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## 1. BACKGROUND INFORMATION

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- 1.1 It is proposed to construct a road traffic flyover to connect the western end of Tsuen King Circuit and Sha Tsui Road. At present the western end of Tsuen King Circuit terminates at a level of approximately 15 mPD between Kam Fung Garden and Tsuen Tak Gardens, while Sha Tsui Road joins Castle Peak Road from the south, this junction being controlled by traffic lights.
- 1.2 The proposed flyover will pass over Tsuen King Circuit at an elevation of approximately 14.5 mPD, and there will no longer be vehicular access directly between Castle Peak Road and Sha Tsui Road.
- 1.3 The location of the proposed flyover is shown on the site location plan (Appendix I). A general plan of the proposed flyover is included in Appendix II, as are the approximate boundaries of the area of study, the surrounding "grey area" which is 20m wide, and the existing road plan (without the flyover) is included as Appendix III.
- 1.4 An initial noise assessment was carried out based on noise predicted to be generated by 1996 and 2006 traffic flow data given by Transport Department of Hong Kong. These traffic flows are included in Appendix IV. Other flows for intervening years were examined, but these did not differ significantly from the 2006 flows. Therefore 2006 flows were used in accordance with the requirement to use flows for the period ten years after road commissioning.
- 1.5 A second noise assessment was carried out to further determine noise levels given a different barrier layout and an alteration in heavy goods vehicles (HGV's) on Tsuen King Circuit and Castle Peak Road. Traffic flows are given in Appendix X and the barrier layout is given in Appendix XI.
- 1.6 This noise assessment report has been prepared in order to meet the guidelines produced by EPD for "Traffic Noise Assessment Reports for New Road Projects" (Ref 1) as enclosed in Appendix IX.

## **2. IDENTIFICATION OF POTENTIALLY AFFECTED USES**

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2.1 As a result of the proposed flyover and associated changes in road traffic flows it is anticipated that noise-sensitive receptors at the following locations will be exposed to increased noise impacts:

- Residential flats at Kam Fung Garden,
- Residential flats and a kindergarten at Tsuen Tak Gardens,
- Residential flats and shops at Joyful Buildings,
- Prevocational school to the north of Tsuen Tak Gardens,
- Church and kindergarten to the north of Joyful Buildings, currently under construction.

2.2 Parts of these sites are situated within the area of study which has been designated for this noise assessment, and are discussed fully within this report. The parts which lie within the surrounding "grey area", are discussed in the following chapters in more general terms. No predictive calculations have been carried out for these sites.

### 3. EXISTING NOISE LEVELS

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3.1 Castle Peak Road currently carries a significant volume of traffic and is the major source of noise within the assessment area. The primary receptors are the residential blocks of Tsuen Tak Gardens and Kam Fung Garden, both of which are built on podium structures and overlook Castle Peak Road. The podium structures will provide partial shielding to the lower floors of blocks, and the southerly facades of blocks which are further away from Castle Peak Road. However, the whole of the southern part of the study area is dominated by noise from Castle Peak Road. In particular, the following aspects will already generally be subject to noise exceeding 70 dB(A) from Castle Peak Road:

- Tsuen Tak Gardens Block E southern aspect
- Tsuen Tak Gardens Block D western aspect
- Tsuen Tak Gardens Block D southern aspect
- Tsuen Tak Gardens Block D eastern aspect
- Kam Fung Garden Block 1 southern aspect
- Kam Fung Garden Block 1 western aspect
- Kam Fung Garden Block 2 southern aspect
- Kam Fung Garden Block 2 western aspect

3.2 At the northern end of the flyover is the closed western end of Tsuen King Circuit, which at this point forms the service road to the two residential developments and associated educational establishments. There is no through traffic along Tsuen King Circuit at this location and the existing flows are not significant in noise terms.

## 4. NOISE ASSESSMENT RESULTS

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4.1 The prediction method used in this report is that described in the document "Calculation of Road Traffic Noise" published by the UK Department of Transport (Ref 2). The noise assessment has been carried out in accordance with noise criteria specified by EPD, which are:

- the combined expected maximum traffic noise level i.e. the relevant noise level, from the new or altered highway together with other traffic in the vicinity must not be less than the specified noise level (70 dB(A) L<sub>10</sub> (1 hr));
- the relevant noise level is at least 1.0 dB(A) more than the prevailing noise level i.e. the total traffic noise level existing before the works to construct or improve the highway were begun;
- the contribution to the increase in the relevant noise level from the new or altered highway must be at least 1.0 dB(A).

4.2 Noise generated by road traffic on and around the proposed flyover has been modelled using "Roadnois" noise modelling software.

### Modelling Exercise 1

4.3 Traffic flow data for 2006 have been used as the basis for deriving predicted noise levels in this report, with reference also being made to 1996 data.

4.4 The traffic flow data is in passenger car units (P.C.U.). In order to facilitate the noise modelling, there have been a number of assumptions made and they are enclosed in Appendix V. Two main assumptions for traffic flow have been made:

- 30% Heavy Goods Vehicles is assumed for the future total traffic flow data. This figure was based on a traffic flow count on 29 January 1993 at 8.00 - 9.00 am, and previous traffic noise assessments.
- Speeds on Tsuen King Circuit/the Flyover and Castle Peak Road have been taken to be 50 kmph.

4.5 Noise level predictions are based on traffic flows adjacent to the residential facades. The predicted residential facade levels from the proposed flyover are contained in Appendix VI. The results are presented based on noise levels from predicted 2006 traffic flows with the flyover in place (mitigated and unmitigated) and without the flyover in place (unmitigated) for comparative purposes in Appendix VI. Figures are in dB (A) and are shown in one-storey increments from floor one to the top of each residential block. For noise predictions based on 2006 flows without the proposed flyover, traffic flows on Tsuen King Circuit are assumed to be zero, and hence noise levels for residential facades facing this road (i.e. facade reference numbers 1 to 11 in Appendix VI) are not generated by the model.

- 4.6 The noise prediction indicates that the unmitigated noise level at the pre-vocational school will be approximately 74 dB(A), i.e. well in excess of the criterion of 65 dB(A) for educational establishments. The kindergarten/church currently under construction, will be exposed to noise levels, which are higher than this at facades facing Tsuen King Circuit. Other facades will benefit from varying degrees of screening.

*Evaluation of Impacts and Proposed Mitigation*

- 4.7 Hong Kong Planning Standards and Guidelines (HKPSG) (Ref 3) apply road traffic noise standards quoted as the  $L_{10(1-hour)}$  to be viewed as the maximum permissible noise level at the external facade. The standards apply to uses which rely on open windows for ventilation. Even though ventilation air conditioning units are present in residential blocks, it has been assumed that at least some rooms have a facade facing the road without such units and that air conditioning is not used all of the time. Therefore the standards have been applied on the assumption that opened windows are used for ventilation.

- 4.8 Four possibilities exist to provide mitigation:

- the use of porous tarmacadam road surface on Tsuen King Circuit within the study area;
- erection of noise barriers along Tsuen King Circuit;
- total enclosure of the existing stretch of Tsuen King Circuit within the study area;
- total enclosure along part of the existing stretch of Tsuen King Circuit within the study area, where this is technically feasible.

A comparative evaluation of the screening and enclosure mitigation options is summarized in Table 4.1.

- 4.9 The methodology of 'Calculation of Road Traffic Noise' allows a correction of 3.5 dB(A) to be used where a porous surface is used. A 50mm overlay of polymer modified asphalt comprising 20mm cushion course material and 30mm friction course material is proposed along Tsuen King Circuit. It is likely that this road surface will provide up to 5 dB(A) noise reduction, however the conservative reduction of 3.5 dB(A) is adopted for predicting the reduction in noise levels. The predicted noise levels are presented in Appendix VI. The benefit of this type of road surfacing can only be extended to reduce excessive noise levels derived from traffic on Castle Peak Road if the road surface is replaced to a similar specification to that proposed for Tsuen King Circuit. This is considered to be beyond the scope of this assessment.

- 4.10 An engineering feasibility assessment for total enclosure of Tsuen King Circuit was conducted to investigate the possibility of mitigating noise levels below the required criteria for all residential facades, apart from those already exposed to excessive noise levels from Castle Peak Road.

4.11 Total enclosure along the entire stretch of Tsuen King Circuit is not considered feasible due to the following:

- Pedestrian access, vehicular access leading to car parks, emergency access and bus access have to be maintained.
- As crossings have to be maintained by forming openings through the enclosure, excessive noise levels at certain residential facades will result.
- Line of sight would be a problem for road users along Tsuen King Circuit.
- There may be inadequate space for incorporating foundations.
- Total enclosure would affect the business of the shops along Tsuen King Circuit, and objections would likely be raised by the shopowners.
- Total enclosure is likely to prove prohibitively expensive and would not result in total mitigation as noise levels would be exceeded because of the necessary openings required for access.

4.12 Total enclosure along two road sections of Tsuen King Circuit was considered technically feasible. The locations and details of the total enclosures are indicated on the drawing nos. SK380 & 381 respectively (Appendix VII & VIII). Enclosed road sections will provide sufficient alternation to demonstrate reasonable best practice having regard to cost and practicality constraints, as given in Section 4.11 and Table 4.1. Other environmental considerations, such as visual and landscape impacts are beyond the scope of this noise assessment study. Noise assessment has been conducted with total enclosure of these road sections, and mitigated noise levels given in Appendix VI include this mitigation measure.

4.13 Along sections of Tsuen King Circuit where total enclosure of the road is not considered feasible, it is considered that the most effective mitigation would be achieved by the use of barriers and porous road surfacing. Three different barrier designs are proposed (drawings SK376A & 377 in Appendix VIII) which are constructed of transparent plexiglas acoustic panels with different degrees of access to suit the locational requirements. In order to maximise the mitigation provided by the noise barriers, it is recommended that these be designed to incorporate a return or canopy projecting towards, or partially over, the carriageway. In this way the barriers can be designed to provide the noise mitigation equivalent of a much higher barrier.

4.14 The location of the different types of noise barrier are given on drawing SK380 in Appendix VII. It can be seen that there will be a need to a number of gaps in the barriers at strategic locations to allow for:

- pedestrian access;
- vehicular access;
- emergency access; and
- bus access.

- 4.15 In some instances access requirements have impaired the benefit that would otherwise be provided by noise barriers. However, the requirements for access and for noise control are directly conflicting in certain localities and the access provisions must prevail. In areas where access is required Type 2 barriers are recommended (Appendix VIII) between entrance/exit points to provide maximum possible mitigation and visibility.
- 4.16 An additional constraint on the barrier design is the existing pavement widths, especially on Tsuen King Circuit adjacent to residential blocks and shops of Joyful Buildings and the kindergarten/church under construction. In addition, there are both technical and aesthetic constraints, since a barrier above 6 metres in height would be difficult to support and also would be aesthetically oppressive. Type 1 and Type 2 barriers are proposed in this locality to provide suitable mitigation and maximum possible access adjacent to Joyful Buildings and the kindergarten/church.
- 4.17 In order to mitigate the noise affecting the pre-vocational school it will be necessary to erect a noise barrier to a height of 3.5 metres as close to the kerb of Tsuen King Circuit, as possible. Type 3 barriers are recommended along this section of road, where only limited access is required. Further mitigation is provided by the existing design of the southern aspect of the school, which shows external walkways with parapets. These will protect the windows on this aspect as the parapets remove the line of sight to the source of noise. It is considered that the parapet will provide approximately 5 dB(A) attenuation, with the barrier also providing 5 dB(A) attenuation at the top floor in order to meet the criteria of 65 dB(A). The effect of totally enclosing the section of Tsuen King Circuit to the north of Tsuen Tak Gardens would be to further reduce noise levels at the pre-vocational school.
- 4.18 All other classrooms facing the road scheme will be protected to an equal or greater extent by the barrier, classrooms on lower floors will be in the shadow of the barrier to a greater extent and hence noise levels will be below 65 dB (A). It may prove more efficient and cost effective to protect the facade of the pre-vocational school by enclosing the external corridors with non-openable high density plastic screening to further reduce noise levels. If this is the case, additional ventilation measures may be necessary. By installing ventilation equipment on building facades facing away from the road any reduction in mitigation efficiency will be avoided.
- 4.19 The highest unmitigated noise level from traffic on Tsuen King Circuit at the kindergarten/church under construction will be 76 dB(A). The use of porous tarmac road surfacing will reduce the noise level to 73 dB(A). In the absence of noise barriers being proposed for this location, the use of indirect mitigation measures, i.e. air-conditioning, ventilation units, and secondary glazing, constitute best practice.
- 4.20 The western and southern facades of the kindergarten appear to be non-sensitive due to the presence of corridors, stair wells and storage space. However, the eastern facade has sensitive windows in it, and upper storeys in the southern part of this facade will require special glazing and air conditioning to achieve a noise level of 65 dB(A). Suitable window types are specified in Appendix 4.4 of HKPSG. A floor plan of the kindergarten/church is attached for reference in Appendix XIII.



- 4.21 Mitigated noise levels for 1996 traffic flows are substantially similar to the corresponding figures for 2006, being slightly higher on facades overlooking Tsuen King Circuit. However, any differences are of little significance, being 1 dB(A) or less and results have not been included into this report.
- 4.22 Noise criteria compliance for flats at each residential facade with a combination of mitigation measures and no mitigation in place, are provided in Table 4.2 - 4.4 and Figure 4.1 for comparative purposes. With no mitigation measures in place a total of 1064 of 1876 flats (ie 57%) in the study area exceed the noise criteria. This compares with 618 flats (ie 33%) exceeding the noise criteria with all mitigation measures in place ie road surfacing, barriers and two enclosures, 726 flats (ie 39%) with road surfacing and barriers only, and 964 flats (ie 51%) with barriers only. It can be seen, therefore that the inclusion of two enclosures reduces the number of flats exceeding the noise criteria by 108 flats (ie 6%).
- 4.23 Therefore, with the mitigation measures in place there is a substantial improvement in the noise environment than in their absence, but effective mitigation is not achieved for all dwellings for the following reasons:
- the high population density of the area;
  - the close proximity of the flyover to the existing properties;
  - the need for access openings onto Tsuen King Circuit;
  - the technical constraints on barrier design; and
  - the technical constraints on total road enclosure along the entire stretch of Tsuen King Circuit.
- 4.24 Of the residual 33% of dwellings not fulfilling the noise criteria with all mitigation measures in place, indirect mitigation measures are recommended to ensure compliance. These indirect measures include the provision of secondary glazing to reduce indoor noise levels or the provision of ventilation air-conditioning units to allow avoidance of opened windows for ventilation. By comparing, in Appendix VI, column 3 (2006 without flyover) with column 6 (2006 with flyover and mitigation in place) the number of flats on each floor, of each facade, requiring indirect mitigation measures can be deduced if required.
- 4.25 In the 20 m wide "grey area", which has been considered on a non-quantitative basis in the noise assessment, any road traffic noise resulting from the development is unlikely to be significant and can be discounted. This is because noise will be sufficiently attenuated by the shielding effect of intervening buildings, and due to Castle Peak Road which acts as the dominant noise source.
- 4.26 The proposals for Route 5 Extension have the potential to impact on the study area of this scheme. The environmental impact assessment (EIA) of the noise impact on Route 5 Extension may identify areas where further control to noise from Route 5 Extension/Castle Peak Road can be supplied. These would result in a further reduction of the overall noise impact within the study area.

## Modelling Exercise 2

4.27 Following the initial noise assessment, and the consideration of results by various government departments, a second round of modelling was undertaken with a set of modified model parameters.

4.28 Changes with respect to traffic flow and management, used for modelling purposes, include the following:

### *Traffic flow*

- An increase in the percentage composition of heavy goods vehicles (HGVs) on Castle Peak Road from 30% to 74% (Directions A and B)
- The use of traffic flows for Castle Peak Road based on 2006 traffic data and for Tsuen King Circuit on 2011 data, as agreed by EPD and TD. Actual traffic flow data used for modelling purposes is given in Appendix X.

### *Traffic management*

- The exclusion of HGVs over 11m in length using Tsuen King Circuit and the flyover. It has been assumed for modelling purposes that vehicles over 11m in length compose 20% of the total HGV flow.
- No banning of HGVs and hence no reduction in traffic flow for modelling purposes.

4.29 Changes with respect to the barrier layout plan include the following:

- The removal of barriers to the forefront of Joyful Building due to their potential obstruction of pedestrians and shops in the vicinity.
- The use of Type 3 barriers (Appendix VIII) in all other locations. Type 3 barriers are taken as being 5.5m in height.

The barrier layout plan used for modelling purposes in Modelling Exercise 2 is given in Appendix XI.

4.30 In addition to the above differences, the road alignment of Tsuen King Circuit has altered slightly from the initial modelling exercise, as shown in Appendix XI. This was not accounted for in the modelling, but is not considered to be a significant factor in affecting predicted noise levels.

4.31 The road enclosures used for modelling purposes in this monitoring exercise were of the same design and specification as in the initial modelling exercise.

4.32

Additional modelling runs which were carried out for the second modelling exercise include the following scenarios:

- i) Exclusion of HGVs over 11m in length using Tsuen King Circuit and flyover
  - The modelling of traffic flow with porous road surfacing and noise barriers in place only.
  - The modelling of traffic flow with porous road surfacing, noise barriers and two enclosures in place.
  - The modelling of traffic flow without porous road surfacing but with noise barriers in place only.
  - The modelling of traffic flow without porous road surfacing but with noise barriers and two enclosures in place.
- ii) No banning of HGVs along Tsuen King Circuit and flyover
  - The modelling of traffic flow with porous road surfacing and noise barriers in place only.
  - The modelling of traffic flow with porous road surfacing, noise barriers and two enclosures in place.
  - The modelling of traffic flow without porous road surfacing but with noise barriers in place only.
  - The modelling of traffic flow without porous road surfacing but with noise barriers and two enclosures in place.

Further modelling was conducted to predict noise levels at residential facades with no mitigation control at all, and for the year 2006 without the flyover present.

*Evaluation of Impacts and Proposed Mitigation*

4.33

Modelling results for each storey, for each facade, are given in Appendix XII and are summarised in Table 4.5 and Table 4.6. Table 4.5 refers to the situations where the banning of HGVs over 11m in length using Tsuen King Circuit (TKC) and the flyover is effective whereas Table 4.6 reflects the situations at which no restriction is taken for the HGVs over 11m in length using TKC and the flyover. Results in Table 4.5 and Table 4.6 exclude those for Kam Fung Garden and are summarised in Figure 4.2 and Figure 4.3 respectively. Results are presented on the basis that the lease conditions of Kam Fung Garden are such that the development of the lot shall design to the satisfaction of the Director of Environmental Protection in regard to noise from Castle Peak Road, the proposed Road 3/2 and the nearby factories.

4.34 Table 4.5 and Table 4.6 show that with no mitigation measures in place 65% of the residential facades within the study area (excluding Kam Fung Garden) are exposed to noise levels in excess of the acceptable noise criteria. This is actually a greater percentage than derived from the initial modelling exercise, which included Kam Fung Garden (ie 57% - see Table 4.2), and is a result of the additional HGV traffic flow on Castle Peak Road.

4.35 The effect of the mitigation measures in reducing the percentage of residences exceeding the noise criteria can be clearly seen on Table 4.5 and Table 4.6. The use of noise barriers and porous road surfacing provides additional noise attenuation when compared to barriers alone, resulting in 46% (where HGVs are selectively banned) and 54% (where HGVs are not banned) of the residences exceeding the noise criteria. This is reduced still further when the road enclosures are incorporated, resulting in 35% and 36% of the residences exceeding the noise criteria. These figures compare to 33% of the facades exceeding the noise criteria with all mitigation measures in place, and including Kam Fung Garden, as presented in the initial modelling exercise (see Table 4.2).

4.36 It is considered that the more unfavourable results of the second modelling exercise when compared to the first, even when Kam Fung Gardens are excluded, are a consequence of the following reasons:

- i) The exclusion of noise barriers to the forefront of Joyful Building.
- ii) The increased HGV traffic flow on Castle Peak Road (from 30% to 74%).
- iii) The use of the more detailed 2011 traffic flow data for Tsuen King Circuit, which resulted in a greater HGV loading (34% compared to 30%), despite the removal of 20% of HGV flow for vehicles exceeding 11 metres in length.

#### **Assessment of Air Pollution in Tsuen King Circuit Road Enclosures**

4.37 A preliminary assessment of the potential air quality impact associated with the emission of vehicle exhausts in the two road enclosures proposed on Tsuen King Circuit has been carried out.

4.38 The road scheme is designed to include two enclosed sections of roadway, comprising tunnels of approximately 40m long with a height of 5.5m and width of approximately 10m respectively.

4.39 Air pollutants are likely to build up within these tunnel sections at a greater rate than on open road sections due to the restricted dispersion caused by the enclosures. Pollutants of major concern include carbon monoxide, lead, particulates, hydrocarbons and oxides of nitrogen.

4.40 In studies undertaken by Hickman et al, at the Transport and Road Research Laboratories, UK, concentrations of carbon monoxide in areas of restricted dispersion were found to be below both short and long term air quality standards recommended by the World Health Organisation. The measured levels were found to be similar to those measured on open roads with similar traffic flows.

4.41 Carbon monoxide is often used on the primary determinant because virtually all other vehicle source pollutants are significantly correlated to it. On this basis it can be concluded that there will be no exceedance of air quality standards by vehicle sourced pollutants with the possible exception of oxides of nitrogen, which may possibly exceed both short (1 hour) term or long (annual) term averages. For this reason, a more thorough assessment of air quality is recommended at the detailed design stage, particularly as the proposed design is likely to pose a greater restriction of air dispersion than the studies from which the above conclusions have been drawn.

## 5. RECOMMENDATIONS

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- 5.1 It is proposed to construct flyover to connect the western end of Tsuen King Circuit and Sha Tsui Road, Tsuen Wan. At present the western end of Tsuen King Circuit terminates at a cul-de-sac, while Sha Tsui Road joins Castle Peak Road from the south, this junction being controlled by traffic lights.
- 5.2 A noise assessment has been conducted to predict the noise impacts from vehicular traffic using the proposed flyover on noise sensitive receivers within a defined study area. This assessment has been conducted in accordance with UK Department of Transport methods, and in conjunction with Hong Kong Government traffic noise criteria.
- 5.3 The objective of the computer modelling exercise was to predict the traffic noise levels at sensitive receivers within the study area against the above criteria, and to recommend direct noise mitigation measures (e.g. noise barriers) in order to reduce the number of residential dwellings exceeding the noise criteria to a minimum.
- 5.4 Future traffic flow data has been used, together with Government approved assumptions on traffic flow characteristics (e.g. vehicle speed and number of heavy goods vehicles), to model the predicted noise levels. A number of mitigation measures were considered, within certain environmental and engineering constraints, to determine the most effective method of reducing noise impacts to below 70 dB(A). These direct mitigation measures included:
- (i) The provision of a porous friction and surface to Tsuen King Circuit. This type of road surfacing has sound absorption properties, and for the purposes of this noise assessment exercise it was assumed that a reduction in traffic noise levels of 3.5 dB(A) was achievable;
  - (ii) The provision of two sections of road cover, one near to Castle Peak Road and the other adjacent to Woo Hon Fai Prevocational School; and
  - (iii) The provision of 5.5 metre high transparent noise barrier walls along certain sections of the existing footpath of Tsuen King Circuit.
- A set of sketches showing the site location plan, the general plan of proposed flyover and area of study, and the layout of proposed direct mitigation measures is attached.
- 5.5 In addition to noise predictions being made with and without the above mitigation measures, modelling was also conducted with and without a restriction on heavy goods vehicles (HGVs) over 11 metres in length using the flyover.

5.6 A total of 1316 residential properties were considered within the study area, excluding residential properties located within Kam Fung Garden. These residences were omitted on the basis that the lease conditions of the building are such that the development of the lot shall design to the satisfaction of the Director of Environmental Protection in regard to noise from Castle Peak Road, the proposed Road 3/2 and the nearby factories.

5.7 With no noise mitigation measures in place it has been predicted that 65% (i.e. 852) of residential facades would have noise levels above 70 dB(A). The reduction in residential facades exceeding 70 dB(A) that meeting all 3 criteria in CRTN with a combination of direct mitigation measures in place is as follows:

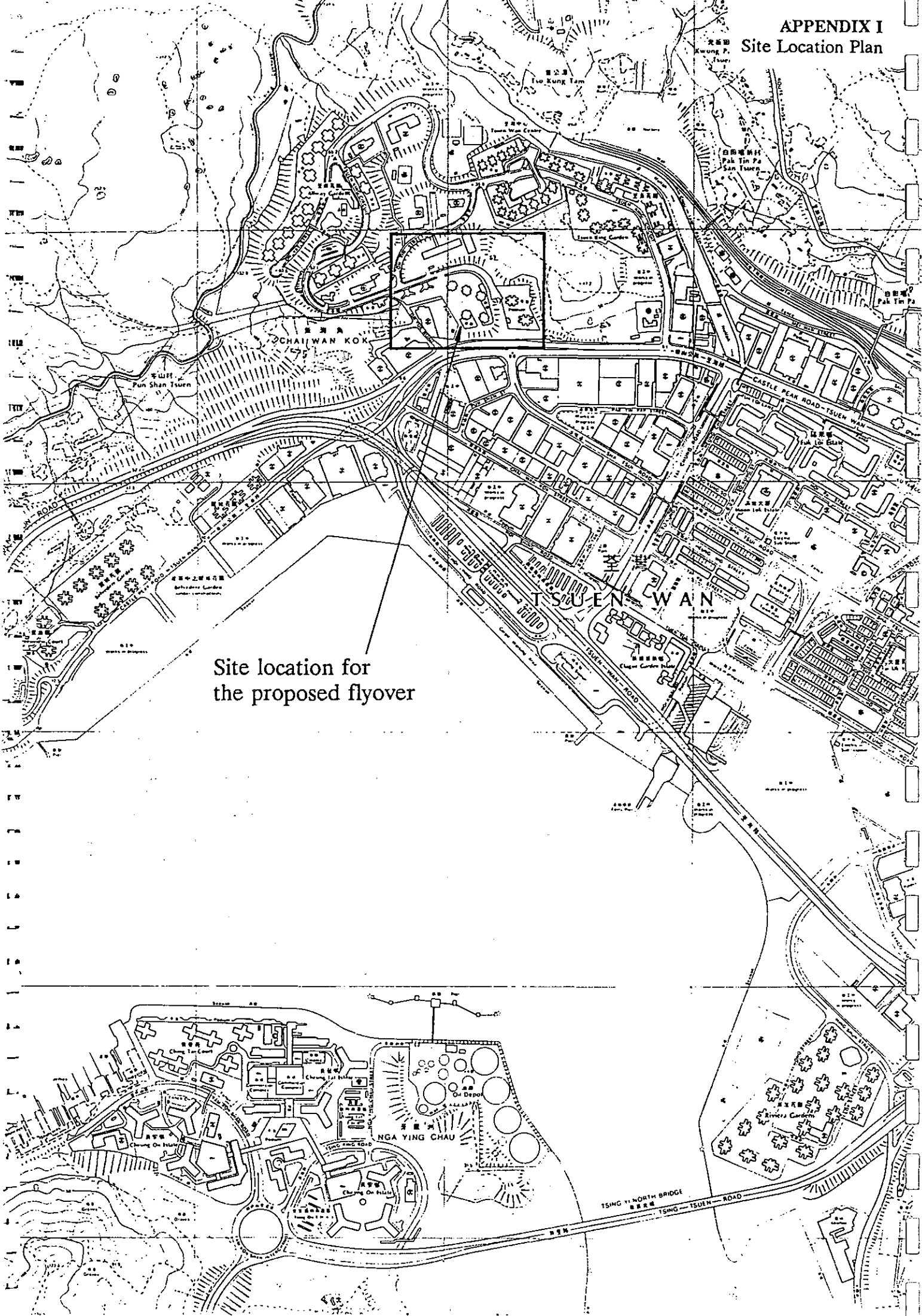
Direct Noise Mitigation	Number of Flats meeting all 3 criteria in CRTN (Total 1316)*
Noise barriers only	776 or 59% (770 or 58.5%)
Noise barriers with porous road surfacing only	705 or 54% (608 or 46%)
Noise barriers with road enclosures but without porous road surfacing	663 or 50% (643 or 49%)
Noise barriers with road enclosures and porous road surfacing	480 or 36% (466 or 35%)

Note:\* figures in brackets refer to number of affected flats meeting all 3 criteria in CRTN with restriction of HGVs over 11 metres in length.

