there may be impacts caused by the construction activities, particularly as there will be interface between population intake in some areas and ongoing roadworks in others. The construction phase noise assessment took into account construction programming and proposed powered mechanical equipment usage specified by HKHA.

The results of the assessment indicated that there would be exceedance of the recommended non-statutory day time criteria at the Po Yin Temple, a residential block on the south western corner of Area 57, and a residential block on the north western corner of Area 67 (i.e. 3 out of the 5 selected representative receivers (60%)), assuming no mitigation. The highest exceedances were found to be caused mainly by the pavement works. However, with the adoption of mitigation, including the use of quieter equipment and screening where appropriate, it was predicted that there would be no exceedances of the non-statutory day time criteria. It is anticipated that there will not be any construction activities during the restricted hours.

##### 4.2 Operational Phase Traffic Noise Impact

This assessment was undertaken to:

- evaluate the extent of noise impacts arising from the proposed new public road
- establish if mitigation measures are required
- identify whether residual impacts arise following the implementation of mitigation measures

The assessment was based on 2016 AM peak hour traffic flow projections. The future worst case unmitigated scenario, for year 2016, was represented by a scheme which included no noise mitigation on roads D4, D8, L731, and L732 but included mitigation measures on the roads outwith the study brief. These included a 2m high noise barrier on Road P2 flyover adjacent to Area 57 north and Area 74 north and a deckover spanning a portion of Road D4 between Area 67 north and Area 57 south.

The predicted noise levels, in general, resulted from future traffic serving the new developments. The present EIA study indicated exceedances of the criteria at different locations. Various mitigation measures for the new roads were considered. These included noise barriers, use of podium and deck-over structures. However, the following were found to be the only practical and effective measures in reducing impacts:

- 5m barriers with a 3m cantilever section on the following roads:



- southbound on Road D8, between Area 73B (MTRC) and Area 74 south to protect Area 74 south; and
- eastbound on Road D4 (at-grade section), between Area 74 south and Area 72 east.

The EIA also demonstrated that the following measures could be beneficial and it is suggested that the future road proponent assess these measures further:

- a 5m vertical roadside noise barrier to be constructed on the kerbside of the southbound carriageway of Road D8 (south of Road D4); and
- a 5m barrier with a 3m cantilever section to be constructed on the Road D4 flyover.

As a result of the implementation of these measures the residual impacts at some NSRs will exceed the Hong Kong Planning Standards and Guidelines (HKPSG) criteria. It is recommended that the building layouts should be refined during the detailed design stage. As a last resort, the affected units should be provided with acoustic insulation and air conditioning.

#### 4.3 Landscape and Visual Impacts

The study area is located on recently reclaimed land which is devoid of any vegetation. This area was formerly open sea, a natural bay and an informal cottage-type settlement. The sea is currently being reclaimed and the settlement has been demolished. The general area is part of the committed development plans for Tseung Kwan O New Town. As such, the proposed roads are entirely compatible with the wider area. Upon development, the area will form a substantial part of Tseung Kwan O (TKO). The proposed infrastructure development will therefore not result in the loss of existing vegetation or impact upon the landscape character of an otherwise featureless reclaimed platform.

There are two main areas of concern, firstly the cut slopes in the west of almost the entire alignment of roads, and secondly the extent and design of the various acoustic barriers. The landscape impact is considered to be acceptable, with mitigation wherever possible, such as landscape planting. Furthermore, it was concluded that the visual impacts of noise barriers, through the use of a number of design techniques and considerations of the mass of the barrier structure, can be reduced.

The Housing Authority, shall be responsible for the design and implementation of these measures, which will be defined during the detailed design stage. The finalised design and its implementation will be subject to approval by relevant Government Departments.

#### 4.4 Land Use Impacts

The planned future land is a residential new town with supporting commercial areas and a full range of community facilities. The provision of new public roads is essential to support the new developments under construction. It was concluded that there will be no land use impacts caused by the proposed project as the land has been intentionally formed for such use as specified in Outline Development Plan D/TKO/1C.

