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**AGREEMENT NO. CE 37/95
DESIGN AND CONSTRUCTION
OF
WONG CHUK HANG ROAD FLYOVER
AND
ASSOCIATED ROAD WIDENING**

**ENVIRONMENTAL IMPACT ASSESSMENT
EXECUTIVE SUMMARY
(FINAL)**

**DOCUMENT BBHK/96086/D/016
ISSUE 3**

APRIL 1997

Highways Department
Major Works Project Management Office
3rd Floor, Ho Man Tin Government Offices
88 Chung Hau Street
Ho Man Tin
Kowloon

Babtie BM'f (Hong Kong) Ltd
in association with
Enpac Ltd
Urbis Ltd
and MVA Asia Ltd

ZHA-1142/
RC

EIA/018.1/97

7 May 1997

Highways Department
Major Works Project Management Office
3/F, Ho Man Tin Government Offices
88 Chung Hau Street
Kowloon

For the attention of Mr. L.F. Au

Dear Sirs,

**Agreement No. CE 37/95
Design and Construction of Wong Chuk Hang Road Flyover and
Associated Road Widening
Final Environmental Impact Assessment Report**

We are pleased to enclose ten (10) copies of our final "Environmental Impact Assessment" (Document BBHK/96086/D/010, Issue 3) together with English and Chinese language versions for our final "Environmental Impact Assessment Executive Summary" (Document BBHK/96086/D/016, Issue 3) for your retention, as requested in your letter of 2 May 1997.

These final reports address all outstanding comments raised by the ESMG on the EIA. A table of all such comments and our response to these comments is attached to this letter for your reference. In addition, we have amended Figure 2.5 "Preliminary Construction Programme" to take account of the recommendations of the Review Report, and we have amended the format of Figures 2.2, 2.3 and 2.4 to avoid the use of non-standard drawing sizes.

Additional copies of the reports have been circulated as indicated on the attached distribution list.

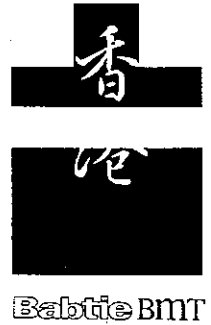
Yours faithfully,
For and on behalf of
Babtie BMT (Hong Kong) Ltd.



Henry Leung
Project Director

Encl

ms/D215/96086.317



寶萬通(香港)工程顧問有限公司
香港九龍柯士甸路廿一號太古貿易大廈七樓

Babtie BMT (Hong Kong) Ltd
7th Floor, Swire & Maclaine House
21 Austin Avenue, Kowloon
Hong Kong
Tel: (852) 2369 0175
Fax: (852) 2739 6648
email: babtibmt@hk.linkage.net

Directors
Roger Colton, David Fawcett,
Peter French, David Goodrich,
Henry Leung
Technical Directors
Mark Cheung, Y. W. Yeung,
Deryck Elheiston

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Agreement No CE 37/95
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of
Wong Chuk Hang Road Flyover
and
Associated Road Widening

ENVIRONMENTAL IMPACT ASSESSMENT
EXECUTIVE SUMMARY
(FINAL)

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**ENVIRONMENTAL IMPACT ASSESSMENT
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1.0 INTRODUCTION

Babtie BMT (Hong Kong) Ltd in association with ENPAC Limited, MVA Asia Limited and Urbis Limited (the Consultants) have been commissioned by Highways Department to provide design and construction supervision services in relation to the Wong Chuk Hang Road flyover and the associated road widening works. The scope of the services includes the execution of an Environmental Impact Assessment of the Project. This document summarises the key findings of that Environmental Impact Assessment (EIA).

2.0 PROJECT DESCRIPTION

Due to ongoing and future planned development in the Southern District, traffic levels on Wong Chuk Hang Road are expected to rise steadily in the future. The need for relief measures to prevent future congestion has been identified by Transport Department.

It is proposed that a dual 2 lane flyover be constructed along the centre of Wong Chuk Hang Road. Figure 2.1 indicates the location of the proposed project, with Figures 2.2, 2.3 and 2.4 providing details of the flyover.

The objectives of the Environmental Impact Assessment (EIA) are to identify sensitive receivers likely to be affected by the scheme, assess the various environmental impacts of the scheme (both during construction and operation) on the receivers, recommend appropriate mitigation measures to reduce these impacts to acceptable levels if they are found to be unacceptable, and assess the residual impact of the scheme on sensitive receivers after incorporation of these mitigation measures.

The PPFS study for the Project, completed in 1995, identified air quality as the key environmental concern, and recommended that an air quality assessment be carried out. Noise assessment is not required, as the industrial buildings along the route do not qualify as noise sensitive receivers.

The predicted air quality up to 2011 has been found to be acceptable, both below the flyover and above the flyover. Predicted levels of Nitrogen Dioxide (NO₂) at the year 2011 are shown on Figures 3.4 and 3.5. The acceptable limit for NO₂ is 300 µg/m³. The worsening conditions for pollutant dispersion below the flyover are counterbalanced by the substantial decrease in at-grade traffic. The flyover will result in a slight improvement in air quality levels close to ground level if compared with the "do-nothing" scenario.

As the impact of the scheme on air quality during operation is acceptable, with predicted air pollution remaining within the levels set by the Air Pollution Control Ordinance, no specific mitigation measures are required.

The impact of traffic noise from the new flyover on the Aberdeen Fire Station and adjacent staff quarters has been assessed using the methodology outlined in the "Calculation of Road Traffic Noise" (CRTN) issued by the Department of Transport, UK. The traffic noise impact from the flyover on the Fire Station has been found to be acceptable. No direct or indirect noise protection measures are required.

4.0 LANDSCAPE AND VISUAL ENVIRONMENT

4.1 Landscape and Visual Context of the Existing Site

The existing Wong Chuk Hang Road is a three lane dual carriageway, fronted on both sides by large scale industrial factory and warehouse buildings, with the streetscape between dominated by the road, buildings, canopies, signage, safety barriers and other street furniture. The predominance of hard paved surfaces of poor quality finish and the wide road corridor of the site is common in Hong Kong. The street encompassing the study area has a uniformly hard and utilitarian character the quality of which is considered to be poor, having a low sensitivity to change.

The scale of the buildings on both sides of the road which extend beyond the limit of the works will result in the proposed flyover having a strictly localised visual impact.

