FINAL REPORT

Civil Engineering Department

Agreement No CE 5/97 : *Construction of Roads and Drains to Serve the Housing Development in Area 56, Tuen Mun: Environmental Impact Assessment*

Executive Summary

November 1998

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CONSULTING SERVICES BY ENVIRONMENTAL RESOURCES MANAGEMENT

FINAL REPORT

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Reference C1672

For and on behalf of ERM-Hong Kong, Ltd

Approved by: FREEMAN CHEUNG

Signed: [signature]

Position: Deputy Managing Director

Date: 20 November 1998

INTRODUCTION

Hong Kong Housing Authority (HKHA) plans to develop Tuen Mun Area 56 in So Kwun Wat for a Private Sector Participation Scheme (PSPS) housing development. A Preliminary Project Feasibility Study (PPFS) for the "Construction of Roads and Drains to serve the Housing Development in Area 56" (hereinafter called "the Project") was carried out by the Territory Development Department (TDD) in February 1996. It was concluded that an Environmental Impact Assessment Study (hereinafter called "the EIA") is required. ERM Hong Kong, in association with Wilbur Smith Associates Limited (WSA), have been commissioned by the Civil Engineering Department (CED) to undertake the EIA Study as part of the Project.

The purpose of the EIA is to assess the potential environmental impacts associated with the construction and operation of the Project and to identify appropriate mitigation measures to be included in the design of the Project. Environmental issues including noise, air quality, terrestrial ecology, landscape and visual are addressed in the EIA, based on the preliminary engineering information from CED.

PROJECT DESCRIPTION

The general layout of the proposed works are shown in *Figure A*, including the following key components:

- construction of approximately 900 m (14.6 m wide) and 850 m (7.3 m wide) of carriageways in Areas 55 and 56;
- construction of stormwater drains and foul sewers and associated services along the road carriageway;
- construction of approximately 30 m (11.65 m wide overall) of vehicular underpass across Tuen Mun road;
- construction of about 200 m of box culvert in Area 55 and 56;
- construction of about 40 m retaining walls in Area 55 and 56;
- design and incorporation of environmental control measures; and
- landscape treatments along road sides.

The construction phase of the Project is anticipated to be carried out between early 1999 and early 2001.

For the purpose of this Study, the peak hour traffic forecasts for the year 2016 have been identified as the worst case scenario in relation to vehicle exhaust emission and noise impacts.

LANDUSE CONTEXT

The existing landuse surrounding the study area is typical disturbed rural nature with scattered village houses, several factories and large container open storage areas. The future planning intention of Tuen Mun Area 55 & 56 is for residential use with Comprehensive Development Areas (CDA), residential areas, village type developments and open spaces.

NOISE IMPACTS

Construction Phase

The noise levels of representative noise sensitive receivers (NSRs) have been predicted. Owing to the close proximity of a few NSRs to the work site, they would be impacted by construction noise. Mitigation measures, such as quiet plant, on-site movable noise barriers, limiting the number of plants operating concurrently have been recommended to limit the noise emission from the site. Regular monitoring of noise during the construction phase is also recommended.

Operational Phase

The potential traffic noise impacts associated with the operation of the Project have been assessed. The NSRs facing Tuen Mun Road and Castle Peak Road will experience high traffic noise from these existing roads, rather than by the Alignment. For the planned Area 56 PSPS housing development and the two school sites in Area 55, exceedances of the HKPSG noise criteria are also predicted due mainly to road traffic noise from the existing road network. A summary of the assessment results are summarized in *Table 1* below.

Table 1 Summary of Predicted Noise Levels

Location of NSRs	*Predicted Noise Levels*
N2, N3, N4, N5, N11, N12 & N25	Dominated by existing roads, 6-15 dB(A) less than noise level from existing roads
N1, N6, N7, N9, N10, N13 to N18, N26 to N28	71-85 dB(A)
N19-N24	within HKPSG 70 dB(A) criterion
School in Area 56	within HKPSG 65 dB(A) criterion
PSPS Site in Area 56	62-77 dB(A)
CDA Sites in Area 56	67-84 dB(A)
Schools in Area 55	75-83 dB(A)

Owning to the road junctions arrangement, ingress and egress, the extent of high noise barriers that could be provided are extremely limited by road design and sightline constraints, and the series of discontinuous 3 m & 5 m of noise barriers along the Alignment that was tested and found to be ineffective.