## 5 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Environmental Monitoring and Audit (EM&A) requirements, comprising monitoring of noise and landscaping impacts during construction of the new public roads are outlined in the Final Report and an EM& A Manual. It is recommended that the following be monitored and audited:

- construction phase noise

This would enable the following:

- checking of compliance with the EIA study recommendations;
- assessment of the effectiveness of the recommended mitigation measures; and
- identification of any further need for additional mitigation measures or remedial action.

This would ensure protection of the potentially large number of receivers in the vicinity of the works from excessively high construction work noise.

- landscape and visual impacts

This would ensure protection of existing vegetation that requires protection and the viability of future planting.

## 6 CONCLUSIONS

### 6.1 Operational Phase Traffic Noise

This EIA study has shown that in certain locations the operation of the proposed public roads will result in traffic noise levels greater than the HKPSG criteria. Practical and effective measures were recommended to reduce noise impacts.

### 6.2 Construction Phase Noise

The noise levels predicted to arise from the construction of the public roads have indicated that there will be no exceedances of the non-statutory day-time criteria at any noise sensitive receivers if mitigation measures are adopted. Construction work during the restricted hours are not proposed. It was recommended that monitoring and audit procedures be implemented to minimise noise nuisance, by ensuring that the EIA recommended mitigation measures are adopted.

### 6.3 Landscape and Visual

The landscape impacts are of concern in only one area: the slope cutting to the west, where the cut face will extend for about 1.7km. Any measures to reduce the slope gradient for landscape rehabilitation would result in even greater impacts on the natural landform, as the slope would become more extensive. The lower slopes of the headland are not of outstanding significance, but the proposals will result in the loss of some areas which are of landscape and visual value. While the proposal is not ideal from a landscape viewpoint, there would seem to be no alternative, without significantly reducing the extent of developable area on the reclamation, which would not be

acceptable if the housing needs stipulated by Hong Kong Government are to be met. The landscape impact therefore is considered to be acceptable, with mitigation such as suitable landscape planting.

The visual impacts of the proposed roads will be discussed in the review study of the Master Landscape Plan due to be completed in 1998. The proposed roads have to be seen in the context of the much larger development area comprising Area 73, Area 74, and the whole of Tseung Kwan O New Town. This context will significantly minimise the perceived visual impact. Nevertheless, the study area also forms part of the urban/rural interface of Tseung Kwan O, and will include cut faces into natural landscape areas to the west. The visual envelope will be relatively small, defined by the Lei Yue Mun headland to the north, west, and south, and by new development in the east. This will restrict the sensitive receivers to residents of Area 73 and Area 74, and people walking in the Lei Yue Mun headland area. Residents of Areas 73 and 74 will be the people who are directly served by the roads, and therefore would be more likely to accept, and benefit from the proposals. Nevertheless, acoustic barriers have been identified to mitigate against traffic noise, and these measures, together with the cut slopes to the west, could be sources of visual impact on the residents.

However, it was concluded that through the use of a number of design techniques and considerations the mass of the barrier structure can be reduced and thus mitigate the visual impacts.

Landscape rehabilitation of the cut slope should be considered essential as a prescriptive measure to the landscape impact in the long term. Hard surfacing treatment of slope face, in particular shotcreting, should be avoided as much as possible. Furthermore, consideration and assessment of the extent of any slope cutting required to reduce slope gradient for landscaping and the resultant loss in existing vegetation should be undertaken at the detailed design stage.

Furthermore at the detailed design stage the following should be considered:

- implementation of the recommendations of the Master Landscape Plan for the Tseung Kwan O Area.
- reduction of visual impacts of acoustic barriers, footbridges, etc. by implementing recommended design guidelines, such as co-ordination of design, roadside planting, and the planting of climbing plants.

#### 6.4 Land use

The land formation programme provides the platform for residential developments to proceed and the future land use includes the proposed public roadworks project as an essential part of the overall plans for the new town development.