4.2 Impact of the Project

Even though the quality of the existing streetscape is considered to be very low, the scale and nature of the proposals will result in a substantial change in the character of the road corridor. The construction of the flyover will substantially reduce the amount of natural light reaching the existing street level and will appear as an enclosing element, effectively blocking out many of the views within and out of the study area at the junctions and along the road.

In the wider context the proposed road will be encompassed within one urban character zone and will be absorbed into the pattern of industrial buildings and land uses. It will also be in the same context and of a similar scale as the existing road corridor. The landscape impact is considered, therefore, to be strictly localised.

The symmetrical curving long profile of the flyover, which rises to a maximum some 14 metres above existing road levels, has been designed both to provide sufficient clearance above the existing footbridges and at the junctions but also to allow greater comfort for the driver.

measures, and implementation of an appropriate EM&A programme the dust impact can be mitigated to meet the established standards and guidelines;

- air quality will deteriorate from 2000 to 2011 (design year) as traffic volumes increase, but will still be within acceptable limits at 2011;
- air quality close to ground level at 2011 in the “do nothing” scenario is expected to be worse than that with flyover construction;
- the flyover will constitute a large element in a small scale environment and will have significant landscape and visual impact;
- the project will result in the loss of two existing mature trees and crown pruning of an additional two trees;
- the enclosed nature of the site means that the visual envelope will be localised; and
- the existing urban character of the site will become more concentrated as a result of the scheme.

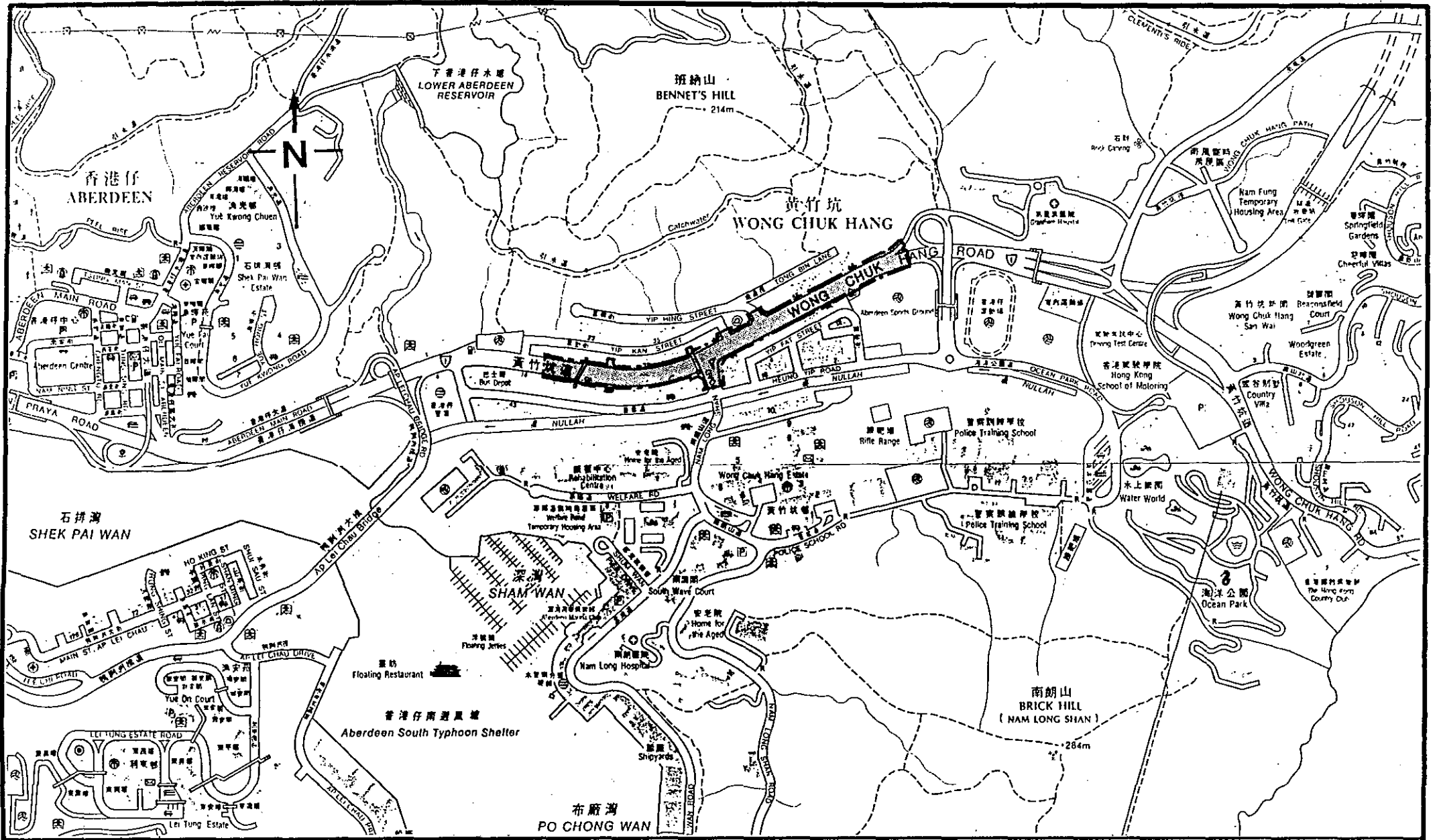
6.0 RECOMMENDATIONS

The following recommendations are made:

- application of dust control measures, including watering the works site twice a day and maintain good housekeeping during the construction phase;
- inclusion of pollution control clauses to the Contract Documents to control dust and other impacts from the construction works;
- implementation of the EM&A programme detailed in the EM&A Manual during the construction stage of the project;
- retention of all existing vegetation within the study area not directly affected by the works and provision of additional new trees to compensate for those lost;
- decorative paving and metal fencing underneath new carriageway in combination with feature lighting and aesthetic treatment to the structural supports; and
- the refinement of the alignments and configurations of all new carriageways, drainage channels and footpaths to minimise potential impacts.