The use of 0.8 m roadside noise barrier will not be constrained by sightline requirement and is recommended in the form of planters located along the junction of Castle Peak Road / So Kwun Wat Road, Road B1 and Road L56B. Locations of NSRs and 0.8 m roadside noise barriers are shown in *Figure B*. The noise reduction at the NSRs are summarized in *Table 2* below:

Table 2 *Summary of Direct Technical Remedies*

Location of Mitigation Measure (0.8 m roadside noise barrier)	Protected NSRs	Reduction in Noise Level
Near Junction of Castle Peak Road/So Kwun Wat Road	N1, N2, N3, N6, N7 & N28	up to 4 dB(A)
Along Road B1	N14, N15, N25, N26, C, G & H	up to 5 dB(A)
Along Road L56B	N16, N17, N18, D, F & L	up to 7 dB(A)

There are still residual impacts predicted at some NSRs, even with the implementation of the recommended direct mitigation measures. The assessment indicates that NSRs N1, N9, N13, N28, approximately 17 village houses as shown in *Figure C*, will meet the criteria for noise insulation as a last resort, in the form of window insulation and air conditioning subject to ExCo approval. It is recommended that a Detailed Noise Insulation Works study be carried out at the Detailed Design stage to identify the exact requirement of noise insulation. The recommended mitigation measures for the NSRs exceeding noise criteria are summarized in *Table 3*.

Table 3 *Summary of Recommended Mitigation Measure*

Locations of NSRs	*Recommended Mitigation Measures*
N1, N9, N13 & N28	Window insulation and air conditioning.
PSPS Site in Area 56 (NSR J)	• Use of a minimum 30m setback distance from road L56A together with restricting the total angle of view of roads to 90° along the eastern facade facing Rod L56A; or • use of noise tolerant building as screening structures, such as multi-storey car parks, commercial building or recreational facilities, adjacent to Road L56A.
CDA Site 1 in Area 56	• use of noise tolerant building as screening structures adjacent to Road L56 B; and • use of suitable building design to mitigate the residual road traffic noise along the northern, western and southern facade facing Tuen Mun Road and Road B1.
CDA Site 2 in Area 56	• use of noise tolerant building along Road L56 B and other affected facades; and • use of suitable building design to mitigate the residual road traffic noise along the northern and western facade facing Road B1 and Road L56B.
Two School Sites in Area 55	Window insulation and air conditioning.

AIR QUALITY IMPACTS

Construction Phase

Dust is the major pollutant during the construction works. Due to the proximity of some ASRs, dust impacts during some construction periods will be high, mainly from excavation and material handling activities. Dust suppression measures are required to reduce the potential dust impacts to acceptable levels, and checked by regular monitoring and audit during construction phase.

Operational Phase

Potential air quality impacts from the exhaust emissions of vehicles on the new roads have been modelled in the assessment, taking into account the background pollutant levels of the surrounding major roads. It is assessed that the statutory Air Quality Objectives (AQO) will be satisfied at all ASRs in the assessment.

TERRESTRIAL ECOLOGY

The area has been disrupted by human activities and the ecological value of the habitats affected by the Project is low and therefore limited ecological impacts are expected. Measures such as minimising trees affected and restricting work boundary have been recommended.

LANDSCAPE AND VISUAL

The existing landscape of the lower So Kwun Wat area is generally very disrupted with large platforms of derelict land, container storage areas and a few village houses. The scale and nature of the proposed works in the present landscape and visual context is not expected to have significant impacts. There will however be inevitable localised loss of tree areas.

Landscape plantings have been proposed for the works to compensate for the loss of existing trees and to enhance the future streetscape of the lower So Kwun Wat area for residential developments. The landscaping proposals are illustrated in *Figure D*. The Landscape Master Plan to be developed at the Detailed Design stage should incorporate the recommendations of this EIA. A Tree Survey is recommended prior to construction of the Project to identify the exact tree loss and to provide a basis for compensatory planting.

OVERALL CONCLUSION

The potential environmental impacts associated with the construction and operation of the proposed road and drain works will comply with environmental requirements, provided the recommended mitigation measures are incorporated into the design of the Project.