5.8 On the basis of the noise assessment, it is recommended that all direct mitigation measures as stated in paragraph 5.4 above be provided in order to provide the maximum practicable degree of noise protection to residents within the study area. From the table above, the adoption of traffic management does not give rise to significant effect on the reduction of number of flats affected. Of the residual number of the flats exceeding the noise criteria, it is suggested that these be considered for indirect mitigation measures including the provision of secondary glazing and air-conditioning units in order to reduce road traffic noise impacts to acceptable levels. In addition to residential facades, a kindergarten/church on Tsuen Wan Circuit will also require indirect mitigation measures to ensure adequate protection from road traffic noise.

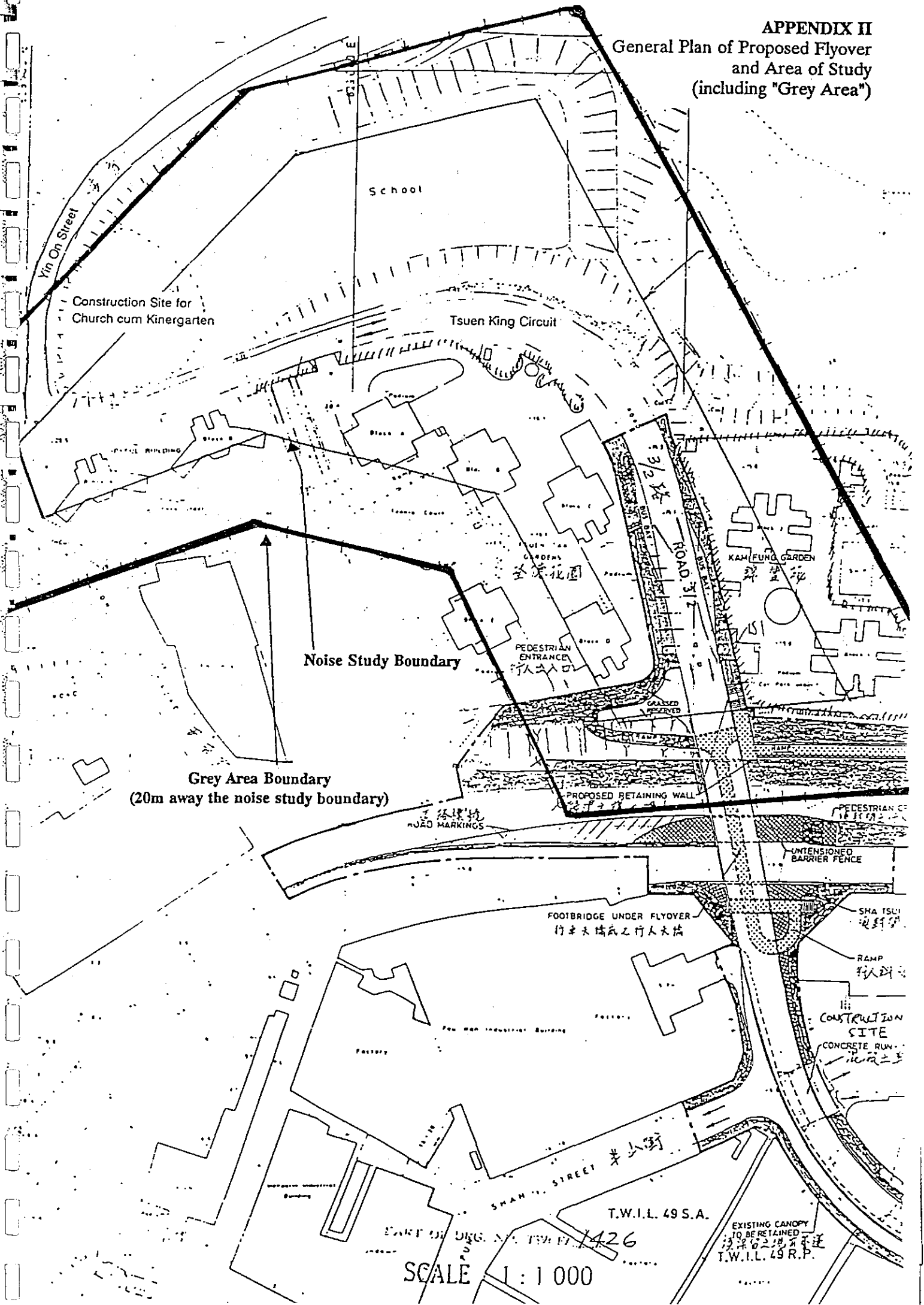
5.9 It is considered that, within the engineering and environmental constraints of providing further direct mitigation measures, the combination of direct measures proposed represents the best practicable solution to mitigating traffic noise impacts within the study area.

APPENDIX I  
Site Location Plan





**APPENDIX II**  
**General Plan of Proposed Flyover**  
**and Area of Study**  
**(including "Grey Area")**

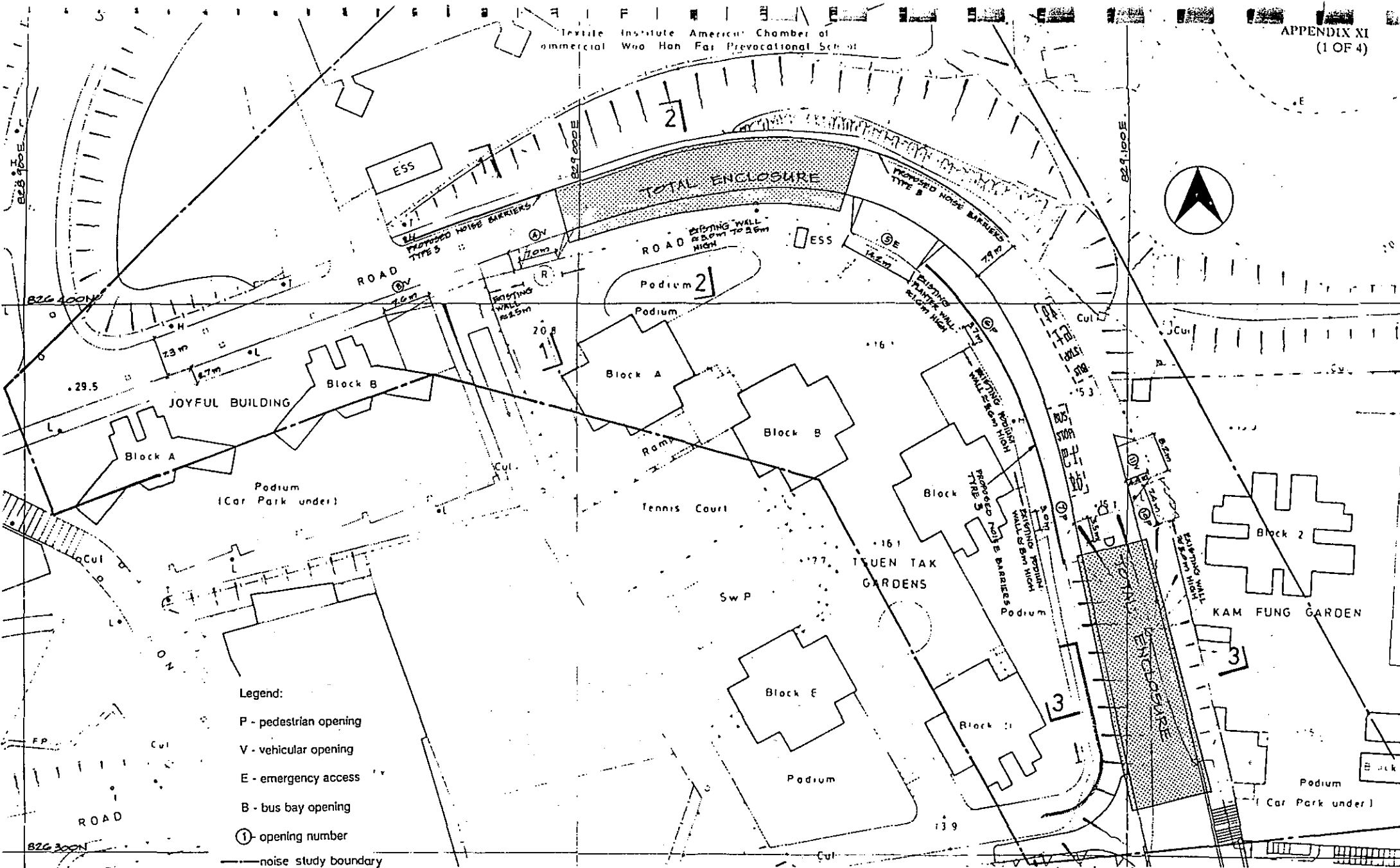


SCALE 1 : 1 000

T.W.I.L. 49 S.A.

EXISTING CANOPY TO BE RETAINED  
 現存之遮篷保留  
 T.W.I.L. 49 R.P.

426



- Legend:
- P - pedestrian opening
  - V - vehicular opening
  - E - emergency access
  - B - bus bay opening
  - ① - opening number
  - noise study boundary

**Scott Wilson Kirkpatrick**  
CONSULTING ENGINEERS

TSUEN WAN DEVELOPMENT  
TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT CHIA TSUI ROAD

MODIFIED LAYOUT OF PROPOSED  
MITIGATION MEASURES  
SHEET 1 OF 2

Suffix	Date	Revision	Drawn	Checked
Drawing No.		73808/SK385		
Date	14.5.75	Drawn	T.M.	Scale N.T.S.
Checked	and	Approved	S.W.	

## 6. CONCLUSIONS

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- 6.1 The modelling exercise carried out has been conducted with the emplacement of three suitable mitigation measures i.e. the use of porous road surfacing, total enclosure of two sections of Tsuen King Circuit and the use of noise barriers. Predicted noise levels indicate that these mitigation measures result in the reduction of the 1984 residential dwellings in the study area exceeding the noise criteria of 70 dB (A) to 33%, compared to 57% with no mitigation in place. Total mitigation using these direct measures is not achievable for a number of reasons related to the high population density in the study area, the access requirements and the technical constraints in providing total enclosure along the entire length of Tsuen King Circuit.
- 6.2 The initial modelling exercise has demonstrated that with the mitigation measures in place noise levels will be reduced to acceptable levels for the majority of classrooms at the pre-vocational school in the study area. Some classrooms on the upper floors facing the road may require further indirect mitigation including suitable screening along the open corridors with suitable ventilation.
- 6.3 For the kindergarten/church porous road surfacing constitutes the best practice, where noise levels achieved will be 73 dB (A). Further indirect mitigation measures including secondary glazing and suitable ventilation will be required on the eastern and southern facades to achieve the noise criteria of 65 dB (A).
- 6.4 The second modelling exercise, conducted with a modified traffic flow and altered barrier design, has also demonstrated that with all mitigation measures in place 35% of the dwellings exceed acceptable noise criteria. However, where traffic management of HGVs along TKC and the flyover is not put in place then 36% of the dwellings are likely to exceed the acceptable noise level criteria. Both figures in each case exclude Kam Fung Garden which was omitted from consideration on the basis of its lease conditions, where the development of the lot shall design to the satisfaction of the Director of Environmental Protection in regard to noise from Castle Peak Road, the proposed Road 3/2 and the nearby factories. The high proportion of HGVs on Castle Peak Road (74%) and the exclusion of barriers along Joyful Building in the modelling exercise account for the higher proportion of flats exceeding the noise criteria when compared to the initial modelling exercise.
- 6.5 Of the residual number of dwellings exceeding the noise criteria, indirect mitigation measures are recommended including the provision of secondary glazing and air-conditioning ventilation units.
- 6.6 Further mitigation control specified under the EIA of the Route 5 Extension proposal may result in further noise reductions in the study area, but these cannot be quantified within the context of this report.

6.7

Preliminary assessment of air pollution as a result of vehicle emissions in the two road enclosures conducted that pollutants were unlikely to be a significant problem, with the possible exception of oxides of nitrogen. A more thorough assessment is therefore recommended.

## **TABLES**

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- 4.1 Comparative Evaluation of Potential Noise Mitigation Measures
- 4.2 Evaluation of Noise Levels With (Including Road Surfacing, Barriers and Enclosures) and Without Mitigation Measures - Modelling Exercise 1
- 4.3 Evaluation of Noise Levels With (Including Road Surfacing and Barriers Only) and Without Mitigation Measures - Modelling Exercise 1
- 4.4 Evaluation of Noise Levels With (Barriers Only) and Without Mitigation Measures - Modelling Exercise 1
- 4.5 Evaluation of Noise Levels With and Without Mitigation Measures - Modelling Exercise 2 (with traffic management of HGVs along Tsuen King Circuit and the flyover)
- 4.6 Evaluation of Noise Levels With and Without Mitigation Measures - Modelling Exercise 2 (without traffic management of HGVs along Tsuen King Circuit and the flyover)

Table 4.1: Comparative Evaluation of Potential Noise Mitigation Measures

	Environmental	Economic	Technical constraints	Maintenance	Visual impact
No action	No mitigation of noise	No additional costs	--	No maintenance	Not applicable
Screening as proposed	Mitigation of noise from Tsuen King Circuit. Mitigation of noise at school	Estimated construction cost of noise barriers and porous pavement = \$6.0M	Proposed noise barriers discontinued at various locations for pedestrian accesses and crossing, vehicular accesses, bus access and emergency access.	Minor maintenance. Resurfacing of porous pavement if necessary, say every 3 years, at a cost of about \$200/m <sup>2</sup> .	Clear plastic screens reduce visual impact
Total enclosure of certain road sections	Additional mitigation beyond screening as proposed, especially at higher floors.	Estimated construction cost of partial enclosure and porous pavement = \$14.0M	in certain locations: <ul style="list-style-type: none"> <li>• Inadequate space for foundations</li> <li>• Sight distance affected</li> <li>• Pedestrian accesses and crossings not provided</li> <li>• Business of the adjacent shops affected</li> </ul>	Maintenance requirements more extensive and difficult than the barriers.	Localized significant impact.
Total enclosure of road	Additional mitigation beyond enclosure of certain road sections. Air quality impacts at locations of extractor fans.	Estimated construction cost of total enclosure = \$30.0M	in certain locations: <ul style="list-style-type: none"> <li>• Inadequate space for foundations</li> <li>• Sight distance affected</li> <li>• Pedestrian accesses and crossings, vehicular accesses, bus accesses and emergency access not provided</li> <li>• Business of the adjacent shops affected</li> </ul>	Maintenance requirements more extensive and difficult than the noise barriers.	Severe impact along entire road.

**Table 4.2: Evaluation of Noise Levels With (Including Road Surfacing, Barriers and Enclosures) and Without Mitigation Measures - Modelling Exercise 1**

Facade Ref.	Total No. of Flats	+ 1dB(A) and over 70 UNMITIGATED	+ 1dB(A) and over 70 Road Surface, Barriers & Enclosures
1	162 (1 to 3)	162 (1 to 3)	38
2	-	-	54
3	-	-	40
4	162 (4 to 6)	162 (4 to 6)	40
5	-	-	54
6	-	-	40
7	248 (7 to 8)	60	16
8	-	54	0
9	248 (9 to 10)	52	0
10	-	52	0
11	248 (11 to 13)	40	0
12	-	60	58
13	-	58	38
14	280 (14 & 17)	70	54
15	280 (15 to 16)	40	18
16	-	70	58
17	-	70	28
18	248 (18 to 20)	58	54
19	-	56	20
20	-	0	8
	1876	1064 (57%)	618 (33%)

**Table 4.3: Evaluation of Noise Levels With (Including Road Surfacing and Barriers Only) and Without Mitigation Measures - Modelling Exercise 1**

Facade Ref.	Total No. of Flats	+ 1dB(A) and over 70 UNMITIGATED	+ 1dB(A) and over 70 Road Surface, Barriers
1	[162] (1 to 3)	[162] (1 to 3)	38
2	-	-	54
3	-	-	40
4	[162] (4 to 6)	[162] (4 to 6)	40
5	-	-	54
6	-	-	48
7	248 (7 to 8)	60	46
8	-	54	0
9	248 (9 to 10)	52	0
10	-	52	0
11	248 (11 to 13)	40	0
12	-	60	60
13	-	58	54
14	280 (14 & 17)	70	70
15	280 (15 to 16)	40	14
16	-	70	58
17	-	70	60
18	248 (18 to 20)	58	58
19	-	56	24
20	-	0	8
	1976	1064 (57%)	726 (39%)



**Table 4.4: Evaluation of Noise Levels With (Barriers Only) and Without Mitigation Measures - Modelling Exercise 1**

Facade Ref.	Total No. of Flats	+ 1dB(A) and over 70 UNMITIGATED	+ 1dB(A) and over 70 Barriers Only
1	[162] (1 to 3)	[162] (1 to 3)	54
2	-	-	54
3	-	-	52
4	[162] (4 to 6)	[162] (4 to 6)	52
5	-	-	54
6	-	-	54
7	248 (7 to 8)	60	58
8	-	54	32
9	248 (9 to 10)	52	24
10	-	52	44
11	248 (11 to 13)	40	20
12	-	60	60
13	-	58	56
14	280 (14 & 17)	70	70
15	280 (15 to 16)	40	34
16	-	70	66
17	-	70	64
18	248 (18 to 20)	58	58
19	-	56	48
20	-	0	10
	1876	1064 (57%)	964 (51%)

**Table 4.5: Evaluation of Noise Levels With and Without Mitigation Measures - Modelling Exercise 2 (with traffic management of HGVs along Tsuen King Circuit and the flyover)**

Facade Ref	Total No. of Flats in Study Area	Unmitigated	Barriers with Porous Road Surfacing	Barriers Enclosures with Porous Road Surfacing	Barriers without Porous Road Surfacing	Barriers Enclosures without Porous Road Surfacing
1	162 (1 to 3)	162	162	162	162	162
2	-					
3	-					
4	162 (4 to 6)	162	162	162	162	162
5	-					
6	-					
7	248 (7 to 8)	92	78	40	92	79
8	-	50	32	0	40	0
9	248 (9 to 10)	54	0	0	38	0
10	-	54	4	0	48	44
11	248 (11 to 13)	54	0	0	50	34
12	-	60	58	58	60	58
13	-	58	56	44	58	52
14	EXCLUDING	KAM FUNG	GARDEN			
15						
16						
17						
18	248 (18 to 20)	60	58	0	62	52
19	-	46	0	0	0	0
20	-	0	0	0	0	0
	1316	852 (65%)	608 (46%)	466 (35%)	770 (59%)	643 (49%)

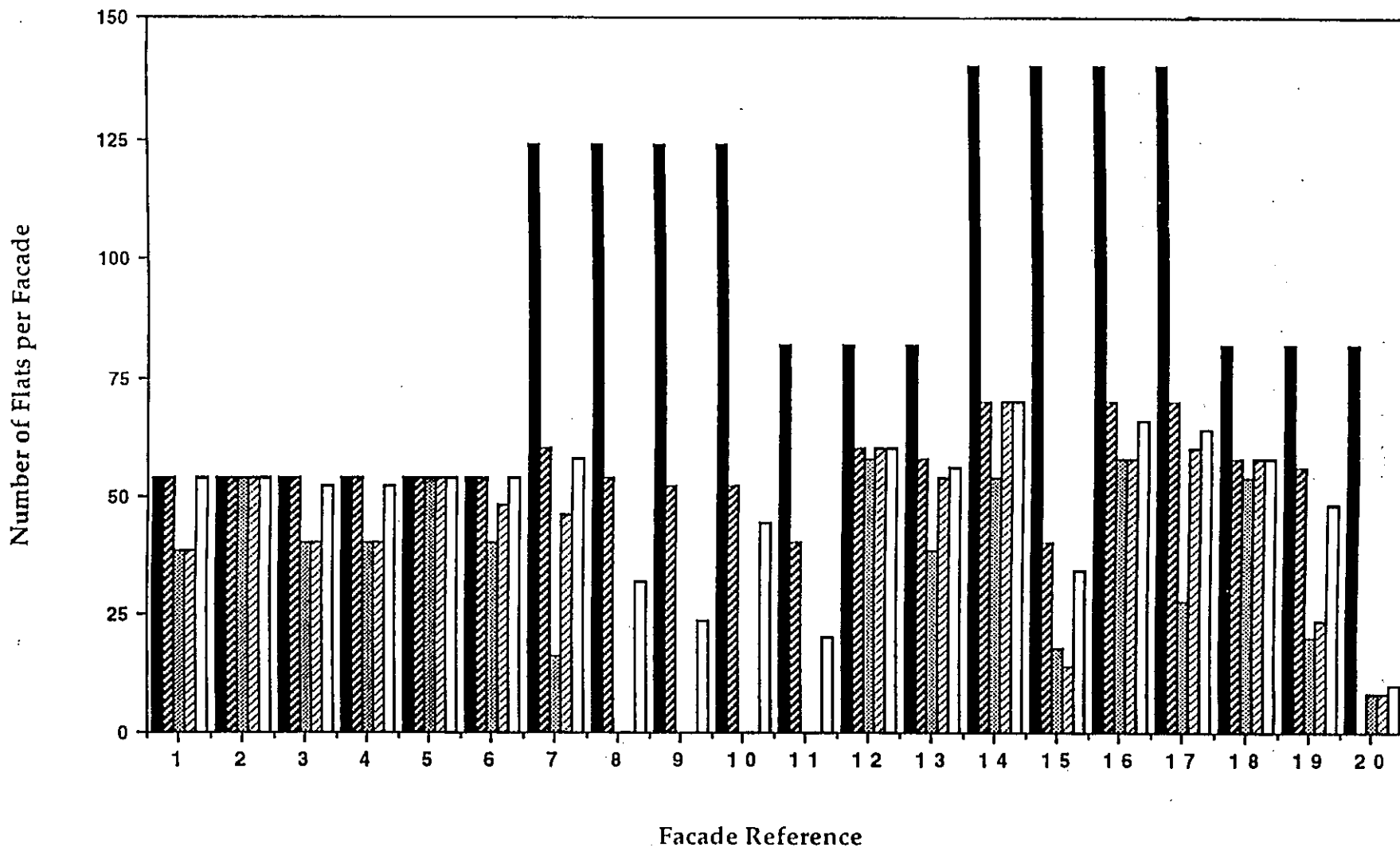
**Table 4.6: Evaluation of Noise Levels With and Without Mitigation Measures - Modelling Exercise 2 (without traffic management of HGVs along Tsuen King Circuit and the flyover)**

Facade Ref	Total No. of Flats in Study Area	Unmitigated	Barriers with Porous Road Surfacing	Barriers Enclosures with Porous Road Surfacing	Barriers without Porous Road Surfacing	Barriers Enclosures without Porous Road Surfacing
1	162 (1 to 3)	162	162	162	162	162
2	-					
3	-					
4	162 (4 to 6)	162	162	162	162	162
5	-					
6	-					
7	248 (7 to 8)	92	85	40	92	83
8	-	50	34	0	42	0
9	248 (9 to 10)	54	26	0	42	0
10	-	54	42	0	48	46
11	248 (11 to 13)	54	20	0	50	46
12	-	60	58	58	60	58
13	-	58	58	58	58	52
14	EXCLUDING	KAM FUNG	GARDEN			
15						
16						
17						
18	248 (18 to 20)	60	56	0	60	54
19	-	46	0	0	0	0
20	-	0	0	0	0	0
	1316	852 (65%)	705 (54%)	480 (36%)	776 (59%)	663 (50%)

## FIGURES

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- 4.1 Noise compliance of Residential Facades within the Study Area With and Without Mitigation Measures - Modelling Exercise 1
- 4.2 Noise compliance of Residential Facades within the Study Area (excluding Kam Fung Gardens) With and Without Mitigation Measures - Modelling Exercise 2 (with traffic management for banning HGVs over 11m in length using TKC and the flyover)
- 4.3 Noise compliance of Residential Facades within the Study Area (excluding Kam Fung Gardens) With and Without Mitigation Measures - Modelling Exercise 2 (without traffic management for banning HGVs over 11m in length using TKC and the flyover)



**Legend**

- - Total no. of flats per facade
- ▨ (diagonal hatching) - No. of flats not in compliance with road surfacing and barriers only
- ▧ (diagonal hatching) - No. of flats not in compliance with no mitigation measures
- - No. of flats not in compliance with barriers only
- ▩ (diagonal hatching) - No. of flats not in compliance with road surfacing, barriers and enclosures

Figure 4.1 - Noise compliance of Residential Facades within the Study Area with and Without Mitigation Measures - Modelling Exercise 1

Figure 4.2 - Noise compliance of Residential Facades within the Study Area (excluding Kam Fung Gardens) With and Without Mitigation Measures - Modelling Exercise 2 (with traffic management for banning HGVs over 11 m in length using TKC and the flyover).