FIGURES

- 2.1 Site Location Plan
- 2.2 Layout of Proposed Works (Sheet 1 of 2)
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- 2.4 Elevation of Proposed Flyover
- 3.1 Isopleths of Hourly Average TSP Concentrations at Ground Level (Mitigated)
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- 3.5 Isopleths of Hourly Average NO₂ Concentrations at 12mPD Level
- 4.1 Landscape Mitigation Measures Plan
- 4.2 Arrangement at Viaduct Abutment
- 4.3 Perspective View of Flyover
- 4.4 Perspective View At Abutment




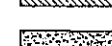

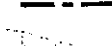


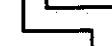
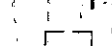


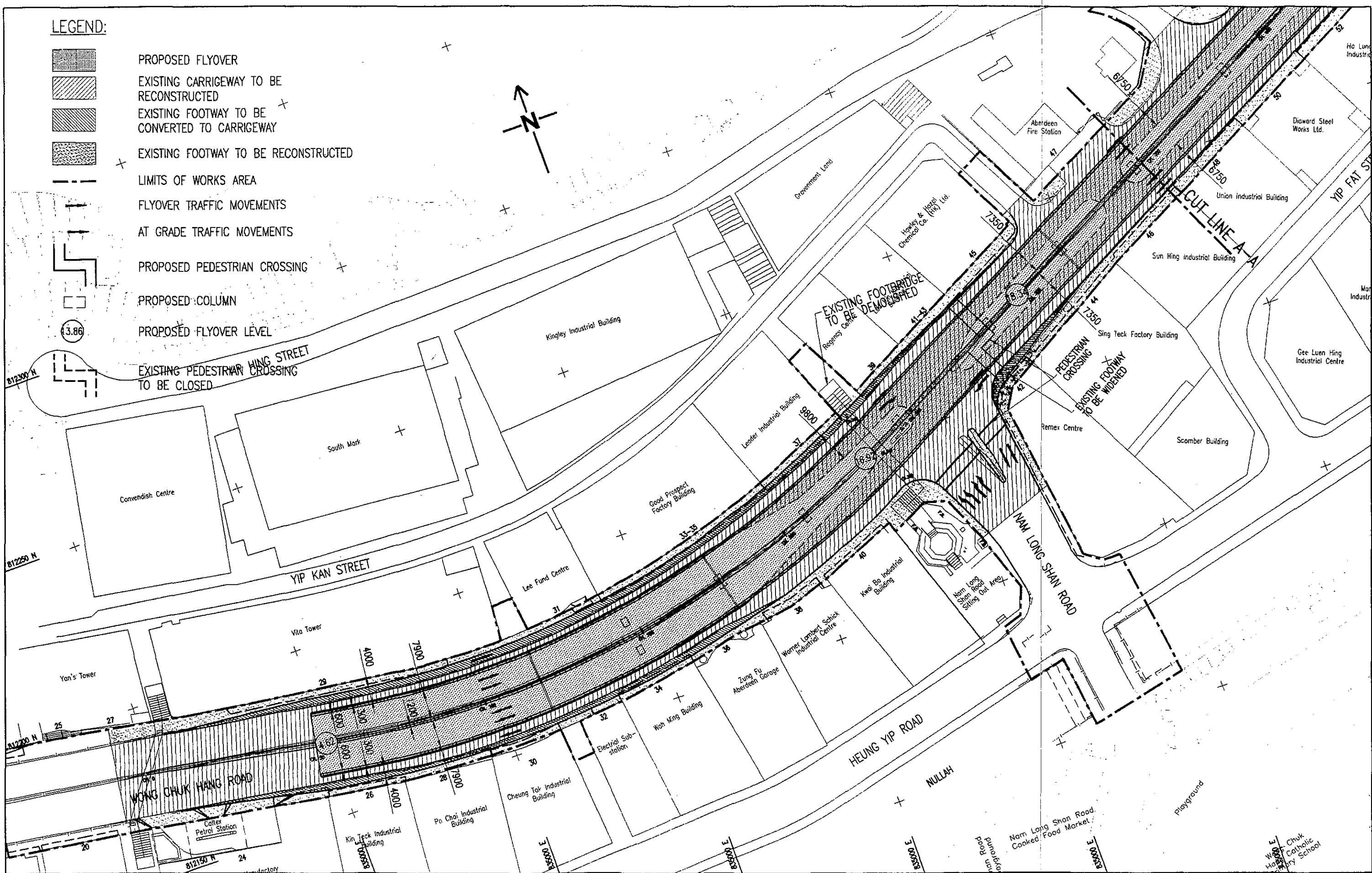
SITE LOCATION PLAN

FIGURE 2.1

Babtie BMT (Hong Kong) Ltd.
Consulting Engineers

LEGEND:

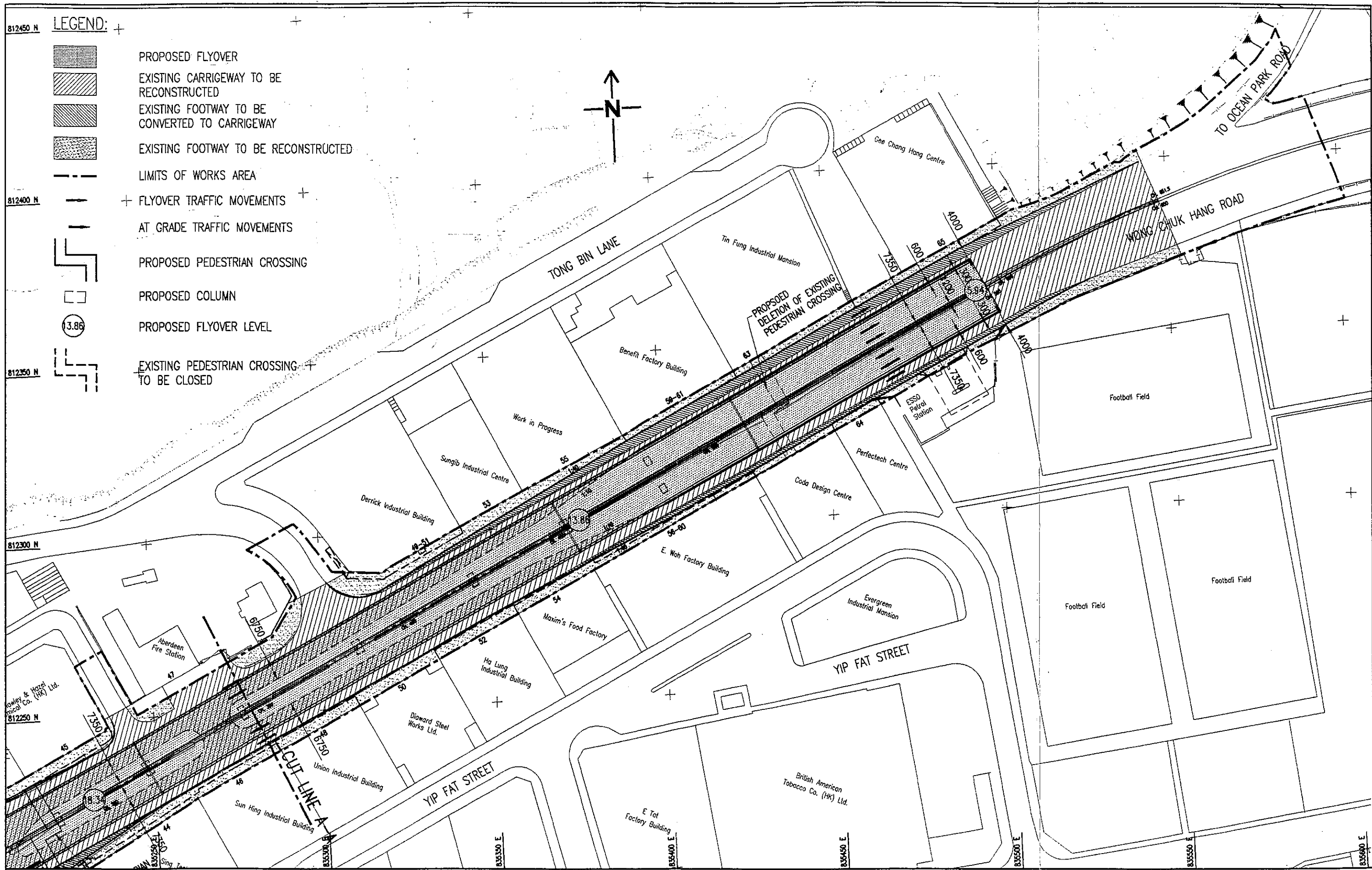
-  PROPOSED FLYOVER
-  EXISTING CARRIGEWAY TO BE RECONSTRUCTED
-  EXISTING FOOTWAY TO BE CONVERTED TO CARRIGEWAY
-  EXISTING FOOTWAY TO BE RECONSTRUCTED
-  LIMITS OF WORKS AREA
-  FLYOVER TRAFFIC MOVEMENTS
-  AT GRADE TRAFFIC MOVEMENTS
-  PROPOSED PEDESTRIAN CROSSING
-  PROPOSED COLUMN
-  PROPOSED FLYOVER LEVEL



LAYOUT OF PROPOSED WORKS (SHEET 1 OF 2)

Figure 2.2

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Consulting Engineers



LAYOUT OF PROPOSED WORKS (SHEET 2 OF 2)

Figure 2.3

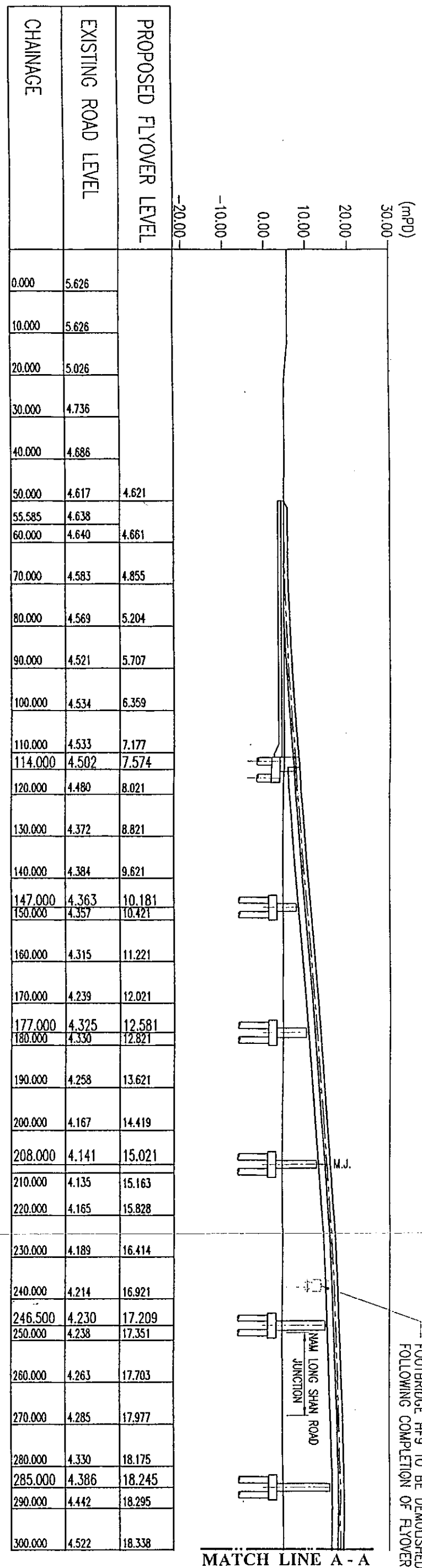
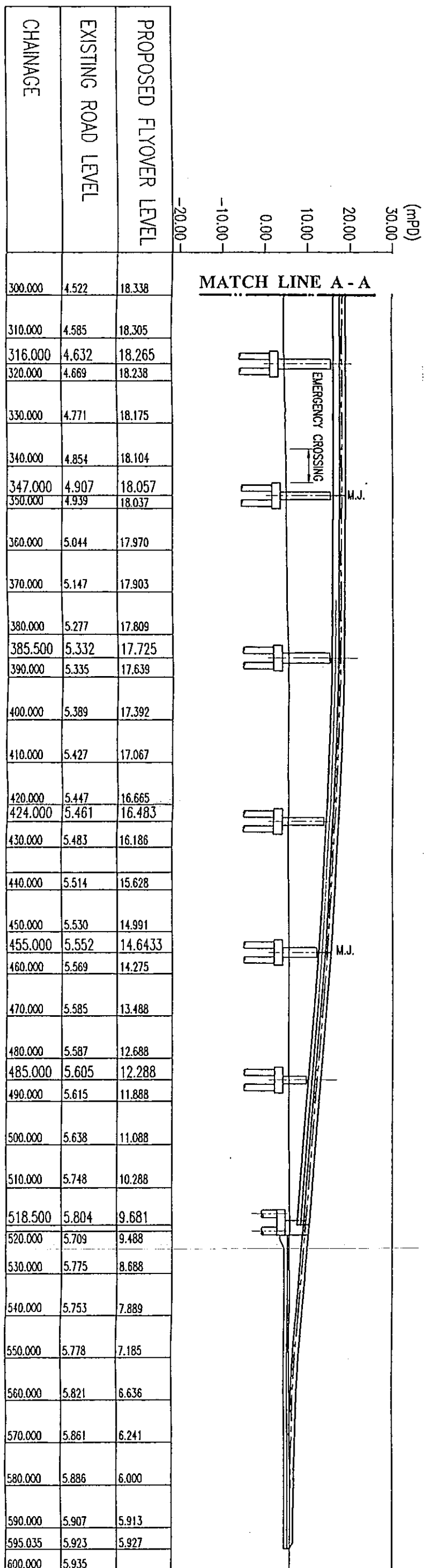
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Consulting Engineers