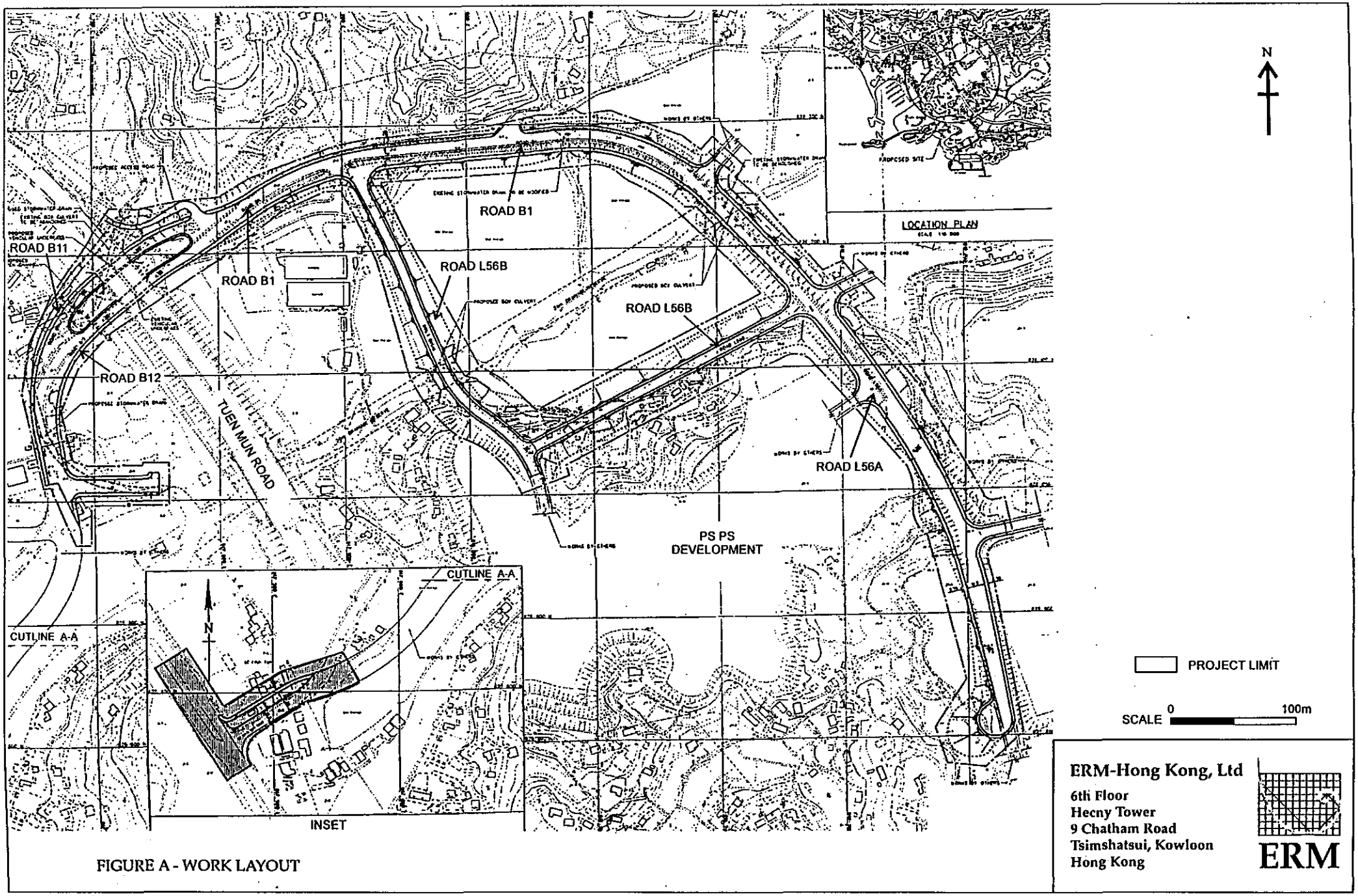

FIGURE A - WORK LAYOUT

