HIGHWAYS DEPARTMENT
HIGHWAYS (HK) REGION

BELCHER BAY LINK

NOISE IMPACT ASSESSMENT STUDY FOR PWP ITEM NO. 412TH : KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

EXECUTIVE SUMMARY

AUGUST 1996

PYPUN ENGINEERING CONSULTANTS LTD.
Consulting Civil Structural Building Services
Environmental Electrical & Mechanical Engineers

MVA ASIA Transportation Planning and Management Consultants

ENPAC Consultants
Environmental Assessment & Pollution Control

HIGHWAYS DEPARTMENT

AGREEMENT NO. CE32/88

NOISE IMPACT ASSESSMENT STUDY FOR PWP ITEM NO. 412TH : KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

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ENPAC Limited
August 1996

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1. INTRODUCTION

The 1988 Western District Traffic Study (WDTS) proposed various infrastructure links within the strategic road network development in the Western District and a staged implementation programme to cater for this local road network development.

As part of the strategic road network development, the widening of Kennedy Town Praya has been included in the Kennedy Town Traffic Management Measures (KTTMM) Stage 3 (the Project), in conjunction with the Belcher Bay Link (BBL) and the associated traffic management measures to provide a corridor between Connaught Road West, the Western Harbour Crossing and Pokfulam Road.

The Belcher Bay Link EIA study completed in 1992 concluded that the provision of direct mitigation measures to Belcher Bay Link will be ineffective as the traffic noise impact is primarily due to the traffic on the part of Route 7 from Hill Road to Queen's Road West and the proposed widened Kennedy Town Praya. Subsequent to the two landmark cases (Western Harbour Crossing and the Southeast Tsing Yi projects) in which ExCo endorsed the provision of acoustical insulation and air-conditioning as indirect mitigation measures and upon the request of OMLEGCO in 1993 a review was conducted. The review recommended the application of low noise road surfacing on Belcher Bay Link and a further examination of the need to provide indirect mitigation measures based on the eligibility criteria set down in the 2 precedent cases. This remaining issue is now addressed in this EIA study together with the impacts arising from this road widening project.

The purpose of this Noise Impact Assessment (NIA) Study is to provide information on the nature and extent of the potential noise impacts on the environment arising from the construction and operation of the proposed Project and all concurrent activities in the area.

2. PROJECT CHARACTERISTICS

2.1 Project Description

Widening of Kennedy Town Praya is to be carried out on the land being formed under the Belcher Bay Reclamation project to provide two clear eastbound lanes, and at the same time to enhance pedestrian safety through provision of footpaths.

The Kennedy Town Praya will be widened for about 480 m long between Sands Street and Queen's Road West. The alignment of the widened Kennedy Town Praya will follow the existing alignment of Kennedy Town Praya. Figure 1 indicates the extent of the widening works.

2.2 Construction Activities

Road works will consist of construction of flexible pavement comprising subbase, roadbase, basecourse and wearing course. Drainage for the carriageway will be provided by a gravity flow drainage system consisting of gullies, manholes, drain pipes, surface channels and possibly subsoil drains.

During the construction period, an appropriate temporary traffic management scheme will be adopted to maintain the existing traffic.

2.3 Construction Programme

The road widening works has been scheduled to be commenced in March 1997 and completed by the end of September 1997. The construction programme is shown in Figure 2.

3. NOISE IMPACT ASSESSMENT

3.1 Construction Noise Impact and Mitigation

3.1.1 Construction Noise Impact

During the construction period, the operation of powered mechnical equipment will impose noise impacts on noise sensitive receivers in daytime. The noise levels of the worst case scenario have been found to be in excess of the construction noise criteria at most of the representative NSRs. Mitigation measures are required to control and reduce construction noise.

3.1.2 Construction Noise Mitigation

It has been demonstrated that the construction noise levels at all the affected NSRs can be reduced to or below the 75 dB(A) criterion through the proper implementation of the following mitigation measures:

- Fit more efficient exhaust or sound reduction equipment, and keep closed the machine's enclosure panels.
- Erect inverted-L acoustic barrier between the equipment and NSRs, and locate the barrier right adjacent to the equipment.
- Enclose the equipment in acoustic enclosure.