ELEVATION OF PROPOSED FLYOVER

SCALE 1:1000

Figure 2.4

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Consulting Engineers

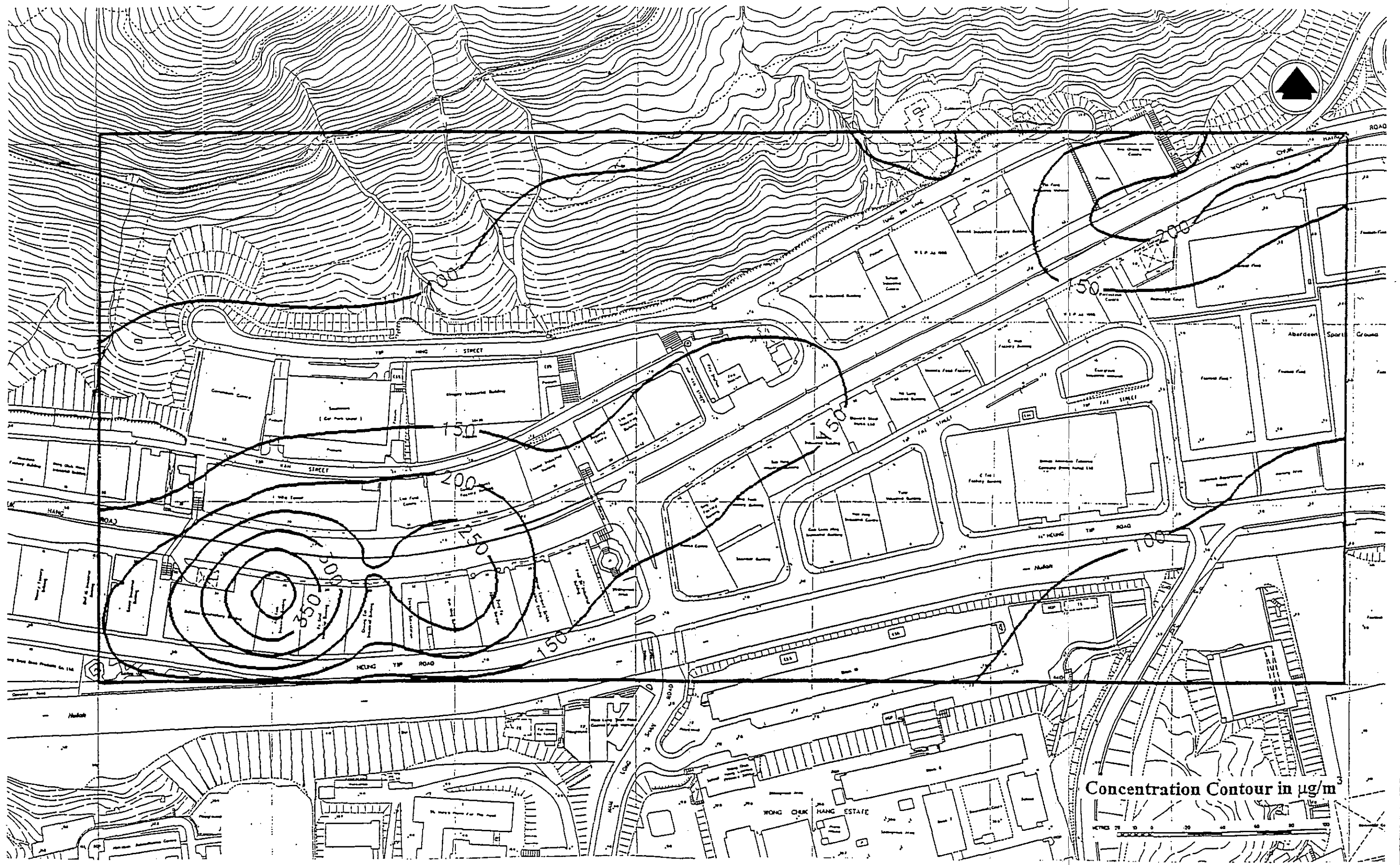


M.J. = MOVEMENT JOINT

NOTES:

FOOTBRIDGE HF9 TO BE DEMOLISHED FOLLOWING COMPLETION OF FLYOVER

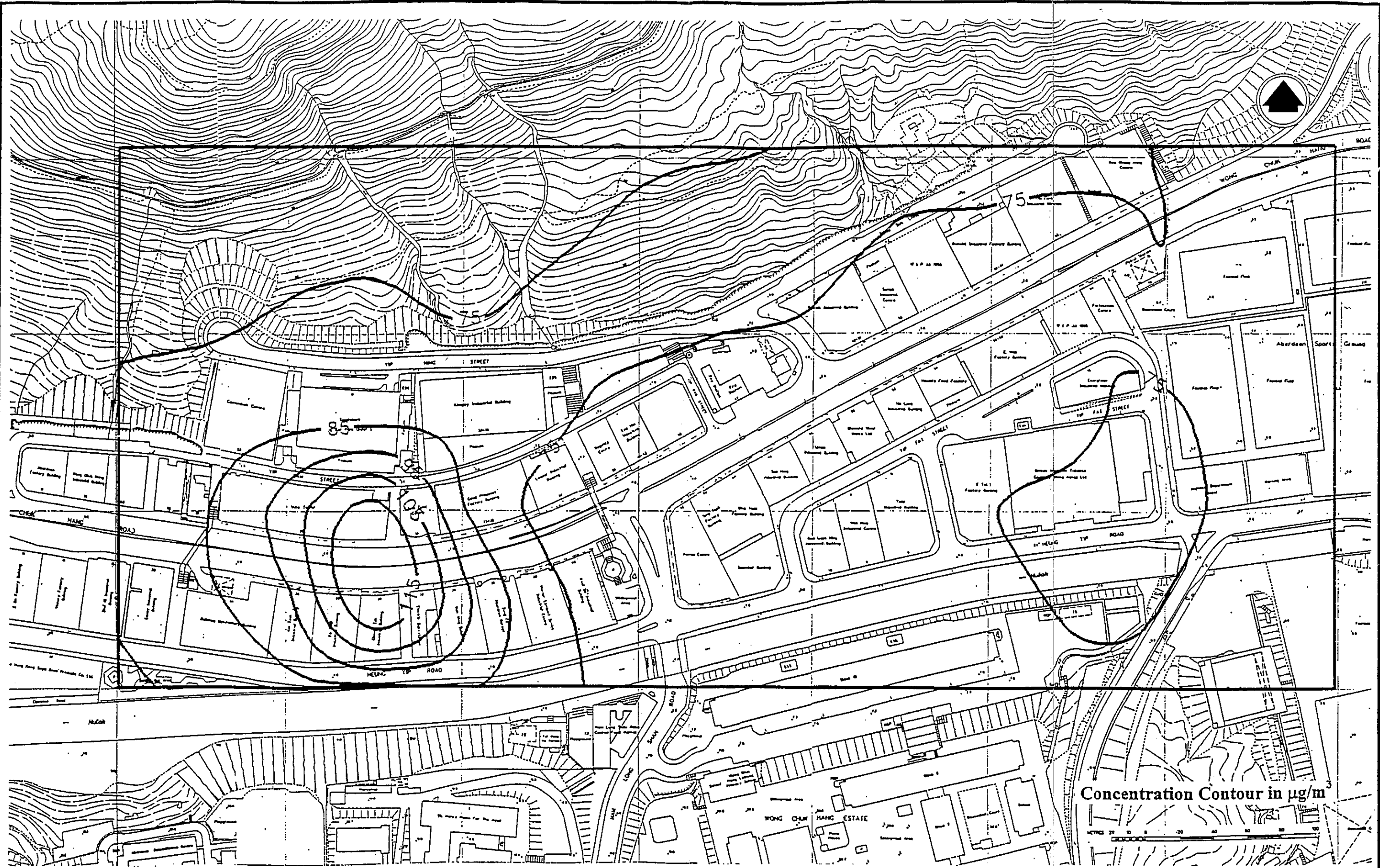
MATCH LINE A - A



TITLE: ISOPLETHS OF HOURLY AVERAGE TSP CONCENTRATIONS AT GROUND LEVEL
(MITIGATED) DURING CONSTRUCTION

FIGURE 3.1

Babtie BMT (Hong Kong) Ltd.
Consulting Engineers



TITLE: ISOPLETHS OF DAILY AVERAGE TSP CONCENTRATIONS AT GROUND LEVEL
(MITIGATED) DURING CONSTRUCTION

FIGURE 3.2

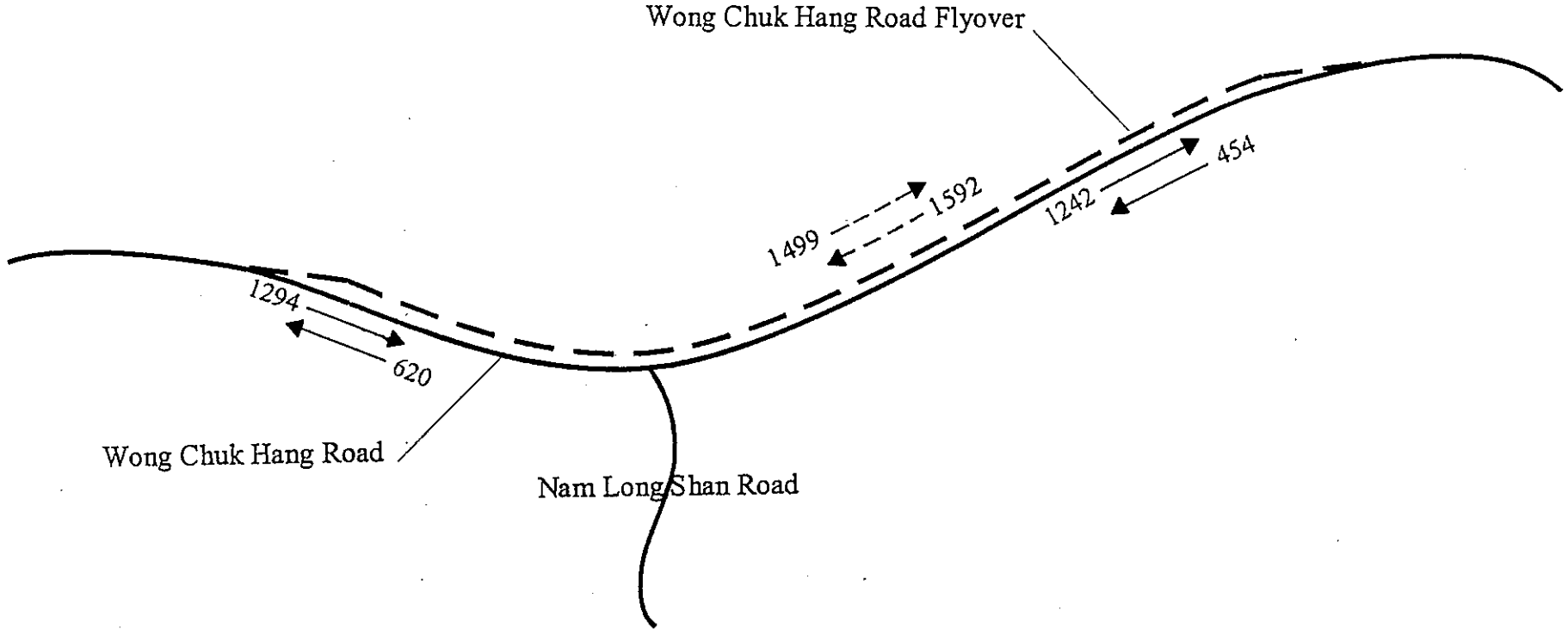
Babbie BMT (Hong Kong) Ltd.
Consulting Engineers