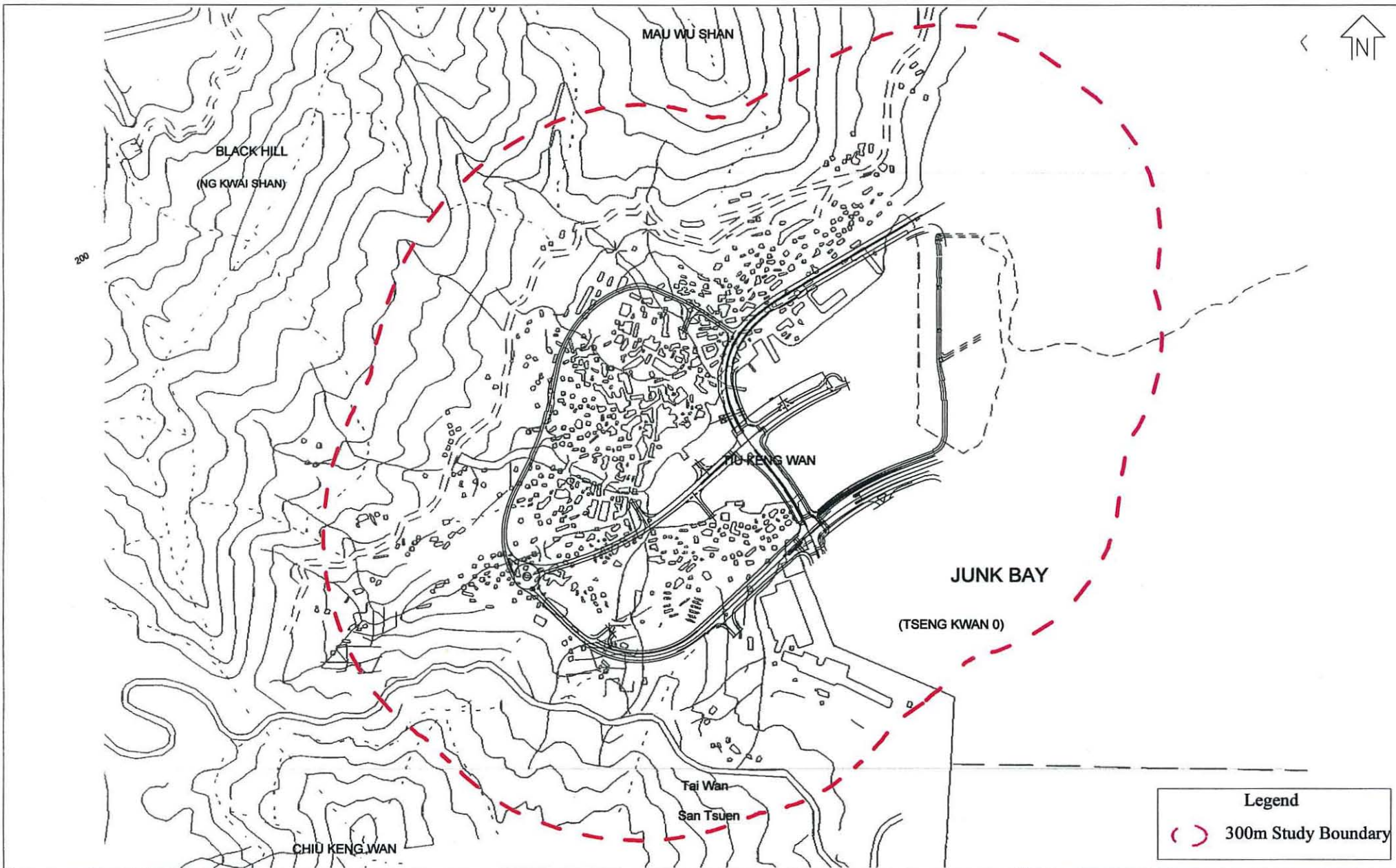
#### 6.5 Schedule of Recommended Mitigation Measures

In summary the schedule of recommended mitigation measures are detailed in Table 6.1 which defines the parties responsible for the implementation of the measures and the estimated completion times of the proposed mitigation measures. All suggested mitigation measures such as the noise barriers on Road D8, and D4 flyover, are subject to review by the project proponent for those sections of road and hence should not be considered as recommendations of this study. 11