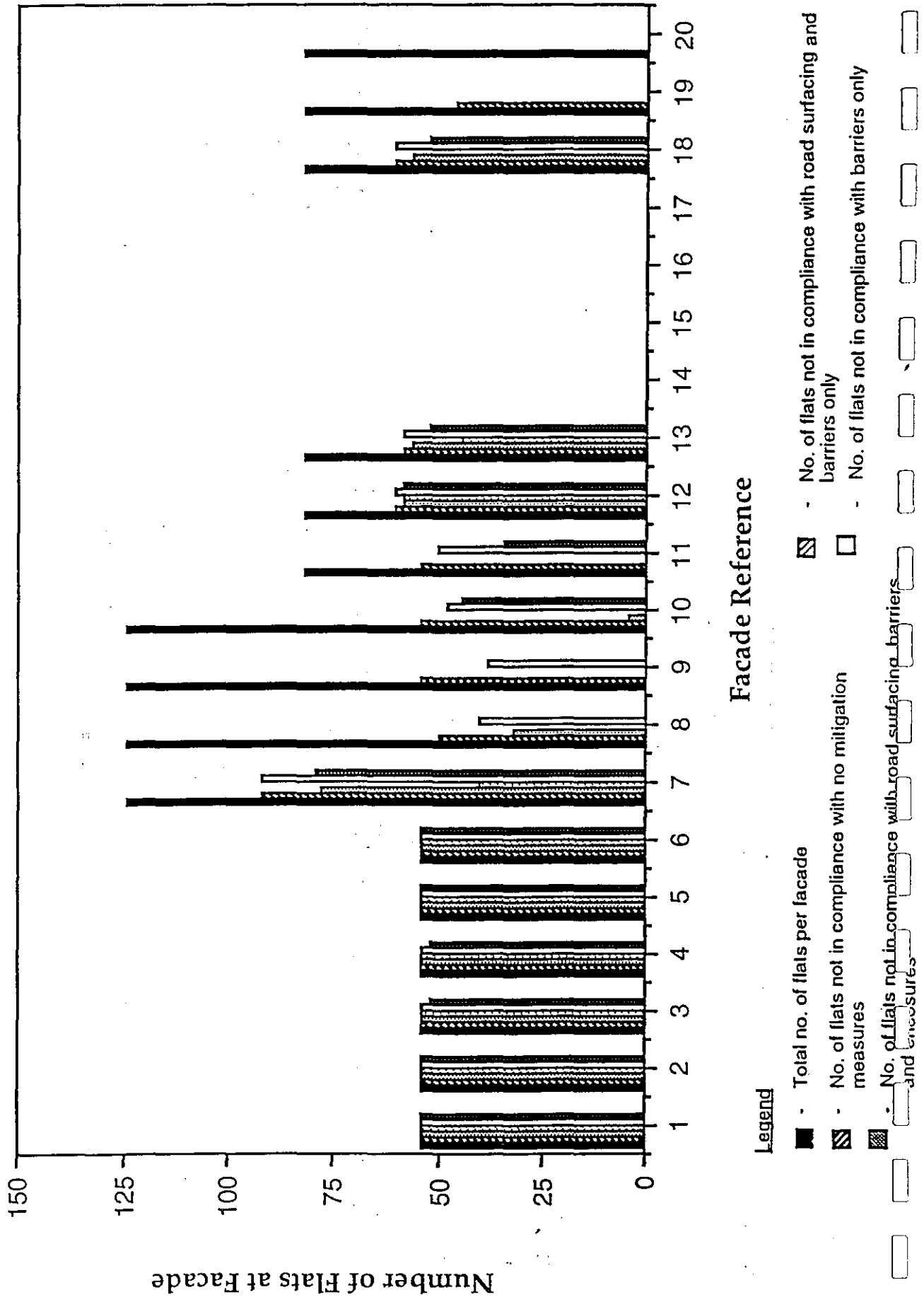
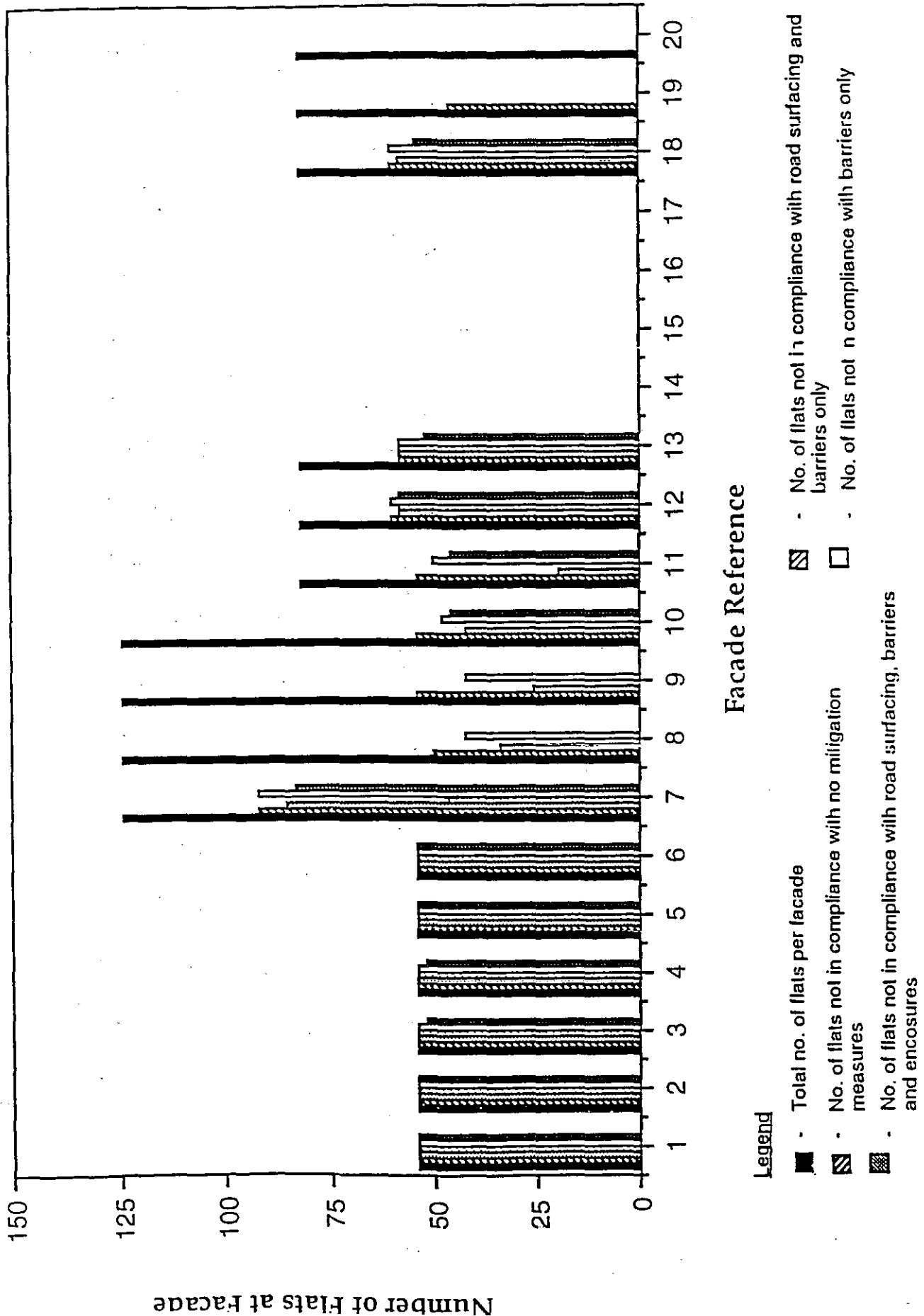


Figure 4.3 - Noise compliance of Residential Facades within the Study Area (excluding Kam Fung Gardens) With and Without Mitigation Measures - Modelling Exercise 2 (without traffic management for banning HGVs over 11 m in length using TKC and the flyover)



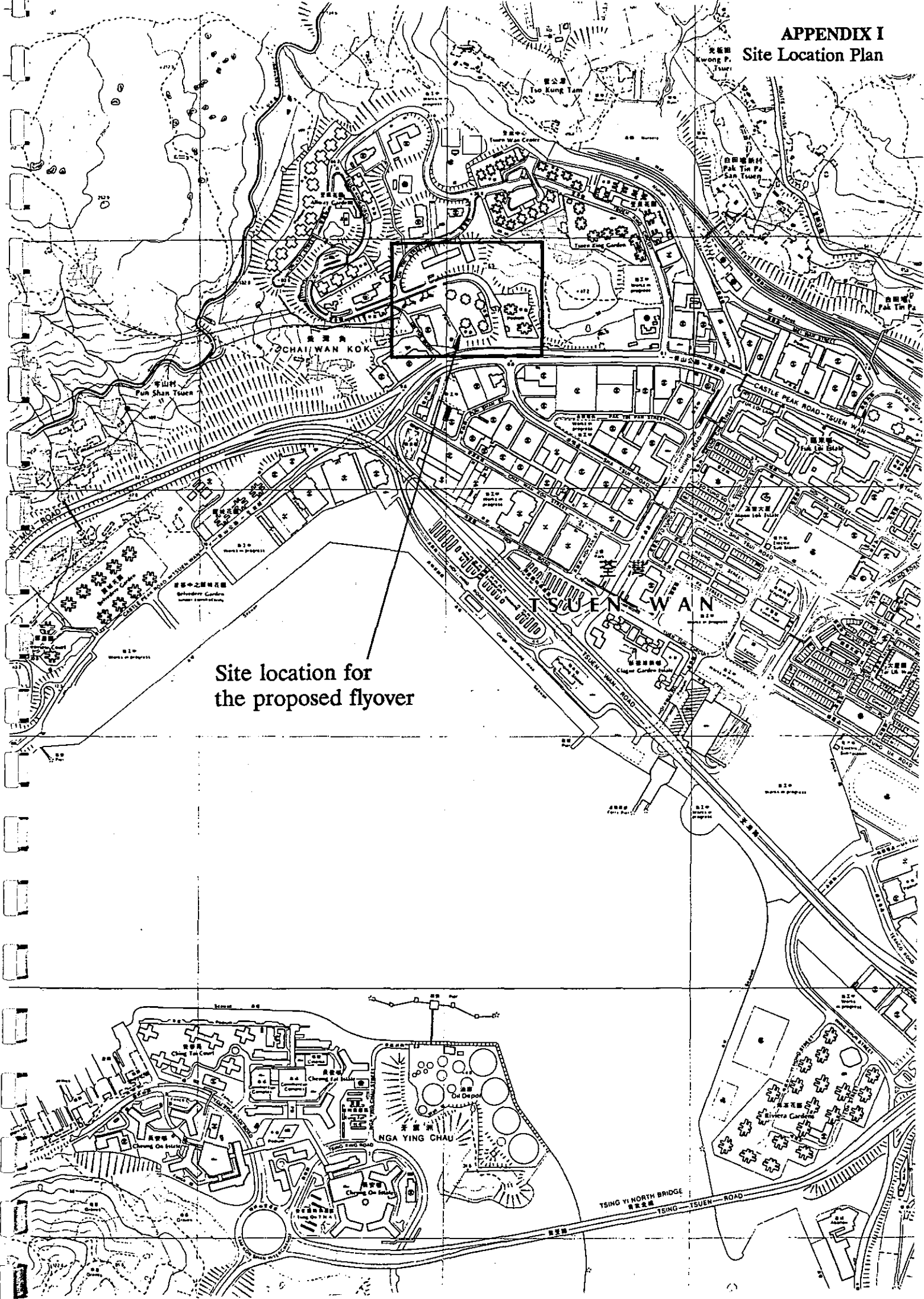
## APPENDICES

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- I Site location plan
- II General plan of proposed flyover and area of study (including "grey area")
- III Existing road plan
- IV Relevant traffic flow figures for 1996 and 2006 - Modelling Exercise 1
- V Assumptions
- VI Predicted facade noise levels from proposed flyover - Modelling Exercise 1
- VII Drawing No. 73808/SK380 showing layout of proposed noise mitigation measures - Modelling Exercise 1
- VIII Drawing Nos. 73808/SK376A, 377 & 381 showing details of noise barriers - Modelling Exercise 1
- IX EPD's Guideline for Traffic Noise Assessment Report for New Road Projects.
- X Relevant traffic flow figures for 2006 and 2011 - Modelling Exercise 2
- XI Drawing Nos 73808/SK380 showing modified layout of proposed mitigation measures and altered road alignment - Modelling Exercise 2
- XII Predicted facade noise levels from proposed flyover - Modelling Exercise 2
- XIII Floor plan of kindergarten/church

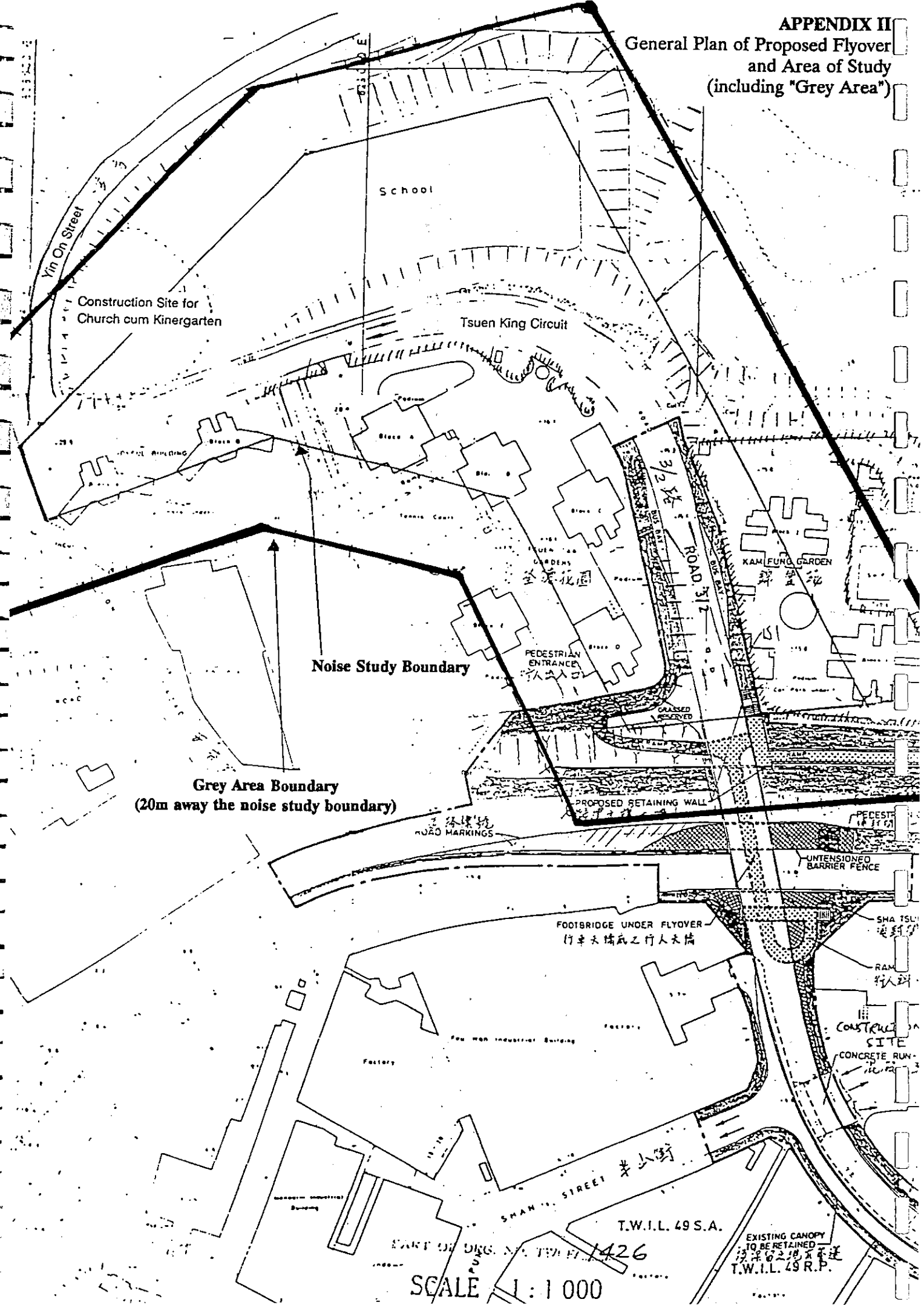


APPENDIX I  
Site Location Plan



Site location for  
the proposed flyover

**APPENDIX II**  
**General Plan of Proposed Flyover**  
**and Area of Study**  
**(including "Grey Area")**



**Noise Study Boundary**

**Grey Area Boundary  
 (20m away the noise study boundary)**

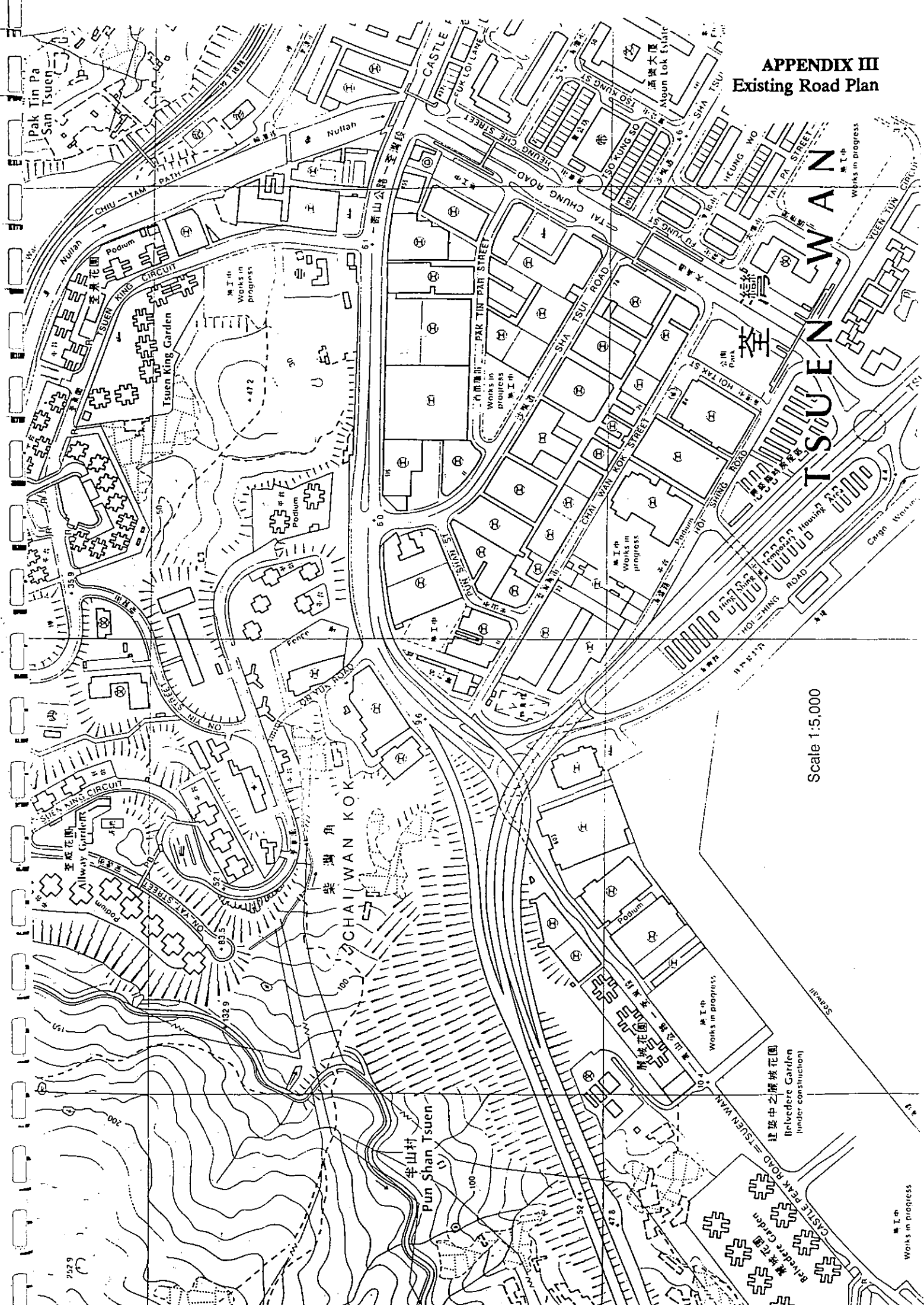
SCALE 1:1000

T.W.I.L. 49 S.A.

EXISTING CANOPY  
 TO BE RETAINED  
 現存之遮篷  
 T.W.I.L. 49 R.P.

EAST OF DRG. NO. TYP. 1426

APPENDIX III  
Existing Road Plan



Scale 1:5,000

TSUEN WAN

半山村  
Pun Shan Tsuen

柴灣角  
CHAI WAN KOK

建築中之聯城花園  
Belvedere Garden  
(under construction)

聯城花園  
Belvedere Garden

Works in progress

Works in progress

Works in progress

Works in progress

Works in progress

Works in progress

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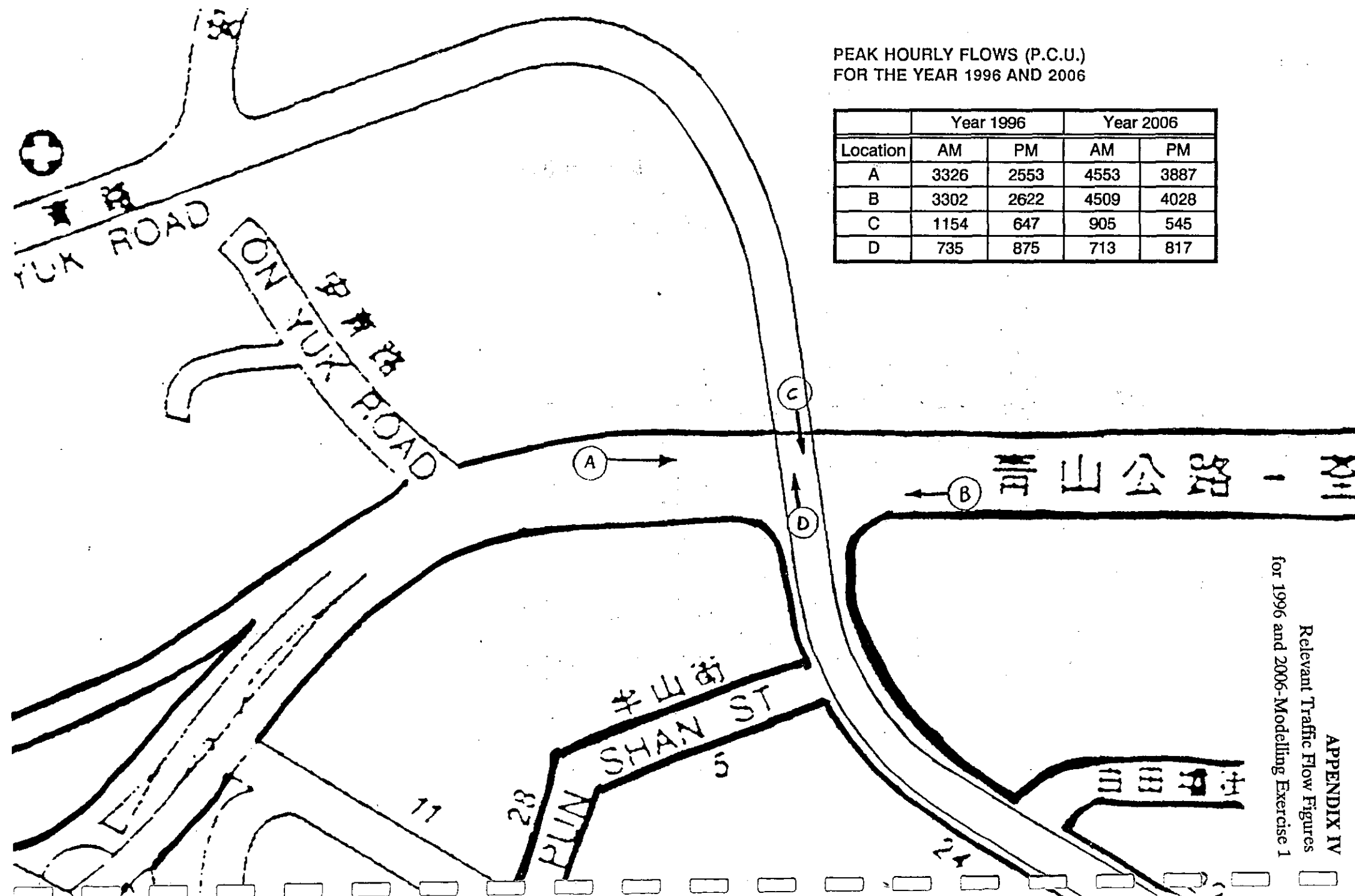
Works in progress

Works in progress

Works in progress

PEAK HOURLY FLOWS (P.C.U.)  
FOR THE YEAR 1996 AND 2006

Location	Year 1996		Year 2006	
	AM	PM	AM	PM
A	3326	2553	4553	3887
B	3302	2622	4509	4028
C	1154	647	905	545
D	735	875	713	817



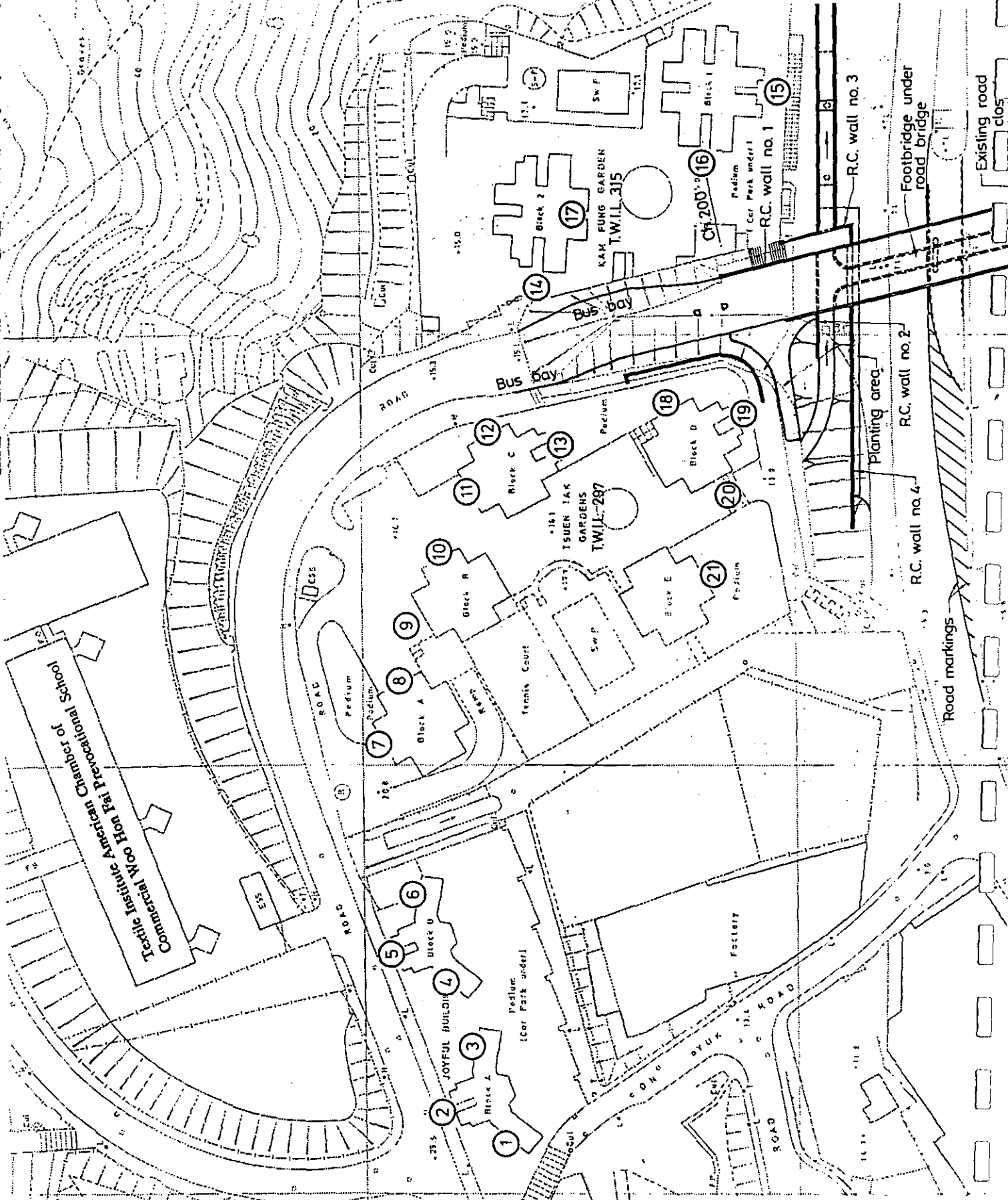
**APPENDIX V**  
**Assumptions**

1. Levels above datum for the Prevacation School have been estimated from site plans and photographs.
2. Levels above datum for the Kindergarten/church which is under construction, and the location and layout of this building have been estimated from site plans and photographs. The facade has been positioned 2 metres from the kerb of Tsuen King Circuit.
3. Podium levels above datum for Joyful Buildings, Tsuen Tak Gardens and Kam Fung Garden have been estimated from site plans and photographs.
4. Traffic flow data for Tsuen King Circuit and On Yin Street for 2006 without the flyover was not available; the contribution to noise levels from these sources has therefore been assumed to be zero.
5. The proposed noise barrier adjacent to and to the north of Joyful Buildings extends beyond the boundary of the schemes as shown on site plans. This barrier has been assumed to be 5 metres high, with a 1 metre return, situated at the kerb.
6. All proposed barrier heights (5 metres and 3.5 metres respectively) are illustrated on Drawing no. 73808/SK376A.
7. Traffic flow data supplied was in Passenger Car Units (PCUs). To convert these units to units for calculations in accordance with CRTN, flows in PCUs were divided by 1.3 and a percentage heavy goods vehicles of 30% has been assumed. A traffic speed of 50 kmph was assumed for Tsuen King Circuit, the proposed flyover, and Castle Peak Road.
8. In situations where there is a conflict between noise mitigation requirements and access through noise barriers, access requirements have been maintained as per Drawing no. 73808/SK380.