Noise control requirements should be incorporated in the tender/contract documents including specific noise standards to be met and requirements for noise monitoring to be undertaken on the site. Details of environmental monitoring and audit (EM&A) requirements are also contained in the EM&A Manual.

The establishment of good community relations can be of great assistance to both the Contractor and local communities. Residents should be notified in advance of planned operations and informed of progress. If necessary, a liaison body can be established to bring together representatives of the affected communities, the Government and the Contractor.

3.2 Operational Noise Impact and Mitigation

3.2.1 Operational Noise Impact

Increased traffic from the improved Kennedy Town Praya as well as other major roads such as Kennedy Town New Praya, Belcher's Street, Belcher Bay Link and Route 7 ramp has been predicted to significantly raise the traffic noise levels at the NSRs.

According to the noise modelling results, the current traffic noise levels at the residential developments along Kennedy Town Praya exceed the HKPSG maxima at most of the NSRs. Based on the traffic flow predictions for the design year 2011, all the existing (2,252) dwellings along the Project alignment will be subject to severe operational noise impacts ranging from 71 to 85 dB(A). With regard to the planned NSRs, the predicted traffic noise levels will be in the range of 76 to 78 dB(A). As such, appropriate noise mitigation measures should be provided to remedy the adverse noise environment. Figures 3 and 4 depicts the locations of the existing and planned NSRs.

3.2.2 Operational Noise Mitigation

Traffic noise may be controlled at source, along its path, or at NSR facades. Various options available for mitigating traffic noise have been reviewed, and their suitability for use in this Project have been assessed.

Traffic management measures such as limiting traffic flow, vehicle speed or use of road by heavy vehicles would defeat the primary objectives of the Project and would thus be impractical for this Project. Application of friction course surfacing is considered not appropriate due to the presence of a number of road junctions, loading and unloading bays, bus bays and pedestrian crossings. Frequent road surface maintenance and repair requirements would offset the benefits of the low noise surfacing.

Altering the road alignment to control the traffic noise would not be practical and effective since the alignment of the improved road is basically fixed by the existing alignment. On the other hand, the high-rise nature of the existing developments, compounded by the extremely limited road-receiver separation within the Project area, would render the use of barriers impractical.

Control of traffic noise at the receiver includes insulation of senstive facades, use of self-protecting buildings, orientation of building facades, building setback, and internal arrangement of rooms to screen sensitive areas. Site survey indicates that the existing receivers within the study area do not incorporate any of these measures. Those receivers that will be affected by increased traffic noise levels following improvement to Kennedy Town Praya as well as the implementation of Belcher Bay Link could be protected by the insulation of sensitive facades. This would involve the provision of acoustical insulation and air conditioning units.

The preceding review of the various traffic noise mitigation options, together with the considerations on source-receiver configurations, existing environment, road conditions and other site constraints has shown that the applications of noise control measures at source and direct technical remedies on the improved Kennedy Town Praya are impractical and unseemly mitigation options.

As there is no further scope to reduce the noise levels by direct mitigation measures, indirect technical remedies in the form of window insulation and air conditioning were recommended for the affected dwellings, subject to ExCo approval. It is noted that approximately 1,786 residential dwellings would be eligible for consideration of noise insulation under the ExCo directive *XCC(89)157: Equitable Redress for Persons Exposed to Increased Noise Resulting From the Use of New Roads* (see Figure 3 for locations of eligible dwellings). Mei King Mansion, Bic Wah Court and Wo Fat Building of 173 dwellings are not eligible for indirect technical remedies in this project because they have been included in the noise insulation work of Western Harbour Crossing. In addition, the eligibility assessment indicates that Harbour View Garden, 5 & 7 Catchick Street and Kelly Court of 293 dwellings are not eligible for indirect technical remedies on the ground that the contribution to the increase in the overall noise level from Kennedy Town Praya is less than 1.0 dB(A).

The noise levels at the representative assessment points of the planned NSRs exceed the HKPSG criterion by up to 8 dB(A). The practicabilities of various mitigation measures have been evaluated. These include: (a) building setback, (b) use of noise tolerant structures, and (c) orientation of windows. In the light of space constraint and linear geometry of the residential zone, however, these mitigtion measures are not workable solutions.