Table 6.1 Schedule of Recommended Mitigation Measures

Mitigation Measure	Location	Purpose	Requirements	Responsible Department	Completion
<b>Operational Phase Noise Impact Mitigation Measures</b>					
5m cantilever barrier	Road D4, at-grade section, on the kerbside of the eastbound carriageway	To protect residential receivers in Area 74 south	Height = 5 m with 3m cantilever section, Length = 186m,	Housing Authority	Prior to the population intake of Area 74 south.
	Road D8, on the southbound carriageway		Height = 5 m, with 3m cantilever section, Length = 130m		
On-site mitigation e.g. barriers, setback, change in orientation, insulated glazing. (note 1)	At schools sites: <ul style="list-style-type: none"> <li>Area 73A Phase 1 and 2 Secondary and Primary schools</li> <li>Area 72 west primary school</li> <li>Area 72 east secondary schools</li> </ul>	To protect school users as listed	Subject to further study, to be completed prior to the approval of the Preliminary Project Feasibility Study and Preliminary Environmental Review Study. Recommendations and compliance criteria should be in accordance with the HKPSG	Architectural Services Department	Prior to the operation of the schools
Note: (1) The actual configuration of the mitigation measures package will be defined after the completion of further traffic noise impact assessment.					
<b>Construction Phase Noise Impact Mitigation Measures</b>					
Silenced or Quieter PME	All construction sites	To protect residential sensitive receivers in Area 59, 57 (N), 57 (S), and 67, and the place of worship (Po Yin Temple)	Sound Power levels of PME should be no higher than those specified in Table 6.1 of this final report.	Housing Authority	August 2002 (see Figure 1.2)
Screening of PME	All construction sites	To protect residential sensitive receivers in Area 59, 57 (N), 57 (S), and 67, and the place of worship (Po Yin Temple)	Equipment such as air compressors, and pneumatic breakers should be screened during operation whenever possible	Housing Authority	August 2002 (see Figure 1.2)

Mitigation Measure	Location	Purpose	Requirements	Responsible Department	Completion
Monitoring & Audit	At sensitive receiver positions as identified in Table 5.1.	To protect residential sensitive receivers in Area 59, 57 (N), 57 (S), and 67, and the place of worship (Po Yin Temple)	Noise Levels must comply with Technical Memoranda issued under the Noise Control Ordinance and <i>ProPECC note PN 2/93</i>	Housing Authority	August 2002 (see Figure 1.2)
<b>Landscape and Visual Impact Mitigation Measures</b>					
Treatment of Acoustic Structures	Road D8 (south of Road D4) and Road D4 flyover	To reduce visual impacts at the secondary school in Area 72 east and at the Road D8 roadside	To follow design guidelines as stated in this Report	Territory Development Department	Immediately after the completion of the barrier construction
	Road D8, and D4			Housing Authority	
Roadside Landscaping	To be implemented throughout the new town development,	To reduce visual impacts of the roads throughout the new town	Details will be defined in the Master Landscape Plan (MLP) for Tseung Kwan O	Housing Authority	August 2002
Monitoring & Audit	All areas where there is vegetation to be protected or where new planting is located	To protect existing vegetation in and around the construction site area and also the ensure the viability/maintenance of future planting	To follow the Contract Requirements stipulated by the Housing Authority	Housing Authority	August 2002

