

Appendix D4

Preliminary Study on Indirect Technical Remedies



WESTWOOD HONG & ASSOCIATES LTD

Consultants in EIA • Acoustics • Air • Vibration

2404 Tung Wai Commercial Building
109-111 Gloucester Road, Hong Kong
Tel : 2838 2738
Fax : 2591 6189
E-mail : wha@pacific.net.hk

EXECUTIVE SUMMARY

The purpose of this Paper is to give some preliminary information on the required Indirect Technical Remedies (ITR) and the extent of the buildings requiring the proposed ITR.

The ITR involves the provision of upgraded glazing and window-type air-conditioners (A/C) to about 381 affected households, who will be subject to severe noise exceedance for a duration of typically 3 to 12 months during the 20 month construction programme. This represents some 15 – 60 % of the total construction period.

INTRODUCTION

The Final Environmental Impact Assessment (FEIA) for the East Rail Extension has identified a number of noise sensitive receivers (NSRs) will be subject to noise exceedance over the 75 dB(A) daytime noise level stipulated in the EIA-TM for construction works.

Due to the proximity of the NSRs, the use of standard mitigation measures including good site practices, reduction of plant items, use of quiet Powered Mechanical Equipment (PME), movable noise barriers and site hoarding would not be fully effective in reducing the high levels of construction noise impacts. An alternative plant schedule and construction management has been proposed by KCRC to further reduce the noise impact on the NSRs. The FEIA has considered all practicable mitigation measures that can realistically be employed without jeopardising the construction programme. As a last resort, the use of indirect technical remedies (ITR) has to be applied to the NSRs for a better indoor environment.

INDIRECT TECHNICAL REMEDIES (ITR)

The ITR in this Paper refers to the noise mitigation measures by treatment at the noise sensitive receivers (NSRs). From findings of the FEIA, the worst affected NSRs are the residential flats located alongside the eight worksites over Mody Road, Blenheim Avenue and Middle Road.

Liaison has been made with the EPD to clarify the form of the ITR appropriate for the East Rail Extension project. The ITR being considered is the provision of window type air-conditioners (A/C) and upgraded window to the flats so as to provide an alternative means of ventilation when the windows have to be kept closed in order to achieve a better roomside noise environment for the occupants.

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In Hong Kong, window-type and split-type A/C have been provided to schools for School Improvement Programmes, and for noise mitigation in the West Rail EIA to abate residual

impact during construction of viaduct and station. Similar mitigation treatments employing glazing and A/C have been given to schools and some 900 residential flats adversely affected by the construction noise from the MTRC Quarry Bay Relief Works.

After exhausting the direct mitigation measures such as enclosures and barriers, ITR in the form of window insulation and air-conditioning are often the “last resort” in order to abate the residual impact. The obvious drawback for ITR is the lack of an “open-window” life style for the occupants as compared with the direct application of noise mitigation at source.

The selection criteria and the practicality of applying ITR needs to be evaluated and confirmed in the detailed design stage.

SELECTION CRITERIA

The selection criteria proposed for qualifying the households to ITR are dependent on the severity of the residual noise impact and duration after the direct mitigation measures have been employed. The selection criteria may be as follows :

- A residual impact of 5 dB(A) or more; and
- The duration of noise exceedance of equal or more than 1 month.

EXTENT OF LIKELY QUALIFIED HOUSEHOLDS

The households likely to qualify for ITR are residential flats with facades fronting the worksites on Mody Road, Blenheim Avenue and Middle Road. Based on site survey records and photos taken on site, there are a total of 381 flats with the following breakdown :-

Road Name	Representative NSRs (referenced to the FEIA)	No. of flats
Middle Road	51 N4	51
Mody Road	52 54 6 6 80 80 N10, N9, N7, N8, N13, N14	278
Blenheim Avenue	8 44 N6, N16	52

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The breakdown of noise exceedance for these households is: -

Exceedance	No. of flats
8-10dB(A)	329
11dB(A)	52
Total	381

Assuming that 1 sitting/dining room and 2 bedrooms per flat require A/C, the estimated total no. of A/Cs for the 381 flats qualified for ITR is 1,143 units.

The glazing upgrading can draw reference to the EIA-TM and HKPSG for suitable window types for noise insulation. Besides single thick glazing systems with 6, 8 and 12mm panes given in the EIA-TM, double glazing systems are listed in the HKPSG for window upgrading.

The cost of ITR per flat is estimated as HK\$30,000 comprising HK\$12,000 for A/C and HK\$18,000 for glazing.

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The window types for noise insulation are:-

Road Name	Representative NSRs	ITR window type * for noise insulation
Middle Road	N4	Type I
Mody Road	N7, N8, N10	Type I
Mody Road	N9, N13, N14	Type II
Blenheim Avenue	N6, N16	Type II

* Type I - openable well-gasketed window, 6mm pane, or transmission loss (TL) of 28dB or above in 250Hz octave-band and sound transmission class (STC) 31 or above

Type II - openable well-gasketed window, 8mm pane, or TL of 32dB or above in 250 Hz octave-band and STC 34 or above

Type III - openable well-gasketed windows, 12mm laminated pane, or TL of 33dB or above in 250Hz octave-band and STC 38 or above

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OTHER ITR OPTIONS

Besides providing glazing upgrading and A/C units, other ITR options have been considered but are not forming the recommended ITR for the affected households:-

- the provision of electrical power

OTHER CONSIDERATIONS

The existing households already fitted with A/C units are not precluded from qualifying for ITR. Hence, the counting of the flats requiring ITR is on the conservative side.

The conditions of the building facade need to be surveyed by a Quantity Surveyor to ascertain the suitability of fitting of A/C units.

The existing glazing may not be adequate for achieving a good internal noise environment when closed. However, the actual conditions will need a close inspection to be conducted by a QS.

A scheme needs to be set up for the carrying out the ITR, which may involve the following tasks:-

- assessing the noise impacts and identifying the qualified households
- devising the ITR reimbursement scheme
- advising the qualified household of the scheme
- a surveying team to assess the existing conditions of the flat (glazing and A/C)
- recommending list of approved contractors (if appropriate) to the qualified household

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Total (Flat No.) : 381

Facing	NSRs	No. of storey	No. of flats
Middle Road	N4 (Southern facades) (Far East)	17 x 3	51
Sub-Total:			51
Mody Road	N10 (S) (Mirador)	13 x 4	52
Mody Road	N9 (N)	9 x 6	54
Mody Road	N7(N)	3 x 2	6
Mody Road	N8 (N)	3 x 2	6
Mody Road	N13 (S+W)	10 X 8	80
Mody Road	N14 (S+E)	10 x 8	80
Sub-Total:			278
Blenheim Ave	N6 (W+S)	4 x 2	8
	N16 (W+N)	11 x 4	44
Sub-Total:			52

Assuming 3 rooms per flat requiring A/C, estimated total no. of A/Cs = 381 x 3

 = 1,143