As Residential Zone I will be subject to severe traffic noise impact and no effective noise mitigation measures will be available to safeguard the environmental quality of the site, due consideration should be given to a review of land use. It is recommended that the land use for this area should be changed to non-noise sensitive or commercial uses instead of residential zone.

4. ENVIRONMENTAL MONITORING AND AUDIT

An environmental monitoring and audit (EM&A) programme performs three functions. It ensures that noise from the construction of the project are kept to acceptable levels; it establishs procedures for checking that mitigation measures, if needed, have been applied and are effective; and it provides the means by which compliance may be checked, exceedancesdocumented, and corrective action recorded.

In view of the close proximity of the Kennedy Town Praya to the identified NSRs, an EM&A

programme is considered necessary during the construction period. The proposed EM&A programme for this Project which forms part of this NIA is contained and described in a stand-alone document, Environmental Monitoring and Audit (EM&A) Manual.

Detailed monitoring schedules and audit requirements should be incorporated into the construction contract for the widening of Kennedy Town Praya. The clauses containing these schedules and requirements should be formulated in consultation with EPD.

5. CONCLUSIONS

Construction of the Project has been shown to cause significant noise impacts on the noise sensitive receivers in the Study Area. The predicted maximum anticipated construction noise levels are above 75 dB(A) at most NSR locations. However, the impacts are amendable through proper implementation of appropriate noise control measures and environmental monitoring programme during the construction of the Project.

Road traffic noise will be the major environmental issue during the operation phase. Based on the projected traffic figures for 2011, it has been predicted that the traffic noise levels at most existing and planned NSRs will exceed the 70 dB(A) noise criterion. Due to site conditions and other constraints, no direct technical remedies and noise controlling measures at source are considered practicable and effective. As such, CRTN's eligibility procedures (with HKPSG criteria) have been applied to determine which affected NSRs are eligible for consideration of indirect technical remedies by Exco.