APPENDIX VI

(1 of 23)

Predicted Facade Noise Level  
from Proposed Flyover



① - Facade reference number

## Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1

(2 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Joyful Building Block A	1	NA	79	76	71	71	73	73
	2			75	71	71	73	73
	3			75	71	71	73	73
	4			75	71	71	73	73
	5			74	71	71	73	73
	6	NA	77	74	72	72	74	74
	7			74	72	72	75	75
	8			73	73	73	75	75
	9			73	73	73	75	75
	10			72	73	73	75	75
	11	NA	75	72	72	72	75	75
	12			72	72	72	75	75
	13			72	72	72	75	75
	14			71	72	72	74	74
	15			71	72	72	74	74
	16	NA	74	71	71	71	74	74
	17			71	71	71	74	74
	18			70	71	71	73	73
	19			70	71	71	73	73
	20			70	70	70	73	73
	21	NA	73	70	70	70	73	73
	22			69	70	70	73	73
	23			69	70	70	72	72
	24			69	70	70	72	72
	25			69	70	70	72	72
	26	NA	72	69	69	69	72	72
	27	NA	72	69	69	69	72	72

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
(3 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 2	1	NA	82	79	78	78	78	81	81
	2			78	78	78	80	80	
	3			78	78	78	80	80	
Joyful Building Block A	4	NA	79	77	77	77	77	80	80
	5			76	77	77	80	80	
	6			76	77	77	79	79	
	7			75	76	76	79	79	
	8			75	75	76	78	78	
	9			74	75	75	78	78	
	10			74	75	75	77	77	
	11			74	74	75	77	77	
	12			73	74	74	77	77	
	13			73	74	74	76	76	
14	73	73	74	76	76				
15	72	73	73	76	76				
16	72	NA	75	72	73	73	76	76	
17	72			73	73	75	75		
18	72			72	73	75	75		
19	71			72	72	75	75		
20	71	NA	74	71	72	72	75	75	
21	71			72	72	75	74		
22	71			72	72	74	74		
23	71			71	72	74	74		
24	70	NA	73	70	71	71	74	74	
25	70			71	71	74	74		
26	70			71	71	74	74		
27	70			71	71	74	73		



**APPENDIX VI**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1**  
(4 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 3	1	NA	79	76	68	68	70	70
	2			75	68	68	71	71
	3			75	69	69	72	72
Joyful Building Block A	4			74	71	71	74	74
	5			74	73	73	75	75
	6	NA	77	74	74	74	76	76
	7			73	74	74	76	76
	8			73	74	74	76	76
	9			73	74	74	76	76
	10			72	73	73	76	76
	11	NA	75	72	73	73	76	76
	12			72	73	73	75	75
	13			71	73	73	75	75
14			71	72	72	75	75	
15			71	72	72	75	75	
16	NA	74	71	72	72	74	74	
17			70	72	72	74	74	
18			70	72	72	74	74	
19			70	71	71	74	74	
20			70	71	71	74	74	
21	NA	73	70	71	71	73	73	
22			69	71	71	73	73	
23			69	71	71	73	73	
24			69	70	70	73	73	
25			69	70	70	73	73	
26	NA	72	69	70	70	73	73	
27	NA		72	69	70	70	72	

APPENDIX V  
 Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise  
 (5 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover							
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing		
Ref 4	1	NA	79	76	68	68	70	70		
	2			75	68	68	71	71		
	3			75	69	69	72	72		
Joyful Building Block B	4	NA	77	74	71	71	74	74		
	5			74	73	73	75	75		
	6			74	74	74	76	76		
	7			73	74	74	76	76		
	8			73	74	74	76	76		
	9			73	74	74	76	76		
	10			72	73	73	76	76		
	11			NA	75	72	73	73	76	76
	12					72	73	73	75	75
	13					71	73	73	75	75
14	NA	74	74	71	72	72	75	75		
15				71	72	72	75	75		
16				71	72	72	74	74		
17				70	72	72	74	74		
18				70	72	72	74	74		
19				70	71	71	74	74		
20	NA	73	73	70	71	71	74	74		
21				70	71	71	73	73		
22				69	71	71	73	73		
23				69	71	71	73	73		
24				69	70	70	73	73		
25				69	70	70	73	73		
26				69	70	70	73	73		
27	NA	72	72	70	70	72	72			

## Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1

(6 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 5	1	NA	82	79	78	78	80	80
	2			78	78	78	81	80
Joyful Building Block B	3			77	78	78	81	81
	4			77	78	78	80	80
	5			76	77	77	80	80
	6	NA	79	76	76	77	79	80
	7			75	76	76	79	78
	8			75	76	76	78	78
	9			74	75	75	78	78
	10			74	75	75	77	77
	11	NA	77	73	74	75	77	77
	12			73	74	74	77	77
	13			73	74	74	77	76
	14			73	74	74	76	76
	15			72	73	73	76	76
	16	NA	75	72	73	73	76	76
	17			72	73	73	76	75
18		72		73	73	75	75	
19			71	72	73	75	75	
20			71	72	72	75	75	
21	NA	74	71	72	72	75	74	
22			71	72	72	75	74	
23			71	72	72	74	74	
24			70	71	72	74	74	
25			70	71	72	74	74	
26	NA	73	70	71	71	74	74	
27	NA		73	70	71	74	73	

**APPENDIX VI**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1**  
**(7 of 23)**

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 6	1	NA	78	75	74	74	77	77
	2			74	74	74	76	76
3	74			74	74	77	76	
Joyful Building Block B	4	NA	77	74	74	74	77	77
	5			74	74	75	77	77
	6			73	74	74	77	77
	7			73	74	74	77	76
	8			73	74	74	76	76
	9	72	73	74	76	76		
	10	72	73	73	76	76		
	11	NA	75	72	73	73	76	75
	12			71	72	73	75	75
	13			71	72	73	75	75
14	71			72	72	75	74	
15	71			72	72	75	74	
16	NA	74	70	71	72	74	74	
17			70	71	72	74	74	
18			70	71	72	74	74	
19			70	71	71	74	73	
20			70	71	71	74	73	
21	NA	73	69	70	71	74	73	
22			69	70	71	73	73	
23			69	70	71	73	73	
24			69	70	71	73	72	
25			69	70	70	73	72	
26	NA	72	69	70	70	73	72	
27	NA	72	68	69	70	73	72	

## Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1

(8 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 7  Tsuen Tak Gardens Block A	1	NA	70	66	66	65	67	67	
	2			69	69	68	70	70	
	3			71	70	69	71	71	
	4				71	70	69	72	72
	5				71	71	70	72	72
	6	NA	77		71	71	70	73	72
	7				71	71	71	73	73
	8				71	71	71	74	73
	9				70	71	71	74	73
	10				70	71	72	74	73
	11	NA	76		70	71	72	74	73
	12				70	71	72	74	73
	13				69	70	72	75	73
	14				69	70	72	75	73
	15				69	70	72	75	73
	16	NA	75		69	70	72	75	72
	17				69	70	72	75	72
	18				68	69	72	75	72
	19				68	69	72	74	72
	20				68	69	72	74	72
	21	NA	74		68	69	72	74	71
	22				68	69	72	74	71
	23				67	69	71	74	71
	24				67	68	71	74	71
	25				67	68	71	74	71
	26	NA	73		67	68	71	73	71
	27				67	68	71	73	71
	28				67	68	71	73	70
	29				67	68	71	73	70
	30				66	67	70	73	70
	31	NA	72		66	67	70	73	70

APPENDIX VI  
 Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
 (9 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 8  Tsuen Tak Gardens Block A	1	NA	62	49	51	55	58	53	
	2			51	52	56	59	54	
	3			52	54	57	60	55	
	4				55	56	59	61	58
	5				57	58	60	63	60
	6	NA	72		58	60	61	64	61
	7				59	60	62	65	62
	8				60	61	63	65	62
	9				60	61	64	66	63
	10				61	62	65	67	64
	11	NA	74		62	62	65	68	64
	12				62	63	66	69	65
	13				63	64	67	70	66
	14				63	64	68	70	66
	15				63	64	68	70	66
	16	NA	73		63	64	69	71	66
	17				63	64	69	71	66
	18				63	64	69	72	67
	19				63	64	69	72	67
	20				63	64	69	72	66
	21	NA	72		63	64	69	72	67
	22				63	64	69	72	66
	23				63	64	69	72	66
	24				63	64	69	72	66
	25				62	64	69	72	66
	26	NA	72		62	64	69	72	66
	27				62	63	69	71	66
	28				62	63	69	71	66
	29				62	63	69	71	66
	30				62	63	69	71	66
	31	NA	71		62	63	69	71	66

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
(10 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 9	1	NA	62	54	55	55	58	55
	2			56	57	56	59	56
	3			58	59	58	60	58
Tsuen Tak Gardens Block B	4	NA	71	60	61	59	62	60
	5			61	62	61	63	62
	6			62	63	62	64	63
	7			62	64	63	65	64
	8			63	64	63	66	64
	9			63	64	64	66	65
	10			63	65	64	67	65
	11			64	65	65	68	66
	12			64	65	66	68	67
	13			64	66	66	69	67
14	64	66	66	69	67			
15	64	66	67	69	67			
16	NA	73	64	66	67	70	67	
17			64	65	67	70	67	
18			64	65	68	70	67	
19	NA	72	64	65	68	71	67	
20			64	65	68	71	67	
21			64	65	68	71	67	
22			63	65	68	71	67	
23			63	65	68	71	67	
24	NA	71	63	65	68	71	67	
25			63	65	68	71	67	
26			63	64	68	71	66	
27			63	64	68	71	66	
28			63	64	68	71	66	
29			63	64	68	71	66	
30			62	64	68	71	66	
31	NA	71	62	64	68	71	66	

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise I  
(11 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 10	1	NA	60	54	54	56	58	57
	2			55	56	57	59	58
	3			57	57	58	61	60
Tsuen Tak Gardens Block B	4			58	59	60	63	62
	5			60	61	62	65	64
	6	NA	71	63	64	65	67	66
	7			65	65	66	69	68
	8			67	67	68	70	70
	9			67	68	68	71	70
	10			67	68	69	71	71
	11	NA	73	68	68	69	71	71
	12			67	68	69	72	71
	13			67	68	69	72	71
14		67		68	69	71	71	
15			67	68	69	71	71	
16	NA	72	67	68	69	71	71	
17			67	68	69	71	70	
18			67	68	69	71	70	
19			67	68	69	71	70	
20			66	67	69	71	70	
21	NA	72	66	67	68	71	70	
22			66	67	68	71	70	
23			66	67	68	71	70	
24			66	67	68	71	69	
25			66	67	68	71	69	
26	NA	71	66	67	68	71	69	
27			65	67	68	71	69	
28			65	66	68	71	69	
29			65	66	68	71	69	
30			65	66	68	71	69	
31	NA	70	65	66	68	70	69	



Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 11  Tsuen Tak Gardens Block C	1	NA	60	55	55	56	58	57
	2			57	57	58	60	59
	3			59	59	60	62	62
	4		71	63	63	63	65	65
	5			66	66	66	69	68
	6	NA		67	68	68	70	70
	7			68	68	69	71	71
	8			68	69	69	71	71
	9		68	68	69	71	71	
	10		68	68	69	71	71	
	11	NA	72	67	68	69	71	71
	12			67	68	69	71	71
	13			67	68	68	71	70
	14		67	68	68	71	70	
	15		67	68	68	71	70	
	16	NA	72	67	67	68	71	70
	17			66	67	68	70	70
	18			66	67	68	70	70
	19			66	67	68	70	69
	20		66	67	68	70	69	
	21	NA	71	66	66	68	70	69
	22			66	66	68	70	69
	23			65	66	67	70	69
	24			65	66	67	70	69
	25			65	66	67	70	69
	26	NA	70	65	66	67	70	68
	27			65	66	67	70	68
	28			65	65	67	70	68
	29			65	65	67	70	68
	30			64	65	67	70	68
	31	NA		70	64	65	67	70

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise  
(13 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 12  Tsuen Tak Gardens Block C	1	58	67	63	63	64	66	65
	2	65		70	70	71	73	71
	3	65		74	74	74	77	76
	4	65	77	74	74	75	77	76
	5	66		74	74	75	77	76
	6	66		73	74	75	77	76
	7	66		73	74	75	77	76
	8	67		73	74	74	77	76
	9	67		73	74	74	76	75
	10	67		72	73	74	76	75
	11	67	76	72	73	74	76	75
	12	68		72	73	74	76	75
	13	68		72	73	74	76	75
	14	68	75	72	73	73	75	75
	15	68		71	73	73	75	74
	16	68		71	72	73	75	74
	17	68		71	72	73	75	74
	18	68		71	72	73	75	74
	19	68		71	72	73	75	74
	20	68		71	72	73	74	74
	21	68	74	70	72	72	74	74
	22	67		70	72	72	74	73
	23	67		70	72	72	74	73
	24	67	74	70	71	72	74	73
	25	67		70	71	72	74	73
	26	67		70	71	72	74	73
	27	67		70	71	72	73	73
	28	67		70	71	72	73	73
	29	67		69	71	71	73	72
	30	67		69	71	71	73	72
	31	67	73	69	71	71	73	72

**APPENDIX VI**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1**  
(14 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 13	1	58	63	60	60	60	62	59	
	2	64		64	65	63	65	62	
	3	67		68	69	67	68	66	
Tsuen Tak Gardens Block C	4	68	75	70	70	70	72	69	
	5	68		71	71	72	73	71	
	6	69		72	71	72	74	71	
	7	69		72	71	73	74	72	
	8	69		72	72	73	74	72	
	9	70		72	72	73	75	72	
	10	70		72	72	73	75	72	
	11	70		75	72	72	73	75	72
	12	70		71	71	73	74	72	
	13	70		71	71	73	74	72	
	14	70		71	71	73	74	72	
	15	70		71	71	73	74	72	
	16	70		74	71	71	73	74	72
	17	70		71	71	71	72	74	72
	18	70		71	71	71	72	74	72
	19	70		71	71	71	72	73	72
	20	70		71	71	71	72	73	72
	21	70		73	71	71	72	73	71
	22	69		70	70	71	72	73	71
	23	69		70	70	71	72	73	71
	24	69		70	70	70	72	73	71
	25	69		70	70	70	72	73	71
	26	69		73	70	70	72	73	71
	27	69		70	70	70	71	73	71
	28	69		70	70	70	71	73	71
	29	69		70	70	70	71	72	71
	30	69		70	70	70	71	72	71
	31	69		72	70	70	71	72	71

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise  
(15 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 14  Kam Fung Garden Block 2	1	68	78	73	73	72	74	72
	2	68		73	73	73	75	73
	3	68		73	73	74	77	73
	4	68	77	72	73	75	77	73
	5	68		72	72	75	77	73
	6	69		72	72	75	77	73
	7	69		72	72	74	76	73
	8	69		72	72	74	76	73
	9	69		71	72	74	76	73
	10	69	76	71	72	74	76	73
	11	70		71	72	74	76	73
	12	70		71	72	74	76	73
	13	70	75	71	72	74	75	73
	14	70		71	72	73	75	73
	15	70		71	72	73	75	73
	16	70		71	72	73	75	73
	17	69		70	71	73	75	72
	18	69		70	71	73	75	72
	19	69	74	70	71	73	74	72
	20	69		70	71	73	74	72
	21	69		70	71	73	74	72
	22	69		70	71	72	74	72
	23	69		70	71	72	74	72
	24	69		70	71	72	74	72
	25	69	74	70	71	72	74	72
	26	69		69	71	72	74	72
	27	69		69	71	72	73	71
	28	69		69	70	72	73	71
	29	69		69	70	72	73	71
	30	69		69	70	72	73	71
	31	69	73	69	70	72	73	71
	32	69		69	70	72	73	71
	33	68		69	70	71	73	71
	34	68	73	69	70	71	73	71
	35	68		69	70	71	73	71

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
(16 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 15	1	80	80	80	80	80	80	80
	2	80		80	80	80	80	80
	3	80		80	80	80	80	80
Kam Fung Garden Block 1	4	79		80	80	79	80	80
	5	79		80	80	79	80	80
	6	79	80	80	79	79	80	80
	7	79		80	79	79	79	79
	8	79		79	79	79	79	79
	9	79		79	79	79	79	79
	10	79		79	79	79	79	79
	11	78	79	79	79	79	79	79
	12	78		79	79	79	79	79
	13	78		79	78	78	79	79
	14	78		79	78	78	79	79
	15	78		78	78	78	78	78
	16	78	78	78	78	78	78	78
	17	78		78	78	78	78	78
	18	78		78	78	78	78	78
	19	77		78	78	78	78	78
	20	77		78	78	78	78	78
	21	77	78	78	77	77	78	78
	22	77		78	77	77	78	78
	23	77		77	77	77	77	77
	24	77		77	77	77	77	77
	25	77		77	77	77	77	77
	26	77	77	77	77	77	77	77
	27	76		77	77	77	77	77
	28	76		77	77	77	77	77
	29	76		77	77	77	77	77
	30	76		77	76	76	77	77
	31	76	77	77	76	76	77	77
	32	76		76	76	76	77	77
	33	76		76	76	76	76	76
	34	76		76	76	76	76	76
	35	76	77	77	76	76	76	76

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 16  Kam Fung Garden Block 1	1	72	75	74	73	71	73	72
	2	74		75	75	73	74	74
	3	75		76	76	74	75	75
	4	75	77	76	76	75	76	75
	5	75		76	76	75	76	75
	6	75		76	76	75	76	75
	7	75		76	76	76	76	76
	8	75		76	75	76	77	76
	9	74	76	76	75	76	77	76
	10	74		76	75	76	77	76
	11	74		76	75	76	77	76
	12	74		75	75	76	76	75
	13	74		75	75	75	76	75
	14	74		75	75	75	76	75
	15	74		75	75	75	76	75
	16	74		75	75	75	75	76
	17	74		75	74	75	76	75
	18	74		75	74	75	76	75
	19	73	75	75	74	75	76	75
	20	73		74	74	75	75	75
	21	73		74	74	74	75	75
	22	73		74	74	74	74	74
	23	73		74	74	74	74	74
	24	73		74	74	74	74	74
	25	73		74	73	74	75	74
	26	73		74	73	74	75	74
	27	73		74	73	74	75	74
	28	72		74	73	74	75	74
	29	72		74	73	74	74	74
	30	72		73	73	73	74	74
	31	72	74	73	73	73	74	
	32	72	74	73	73	73	74	73
	33	72		73	73	73	74	73
	34	72		73	73	73	74	73
	35	72		73	73	73	74	73
				74	73	73	73	73

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
(18 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 17	1	69	74	71	70	67	68	67	
	2	70		72	72	68	70	68	
3	71	73		72	72	70	71	70	
Kam Fung Garden Block 2	4	72	76	73	73	72	73	71	
	5	73		74	73	73	75	72	
	6	73		74	74	74	74	75	73
	7	74		74	74	74	75	76	74
	8	74		75	74	74	75	76	74
	9	74	75	76	75	74	75	76	74
	10	74	75		74	74	75	76	74
	11	74	75		74	74	75	76	74
	12	74	75		74	74	75	76	74
	13	74	74		74	74	75	76	74
	14	74	74	75	74	74	75	76	74
	15	74	74		74	74	75	76	74
	16	74	74		74	74	75	76	74
	17	73	74		74	74	75	75	74
	18	73	74		74	74	75	75	74
	19	73	74	75	74	74	74	75	74
	20	73	74		74	74	74	75	74
	21	73	74		74	74	74	75	74
	22	73	74		74	73	74	75	74
	23	73	74		74	73	74	75	74
	24	73	74	74	74	73	74	75	74
	25	73	73		73	73	74	75	73
	26	73	73		73	73	74	75	73
	27	73	73		73	73	74	74	73
	28	73	73		73	73	74	74	73
	29	73	73	74	73	73	74	74	73
	30	73	73		73	73	74	74	73
	31	72	73		73	73	73	74	73
	32	72	73		73	73	73	74	73
	33	72	73		73	73	73	74	73
	34	72	73	74	73	73	73	74	73
	35	72	73		73	73	73	74	73

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise  
(19 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 18	1	61	66	63	63	63	64	62	
	2	69		70	70	69	69	68	
3	71	73		73	73	72	73	71	
Tsuen Tak Gardens Block D	4	72	77	75	74	73	74	73	
	5	73		75	74	74	75	74	
	6	73		75	74	74	74	75	74
	7	73		75	74	74	75	76	74
	8	73		75	74	74	75	76	74
	9	73		74	74	74	75	76	74
	10	72	76	74	74	75	76	74	
	11	72		74	73	75	76	74	
	12	72		74	73	75	76	74	
	13	72		74	73	75	76	74	
	14	72		74	73	75	76	74	
	15	72		74	73	75	76	74	
	16	72	76	73	73	74	76	73	
	17	72		73	73	74	75	73	
	18	72		73	73	74	75	73	
	19	72		73	73	74	75	73	
	20	72		73	72	74	75	73	
	21	72		75	73	72	74	75	73
	22	71	73		72	74	75	73	
	23	71	73		72	74	75	73	
	24	71	73		72	73	75	73	
	25	71	73		72	73	74	73	
	26	71	74		72	72	73	74	72
	27	71		72	72	73	74	72	
	28	71		72	72	73	74	72	
	29	71		72	72	73	74	72	
	30	71		72	72	73	74	72	
	31	71		74	72	71	73	74	72



Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
(20 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover						
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing	
Ref 19	1	69	70	69	69	68	69	68	
	2	78		79	79	77	78	78	
	3	79		79	79	78	78	78	
Tsuen Tak Gardens Block D	4	79	79	79	79	79	79	79	
	5	78		79	79	79	79	79	
	6	78		79	79	79	78	79	79
	7	78		79	79	79	78	79	78
	8	78		79	78	78	78	79	78
	9	78		78	78	78	78	79	78
	10	78		78	78	78	78	79	78
	11	78		79	78	78	78	78	78
	12	78		78	78	78	78	78	78
	13	77	78	78	78	78	78	78	
	14	77	78	78	78	78	78	78	
	15	77	78	78	77	78	78	78	
	16	77	78	78	77	78	78	78	
	17	77	77	78	77	77	78	77	
	18	77	77	77	77	77	78	77	
	19	77	77	77	77	77	78	77	
	20	77	77	77	77	77	77	77	
	21	76	77	77	77	77	77	77	
	22	76	77	77	77	77	77	77	
	23	76	77	77	76	77	77	77	
	24	76	77	77	76	77	77	77	
	25	76	77	77	76	77	77	76	
	26	76	77	77	76	76	77	76	
	27	76	76	77	76	76	77	76	
	28	76	76	76	76	76	77	76	
	29	76	76	76	76	76	76	76	
	30	75	76	76	76	76	76	76	
	31	75	76	76	76	76	76	76	

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise  
(21 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 20	1	73	73	73	73	73	73	73
	2	73		73	73	73	73	73
Tsuen Tak Gardens Block D	3	74	76	74	74	74	74	74
	4	75		76	76	76	76	76
	5	76		76	76	76	76	76
	6	76		76	76	76	76	76
	7	76		76	76	76	76	76
	8	76		76	76	76	76	76
	9	75	75	76	76	76	76	76
	10	75		76	75	75	75	76
	11	75		75	75	75	75	75
	12	75		75	75	75	75	75
	13	75		75	75	75	75	75
	14	75		75	75	75	75	75
	15	75	75	75	75	75	75	75
	16	75		75	75	75	75	75
	17	75		75	75	75	75	75
	18	75		75	75	75	75	75
	19	74		75	75	75	75	75
	20	74		74	74	74	74	74
	21	74	74	74	74	74	74	74
	22	74		74	74	74	74	74
	23	74		74	74	74	74	74
24	74	74		74	74	74	74	
25	74	74		74	74	74	74	
26	74	74		74	74	74	74	
27	74	74	74	74	74	74	74	
28	74		74	74	74	74	74	
29	73		74	74	74	74	74	
30	73		73	73	73	73	73	
31	73		73	73	73	73	73	

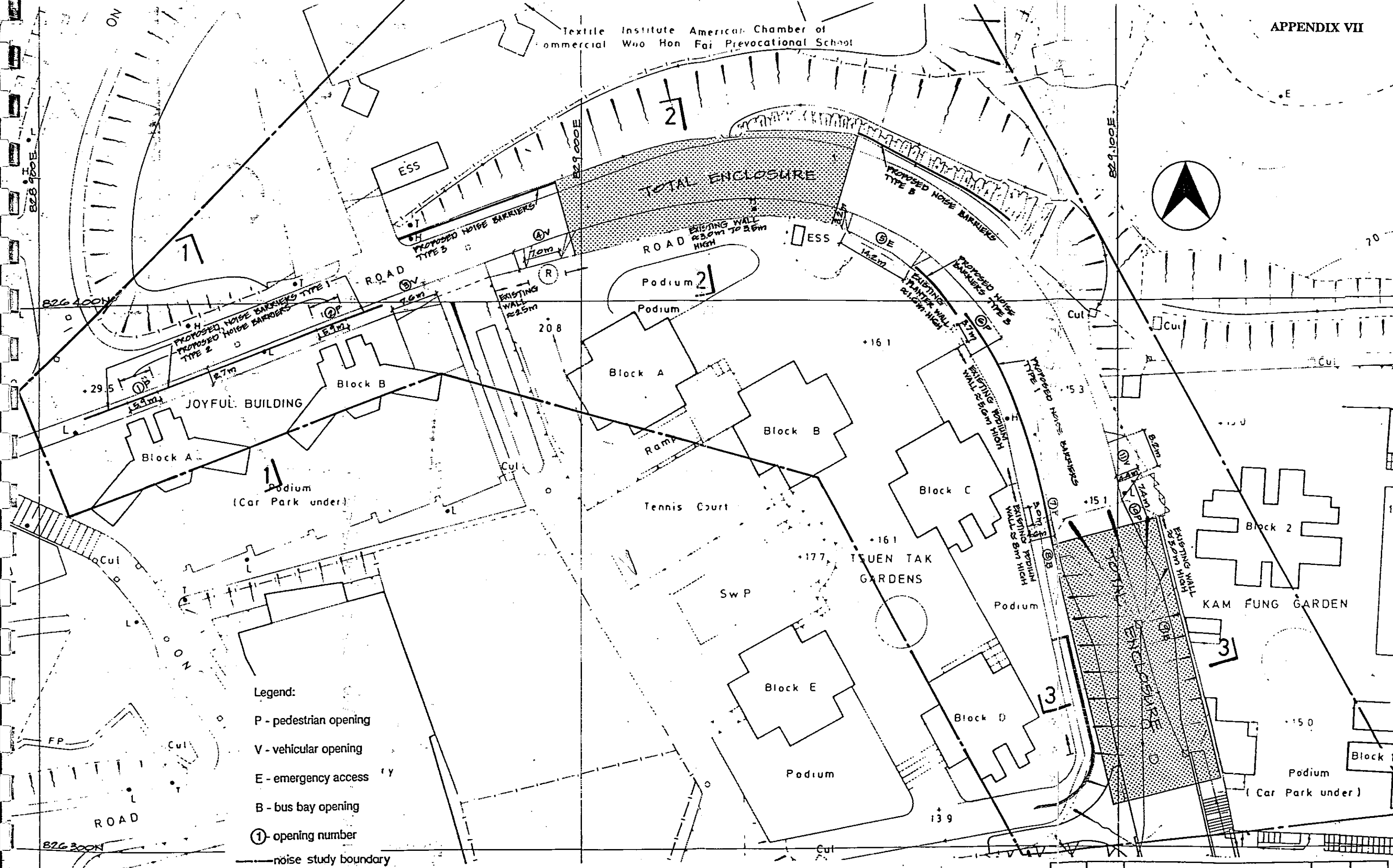
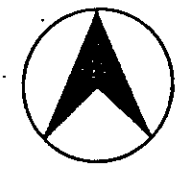
APPENDIX VI  
 Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 1  
 (22 of 23)

Facade Reference Number	Receiver Floor	2006 without flyover	2006 with Flyover					
			Unmitigated	With Road Enclosures & Road Surfacing	With Road Enclosures, Road Surfacing & Barriers	Barriers Only (No Enclosure) + Surfacing	Barriers Only (No Enclosure) No Surfacing	Barriers with Enclosures No Surfacing
Ref 21  Tsuen Tak Gardens Block E	1	63	64	64	64	63	63	63
	2	77		77	77	77	77	77
	3	77		77	77	77	77	77
	4	76	77	77	77	77	77	77
	5	76		77	76	76	76	76
	6	76		76	76	76	76	76
	7	76		76	76	76	76	76
	8	76		76	76	76	76	76
	9	76		76	76	76	76	76
	10	76		76	76	76	76	76
	11	76	77	76	76	76	76	76
	12	76		76	76	76	76	76
	13	75		76	76	76	76	76
	14	75	76	76	76	76	76	76
	15	75		76	75	75	76	76
	16	75		75	75	75	75	75
	17	75		75	75	75	75	75
	18	75		75	75	75	75	75
	19	75		75	75	75	75	75
	20	75		75	75	75	75	75
	21	75	76	75	75	75	75	75
	22	75		75	75	75	75	75
	23	75		75	75	75	75	75
	24	74	75	75	75	75	75	75
	25	74		75	75	75	75	75
	26	74		74	74	74	74	75
	27	74		74	74	74	74	74
	28	74		74	74	74	74	74
	29	74		74	74	74	74	74
	30	74		74	74	74	74	74
	31	74	75	74	74	74	74	74