LEGEND

Traffic Flow (veh/hour) for

←—— Wong Chuk Hang Road

←--- Wong Chuk Road Flyover



TRAFFIC FLOW DIAGRAM - 2011 (AM PEAK)

FIGURE 3.3

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TITLE: ISOPLETHS OF HOURLY AVERAGE NO₂ CONCENTRATIONS AT 7 mPD LEVEL (2011)

FIGURE 3.4

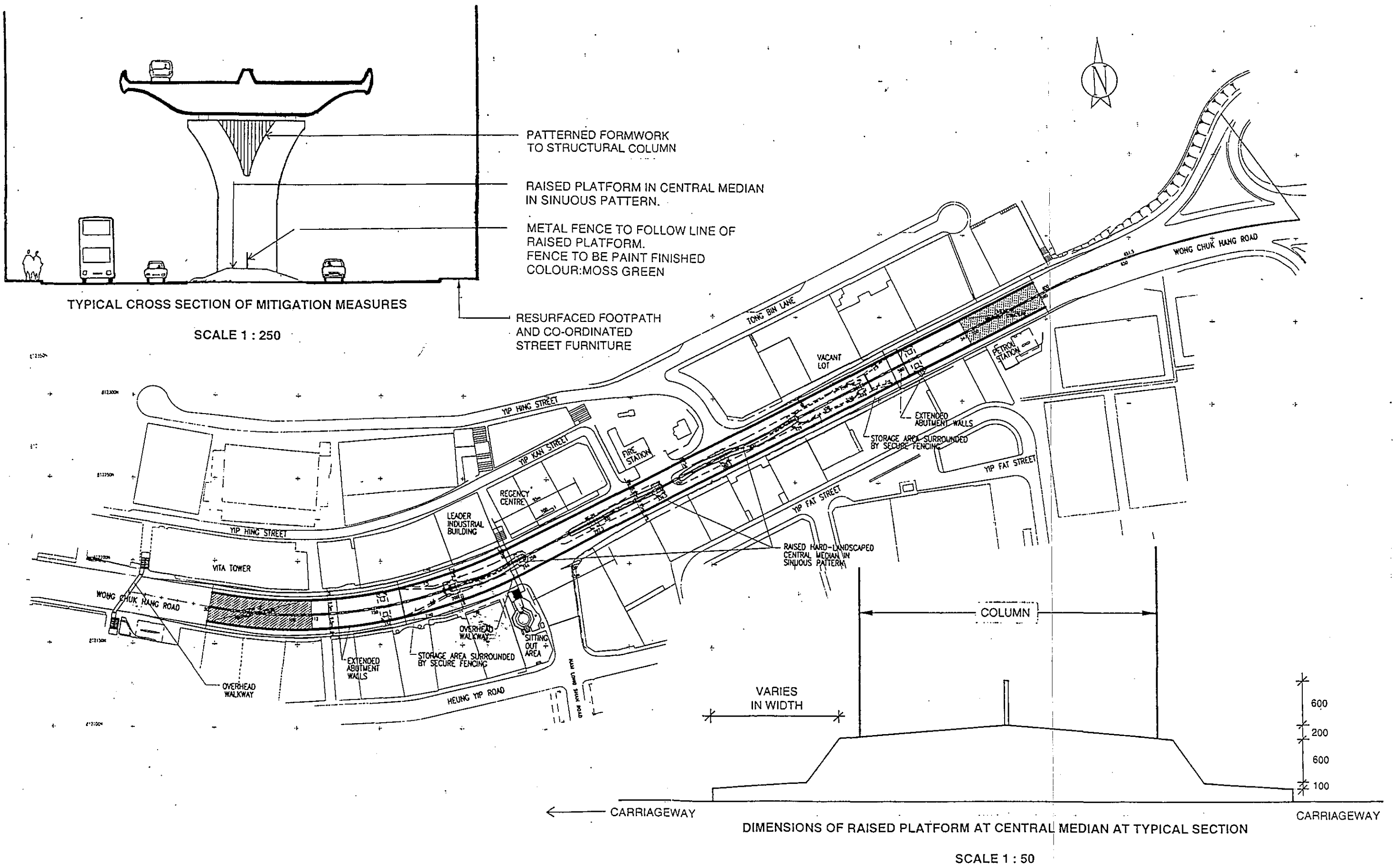
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TITLE: ISOPLETHS OF HOURLY AVERAGE NO₂ CONCENTRATIONS AT 12 mPD LEVEL (2011)