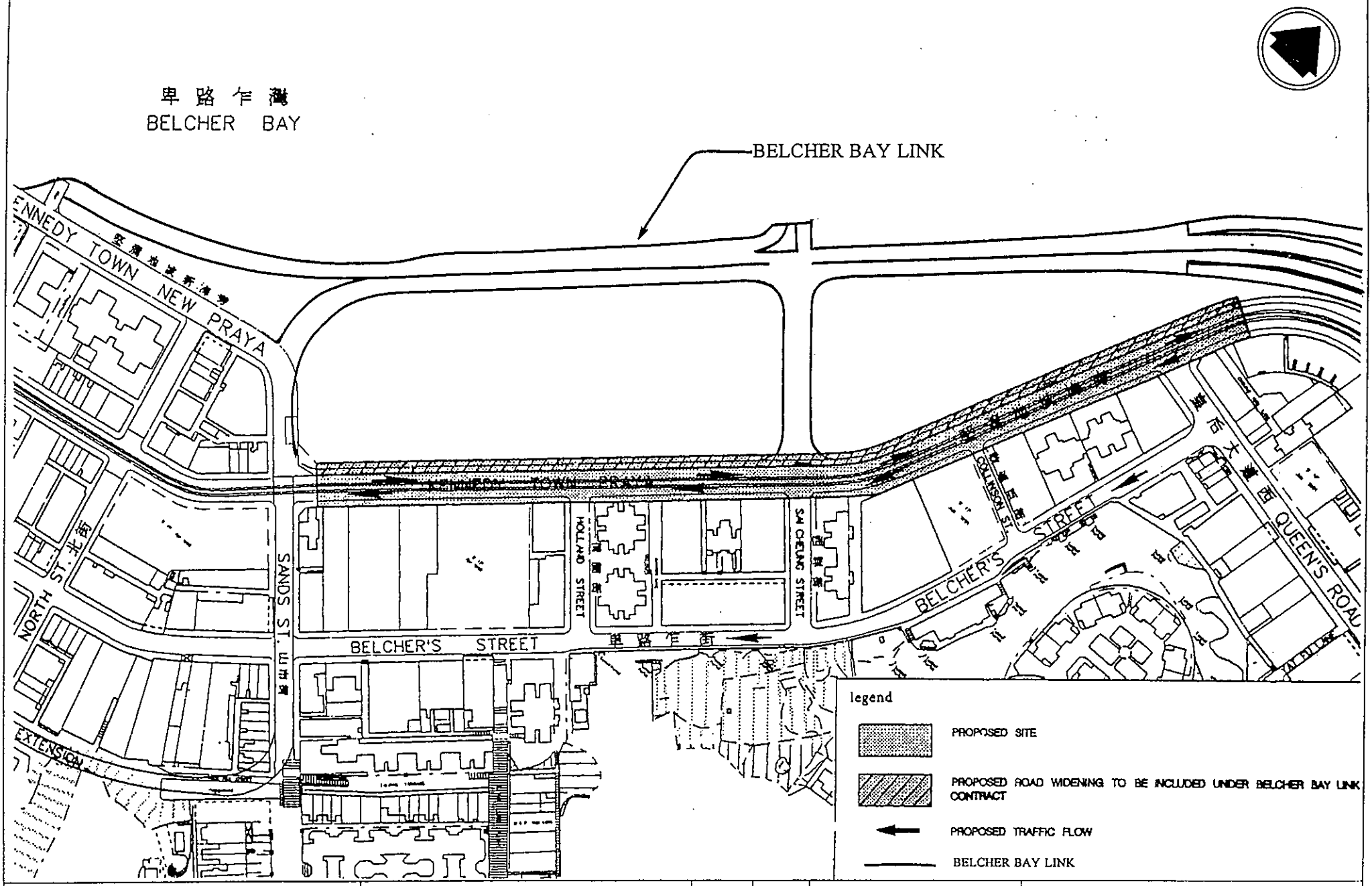
It has been estimated that 1,786 out of 2,252 number of affected dwellings in the Study Area are eligible for consideration of indirect technical remedies. As Mei King Mansion, Bic Wah Court and Wo Fat Building of 173 dwellings have already been found to be qualified for indirect technical remedies under the Western Harbour Crossing Project, further study on insulation works for these NSRs will not be covered by this Project. Besides, Harbour View Garden, 5 & 7 Catchick Street and Kelly Court of 293 dwellings are not eligible for indirect technical remedies on the ground that the contribution to the increase in the overall noise level from Kennedy Town Praya is less than 1.0 dB(A).

A practical guide that will be designed to assist the Engineer and the Contractor in fulfilling their requirements for environmental review and to ensure the effectiveness of the environmental protection and pollution control measures adopted has been provided in a stand-alone EM&A Manual, that also forms part of this NIA.

6. RECOMMENDATIONS

The following recommendations are made:

- Inclusion of noise pollution control clauses to the Contract Documents to control construction noise from the improvement works.
- Implementation of the EM&A programme as detailed in the EM&A Manual during the construction stage of the project.
- Further study to identify the exact extent of eligible premises and detailed scope of noise insulation works for indirect technical remedies.
- Implementation of noise insulation work to qualified dwellings.
- Change Residential Zone I to other non-noise sensitive or commercial uses.



DRAWING TITLE:

WORKS LIMIT OF PROPOSED ROAD IMPROVEMENT WORKS

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KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