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise

Facade Reference	Floor Height	2006 without flyover (Castle peak Road Only)	2006 with Flyover		
			Contribution from Flyover & Tsuen King Cir.	Contribution from Flyover & Tsuen King Cir. Mitigated	Total Mitigated
Prevocational School	6th Floor	52	74	61	61
	5th Floor	53	74	60	60

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- Legend:
- P - pedestrian opening
  - V - vehicular opening
  - E - emergency access
  - B - bus bay opening
  - ① - opening number
  - noise study boundary

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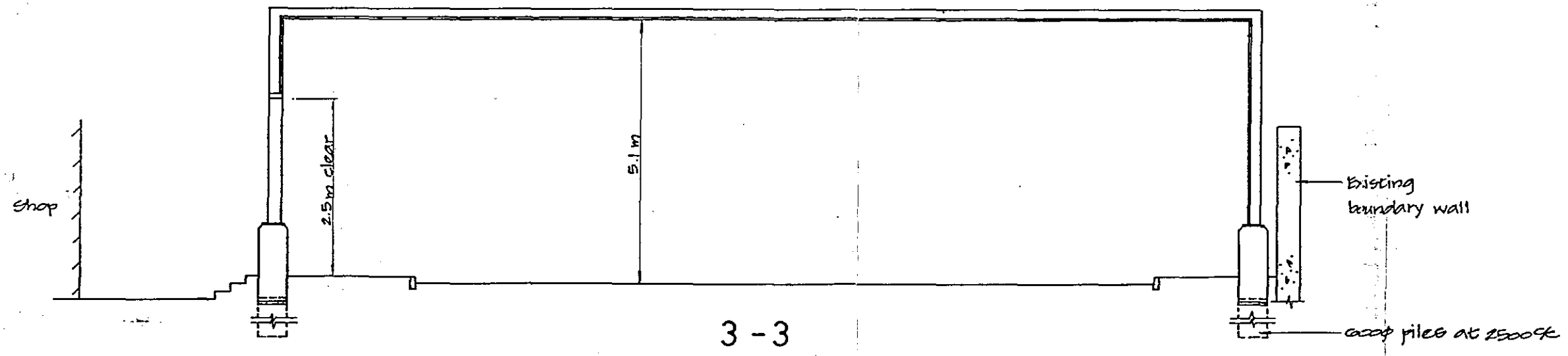
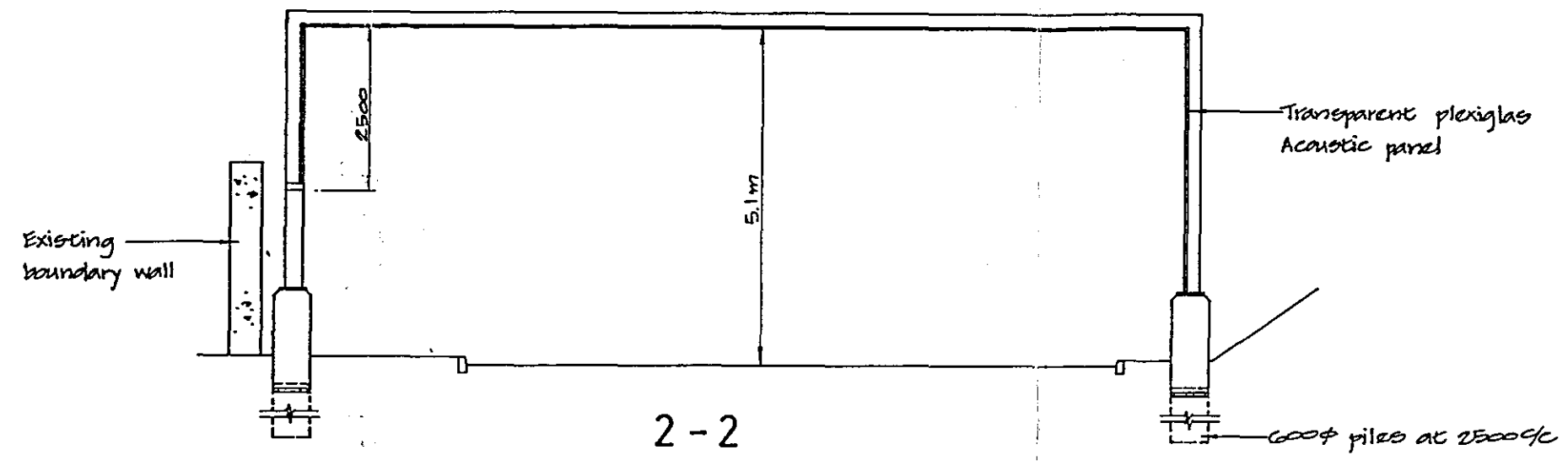
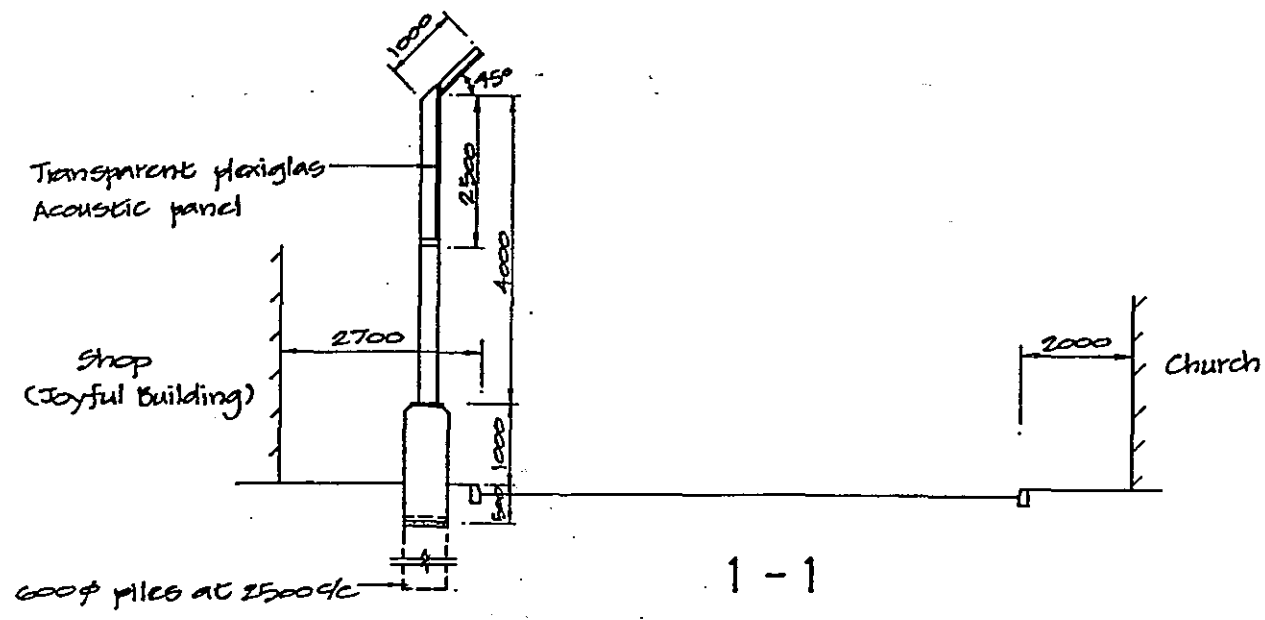
TSUEN WAN DEVELOPMENT  
TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

LAYOUT OF PROPOSED  
MITIGATED MEASURES

Suffis	Date	Revision		Drawn	Checked
Drawing No.	73808/SK380				
Date	14.5.93	Drawn	T.M.	Scale	N.T.S.
Checked	AM	Approved	SFW		

Notes :

1. Dimensions are in millimetres unless otherwise stated.



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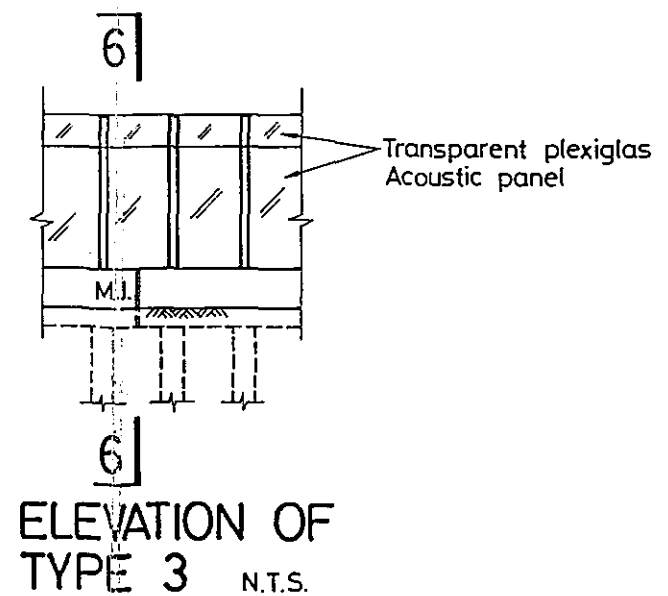
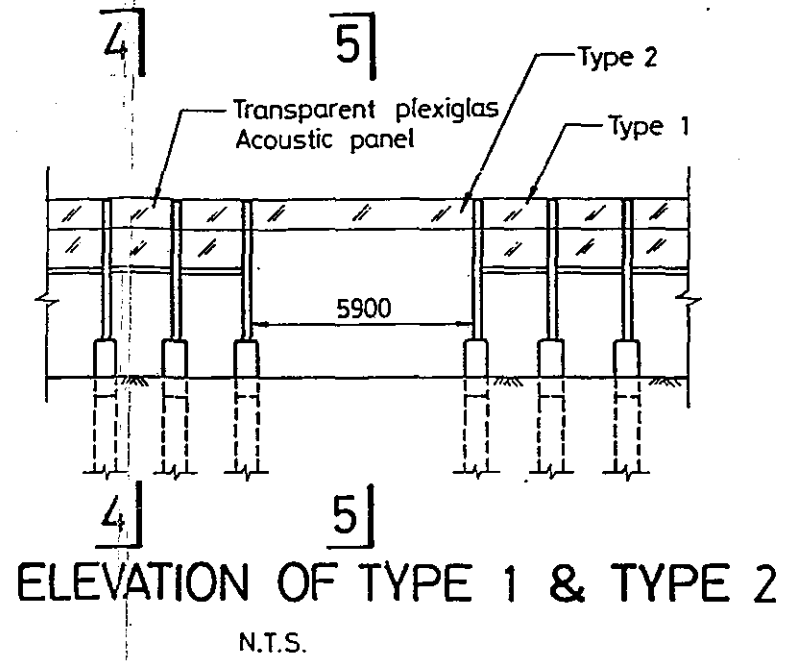
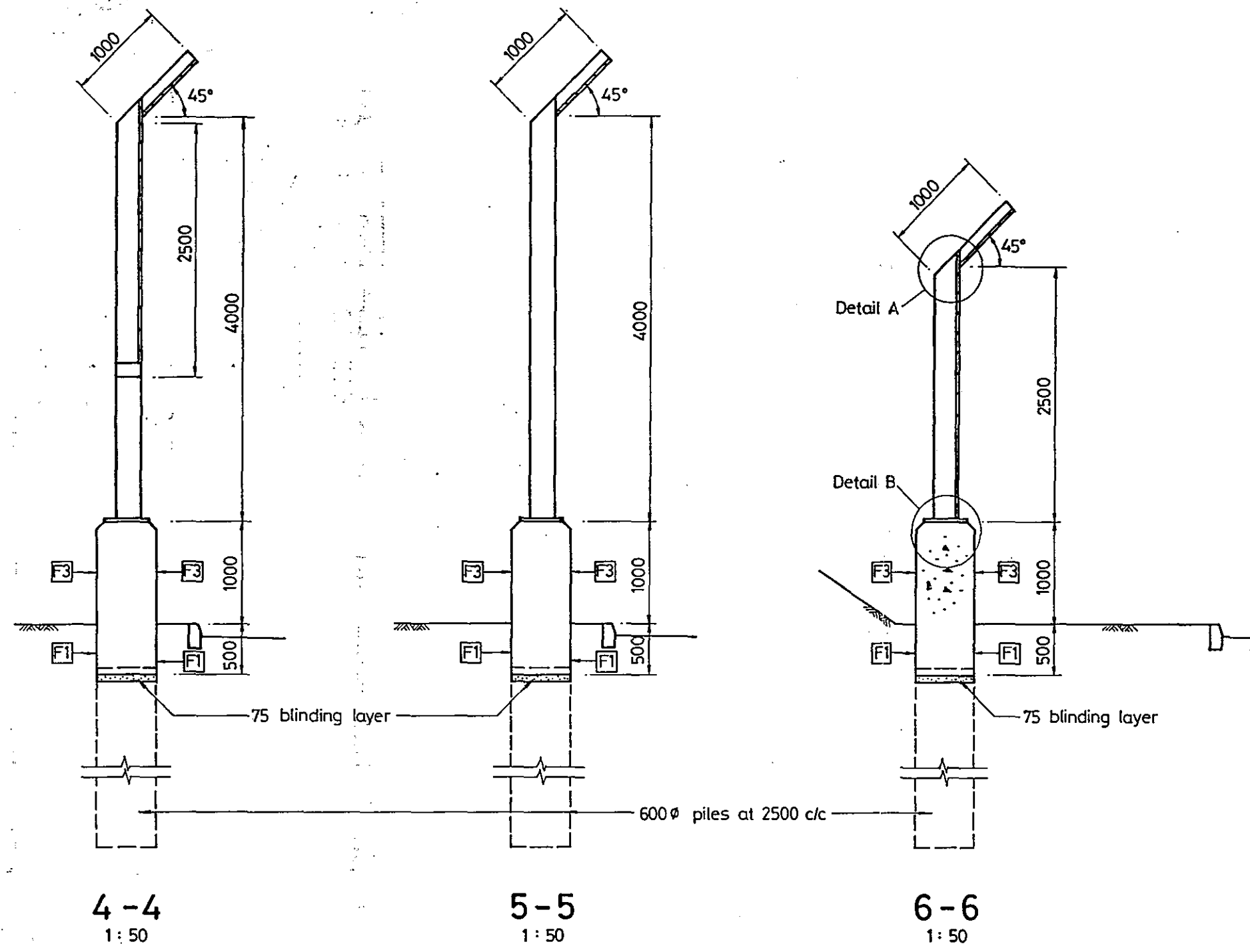
TSUEN WAN DEVELOPMENT  
TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

DETAILS OF NOISE BARRIERS  
SHEET 1 OF 3

Suffix	Date	Revision		Drawn	Checked
Drawing No.		73808/SK381			
Date	14.5.93	Drawn	TAL	Scale 1:100	
Checked	SPW	Approved	SPW		

Notes :

1. Dimensions are in millimetres unless otherwise stated.
2. Maximum movement joint spacing shall be 12m.
3. All steelwork except otherwise stated shall be hot dip galvanised.
4. Legend :  
F3 F3 finish  
M.J. Movement joint

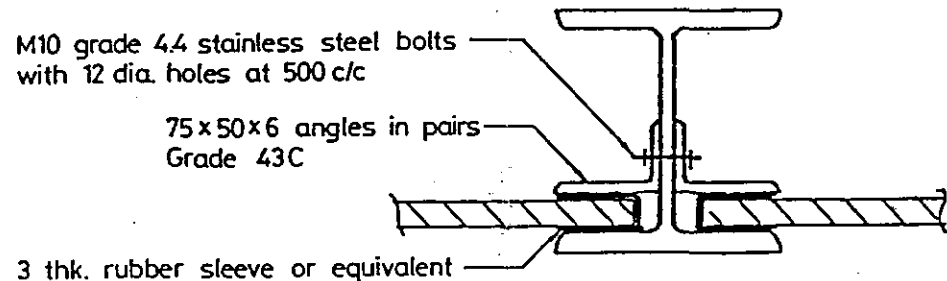


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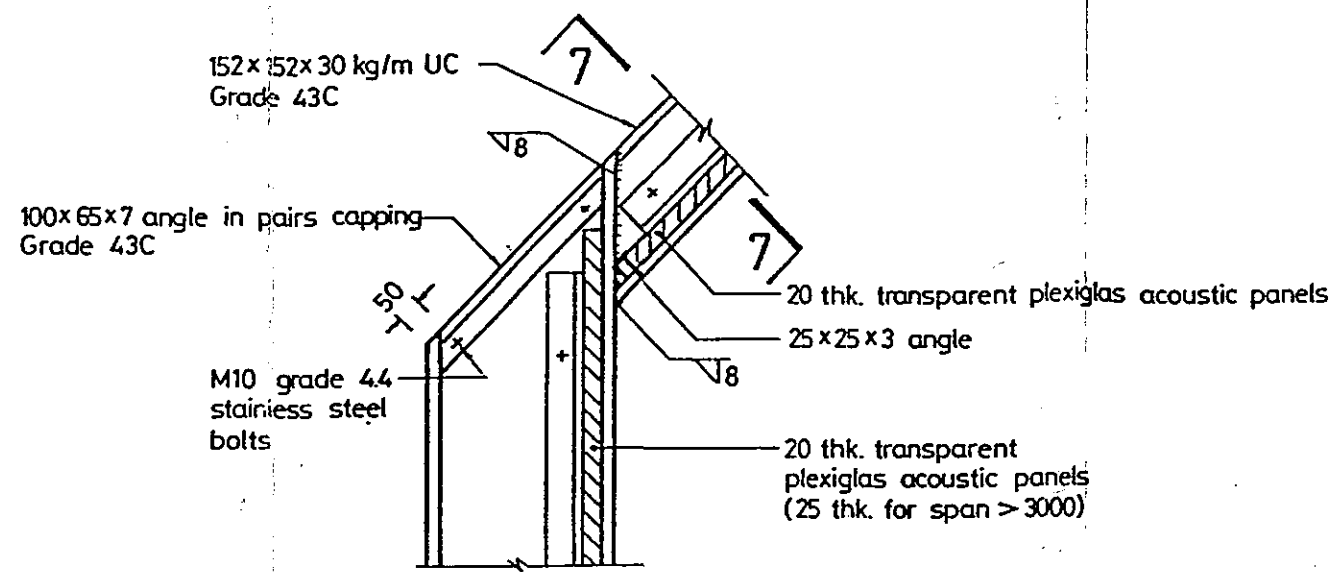
TSUEN WAN DEVELOPMENT  
TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

DETAILS OF NOISE BARRIERS  
SHEET 2 OF 3

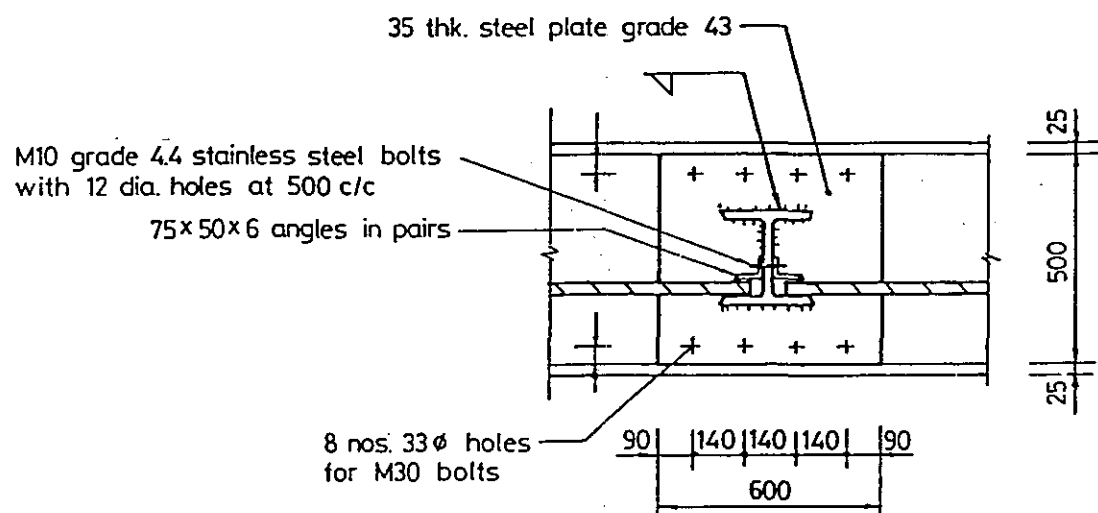
A	17.5.93	Sizes of noise barriers revised.	T.M.	SPW
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Date	8.4.93	Drawn	T.M.	Scale 1:50
Checked	SPW	Approved	SPW	N.T.S.



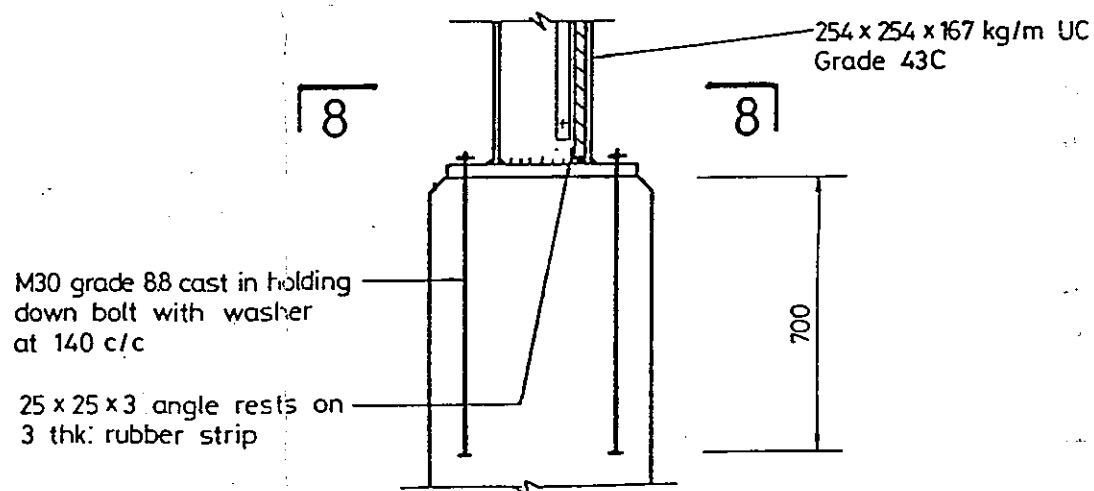
7-7  
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DETAIL A  
 1:10



8-8  
 1:5



DETAIL B  
 1:10

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TSUEN WAN DEVELOPMENT  
 TSUEN WAN NORTH  
 TDD CONTRACT TW50/86  
 FLYOVER ACROSS CASTLE PEAK ROAD  
 AT SHA TSUI ROAD

DETAILS OF NOISE BARRIERS  
 SHEET 3 OF 3

Suffix	Date	Revision	Drawn	Checked
Drawing No.		73808/SK377		
Date	8.4.93	Drawn	TAC	Scale 1:5
Checked	AM	Approved	SEW	1:10 1:20



Guideline  
for  
Traffic Noise Assessment Report  
for  
New Road Projects

INTRODUCTION

1. This guideline sets out, in general, the scope and methodology to be adopted for a Traffic Noise Assessment Report (TNAR) prepared for any proposed new road projects. The requirement to submit the TNAR will be specifically provided for in the approval process of the proposal and therefore will not be discussed in this guideline.

SCOPE OF THE TNAR

2. Whilst there is no specified format which the TNAR has to follow, the scope of a TNAR should essentially cover the following aspects :-

- . Background information of the proposal;
- . Identification of potentially affected uses (PAUs);
- . Presentation of existing noise levels;
- . Presentation of predicted future noise levels;
- . Evaluation of impact and proposals of direct technical remedies; and
- . Recommendation.

Each of these components will be further described in the ensuing sections.

BACKGROUND INFORMATION

3. This section should contain a brief description of the proposal, a locational plan (or plans) of a suitable scale showing the various proposed alignments and any additional information which may be useful for the purpose of the present assessment.

IDENTIFICATION OF POTENTIALLY AFFECTED USES (PAUs)

4. For the purpose of this assessment, all existing and planned noise sensitive uses that may be exposed to traffic noise arising from the proposal are classified as potentially affected uses. A detailed description of noise sensitive uses is contained in the Environment Chapter of the Hong Kong Planning Standards and Guidelines (HKPSG). All planned uses shall be determined based on the latest versions of Outline Development Plans (ODPs) which are available from the Territory Development Department (TDD).

5. Representative facades shall be identified amongst the PAUs for the purpose of noise assessment. Agreement from the Director of Environmental Protection regarding the selection of these Noise Assessment Facades (NAFs) shall be obtained prior to the carrying out of any assessment.

EXISTING NOISE LEVELS

6. Existing noise levels,  $L_{10}$  (1 Hr), at the NAFs shall be presented. These noise levels shall either be obtained by on site measurements or by calculation according to procedures contained in the "Calculation of Road Traffic Noise" published by the Department of Transport, U.K. 1988.

PREDICTED FUTURE NOISE LEVELS

7. The traffic noise levels at the NAFs shall be predicated using the method mentioned in paragraph 6 above.

8. Unless specific agreement from the Director of Environmental Protection is obtained, the traffic assumption for the noise prediction shall normally be based on the peak hour flow projected ten years after the proposed scheme is first open for operation.

9. Where the options considered include a "do-nothing" scenario, noise predictions shall similarly be made to estimate future noise levels from projected traffic on the existing roads assuming that the proposed scheme will not be introduced. A typical presentation of the predicted noise levels is at Annex A.

EVALUATION OF IMPACTS & PROPOSALS OF DIRECT TECHNICAL REMEDIES

10. The evaluation stage of the TNAR will require different levels of detail according to the stage in which the proposed scheme is being studied. Generally speaking there are two broad categories :-

- (a) the scheme is at the stage of feasibility studies involving route selection;
- (b) the scheme is at design stage of a preferred route with possibly only minor adjustment in alignment.

11. For schemes that belong to category 10(a), the evaluation shall consist of essential elements as outlined in paragraphs 12 to 14. For schemes that are of a similar nature to 10(b), paragraphs 15 and 16 are relevant.

12. Predicted noise levels at the NAFs of all planned and existing noise sensitive uses for each alignment shall be compared against the criteria set out in the Environment Chapter of the HKPSG. The potential noise impact of each proposed alignment on existing and planned noise sensitive uses shall be quantified by estimating the total number of dwellings and/or the total number of classrooms that will be exposed to levels above the HKPSG criteria. These results should then be presented in a manner similar to that which is shown in Annex (B).

13. Where exceedance above HKPSG guidelines has been identified in paragraph 12 above, potential for direct technical remedies shall be indicated for each alignment proposed together with their likely costs. These costs do not have to be exact and are meant to be used for comparing the merits of each alignment option. Examples of direct technical remedies are tunnelling, enclosures, barriers, earth mound etc. that could be constructed within the road reserve. In the case where an existing building is already subject to noise levels equal to, or in excess of, the recommended maximum, measures to avoid (as far as possible) deterioration of the situation are to be put forward.

14. Normally the alignment that will affect the least number of dwellings (and/or classrooms) would be preferred. In cases where exceptionally high noise levels or the presence of other factors may influence the preference, additional comments should be included in the TNAR for DEP's consideration.

15. For schemes which fall into the category of 10(b), predicted noise levels at the NAFs of all planned and existing noise sensitive uses shall be carried out. Where exceedance over the levels recommended in the HKPSG is identified, the noise exposure in terms of number of dwellings (or classrooms as the case may be) shall be estimated and presented. Direct technical remedies should be incorporated in the design and the resultant noise levels and noise exposure re-run. A typical presentation is contained in Annex C.

