

## CHAPTER 3

### MATERIALS AND METHODS

#### 3.0 STUDY AREA

Noise levels for several areas were sampled for the purpose of this study. Locations of the sampling points are shown in **Figure 1**. The areas of study was divided into 3 types :

##### (1) Urban Residential Areas

Two locations were studied for the urban area.

- (i) Along Jalan Enggang – This sampling location is located near Keramat. This road is heading towards the Zoo Negara and other residential and commercial areas. This location is a very busy area with the residential houses located on both sides of the road. The road is a single dual carriageway with simple (flat) geometry.
  
- (ii) Jalan Puchong – This area is also a busy area with residential houses on both sides of the roadway. The road is a single dual carriageway with simple geometry. This road is used by the residents living in the vicinity and by vehicles heading towards Dengkil and other areas.

**(2) Suburban Residential Area.**

The Suburban Residential Areas in the context of this study is residential areas outside the central part of town or city. Two locations were chosen for this area of study.

- (i) Kampung Lembah Jaya – This is a suburban settlement located in the Ampang Jaya region. Sampling was carried out along the main road in the settlement which is a single dual carriageway with houses on both sides of the roadway. This road ends at the Ampang forest reserve. This road is used mainly by the residents and visitors to the forest reserve.
  
- (ii) Kampung Sri Tanjung – This settlement is located near the Kampung Melayu Ampang. The sampling was carried out along the main road of the village which is used by residents and passerbys as a short cut towards Taman Kosas and Ampang Jaya. The road is a single dual carriageway with residents on both sides of the road.

**(3) Noise Barrier**

Only one location was studied for this purpose. The sampling area is located along the Kemas Highway at the Puchong area. The barrier is 5 inches in thickness and at a height of approximately 6 feet and is erected between the residential houses and the highway. Samples were taken

before the barrier at the side of the highway (Source of Noise) and after the barrier at the side of the residential houses.

Locations of each of the study area and sampling points are shown in **Figures 2, 3, and 4**. The geometric plan view of the sampling locations in Kampung Sri Tanjung, Jalan Puchong and Jalan Enggang is also shown in **Figures 5, 6 and 7**.

### **3.1 SAMPLING METHOD**

Sampling was carried out for two categories.

- 1 Sampling of noise levels using a noise level meter.
- 2 Traffic/vehicular count using manual counters.

#### **Noise Sampling**

For noise level recording, the sound level meter made by Quest Technologies was used. **Figures 8 and 9** show the noise meter being placed by the side of the road whilst **Figure 10** shows the photograph of the noise meter. The automatic measurement mode was used. Noise level readings were taken in replicates for a duration of one hour for urban and suburban areas and half an hour for the noise barrier.

Noise level reading was taken for the following parameters:

- Leq - Equivalent continuous sound level
- Lmax - Maximum sound level
- L10 - The minimum noise level which exceeds 10% of the measurement
- L90 - The minimum noise level which exceeds 90% of the measurement

For noise measurement of vehicular noise, the microphone of the sound level meter is placed at a height 1.2 m from the ground and not less than 7.5m from the centre line of the road as stated in the International Organisation for Standardisation (ISO) for vehicular noise measurement.

### **Traffic Volume Count**

Determination of traffic volume is carried out using the manual counter. This equipment has the ability to record up to 4 digits starting from 0 to 9999. The counting is carried out simultaneously with the recording of the noise level.

## **3.2 SAMPLING FREQUENCY**

Sampling was carried out at 5 locations. Sampling time for four of the locations i.e the urban and suburban areas is 1 hour and a logging time of 3 minutes ( noise level at every 3 minutes is automatically recorded) .

Sampling for the noise barrier was carried out for a duration of half an

hour and a logging time of 3 minutes. Each location was sampled three times (on three different days).