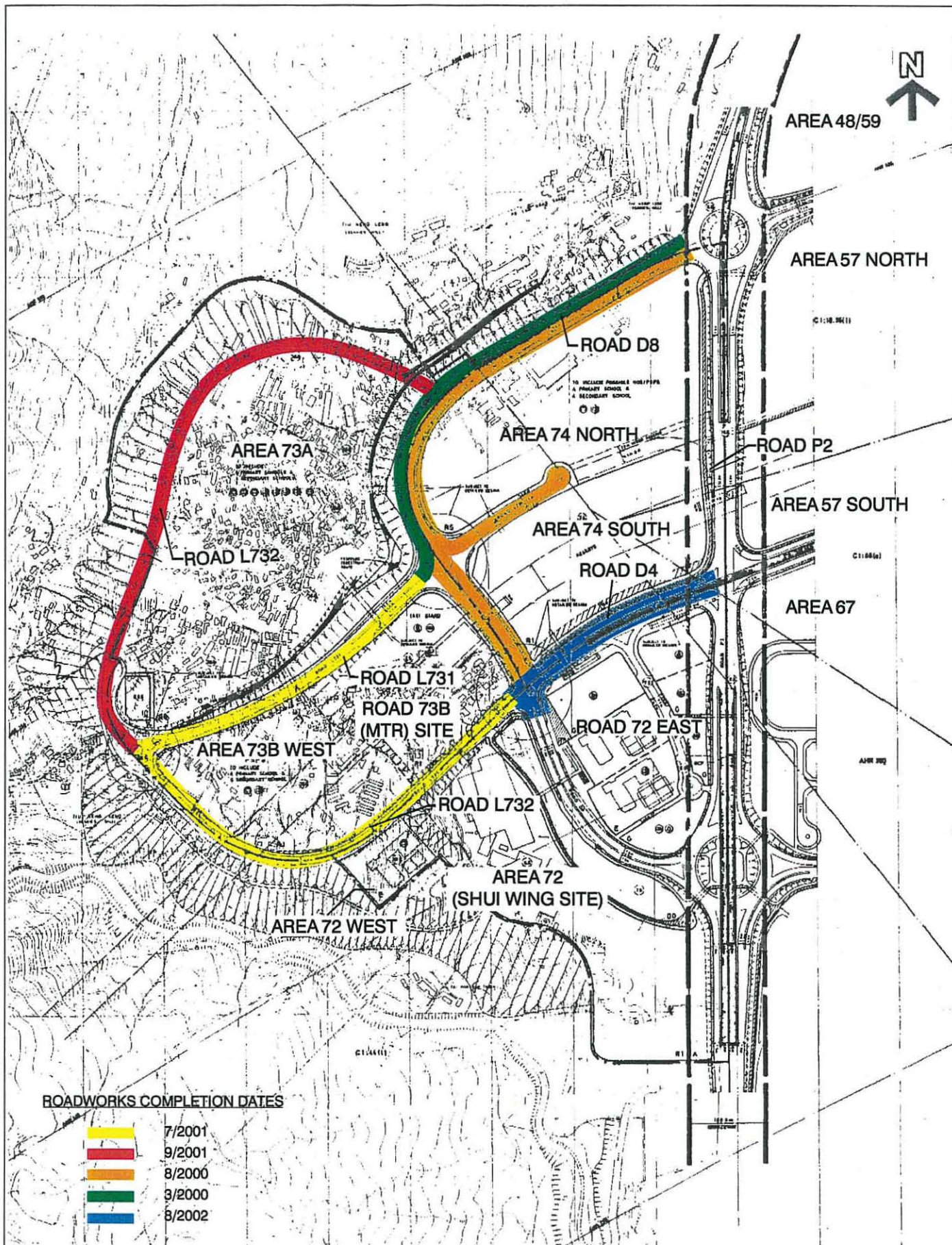


Legend  
 ( ) 300m Study Boundary



TITLE  
**General Area and 300m Study Boundary Area**

CES (ASIA) LIMITED			
PROJECT NO.	C230	DATE	November 1997
DESIGNED	Fanny Lau	DRAWING NO.	Figure 1.1



**ROADWORKS COMPLETION DATES**

- 7/2001
- 9/2001
- 8/2000
- 3/2000
- 8/2002



TITLE

Layout of the Proposed New Roads  
(Also Showing the Construction Works Phasing)

CES (ASIA) LIMITED

PROJECT NO	C230	DATE	January 1998
DESIGNED	Suki Chung	DRAWING NO	Figure 1.2

**MVA ASIA Limited**

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3rd Floor, East Town Building, 41 Lockhart Road, Wanchai, Hong Kong  
Tel : 2529 7037 Fax : 2527 8490