DESIGNED		FIGURE NO. 1
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APPROVED		
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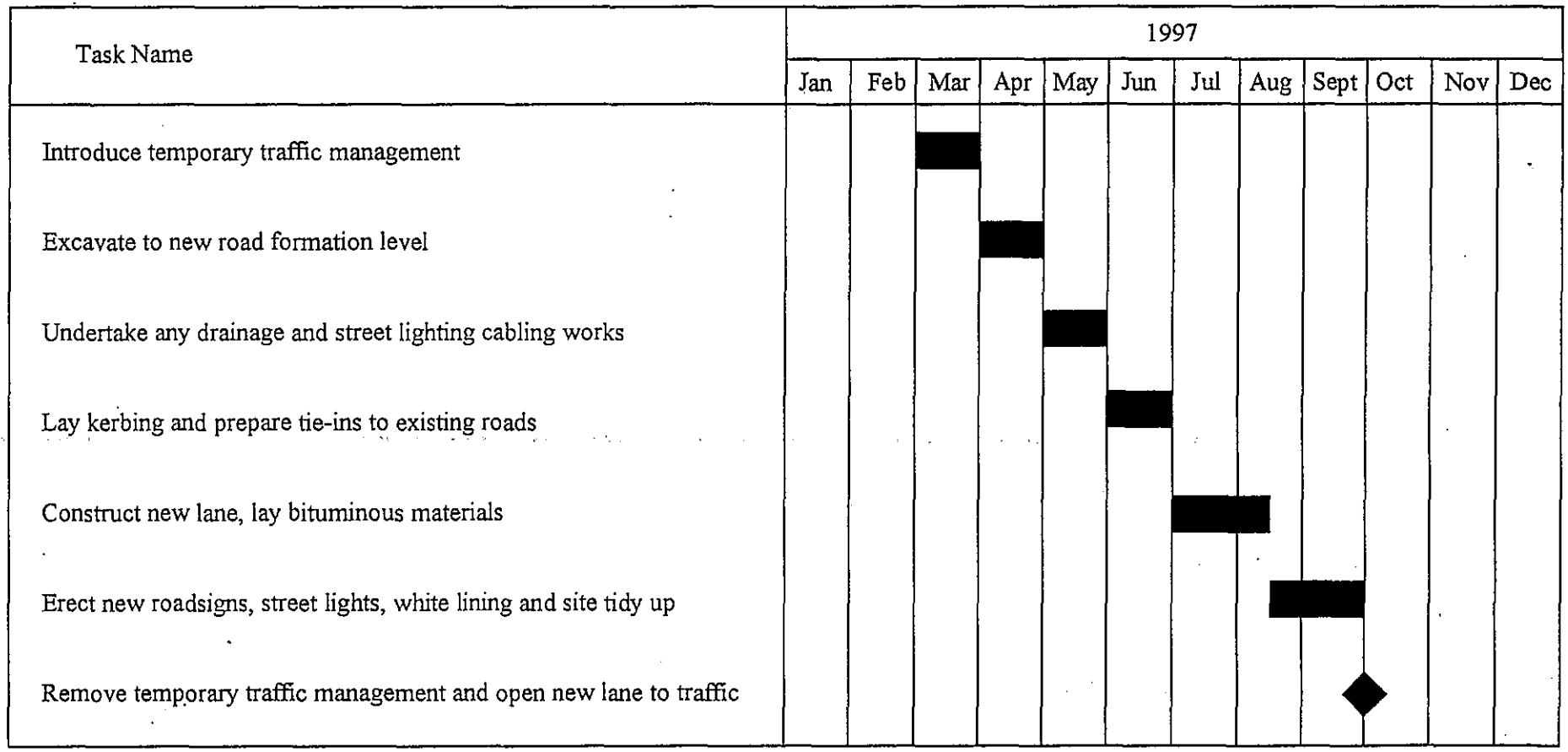

DRAWING TITLE:

WIDENING OF KENNEDY TOWN PRAYA
PRELIMINARY CONSTRUCTION PROGRAMME

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KENNEDY TOWN TRAFFIC
MANAGEMENT MEASURES STAGE 3

DESIGNED	
DRAWN	
CHECKED	
APPROVED	
DATE	Mar 96

FIGURE NO. 2

SCALE: N.T.S.