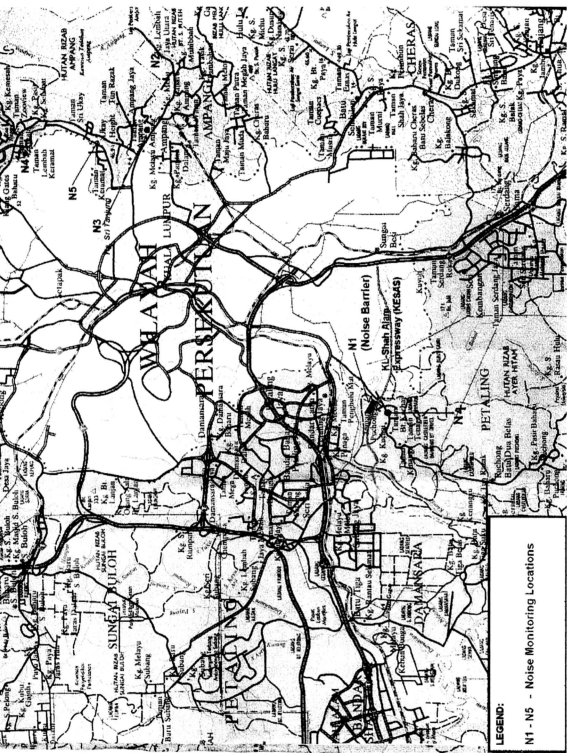
All the locations were sampled for day and night time noise. Day time is defined as from 7am to 10pm, whilst night time is between 10pm to 7am.

Replicates were taken for each sampling location for a more accurate reading.

### **3.3 AUDIOMETRY (HEARING TEST)**

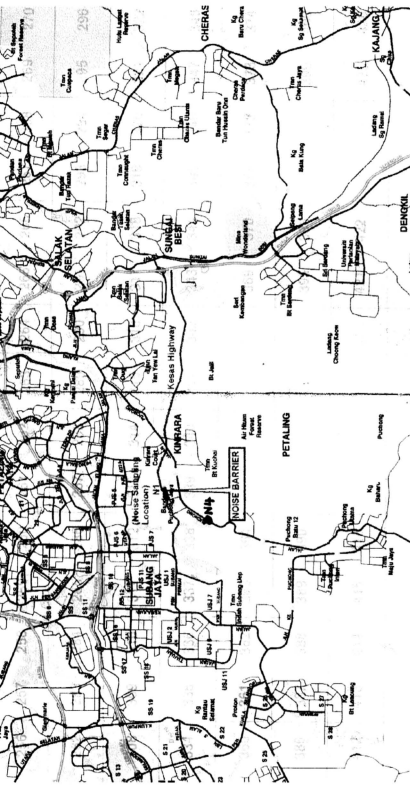
A sample population from each of the urban and suburban areas was taken for a hearing test to the University Hospital in Kuala Lumpur. A hearing test (pure tone audiometry) using the OB922 Clinical Audiometer was conducted in a sound proof room. The tests was carried out by an ENT Specialist.

The hearing test was conducted to determine if there was noise induced hearing loss among residents exposed to traffic noise. A dip in intensity (in decibels) at 4 kHz and then a recovery at higher frequency is taken to mean Noise Induced Hearing Loss (NIHL) has occurred.



**LEGEND:**  
 N1 - N5 - Noise Monitoring Locations  
 Noise Barrier

**FIGURE 1 LOCATIONS OF NOISE SAMPLING POINTS FOR THE URBAN AND SUBURBAN AREAS AND NOISE BARRIER**

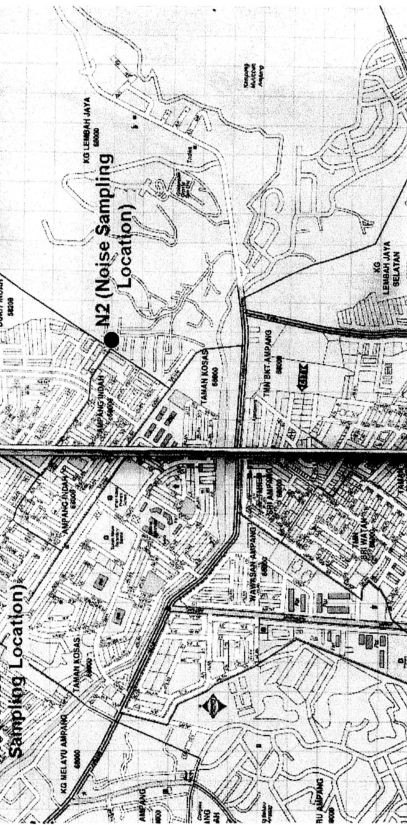


**LEGEND:**

- Highway
- Main Traffic Route
- Alternative Traffic Route
- Trafficable Road
- Untrafficable Road
- Traffic Light
- Railway Level Crossing
- Road & Railway Bridge
- One-Way Traffic Route
- Proposed Highway