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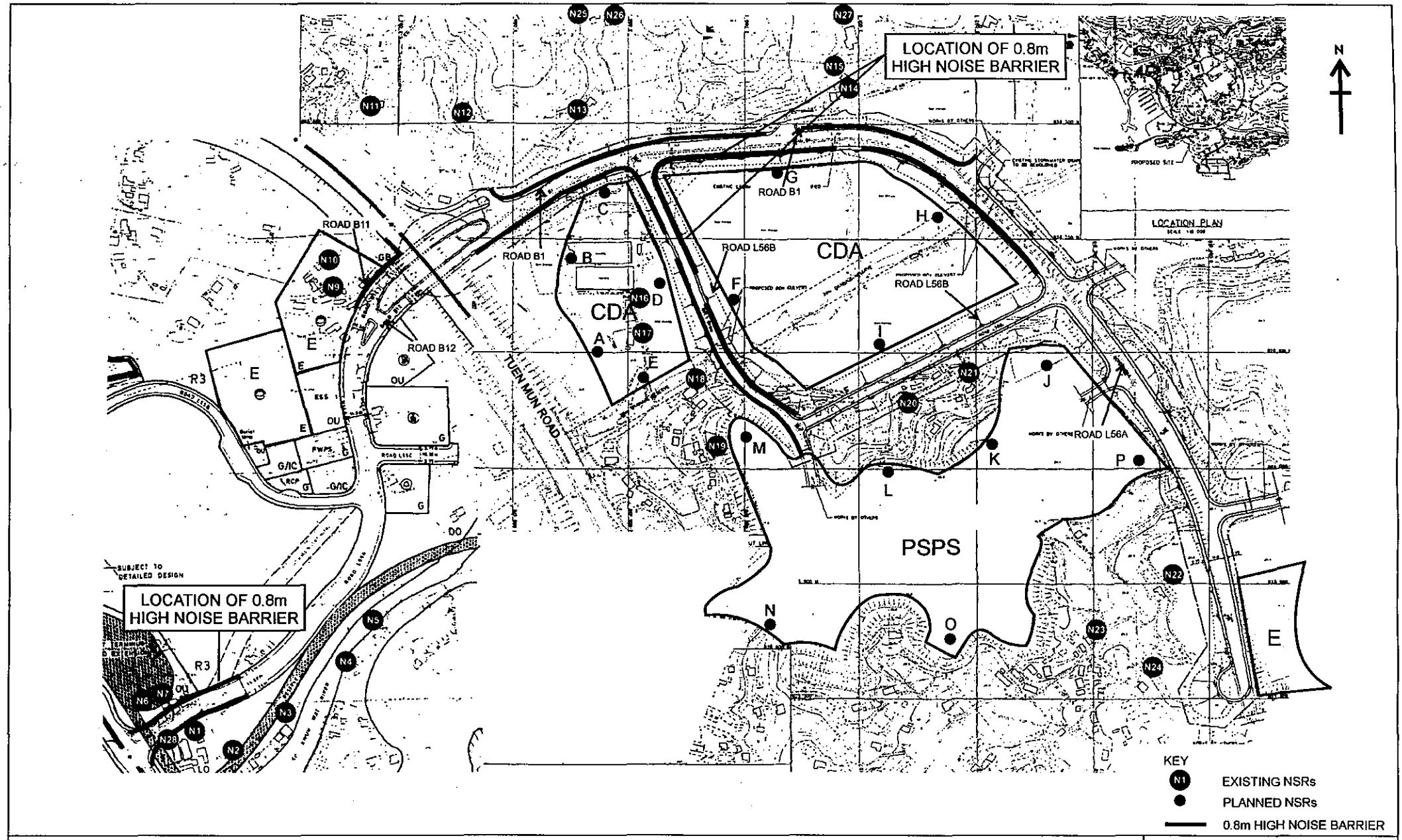