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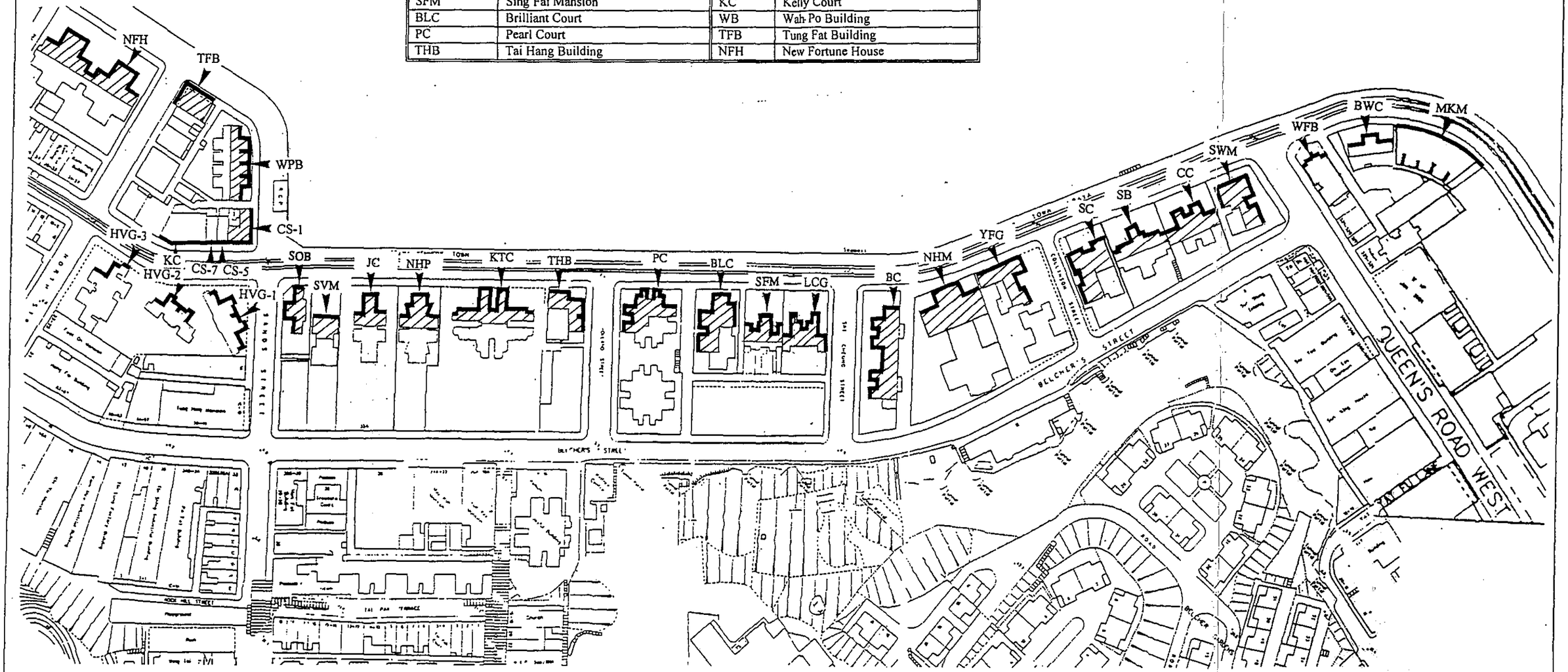
NSR ID	Name / Description	NSR ID	Name / Description
MKM	Mei King Mansion	KTC	Kennedy Town Centre
BWC	Bic Wah Building	NHP	Nan Hai Plaza
WFB	Wo Fat Building	JC	Jade Centre
SWM	Sum Way Mansion	SVM	Sea View Mansion
CC	Chester Court	SOB	Shung On Building
SB	Sunglow Building	HVG-1	Harbour View Garden, Tower 1
SC	Sun Court	HVG-2	Harbour View Garden, Tower 2
YFG	Yick Fung Garden	HVG-3	Harbour View Garden, Phase 3
NHM	Nam Hung Mansion	CS-1	1-3, Catchick Street
BC	Belcher Court	CS-5	5, Catchick Street
LCG	Lung Cheung Garden	CS-7	7, Catchick Street
SFM	Sing Fai Mansion	KC	Kelly Court
BLC	Brilliant Court	WB	Wah Po Building
PC	Pearl Court	TFB	Tung Fat Building
THB	Tai Hang Building	NFH	New Fortune House



Legend

- 100% of dwelling which are located at affected facades are eligible for consideration of Indirect Technical Remedies by ExCo
- JC — Representative sensitive facade at NSR JC
- Extent of affected facades

METRES 20 10 0 70 40 60 80

DRAWING TITLE:

NOISE SENSITIVE RECEIVERS AND REPRESENTATIVE SENSITIVE FACADES

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KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