**FIGURE 2 KESAS HIGHWAY AND JALAN PUCHONG**

*Note:*  
 N1 & N4 - Noise Sampling Location

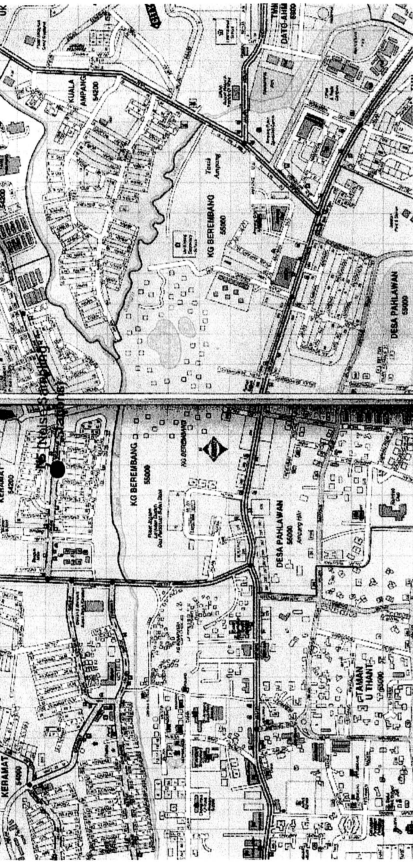


**FIGURE 3 KAMPUNG LEMBAH JAYA AND KG. SRI TANJUNG**

**LEGEND:**

- Highway
- Main Traffic Route
- Alternative Traffic Route
- Trafficable Road
- Untrafficable Road
- Traffic Light
- Railway Level Crossing
- Road & Railway Bridge
- One-Way Traffic Route
- Proposed Highway





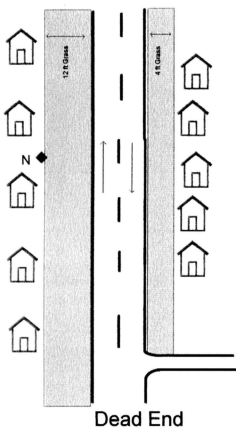
**FIGURE 4 JALAN ENGGANG**

*Note:*  
NS - Noise Sampling Location

**LEGEND:**

- Highway
- Main Traffic Route
- Alternative Traffic Route
- Trafficable Road
- Untrafficable Road
- Traffic Light
- Railway Level Crossing
- Road & Railway Bridge
- One-Way Traffic Route
- Proposed Highway