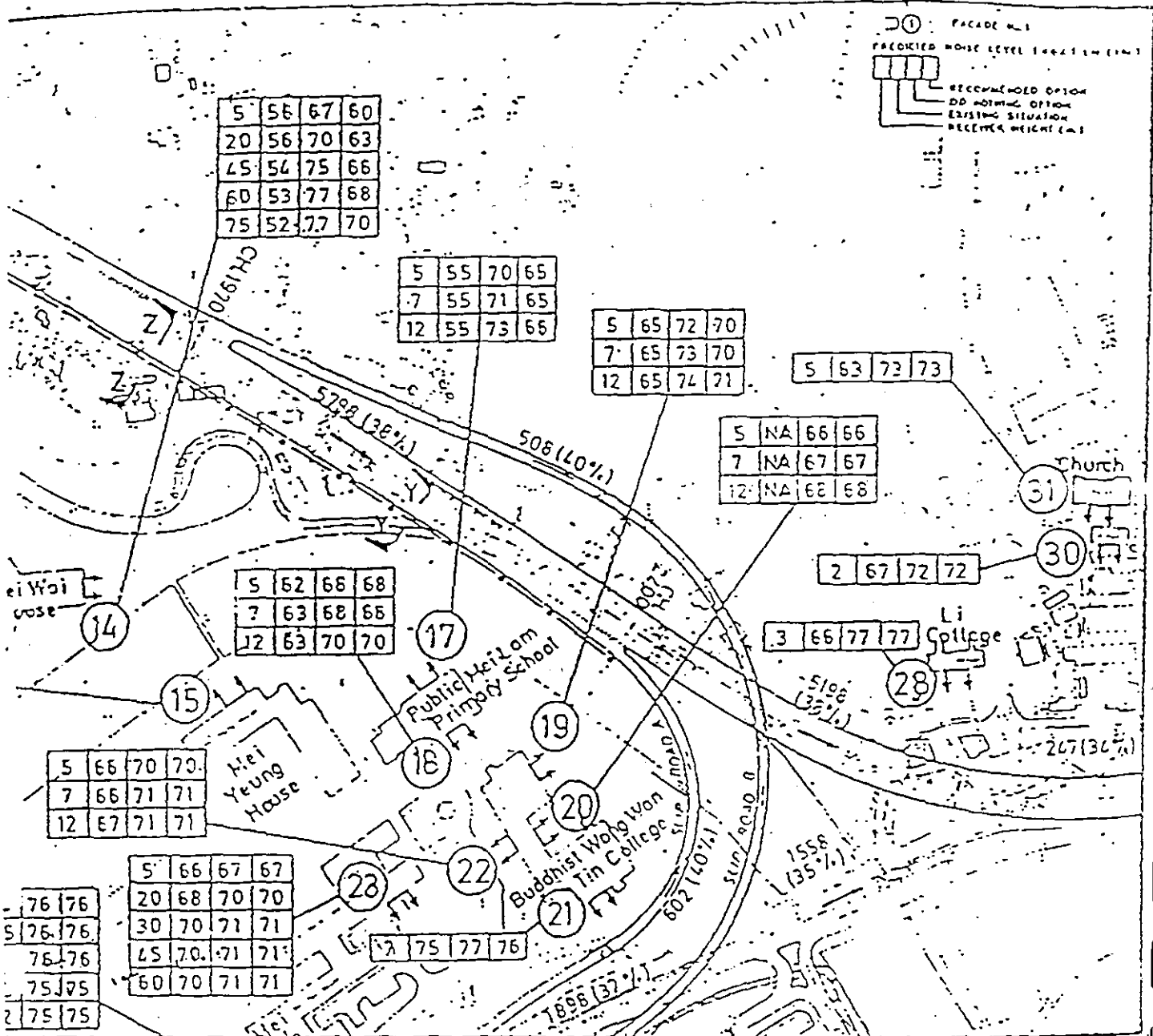
16. Where direct technical remedies have been incorporated, reasonably accurate cost estimates of these measures should also be provided at this stage.

RECOMMENDATIONS

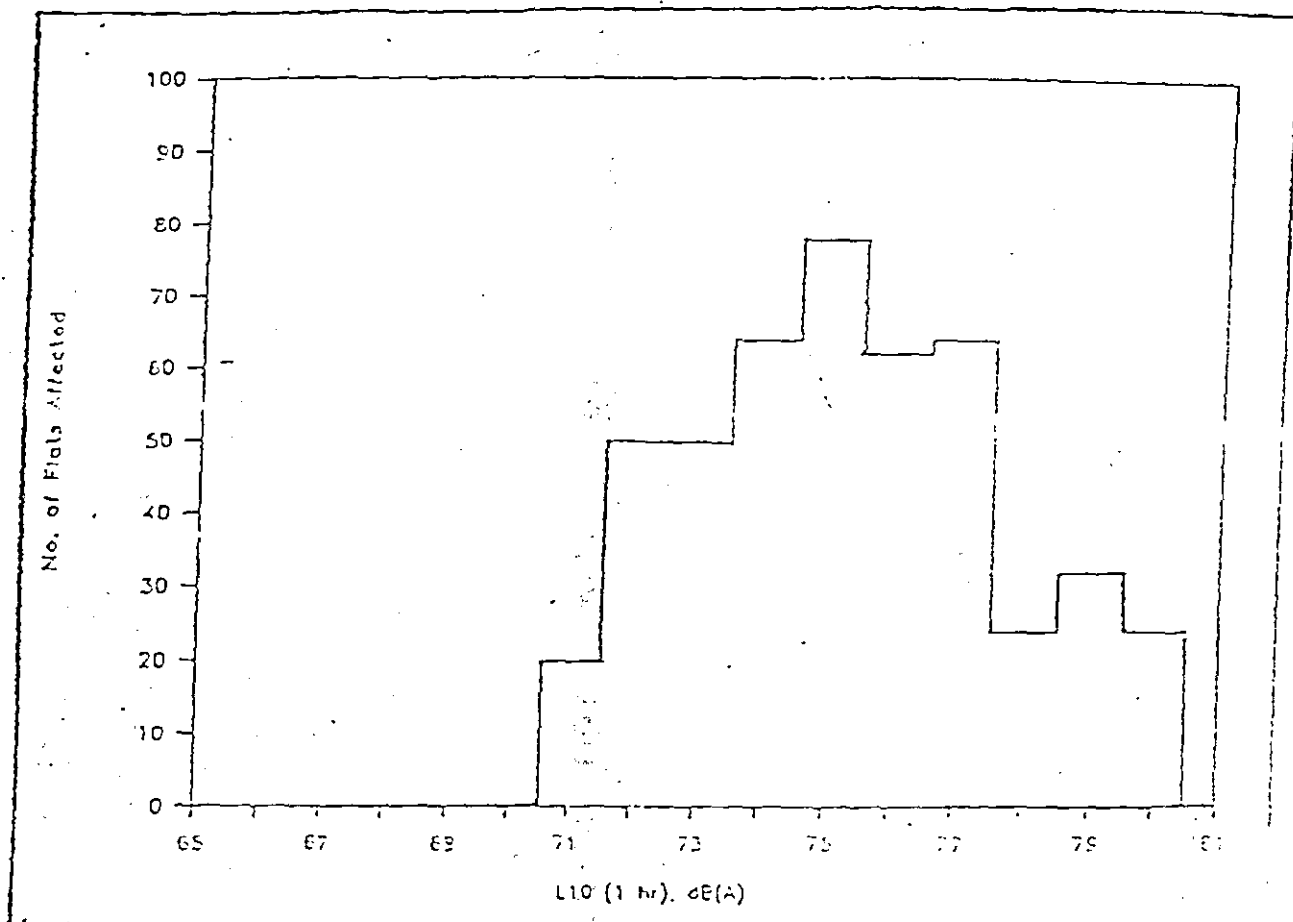
17. Based on the evaluations carried out in paragraphs 12 to 16 above, recommendations shall be made to adopt one particular alignment and if necessary, to incorporate direct technical remedies. Estimated costs associated with the provision of the direct technical remedies shall also be indicated.

18. The recommendations shall be vetted by the Director of Environmental Protection for its effectiveness and practicability. The Director of Environmental Protection may, in his consideration, take into account other factors brought to light by the data supplied in the TNAR.

Environmental Protection Department  
Noise Policy Group  
August 1988



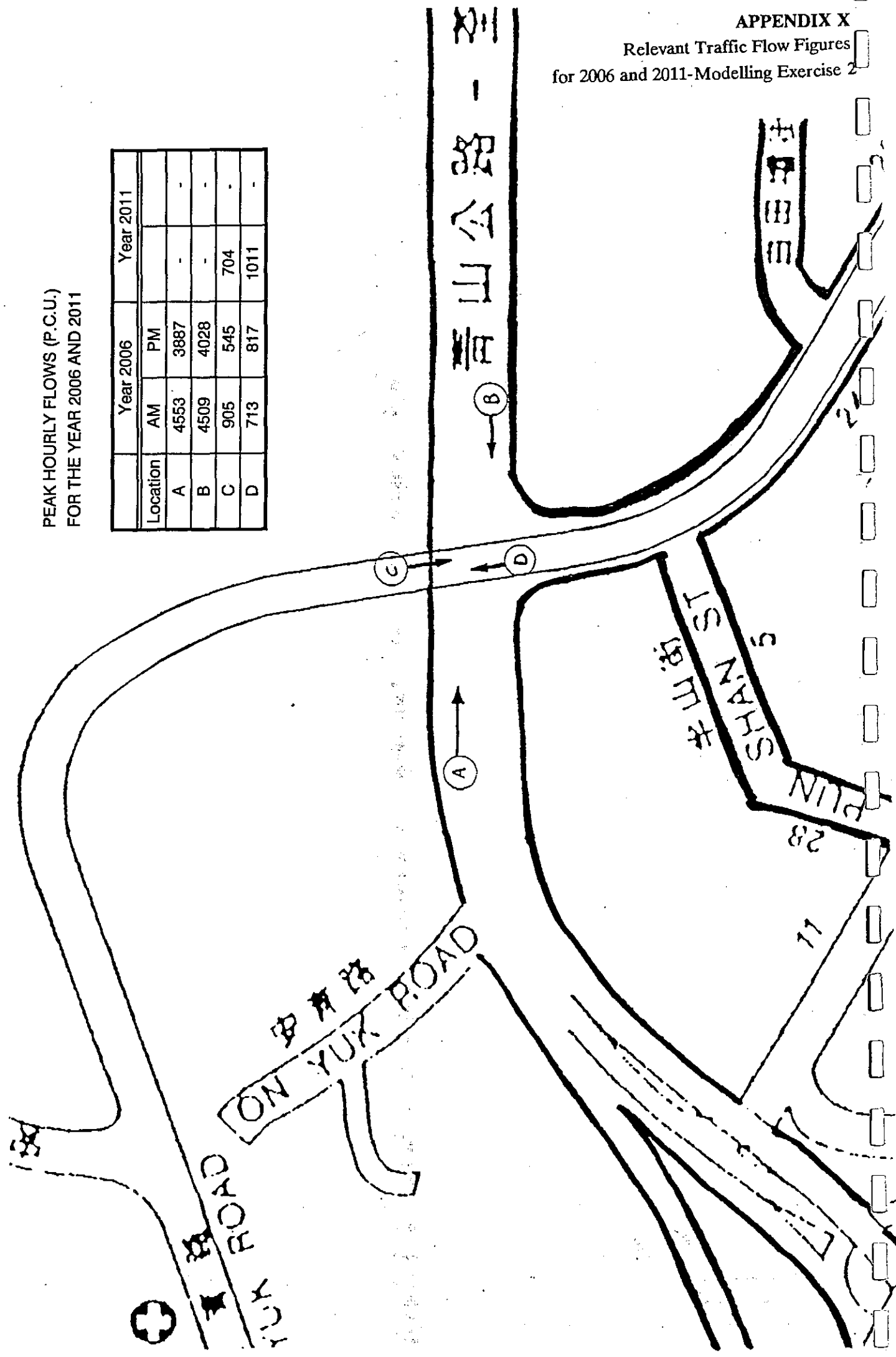
Example of a Plan showing the Predicted Noise Levels from a Proposed New Road



Example of a Chart showing the number of units in a Noise Sensitive Development against the corresponding Predicted Noise Levels

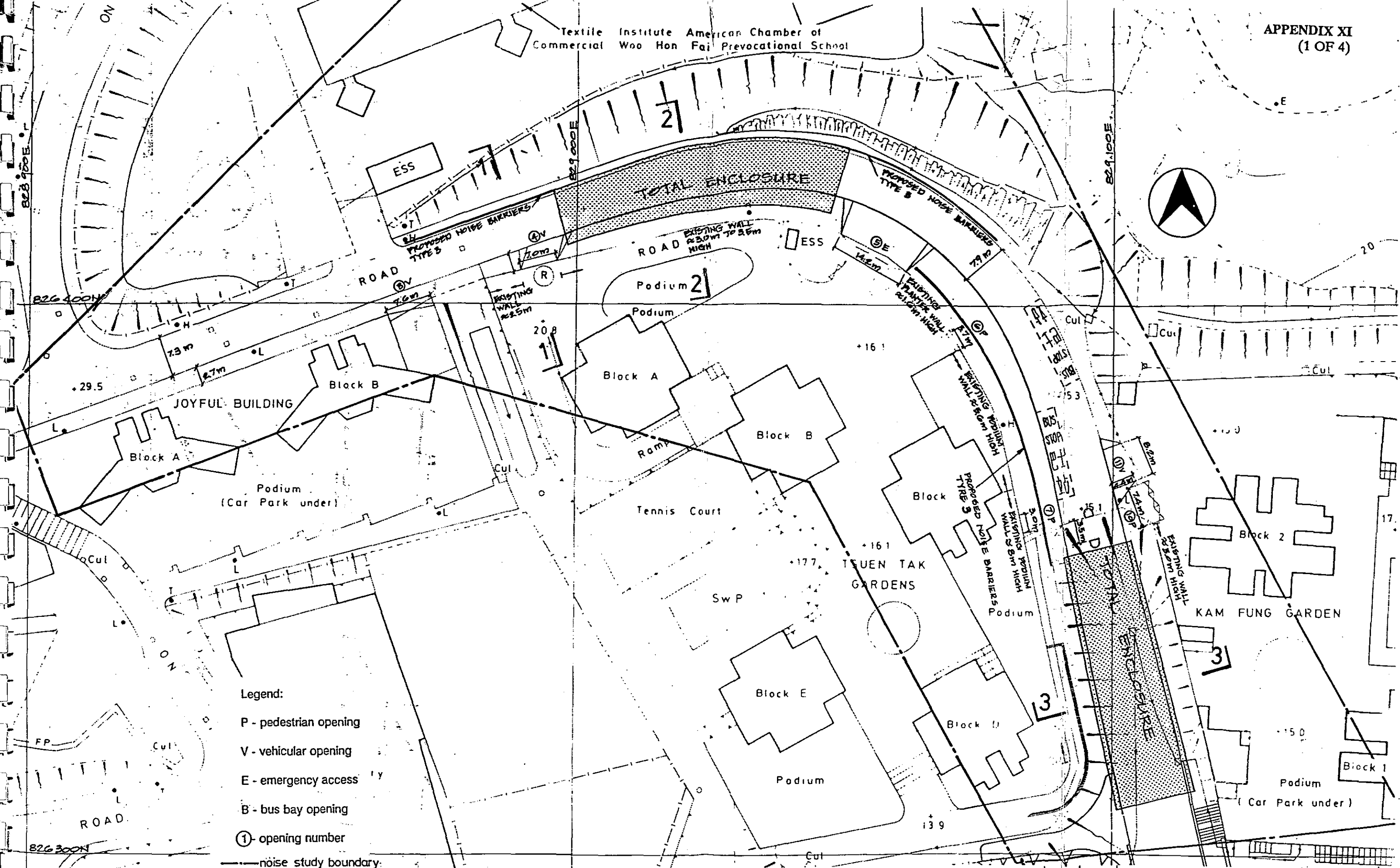
PEAK HOURLY FLOWS (P.C.U.)  
 FOR THE YEAR 2006 AND 2011

Location	Year 2006		Year 2011	
	AM	PM		
A	4553	3887	-	-
B	4509	4028	-	-
C	905	545	704	-
D	713	817	1011	-





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- Legend:
- P - pedestrian opening
  - V - vehicular opening
  - E - emergency access
  - B - bus bay opening
  - ① - opening number
  - noise study boundary

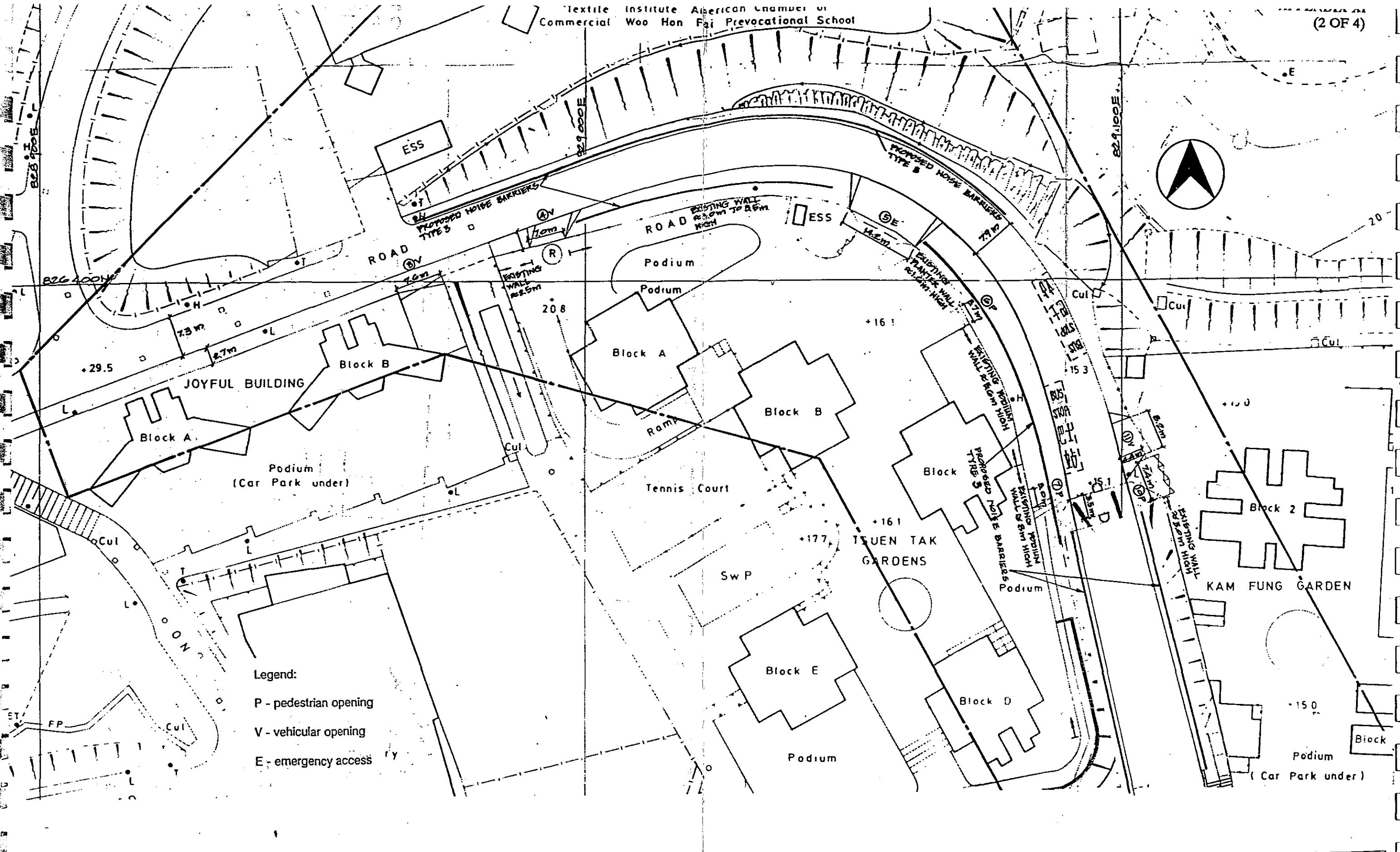
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TSUEN WAN DEVELOPMENT  
TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

MODIFIED LAYOUT OF PROPOSED  
MITIGATION MEASURES  
SHEET 1 OF 2

Suffix	Date	Revision		Drawn	Checked
Drawing No.		73808/SK385			
Date	14.5.95	Drawn	T.M.L.	Scale N.T.S.	
Checked	M	Approved	S.F.W.		

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Legend:

- P - pedestrian opening
- V - vehicular opening
- E - emergency access

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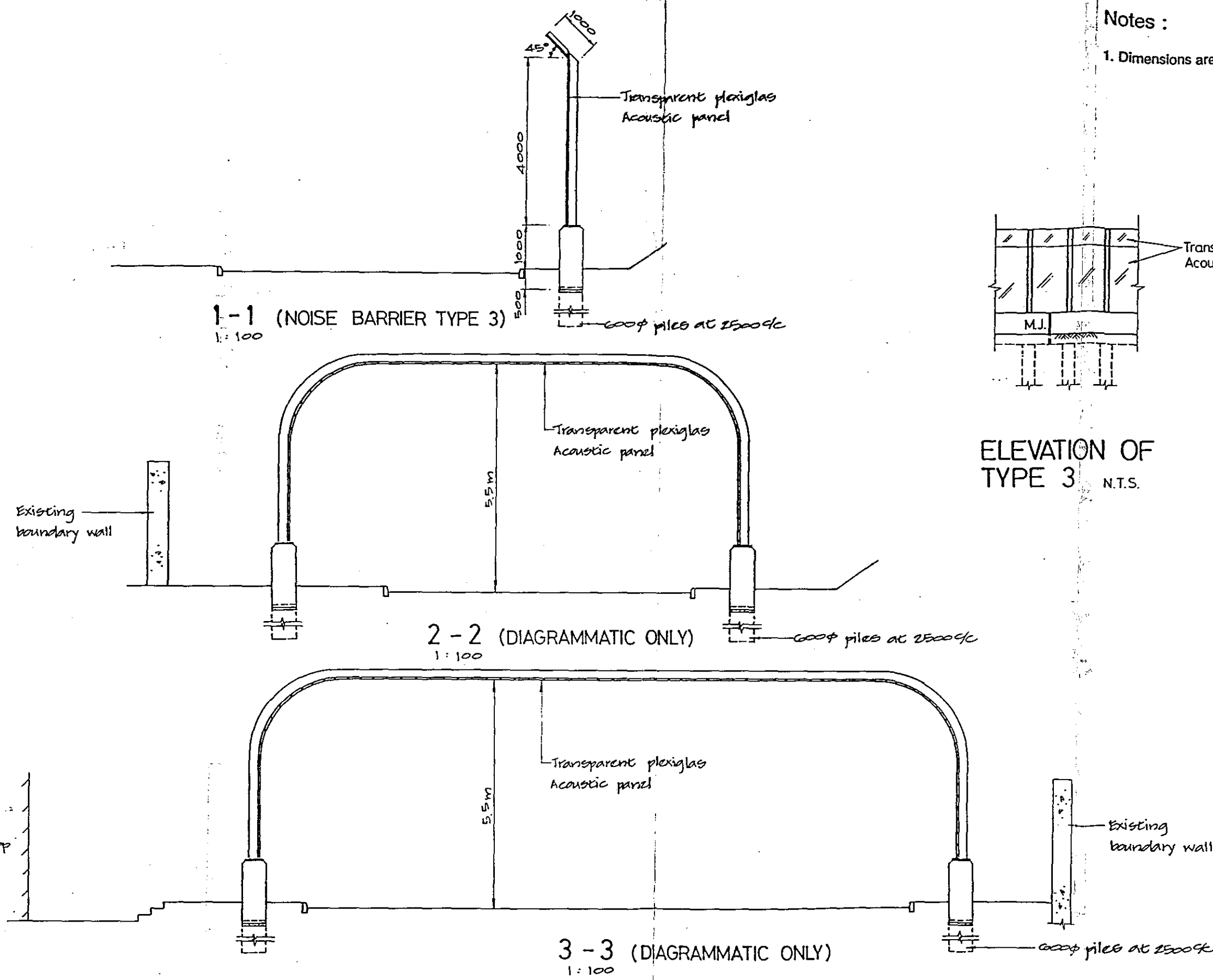
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TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

MODIFIED LAYOUT OF PROPOSED  
MITIGATION MEASURES  
SHEET 2 OF 2

Suffix	Date	Revision	Drawn	Checked
Drawing No.		73808/SK 383		
Date	26.8.93	Drawn	Li	Scale N.T.S.
Checked	RM	Approved	Stw	

Notes :

1. Dimensions are in millimetres unless otherwise stated.



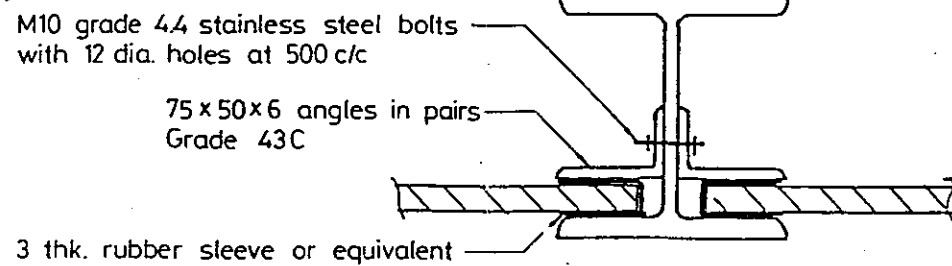
ELEVATION OF  
TYPE 3 N.T.S.