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FIGURE NO. 3

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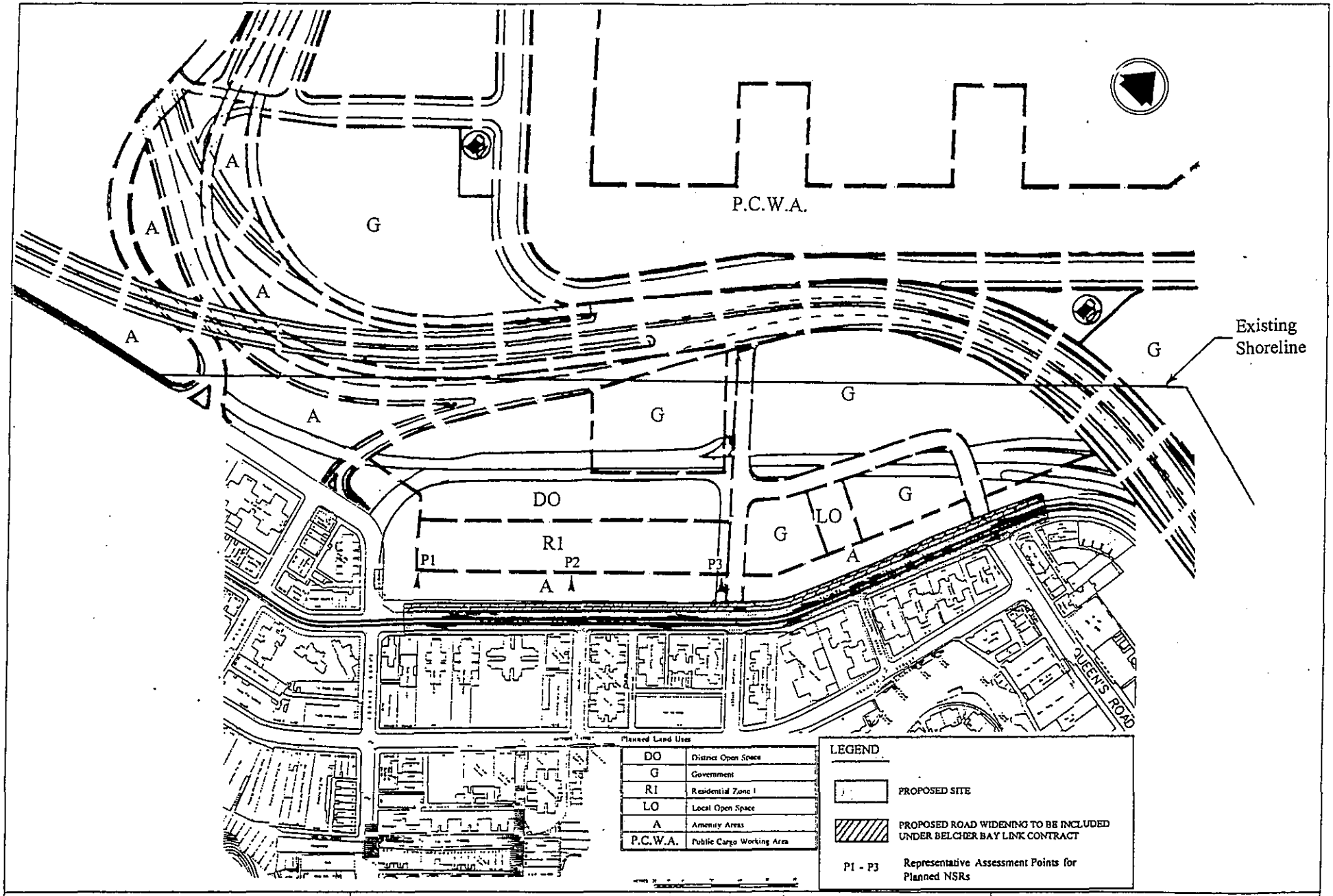
MVA ENAC



DRAWING TITLE:

PLANNED LAND USES WITHIN STUDY AREA

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KENNEDY TOWN TRAFFIC MANAGEMENT MEASURES STAGE 3

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