FIGURE 3.5

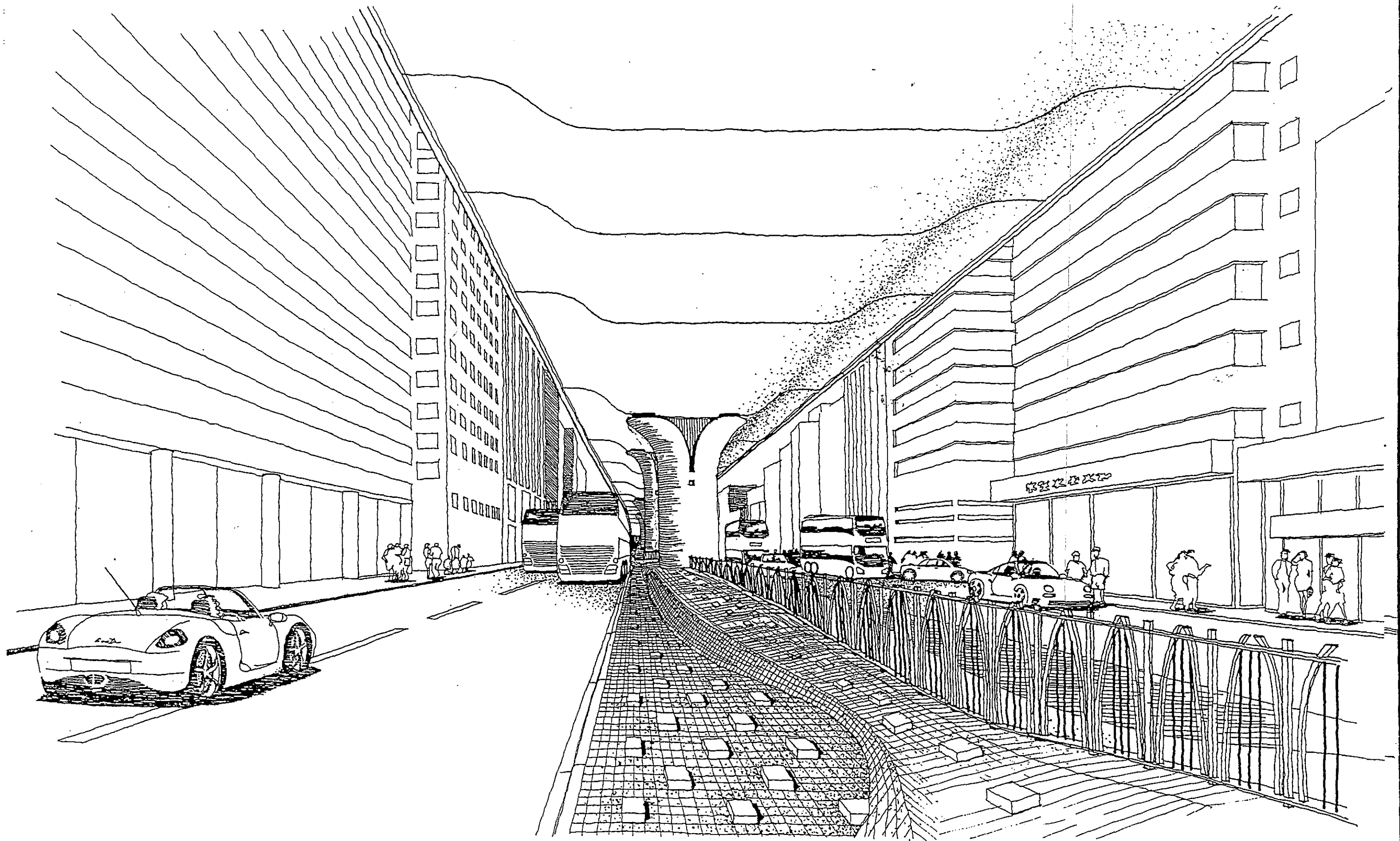
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TITLE : LANDSCAPE MITIGATION MEASURES PLAN

FIGURE 4.1

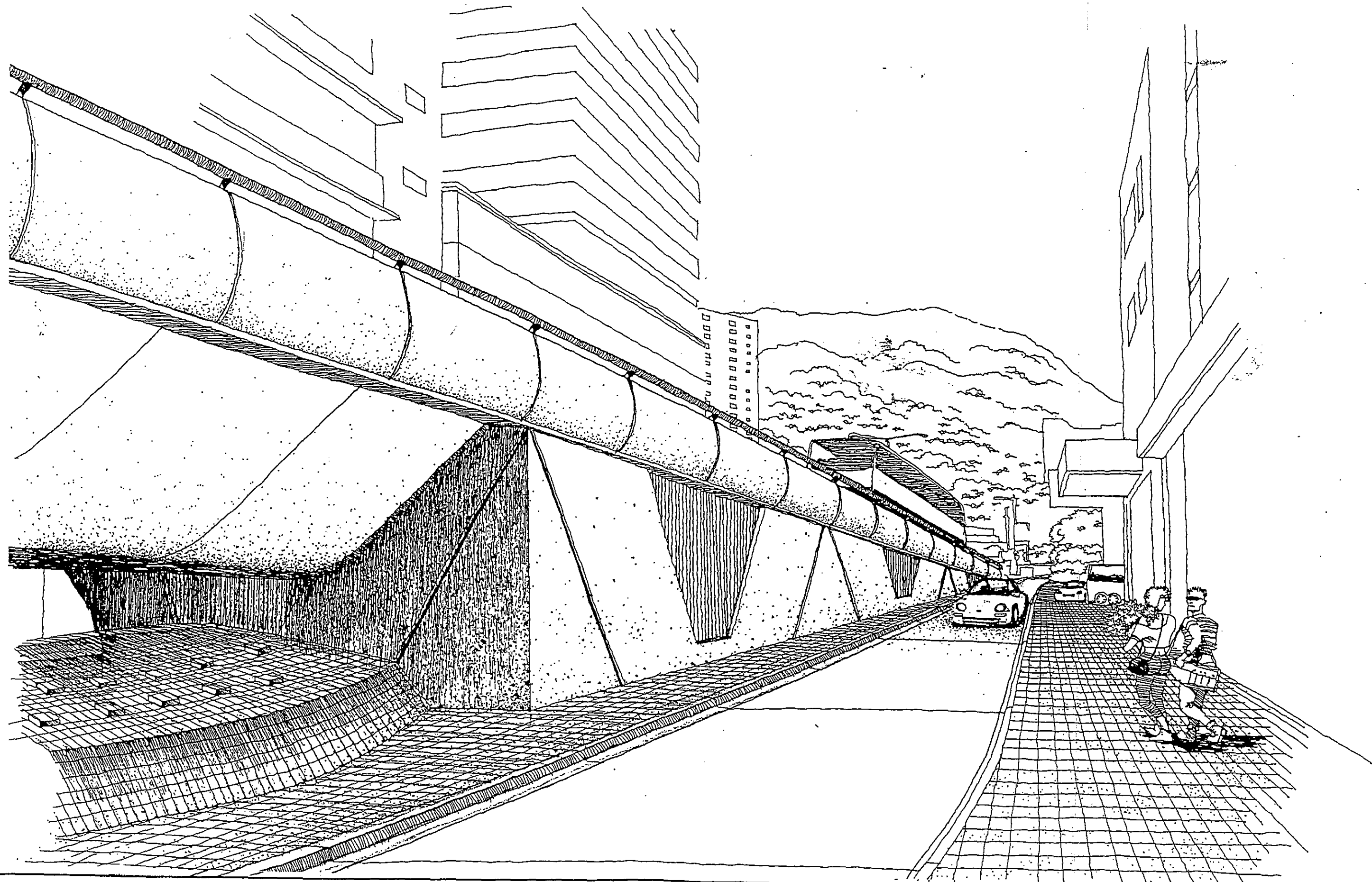
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TITLE : PERSPECTIVE VIEW OF FLYOVER CENTRE

FIGURE 4.3

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TITLE : PERSPECTIVE VIEW AT ABUTMENT

FIGURE 4.4

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