FIGURE B

LOCATIONS OF RECOMMENED 0.8m HIGH NOISE BARRIER AND NSRs

FILE: C1672/C1672Z26
DATE: 14/01/99

Environmental Resources Management

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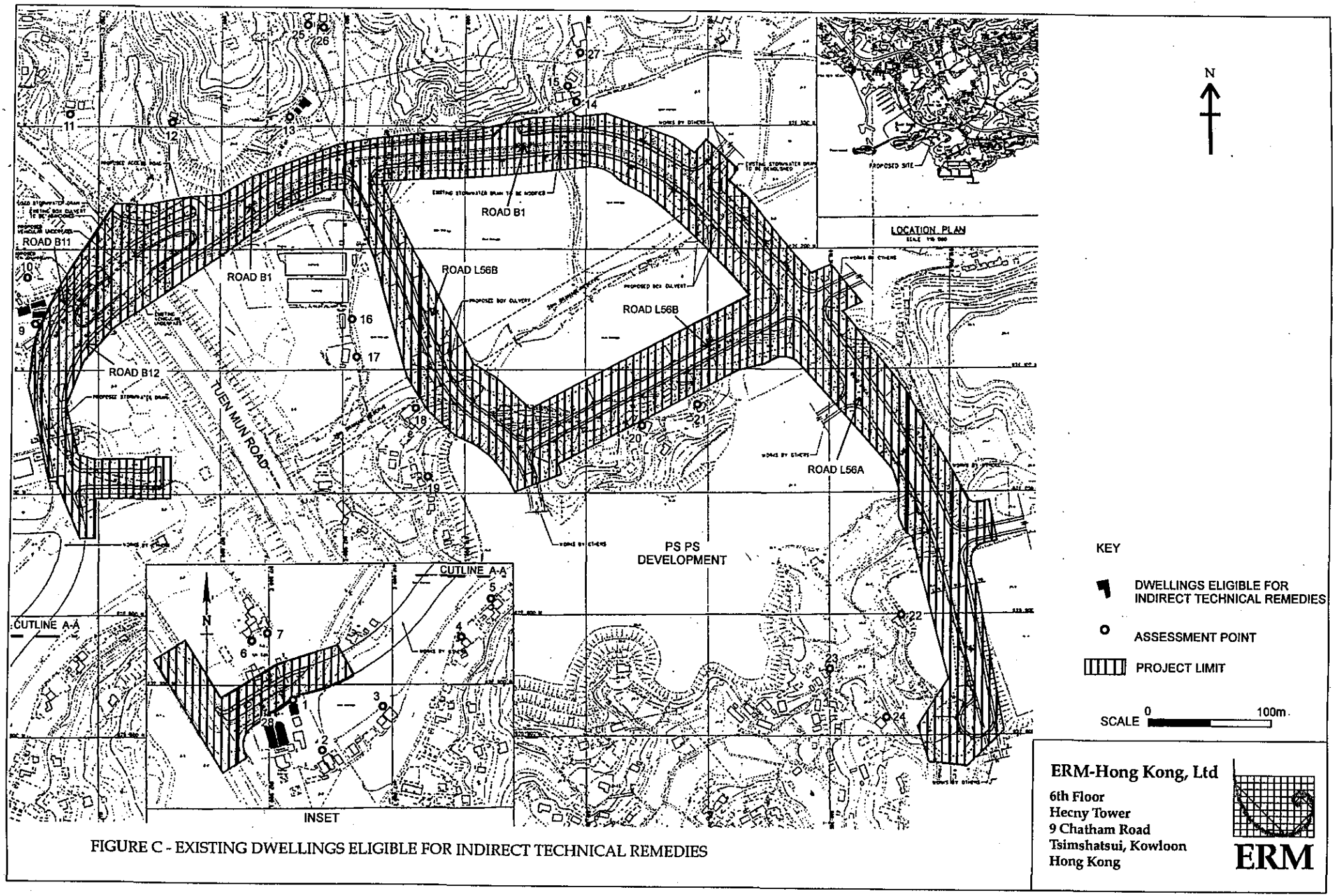

FIGURE C - EXISTING DWELLINGS ELIGIBLE FOR INDIRECT TECHNICAL REMEDIES

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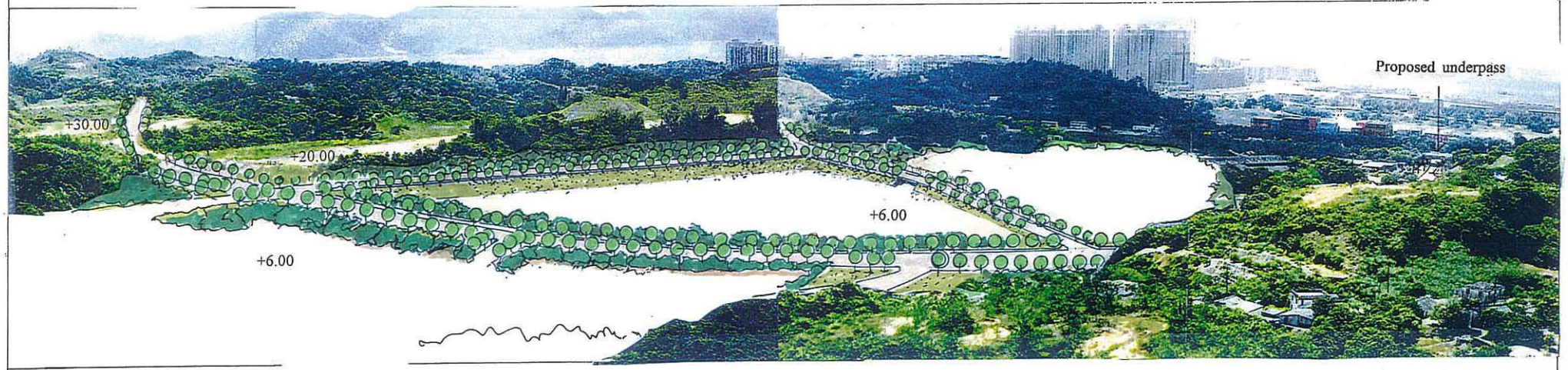
VIEW SHOWING THE EXISTING LANDSCAPING



PHOTOMONTAGE SHOWING THE PROPOSED LANDSCAPING FOR THE WORKS

FIGURE D

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