**FIGURE 5: VIEW OF SAMPLING AREA IN KG. SRI TANJUNG**







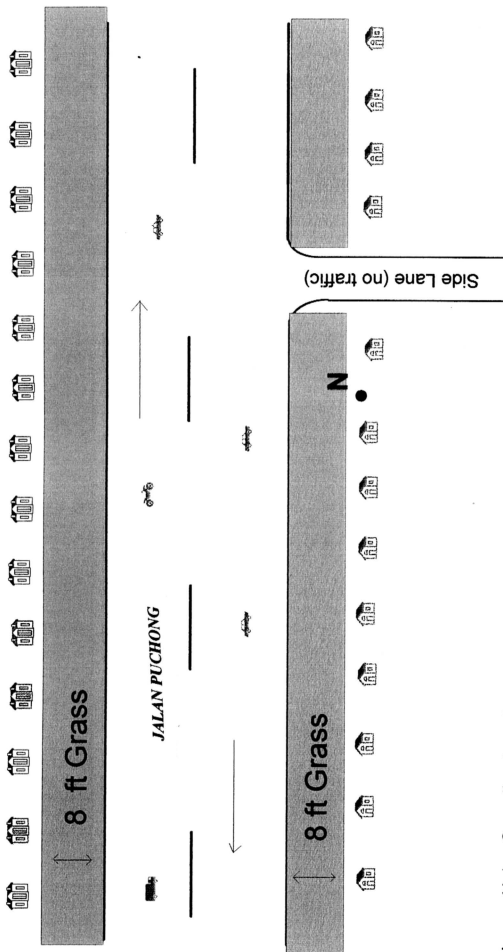


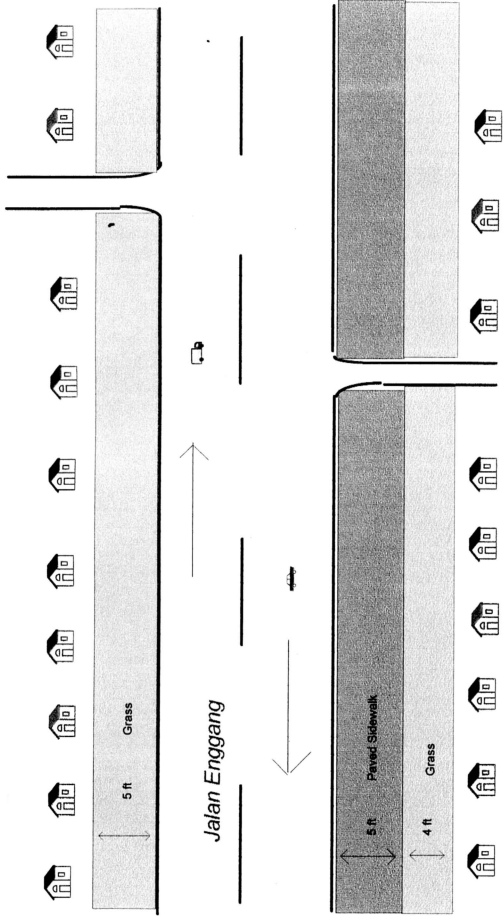
-  = Houses
-  = Traffic flow direction
-  = Traffic flow direction
-  = Noise Sampling Location

FIGURE 6 : PLAN VIEW OF SAMPLING LOCATION AT JALAN PUCHONG



- N = Noise Sampling Location
-  = Residential Houses
-  = Traffic flow direction

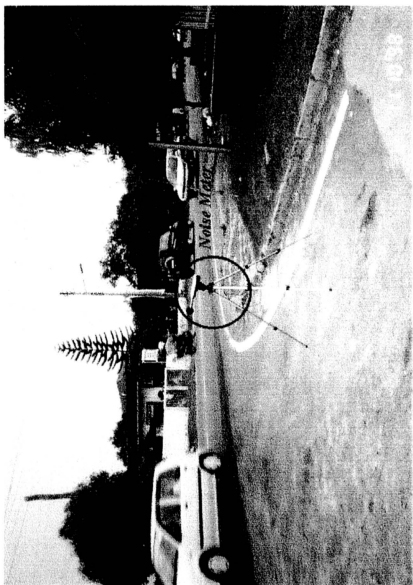


★ = Noise sampling location

🏠 = Houses

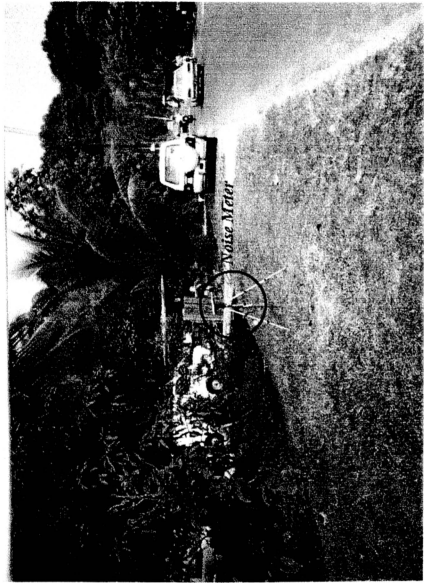
↔ = Direction of traffic flow

**FIGURE 8**



*Noise Monitoring along the urban road (Jalan Enggang)*

**FIGURE 9**



*Noise Monitoring along the suburban road (Kg. Lembah Jaya)*

**FIGURE 10 : PHOTOGRAPH OF NOISE METER**