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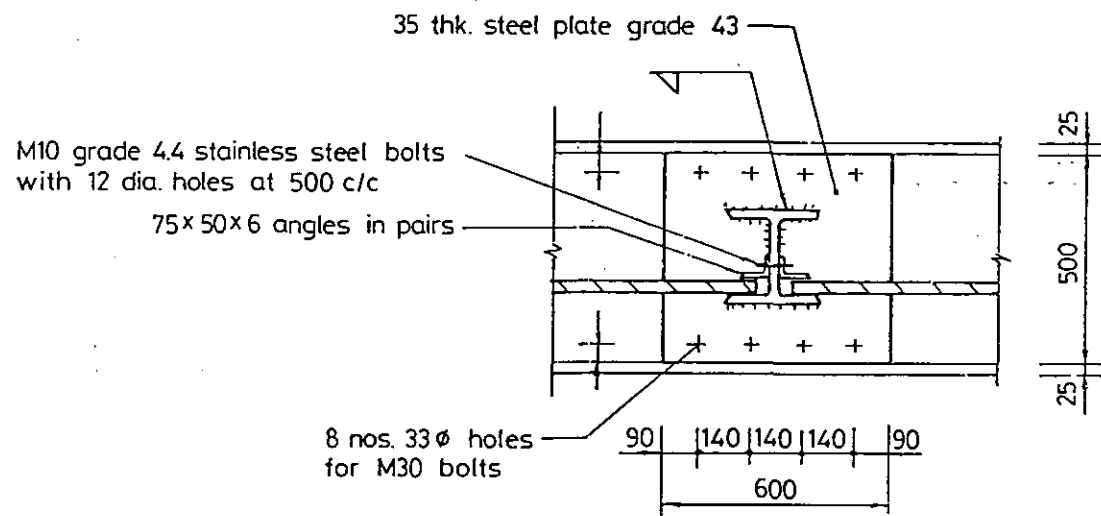
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TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

MODIFIED DETAILS OF  
NOISE BARRIERS  
SHEET 1 OF 2

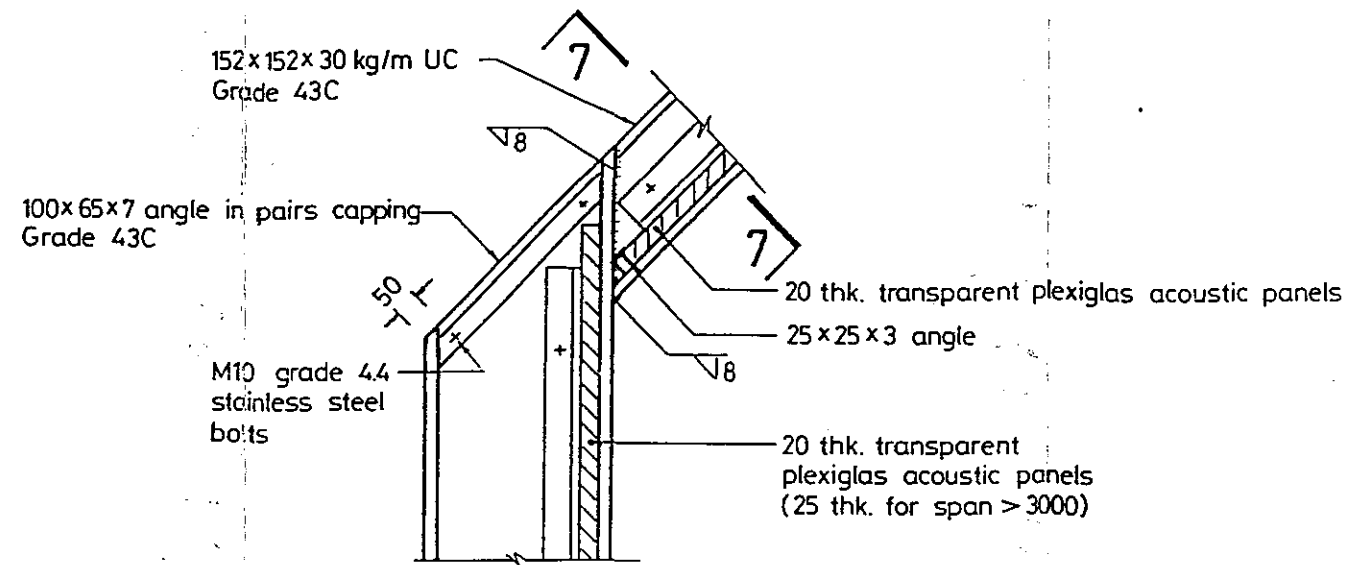
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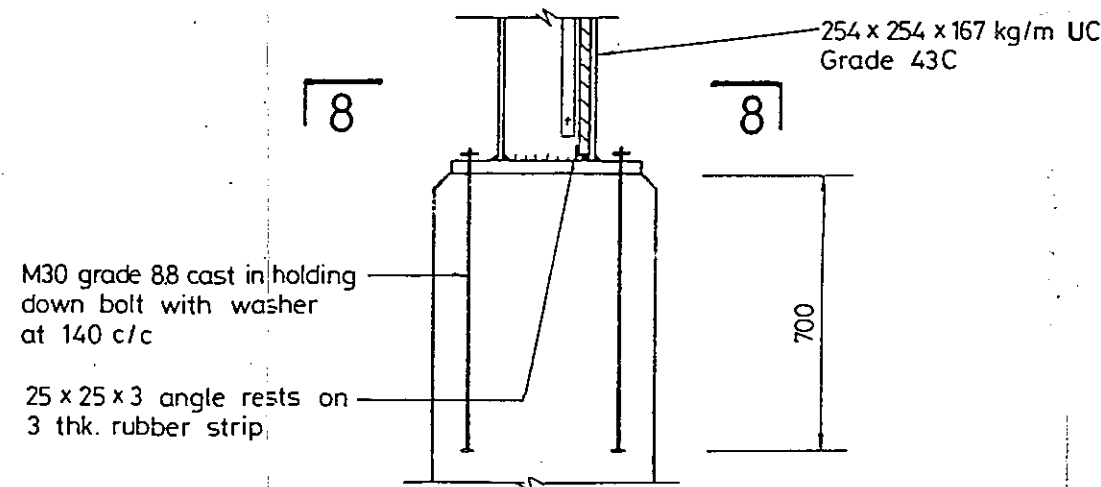
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8-8  
1:5



DETAIL A  
1:10



DETAIL B  
1:10

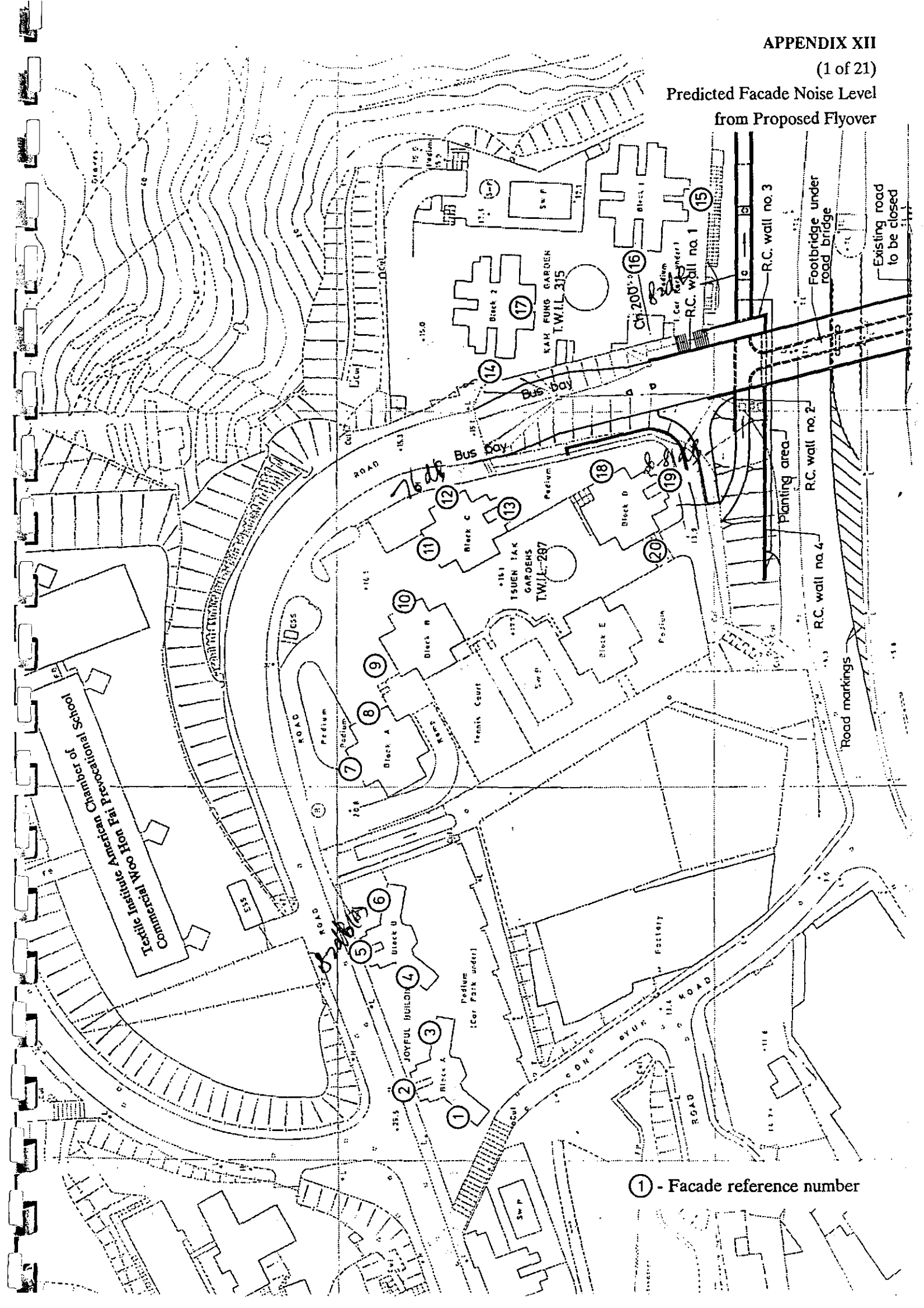
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TSUEN WAN DEVELOPMENT  
TSUEN WAN NORTH  
TDD CONTRACT TW50/86  
FLYOVER ACROSS CASTLE PEAK ROAD  
AT SHA TSUI ROAD

MODIFIED DETAILS OF  
NOISE BARRIERS  
SHEET 2 OF 2

Suffix	Date	Revision		Drawn	Checked
Drawing No.		73808/SK387			
Date	8.4.93	Drawn	T.M.	Scale	1:5
Checked	SM	Approved	SEW	Scale	1:10 1:20

Predicted Facade Noise Level  
from Proposed Flyover



① - Facade reference number

APPENDIX XII

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
(2 of 21)

FACADE 1	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	78 (78)	78 (78)	80 (81)	80 (81)	N/A	81
2	77 (78)	77 (78)	80 (81)	80 (81)	N/A	81
3	77 (78)	77 (78)	80 (80)	80 (80)	N/A	80
4	77 (78)	77 (78)	79 (80)	79 (80)	N/A	80
5	76 (77)	76 (77)	79 (80)	79 (80)	N/A	80
6	76 (77)	76 (77)	78 (79)	78 (80)	N/A	79
7	76 (76)	76 (76)	78 (79)	78 (79)	N/A	79
8	75 (76)	75 (76)	78 (78)	78 (78)	N/A	78
9	75 (76)	75 (76)	77 (78)	77 (78)	N/A	78
10	74 (75)	74 (75)	77 (78)	77 (78)	N/A	78
11	74 (75)	74 (75)	77 (77)	77 (77)	N/A	77
12	74 (75)	74 (75)	76 (77)	76 (77)	N/A	77
13	74 (74)	74 (74)	76 (77)	76 (77)	N/A	77
14	73 (74)	73 (74)	76 (77)	76 (77)	N/A	77
15	73 (74)	73 (74)	75 (76)	75 (76)	N/A	76
16	73 (74)	73 (74)	75 (76)	75 (76)	N/A	76
17	73 (73)	73 (73)	75 (76)	75 (76)	N/A	76
18	72 (73)	72 (73)	75 (76)	75 (76)	N/A	76
19	72 (73)	72 (73)	75 (75)	75 (75)	N/A	75
20	72 (73)	72 (73)	74 (75)	74 (75)	N/A	75
21	72 (72)	72 (72)	74 (75)	74 (75)	N/A	75
22	71 (72)	71 (72)	74 (75)	74 (75)	N/A	75
23	71 (72)	71 (72)	74 (75)	74 (75)	N/A	75
24	71 (72)	71 (72)	74 (74)	74 (74)	N/A	74
25	71 (72)	71 (72)	73 (74)	73 (74)	N/A	74
26	71 (72)	71 (72)	73 (74)	73 (74)	N/A	74
27	71 (71)	71 (71)	73 (74)	73 (74)	N/A	74

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
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FACADE 2	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	81 (82)	81 (82)	84 (84)	84 (84)	N/A	84
2	80 (81)	80 (81)	83 (84)	83 (84)	N/A	84
3	80 (80)	80 (81)	82 (83)	82 (83)	N/A	83
4	79 (80)	79 (80)	81 (82)	82 (82)	N/A	82
5	78 (79)	78 (79)	81 (82)	81 (82)	N/A	82
6	78 (79)	78 (79)	80 (81)	80 (81)	N/A	81
7	77 (78)	77 (78)	80 (81)	80 (81)	N/A	81
8	77 (78)	77 (78)	80 (80)	79 (80)	N/A	80
9	76 (77)	76 (77)	79 (80)	79 (80)	N/A	80
10	76 (77)	76 (77)	78 (79)	79 (79)	N/A	79
11	76 (76)	76 (76)	78 (79)	78 (79)	N/A	79
12	75 (76)	75 (76)	78 (79)	78 (79)	N/A	79
13	75 (76)	75 (76)	78 (78)	78 (78)	N/A	78
14	75 (76)	75 (76)	77 (78)	77 (78)	N/A	78
15	74 (75)	74 (75)	77 (78)	77 (78)	N/A	78
16	74 (75)	74 (75)	77 (77)	77 (77)	N/A	77
17	74 (75)	74 (75)	76 (77)	76 (77)	N/A	77
18	74 (75)	74 (75)	76 (77)	76 (77)	N/A	77
19	73 (74)	73 (74)	76 (77)	76 (77)	N/A	77
20	73 (74)	73 (74)	76 (77)	76 (77)	N/A	77
21	73 (74)	73 (74)	76 (76)	76 (76)	N/A	76
22	73 (74)	73 (74)	75 (76)	75 (76)	N/A	76
23	73 (73)	73 (73)	75 (76)	75 (76)	N/A	76
24	73 (73)	73 (73)	75 (76)	75 (76)	N/A	76
25	72 (73)	72 (73)	75 (76)	75 (76)	N/A	76
26	72 (73)	72 (73)	75 (75)	75 (75)	N/A	75
27	72 (73)	72 (73)	75 (75)	75 (75)	N/A	75

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
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FACADE 3	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	78 (79)	78 (79)	80 (81)	80 (81)	N/A	81
2	77 (78)	77 (78)	80 (81)	80 (81)	N/A	81
3	77 (78)	77 (78)	79 (80)	79 (80)	N/A	80
4	77 (77)	77 (77)	79 (80)	79 (80)	N/A	80
5	76 (77)	76 (77)	79 (79)	79 (79)	N/A	79
6	76 (77)	76 (77)	78 (79)	78 (79)	N/A	79
7	75 (76)	75 (76)	78 (79)	78 (79)	N/A	79
8	75 (76)	75 (76)	77 (78)	77 (78)	N/A	78
9	75 (75)	75 (75)	77 (78)	77 (78)	N/A	78
10	74 (75)	74 (75)	77 (78)	77 (78)	N/A	77
11	74 (75)	74 (75)	76 (77)	76 (77)	N/A	77
12	74 (74)	74 (74)	76 (77)	76 (77)	N/A	77
13	73 (74)	73 (74)	76 (77)	76 (77)	N/A	77
14	73 (74)	73 (74)	76 (76)	76 (76)	N/A	76
15	73 (74)	73 (74)	75 (76)	75 (76)	N/A	76
16	73 (73)	73 (73)	75 (76)	75 (76)	N/A	76
17	72 (73)	72 (73)	75 (76)	75 (76)	N/A	76
18	72 (73)	72 (73)	75 (76)	75 (76)	N/A	75
19	72 (73)	72 (73)	75 (75)	75 (75)	N/A	75
20	72 (73)	72 (73)	74 (75)	74 (75)	N/A	75
21	72 (72)	72 (72)	74 (75)	74 (75)	N/A	75
22	71 (72)	71 (72)	74 (75)	74 (75)	N/A	75
23	71 (72)	71 (72)	74 (75)	74 (75)	N/A	74
24	71 (72)	71 (72)	74 (74)	74 (74)	N/A	74
25	71 (72)	71 (72)	73 (74)	73 (74)	N/A	74
26	71 (72)	71 (72)	73 (74)	73 (74)	N/A	74
27	71 (71)	71 (71)	73 (74)	73 (74)	N/A	74

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover



**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
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FACADE 4	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006- Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	78 (79)	78 (79)	80 (81)	80 (81)	N/A	81
2	77 (78)	77 (78)	80 (81)	80 (81)	N/A	81
3	77 (78)	77 (78)	79 (80)	79 (80)	N/A	80
4	77 (77)	77 (77)	79 (80)	79 (80)	N/A	80
5	76 (77)	76 (77)	79 (79)	79 (79)	N/A	79
6	76 (77)	76 (77)	78 (79)	78 (79)	N/A	79
7	75 (76)	75 (76)	78 (79)	78 (79)	N/A	79
8	75 (76)	75 (76)	77 (78)	77 (78)	N/A	78
9	75 (75)	75 (75)	77 (78)	77 (78)	N/A	78
10	74 (75)	74 (75)	77 (78)	77 (78)	N/A	77
11	74 (75)	74 (75)	76 (77)	76 (77)	N/A	77
12	74 (74)	74 (74)	76 (77)	76 (77)	N/A	77
13	73 (74)	73 (74)	76 (77)	76 (77)	N/A	77
14	73 (74)	73 (74)	76 (76)	76 (76)	N/A	76
15	73 (74)	73 (74)	75 (76)	75 (76)	N/A	76
16	73 (73)	73 (73)	75 (76)	75 (76)	N/A	76
17	72 (73)	72 (73)	75 (76)	75 (76)	N/A	76
18	72 (73)	72 (73)	75 (76)	75 (76)	N/A	75
19	72 (73)	72 (73)	75 (75)	75 (75)	N/A	75
20	72 (73)	72 (73)	74 (75)	74 (75)	N/A	75
21	72 (72)	72 (72)	74 (75)	74 (75)	N/A	75
22	71 (72)	71 (72)	74 (75)	74 (75)	N/A	75
23	71 (72)	71 (72)	74 (75)	74 (75)	N/A	75
24	71 (72)	71 (72)	74 (74)	74 (74)	N/A	74
25	71 (72)	71 (72)	73 (74)	73 (74)	N/A	74
26	71 (72)	71 (72)	73 (74)	73 (74)	N/A	74
27	71 (71)	71 (71)	73 (74)	73 (74)	N/A	74

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
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FACADE 5	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	81 (82)	81 (82)	84 (84)	84 (84)	N/A	84
2	80 (81)	80 (81)	83 (84)	83 (84)	N/A	84
3	80 (81)	80 (80)	82 (83)	82 (83)	N/A	83
4	79 (80)	80 (80)	82 (82)	81 (82)	N/A	82
5	78 (79)	78 (79)	81 (82)	81 (82)	N/A	82
6	78 (79)	78 (79)	80 (81)	80 (81)	N/A	81
7	77 (78)	77 (78)	80 (81)	80 (81)	N/A	81
8	77 (78)	77 (78)	80 (80)	79 (80)	N/A	80
9	77 (77)	76 (77)	79 (80)	79 (80)	N/A	80
10	76 (77)	76 (77)	79 (80)	79 (79)	N/A	79
11	76 (77)	76 (76)	78 (79)	78 (79)	N/A	79
12	76 (76)	75 (76)	78 (79)	78 (79)	N/A	79
13	75 (76)	75 (76)	78 (79)	78 (78)	N/A	78
14	75 (76)	75 (76)	78 (78)	77 (78)	N/A	78
15	75 (76)	74 (75)	77 (78)	77 (78)	N/A	78
16	75 (75)	74 (75)	77 (78)	77 (78)	N/A	78
17	74 (75)	74 (75)	77 (78)	76 (77)	N/A	77
18	74 (75)	74 (75)	77 (77)	76 (77)	N/A	77
19	74 (75)	74 (74)	76 (77)	76 (77)	N/A	77
20	74 (74)	73 (74)	76 (77)	76 (77)	N/A	77
21	73 (74)	73 (74)	76 (77)	76 (76)	N/A	76
22	73 (74)	73 (74)	76 (77)	75 (76)	N/A	76
23	73 (74)	73 (74)	76 (76)	75 (76)	N/A	76
24	73 (74)	73 (73)	75 (76)	75 (76)	N/A	76
25	73 (74)	72 (73)	75 (76)	75 (76)	N/A	76
26	73 (73)	72 (73)	75 (76)	75 (76)	N/A	76
27	72 (73)	72 (73)	75 (76)	75 (75)	N/A	75

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

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Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
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FACADE 6	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	77 (78)	77 (78)	80 (80)	80 (80)	N/A	80
2	77 (78)	77 (78)	80 (80)	79 (80)	N/A	80
3	77 (78)	77 (78)	80 (80)	79 (80)	N/A	80
4	77 (78)	77 (77)	79 (80)	79 (80)	N/A	80
5	77 (77)	76 (77)	79 (80)	79 (80)	N/A	79
6	76 (77)	76 (77)	79 (79)	78 (79)	N/A	79
7	76 (77)	76 (76)	78 (79)	78 (79)	N/A	79
8	75 (76)	75 (76)	78 (79)	78 (78)	N/A	78
9	75 (76)	75 (76)	78 (79)	77 (78)	N/A	78
10	75 (76)	75 (75)	77 (78)	77 (78)	N/A	78
11	75 (76)	74 (75)	77 (78)	77 (78)	N/A	77
12	74 (75)	74 (75)	77 (78)	76 (77)	N/A	77
13	74 (75)	74 (74)	77 (78)	76 (77)	N/A	77
14	74 (75)	73 (74)	76 (77)	76 (77)	N/A	77
15	74 (75)	73 (74)	76 (77)	76 (76)	N/A	76
16	74 (74)	73 (74)	76 (77)	75 (76)	N/A	76
17	73 (74)	73 (73)	76 (77)	75 (76)	N/A	76
18	73 (74)	72 (73)	76 (76)	75 (76)	N/A	76
19	73 (74)	72 (73)	75 (76)	75 (76)	N/A	76
20	73 (74)	72 (73)	75 (76)	75 (75)	N/A	75
21	73 (73)	72 (73)	75 (76)	74 (75)	N/A	75
22	72 (73)	72 (72)	75 (76)	74 (75)	N/A	75
23	72 (73)	72 (72)	75 (76)	74 (75)	N/A	75
24	72 (73)	71 (72)	75 (75)	74 (75)	N/A	75
25	72 (73)	71 (72)	74 (75)	74 (75)	N/A	75
26	72 (73)	71 (72)	74 (75)	73 (74)	N/A	74
27	72 (72)	71 (72)	74 (75)	73 (74)	N/A	74

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

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Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
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FACADE 7	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	68 (69)	68 (69)	71 (72)	70 (71)	N/A	72
2	71 (72)	71 (72)	74 (75)	74 (74)	N/A	75
3	73 (73)	72 (73)	75 (76)	75 (76)	N/A	76
4	73 (74)	73 (73)	75 (76)	75 (76)	N/A	77
5	73 (74)	73 (74)	76 (77)	75 (76)	N/A	78
6	73 (74)	73 (74)	76 (77)	75 (76)	N/A	78
7	73 (74)	73 (74)	76 (77)	75 (76)	N/A	78
8	73 (74)	73 (74)	76 (77)	75 (76)	N/A	78
9	74 (74)	72 (73)	76 (77)	75 (76)	N/A	78
10	74 (75)	72 (73)	76 (77)	75 (76)	N/A	78
11	74 (75)	72 (73)	76 (77)	74 (75)	N/A	77
12	74 (75)	72 (73)	77 (78)	74 (75)	N/A	77
13	74 (75)	72 (72)	77 (78)	74 (75)	N/A	77
14	74 (75)	71 (72)	77 (78)	74 (75)	N/A	77
15	74 (75)	71 (72)	77 (77)	74 (75)	N/A	77
16	74 (75)	71 (72)	76 (77)	74 (74)	N/A	76
17	74 (75)	71 (72)	76 (77)	73 (74)	N/A	76
18	74 (75)	71 (71)	76 (77)	73 (74)	N/A	76
19	74 (74)	70 (71)	76 (77)	73 (74)	N/A	76
20	73 (74)	70 (71)	76 (77)	73 (74)	N/A	76
21	73 (74)	70 (71)	76 (77)	73 (73)	N/A	75
22	73 (74)	70 (71)	76 (76)	72 (73)	N/A	75
23	73 (74)	70 (71)	75 (76)	72 (73)	N/A	75
24	73 (74)	70 (70)	75 (76)	72 (73)	N/A	75
25	73 (73)	69 (70)	75 (76)	72 (73)	N/A	75
26	72 (73)	69 (70)	75 (76)	72 (73)	N/A	75
27	72 (73)	69 (70)	75 (76)	72 (72)	N/A	74
28	72 (73)	69 (70)	75 (75)	71 (72)	N/A	74
29	72 (73)	69 (70)	75 (75)	71 (72)	N/A	74
30	72 (73)	69 (70)	74 (75)	71 (72)	N/A	74
31	72 (73)	69 (69)	74 (75)	71 (72)	N/A	74

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

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Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
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FACADE 8.	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	57 (57)	51 (52)	60 (60)	54 (55)	N/A	62
2	58 (59)	53 (54)	60 (61)	55 (56)	N/A	63
3	59 (60)	55 (56)	62 (63)	57 (58)	N/A	65
4	61 (62)	57 (58)	64 (64)	60 (61)	N/A	67
5	63 (64)	60 (60)	66 (66)	62 (63)	N/A	68
6	64 (65)	60 (61)	66 (67)	63 (64)	N/A	70
7	64 (65)	61 (61)	67 (68)	63 (64)	N/A	71
8	65 (66)	61 (62)	67 (68)	64 (64)	N/A	72
9	66 (66)	61 (62)	68 (69)	64 (64)	N/A	73
10	66 (67)	62 (62)	69 (70)	64 (65)	N/A	74
11	67 (68)	62 (63)	69 (70)	65 (65)	N/A	74
12	68 (69)	63 (63)	70 (71)	65 (66)	N/A	74
13	69 (69)	63 (64)	71 (72)	66 (66)	N/A	74
14	69 (70)	64 (64)	71 (72)	66 (67)	N/A	74
15	70 (70)	64 (65)	72 (73)	66 (67)	N/A	74
16	70 (71)	64 (65)	73 (73)	67 (67)	N/A	74
17	70 (71)	64 (65)	73 (74)	67 (67)	N/A	74
18	71 (72)	64 (65)	73 (74)	67 (68)	N/A	74
19	71 (72)	65 (65)	73 (74)	67 (68)	N/A	74
20	71 (72)	65 (65)	73 (74)	67 (68)	N/A	74
21	71 (72)	65 (65)	73 (74)	67 (68)	N/A	74
22	71 (72)	65 (65)	73 (74)	67 (68)	N/A	73
23	71 (72)	65 (65)	73 (74)	67 (68)	N/A	73
24	71 (72)	65 (65)	73 (74)	67 (68)	N/A	73
25	71 (71)	65 (65)	73 (74)	67 (68)	N/A	73
26	71 (71)	65 (65)	73 (74)	67 (68)	N/A	73
27	71 (71)	65 (65)	73 (74)	67 (68)	N/A	73
28	70 (71)	64 (65)	73 (74)	67 (68)	N/A	73
29	70 (71)	64 (65)	73 (74)	67 (68)	M/A	73
30	70 (71)	64 (65)	73 (73)	67 (68)	N/A	72
31	70 (71)	64 (65)	73 (73)	67 (68)	N/A	72

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

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Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
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FACADE 9	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	57 (58)	54 (55)	60 (61)	56 (57)	N/A	63
2	59 (60)	56 (57)	61 (62)	58 (59)	N/A	64
3	61 (62)	58 (59)	63 (64)	61 (62)	N/A	66
4	63 (64)	61 (62)	66 (66)	64 (64)	N/A	68
5	64 (65)	62 (63)	67 (67)	65 (65)	N/A	70
6	65 (66)	62 (63)	68 (68)	65 (66)	N/A	72
7	65 (66)	63 (64)	68 (69)	65 (66)	N/A	72
8	66 (67)	63 (64)	68 (69)	66 (66)	N/A	73
9	66 (67)	64 (64)	69 (69)	66 (67)	N/A	73
10	67 (67)	64 (65)	69 (70)	66 (67)	N/A	73
11	67 (68)	65 (65)	70 (70)	67 (68)	N/A	73
12	68 (68)	65 (66)	70 (71)	67 (68)	N/A	74
13	68 (69)	65 (66)	70 (71)	68 (68)	N/A	74
14	68 (69)	65 (66)	71 (71)	68 (69)	N/A	74
15	68 (69)	65 (66)	71 (72)	68 (69)	N/A	74
16	69 (70)	65 (66)	71 (72)	68 (69)	N/A	74
17	69 (70)	66 (66)	72 (72)	68 (69)	N/A	74
18	69 (70)	65 (66)	72 (72)	68 (69)	N/A	74
19	69 (70)	65 (66)	72 (73)	68 (69)	N/A	73
20	70 (70)	65 (66)	72 (73)	68 (69)	N/A	73
21	70 (71)	65 (66)	72 (73)	68 (69)	N/A	73
22	70 (71)	65 (66)	72 (73)	68 (69)	N/A	73
23	70 (71)	65 (66)	72 (73)	68 (69)	N/A	73
24	70 (71)	65 (66)	72 (73)	68 (69)	N/A	73
25	70 (71)	65 (66)	72 (73)	68 (69)	N/A	73
26	70 (71)	65 (66)	72 (73)	68 (68)	N/A	73
27	70 (71)	65 (66)	72 (73)	68 (68)	N/A	72
28	70 (71)	65 (66)	72 (73)	68 (68)	N/A	72
29	70 (71)	65 (66)	72 (73)	68 (68)	N/A	72
30	70 (71)	65 (66)	72 (73)	68 (68)	N/A	72
31	70 (70)	65 (66)	72 (73)	68 (68)	N/A	72

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

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**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
(11 of 21)

FACADE 10	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY						
1	57 (58)	55 (56)	60 (60)	58 (59)	N/A	62
2	58 (59)	56 (57)	61 (62)	59 (60)	N/A	63
3	60 (61)	58 (58)	62 (63)	60 (61)	N/A	65
4	62 (63)	59 (60)	64 (65)	62 (62)	N/A	68
5	64 (65)	61 (61)	66 (67)	63 (64)	N/A	70
6	65 (66)	63 (64)	68 (69)	65 (66)	N/A	72
7	67 (67)	65 (65)	69 (70)	67 (68)	N/A	73
8	68 (68)	66 (67)	70 (71)	69 (69)	N/A	74
9	68 (69)	67 (68)	71 (72)	69 (70)	N/A	74
10	69 (70)	68 (69)	71 (72)	70 (71)	N/A	74
11	69 (70)	68 (69)	72 (72)	71 (71)	N/A	74
12	70 (70)	69 (69)	72 (73)	71 (72)	N/A	74
13	70 (71)	69 (70)	72 (73)	71 (72)	N/A	74
14	70 (71)	69 (70)	72 (73)	72 (72)	N/A	74
15	70 (71)	69 (70)	73 (73)	72 (72)	N/A	74
16	70 (71)	69 (70)	73 (73)	72 (72)	N/A	74
17	70 (71)	69 (70)	73 (73)	72 (72)	N/A	74
18	70 (71)	69 (70)	73 (73)	72 (72)	N/A	74
19	70 (71)	69 (70)	73 (73)	72 (72)	N/A	74
20	70 (71)	69 (70)	73 (73)	71 (72)	N/A	73
21	70 (71)	69 (70)	73 (73)	71 (72)	N/A	73
22	70 (71)	69 (69)	73 (73)	71 (72)	N/A	73
23	70 (71)	69 (69)	73 (73)	71 (72)	N/A	73
24	70 (71)	68 (69)	72 (73)	71 (72)	N/A	73
25	70 (71)	68 (69)	72 (73)	71 (72)	N/A	73
26	70 (71)	68 (69)	72 (73)	71 (71)	N/A	73
27	70 (71)	68 (69)	72 (73)	71 (71)	N/A	73
28	70 (71)	68 (69)	72 (73)	70 (71)	N/A	72
29	70 (70)	68 (69)	72 (73)	70 (71)	N/A	72
30	70 (70)	68 (69)	72 (73)	70 (71)	N/A	72
31	70 (70)	68 (68)	72 (73)	70 (71)	N/A	72

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
(12 of 21)

FACADE 11	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 with Flyover Unmitigated
STOREY						
1	57 (58)	56 (56)	59 (60)	58 (59)	N/A	61
2	58 (59)	57 (58)	61 (62)	60 (60)	N/A	63
3	60 (61)	60 (60)	63 (63)	62 (62)	N/A	65
4	62 (63)	61 (62)	65 (66)	64 (65)	N/A	68
5	65 (66)	64 (65)	67 (68)	67 (67)	N/A	71
6	67 (68)	66 (67)	69 (70)	69 (69)	N/A	73
7	68 (69)	67 (68)	70 (71)	70 (70)	N/A	74
8	69 (69)	68 (69)	71 (72)	71 (71)	N/A	74
9	70 (70)	69 (70)	72 (73)	71 (72)	N/A	74
10	70 (71)	69 (70)	72 (73)	72 (72)	N/A	74
11	70 (71)	69 (70)	72 (73)	72 (73)	N/A	74
12	70 (71)	69 (70)	72 (73)	72 (72)	N/A	74
13	70 (71)	69 (70)	72 (73)	72 (72)	N/A	73
14	70 (70)	69 (70)	72 (73)	72 (72)	N/A	73
15	70 (70)	69 (70)	72 (73)	72 (72)	N/A	73
16	70 (70)	69 (70)	72 (73)	71 (72)	N/A	73
17	69 (70)	69 (69)	72 (73)	71 (72)	N/A	73
18	69 (70)	69 (69)	72 (73)	71 (72)	N/A	73
19	69 (70)	68 (69)	72 (73)	71 (72)	N/A	73
20	69 (70)	68 (69)	72 (72)	71 (71)	N/A	73
21	69 (70)	68 (69)	72 (72)	71 (71)	N/A	73
22	69 (70)	68 (69)	72 (72)	70 (71)	N/A	72
23	69 (70)	68 (69)	72 (72)	70 (71)	N/A	72
24	69 (70)	68 (68)	71 (72)	70 (71)	N/A	72
25	69 (70)	67 (68)	71 (72)	70 (71)	N/A	72
26	69 (70)	67 (68)	71 (72)	70 (71)	N/A	72
27	69 (70)	67 (68)	71 (72)	70 (70)	N/A	72
28	69 (70)	67 (68)	71 (72)	70 (70)	N/A	72
29	69 (70)	67 (68)	71 (72)	69 (70)	N/A	72
30	69 (69)	67 (68)	71 (72)	69 (70)	N/A	72
31	69 (69)	67 (67)	71 (72)	69 (70)	N/A	71

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover



APPENDIX XII

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
(13 of 21)

FACADE 12	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY						
1	64 (65)	63 (64)	66 (67)	65 (66)	60	69
2	69 (69)	67 (68)	71 (71)	69 (70)	67	76
3	73 (73)	71 (72)	75 (76)	74 (74)	67	80
4	75 (76)	74 (75)	78 (78)	76 (77)	67	80
5	76 (77)	75 (76)	78 (79)	77 (78)	68	80
6	76 (77)	75 (76)	78 (79)	77 (78)	68	79
7	76 (77)	75 (76)	78 (79)	77 (78)	68	79
8	76 (76)	75 (76)	78 (79)	77 (78)	69	79
9	76 (77)	75 (76)	78 (79)	77 (78)	69	78
10	76 (76)	75 (75)	78 (78)	77 (78)	69	78
11	76 (76)	75 (75)	78 (78)	77 (77)	69	78
12	75 (76)	75 (75)	77 (78)	77 (77)	70	78
13	75 (76)	75 (75)	77 (78)	76 (77)	70	78
14	75 (76)	74 (75)	77 (78)	76 (77)	70	77
15	75 (76)	74 (75)	77 (78)	76 (77)	70	77
16	75 (75)	74 (75)	77 (77)	76 (77)	70	77
17	75 (75)	74 (75)	76 (77)	76 (76)	70	77
18	75 (75)	74 (74)	76 (77)	76 (76)	70	77
19	74 (75)	74 (74)	76 (77)	75 (76)	70	77
20	74 (75)	74 (74)	76 (77)	75 (76)	70	76
21	74 (75)	74 (74)	76 (77)	75 (76)	70	76
22	74 (74)	73 (74)	76 (76)	75 (76)	70	76
23	74 (74)	73 (74)	76 (76)	75 (75)	70	76
24	74 (74)	73 (74)	75 (76)	75 (75)	69	76
25	74 (74)	73 (74)	75 (76)	75 (75)	69	76
26	74 (74)	73 (73)	75 (76)	75 (75)	69	76
27	73 (74)	73 (73)	75 (76)	74 (75)	69	75
28	73 (74)	73 (73)	75 (76)	74 (75)	69	75
29	73 (74)	73 (73)	75 (76)	74 (75)	69	75
30	73 (74)	73 (73)	75 (75)	74 (75)	69	75
31	73 (73)	72 (73)	75 (75)	74 (75)	69	75

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
**(14 of 21)**

FACADE 13 STOREY	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
1	62 (63)	60 (60)	63 (64)	61 (61)	60	65
2	67 (67)	64 (64)	67 (68)	64 (65)	66	69
3	70 (70)	67 (67)	71 (71)	67 (68)	69	73
4	71 (72)	68 (68)	72 (73)	69 (70)	70	76
5	72 (73)	70 (70)	73 (74)	71 (71)	70	77
6	73 (74)	71 (71)	74 (75)	72 (72)	71	77
7	74 (74)	72 (72)	75 (76)	73 (73)	71	77
8	74 (75)	73 (73)	76 (76)	74 (74)	72	77
9	75 (75)	73 (73)	76 (76)	74 (74)	72	77
10	75 (75)	73 (73)	76 (77)	74 (74)	72	77
11	75 (75)	73 (74)	76 (77)	74 (74)	72	76
12	75 (75)	73 (74)	76 (77)	74 (74)	72	77
13	75 (75)	73 (74)	76 (76)	74 (74)	72	77
14	75 (75)	73 (73)	76 (76)	74 (74)	72	76
15	74 (75)	73 (73)	76 (76)	74 (74)	72	76
16	74 (75)	73 (73)	76 (76)	74 (74)	72	76
17	74 (75)	73 (73)	75 (76)	74 (74)	72	76
18	74 (75)	73 (73)	75 (76)	74 (74)	72	76
19	74 (74)	73 (73)	75 (76)	74 (74)	72	76
20	74 (74)	73 (73)	75 (76)	73 (74)	72	76
21	74 (74)	73 (73)	75 (75)	73 (74)	72	75
22	74 (74)	73 (73)	75 (75)	73 (74)	72	75
23	74 (74)	73 (73)	75 (75)	73 (73)	72	75
24	74 (74)	72 (73)	75 (75)	73 (73)	71	75
25	73 (74)	72 (73)	75 (75)	73 (73)	71	75
26	73 (74)	72 (72)	74 (75)	73 (73)	71	75
27	73 (74)	72 (72)	74 (75)	73 (73)	71	75
28	73 (74)	72 (72)	74 (75)	73 (73)	71	75
29	73 (73)	72 (72)	74 (75)	73 (73)	71	75
30	73 (73)	72 (72)	74 (75)	73 (73)	71	75
31	73 (73)	72 (72)	74 (75)	73 (73)	71	75

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

APPENDIX XII

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
(15 of 21)

FACADE 14 STOREY	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
1	73 (74)	73 (74)	76 (77)	75 (76)	70	80
2	74 (74)	73 (73)	76 (77)	75 (76)	70	80
3	74 (75)	73 (73)	76 (77)	75 (76)	70	80
4	75 (75)	73 (73)	77 (77)	75 (76)	71	79
5	75 (76)	73 (73)	77 (78)	75 (75)	70	79
6	76 (76)	73 (74)	78 (78)	75 (76)	71	79
7	76 (77)	73 (74)	78 (78)	75 (76)	71	79
8	76 (77)	73 (74)	78 (78)	75 (76)	71	78
9	76 (76)	74 (74)	78 (78)	75 (76)	71	78
10	76 (76)	74 (74)	78 (78)	75 (76)	71	78
11	76 (76)	74 (74)	77 (78)	75 (76)	72	78
12	76 (76)	74 (74)	77 (78)	75 (75)	72	78
13	75 (76)	74 (74)	77 (78)	75 (75)	72	78
14	75 (76)	74 (74)	77 (77)	75 (75)	72	77
15	75 (76)	74 (74)	77 (77)	75 (75)	72	77
16	75 (76)	73 (74)	77 (77)	75 (75)	72	77
17	75 (75)	73 (74)	76 (77)	74 (75)	71	77
18	75 (75)	73 (74)	76 (77)	74 (75)	71	77
19	75 (75)	73 (73)	76 (77)	74 (75)	71	77
20	75 (75)	73 (73)	76 (77)	74 (74)	71	76
21	74 (75)	73 (73)	76 (76)	74 (74)	71	76
22	74 (75)	73 (73)	76 (76)	74 (74)	71	76
23	74 (75)	73 (73)	76 (76)	74 (74)	71	76
24	74 (75)	73 (73)	76 (76)	74 (74)	71	76
25	74 (74)	73 (73)	75 (76)	74 (74)	71	76
26	74 (74)	73 (73)	75 (76)	73 (74)	71	76
27	74 (74)	72 (73)	75 (76)	73 (74)	71	76
28	74 (74)	72 (73)	75 (76)	73 (74)	71	75
29	74 (74)	72 (73)	75 (76)	73 (73)	71	75
30	74 (74)	72 (72)	75 (75)	73 (73)	71	75
31	73 (74)	72 (72)	75 (75)	73 (73)	71	75
32	73 (74)	72 (72)	75 (75)	73 (73)	71	75
33	73 (74)	72 (72)	75 (75)	73 (73)	71	75
34	73 (74)	72 (72)	75 (75)	73 (73)	71	75
35	73 (73)	72 (72)	74 (75)	73 (73)	70	75

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

APPENDIX XII

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
(16 of 21)

FACADE 15	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY						
1	82 (82)	82 (82)	82 (82)	82 (82)	82	82
2	82 (82)	82 (82)	82 (82)	82 (82)	82	82
3	82 (82)	82 (82)	82 (82)	82 (82)	82	82
4	82 (82)	82 (82)	82 (82)	82 (82)	82	82
5	82 (82)	82 (82)	82 (82)	82 (82)	81	82
6	81 (82)	81 (82)	82 (82)	82 (82)	81	82
7	81 (81)	81 (81)	82 (82)	82 (82)	81	82
8	81 (81)	81 (81)	81 (81)	81 (81)	81	81
9	81 (81)	81 (81)	81 (81)	81 (81)	81	81
10	81 (81)	81 (81)	81 (81)	81 (81)	81	81
11	81 (81)	81 (81)	81 (81)	81 (81)	81	81
12	81 (81)	81 (81)	81 (81)	81 (81)	80	81
13	81 (81)	81 (81)	81 (81)	81 (81)	80	81
14	80 (80)	80 (80)	81 (81)	81 (81)	80	81
15	80 (80)	80 (80)	80 (81)	80 (81)	80	81
16	80 (80)	80 (80)	80 (80)	80 (80)	80	80
17	80 (80)	80 (80)	80 (80)	80 (80)	80	80
18	80 (80)	80 (80)	80 (80)	80 (80)	80	80
19	80 (80)	80 (80)	80 (80)	80 (80)	79	80
20	80 (80)	80 (80)	80 (80)	80 (80)	79	80
21	79 (80)	79 (79)	80 (80)	80 (80)	79	80
22	79 (79)	79 (79)	80 (80)	80 (80)	79	80
23	79 (79)	79 (79)	79 (79)	79 (79)	79	79
24	79 (79)	79 (79)	79 (79)	79 (79)	79	79
25	79 (79)	79 (79)	79 (79)	79 (79)	79	79
26	79 (79)	79 (79)	79 (79)	79 (79)	79	79
27	79 (79)	79 (79)	79 (79)	79 (79)	78	79
28	79 (79)	79 (79)	79 (79)	79 (79)	78	79
29	79 (79)	79 (79)	79 (79)	79 (79)	78	79
30	78 (79)	78 (79)	79 (79)	79 (79)	78	79
31	78 (78)	78 (78)	79 (79)	79 (79)	78	79
32	78 (78)	78 (78)	78 (79)	78 (79)	78	79
33	78 (78)	78 (78)	78 (78)	78 (78)	78	78
34	78 (78)	78 (78)	78 (78)	78 (78)	78	78
35	78 (78)	78 (78)	78 (78)	78 (78)	78	78

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

APPENDIX XII

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
(17 of 21)

FACADE 16	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY						
1	75 (75)	75 (75)	76 (76)	76 (76)	74	77
2	77 (77)	77 (77)	77 (78)	77 (77)	76	79
3	78 (78)	78 (78)	78 (78)	78 (78)	77	79
4	78 (78)	78 (78)	78 (78)	78 (78)	77	79
5	78 (78)	78 (78)	78 (78)	78 (78)	77	79
6	78 (78)	78 (78)	78 (78)	78 (78)	77	79
7	78 (78)	77 (78)	78 (78)	78 (78)	77	79
8	77 (78)	77 (77)	78 (78)	78 (78)	77	79
9	77 (78)	77 (77)	78 (78)	78 (78)	77	79
10	77 (77)	77 (77)	78 (78)	78 (78)	76	79
11	77 (77)	77 (77)	78 (78)	77 (78)	76	79
12	77 (77)	77 (77)	78 (78)	77 (78)	76	78
13	77 (77)	77 (77)	78 (78)	77 (77)	76	78
14	77 (77)	77 (77)	78 (78)	77 (77)	76	78
15	77 (77)	77 (77)	78 (78)	77 (77)	76	78
16	77 (77)	76 (77)	78 (78)	77 (77)	76	78
17	77 (77)	76 (76)	78 (78)	77 (77)	76	78
18	77 (77)	76 (76)	77 (78)	77 (77)	76	78
19	77 (77)	76 (76)	77 (78)	77 (77)	75	78
20	76 (77)	76 (76)	77 (77)	76 (77)	75	77
21	76 (77)	76 (76)	77 (77)	76 (77)	75	77
22	76 (76)	76 (76)	77 (77)	76 (76)	75	77
23	76 (76)	76 (76)	77 (77)	76 (76)	75	77
24	76 (76)	76 (76)	77 (77)	76 (76)	75	77
25	76 (76)	75 (76)	77 (77)	76 (76)	75	77
26	76 (76)	75 (75)	77 (77)	76 (76)	75	77
27	76 (76)	75 (75)	76 (77)	76 (76)	75	77
28	76 (76)	75 (75)	76 (77)	76 (76)	75	77
29	76 (76)	75 (75)	76 (77)	76 (76)	74	77
30	75 (76)	75 (75)	76 (76)	75 (76)	74	76
31	75 (76)	75 (75)	76 (76)	75 (76)	74	76
32	75 (76)	75 (75)	76 (76)	75 (75)	74	76
33	75 (75)	75 (75)	76 (76)	75 (75)	74	76
34	75 (75)	75 (75)	76 (76)	75 (75)	74	76
35	75 (75)	74 (75)	76 (76)	75 (75)	74	76

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
**(18 of 21)**

FACADE 17	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY						
1	69 (69)	68 (68)	70 (70)	69 (70)	71	76
2	70 (71)	70 (70)	72 (72)	71 (71)	72	77
3	73 (73)	72 (72)	73 (74)	72 (73)	73	78
4	74 (74)	73 (73)	75 (75)	74 (74)	74	78
5	75 (75)	74 (74)	76 (76)	75 (75)	75	78
6	76 (76)	75 (75)	76 (76)	75 (76)	75	78
7	76 (76)	76 (76)	77 (77)	76 (76)	76	78
8	77 (77)	76 (76)	77 (77)	76 (76)	76	78
9	77 (77)	76 (76)	77 (77)	76 (77)	76	78
10	77 (77)	76 (76)	77 (78)	76 (77)	76	78
11	77 (77)	76 (76)	78 (78)	76 (77)	76	78
12	77 (77)	76 (76)	78 (78)	76 (77)	76	78
13	77 (77)	76 (76)	77 (78)	76 (76)	76	78
14	77 (77)	76 (76)	77 (78)	76 (76)	76	78
15	77 (77)	76 (76)	77 (78)	76 (76)	76	78
16	77 (77)	76 (76)	77 (78)	76 (76)	76	78
17	77 (77)	76 (76)	77 (77)	76 (76)	76	77
18	76 (77)	76 (76)	77 (77)	76 (76)	75	77
19	76 (77)	76 (76)	77 (77)	76 (76)	75	77
20	76 (76)	76 (76)	77 (77)	76 (76)	75	77
21	76 (76)	76 (76)	77 (77)	76 (76)	75	77
22	76 (76)	75 (76)	77 (77)	76 (76)	75	77
23	76 (76)	75 (75)	77 (77)	76 (76)	75	77
24	76 (76)	75 (75)	77 (77)	76 (76)	75	77
25	76 (76)	75 (75)	76 (77)	75 (76)	75	77
26	76 (76)	75 (75)	76 (77)	75 (75)	75	77
27	76 (76)	75 (75)	76 (77)	75 (75)	75	77
28	76 (76)	75 (75)	76 (76)	75 (75)	75	76
29	76 (76)	75 (75)	76 (76)	75 (75)	75	76
30	75 (76)	75 (75)	76 (76)	75 (75)	75	76
31	75 (76)	75 (75)	76 (76)	75 (75)	75	76
32	75 (75)	75 (75)	76 (76)	75 (75)	74	76
33	75 (75)	75 (75)	76 (76)	75 (75)	74	76
34	75 (75)	75 (75)	76 (76)	75 (75)	74	76
35	75 (75)	74 (75)	76 (76)	75 (75)	74	76

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
**(19 of 21)**

FACADE 18	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY						
1	65 (65)	64 (64)	66 (67)	64 (64)	63	68
2	72 (72)	70 (70)	73 (73)	70 (70)	71	74
3	74 (75)	73 (73)	75 (75)	73 (74)	74	78
4	75 (76)	75 (75)	76 (76)	75 (75)	74	80
5	76 (76)	75 (75)	77 (77)	76 (76)	75	80
6	77 (77)	75 (75)	78 (78)	76 (76)	75	80
7	77 (77)	75 (76)	78 (79)	76 (76)	75	80
8	77 (77)	75 (76)	78 (79)	76 (76)	75	79
9	77 (77)	75 (75)	78 (79)	76 (76)	75	79
10	77 (77)	75 (75)	78 (79)	76 (76)	75	79
11	77 (77)	75 (75)	78 (79)	76 (76)	74	79
12	77 (77)	75 (75)	78 (78)	76 (76)	74	79
13	77 (77)	75 (75)	78 (78)	76 (76)	74	78
14	77 (77)	75 (75)	78 (78)	76 (76)	74	78
15	76 (77)	75 (75)	78 (78)	75 (76)	74	78
16	76 (77)	75 (75)	77 (78)	75 (76)	74	78
17	76 (76)	75 (75)	77 (78)	75 (75)	74	78
18	76 (76)	75 (75)	77 (78)	75 (75)	74	78
19	76 (76)	75 (75)	77 (77)	75 (75)	74	77
20	76 (76)	74 (75)	77 (77)	75 (75)	74	77
21	76 (76)	74 (74)	77 (77)	75 (75)	74	77
22	76 (76)	74 (74)	77 (77)	75 (75)	74	77
23	75 (76)	74 (74)	76 (77)	75 (75)	73	77
24	75 (76)	74 (74)	76 (77)	75 (75)	73	77
25	75 (75)	74 (74)	76 (77)	74 (75)	73	77
26	75 (75)	74 (74)	76 (77)	74 (75)	73	76
27	75 (75)	74 (74)	76 (76)	74 (74)	73	76
28	75 (75)	74 (74)	76 (76)	74 (74)	73	76
29	75 (75)	74 (74)	76 (76)	74 (74)	73	76
30	75 (75)	73 (74)	76 (76)	74 (74)	73	76
31	75 (75)	73 (73)	76 (76)	74 (74)	73	76

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover

**APPENDIX XII**  
**Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2**  
(20 of 21)

FACADE 19	Barriers Only NO Enclosures TKC/Flyover with Porous Road Surfacing	Barriers and Enclosures TKC/Flyover with Porous Road Surfacing	Barriers Only NO Enclosures TKC/Flyover without Porous Road Surfacing	Barriers and Enclosures TKC/Flyover without Porous Road Surfacing	2006 Without Flyover	2006 With Flyover Unmitigated
1	71 (71)	71 (71)	71 (72)	71 (71)	71	72
2	81 (81)	81 (81)	81 (81)	81 (81)	80	81
3	81 (81)	81 (81)	81 (81)	81 (81)	81	82
4	81 (81)	81 (81)	81 (81)	81 (81)	81	82
5	81 (81)	81 (81)	81 (81)	81 (81)	80	82
6	81 (81)	81 (81)	81 (81)	81 (81)	80	82
7	81 (81)	80 (81)	81 (81)	81 (81)	80	81
8	81 (81)	80 (80)	81 (81)	81 (81)	80	81
9	80 (81)	80 (80)	81 (81)	80 (81)	80	81
10	80 (80)	80 (80)	81 (81)	80 (80)	80	81
11	80 (80)	80 (80)	81 (81)	80 (80)	80	81
12	80 (80)	80 (80)	80 (81)	80 (80)	80	81
13	80 (80)	80 (80)	80 (81)	80 (80)	79	81
14	80 (80)	80 (80)	80 (80)	80 (80)	79	80
15	80 (80)	79 (80)	80 (80)	80 (80)	79	80
16	80 (80)	79 (79)	80 (80)	80 (80)	79	80
17	79 (80)	79 (79)	80 (80)	79 (79)	79	80
18	79 (79)	79 (79)	80 (80)	79 (79)	79	80
19	79 (79)	79 (79)	80 (80)	79 (79)	79	80
20	79 (79)	79 (79)	79 (80)	79 (79)	79	80
21	79 (79)	79 (79)	79 (79)	79 (79)	78	79
22	79 (79)	79 (79)	79 (79)	79 (79)	78	79
23	79 (79)	79 (79)	79 (79)	79 (79)	78	79
24	79 (79)	78 (78)	79 (79)	79 (79)	78	79
25	79 (79)	78 (78)	79 (79)	77 (79)	78	79
26	78 (79)	78 (78)	79 (79)	77 (78)	78	79
27	78 (78)	78 (78)	79 (79)	77 (78)	78	79
28	78 (78)	78 (78)	78 (79)	77 (78)	78	79
29	78 (78)	78 (78)	78 (79)	77 (78)	78	79
30	78 (78)	78 (78)	78 (78)	77 (78)	78	78
31	78 (78)	78 (78)	78 (78)	77 (78)	77	78

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover



APPENDIX XII

Predicted Facade Noise Level from Proposed Flyover - Modelling Exercise 2  
(21 of 21)

FACADE 20	Barriers Only NO Enclosures	Barriers and Enclosures	Barriers Only NO Enclosures	Barriers and Enclosures	2006 Without Flyover	2006 With Flyover Unmitigated
STOREY	TKC/Flyover with Porous Road Surfacing	TKC/Flyover with Porous Road Surfacing	TKC/Flyover without Porous Road Surfacing	TKC/Flyover without Porous Road Surfacing		
1	75 (75)	75 (75)	75 (75)	75 (75)	75	75
2	75 (75)	75 (75)	75 (75)	75 (75)	75	75
3	76 (76)	76 (76)	76 (76)	76 (76)	76	76
4	78 (78)	78 (78)	78 (78)	78 (78)	78	78
5	78 (78)	78 (78)	78 (78)	78 (78)	79	78
6	78 (78)	78 (78)	78 (78)	78 (78)	78	78
7	78 (78)	78 (78)	78 (78)	78 (78)	78	78
8	78 (78)	78 (78)	78 (78)	78 (78)	78	78
9	78 (78)	78 (78)	78 (78)	78 (78)	78	78
10	78 (78)	78 (78)	78 (78)	78 (78)	77	78
11	77 (77)	77 (77)	77 (77)	77 (77)	77	77
12	77 (77)	77 (77)	77 (77)	77 (77)	77	77
13	77 (77)	77 (77)	77 (77)	77 (77)	77	77
14	77 (77)	77 (77)	77 (77)	77 (77)	77	77
15	77 (77)	77 (77)	77 (77)	77 (77)	77	77
16	77 (77)	77 (77)	77 (77)	77 (77)	77	77
17	77 (77)	77 (77)	77 (77)	77 (77)	77	77
18	77 (77)	77 (77)	77 (77)	77 (77)	77	77
19	77 (77)	77 (77)	77 (77)	77 (77)	77	77
20	76 (76)	76 (76)	77 (77)	77 (77)	76	77
21	76 (76)	76 (76)	76 (76)	76 (76)	76	76
22	76 (76)	76 (76)	76 (76)	76 (76)	76	76
23	76 (76)	76 (76)	76 (76)	76 (76)	76	76
24	76 (76)	76 (76)	76 (76)	76 (76)	76	76
25	76 (76)	76 (76)	76 (76)	76 (76)	76	76
26	76 (76)	76 (76)	76 (76)	76 (76)	76	76
27	76 (76)	76 (76)	76 (76)	76 (76)	76	76
28	76 (76)	76 (76)	76 (76)	76 (76)	76	76
29	76 (76)	76 (76)	76 (76)	76 (76)	76	76
30	75 (75)	75 (75)	76 (76)	76 (76)	75	76
31	75 (75)	75 (75)	75 (75)	75 (75)	75	75

Figures shown in brackets ( ) exclude the use of traffic management measures for HGVs along Tsuen King Circuit and Flyover



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