CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter explains the research design, study area, sampling strategy, data collection and data analysis method. The aim of this chapter is to make sure all the data sampling process are done correctly and accurately based on the standard procedures. Detail procedures of data collection and instrumentation are also discussed in this chapter, with the use of several instruments such as Handheld Laser Particle Counters, DustMate and IAQ meter to monitor the particle size distribution and environmental parameters in the study area.

3.2 RESEARCH DESIGN

In this research, an experimental study was carried out to investigate the particle size distribution under different indoor activities in an office building. This study was conducted in two different offices to compare the result. Typical indoor activities which act as potential indoor aerosol sources were chosen based on the literature analysis of potential sources in offices and on the probability of presence in most of the offices in Malaysia. These sources were classified into three categories: (1) printing, (2) photocopying and (3) use of air freshener sprays. A continuous real time monitoring measurement was conducted in offices to measure the environmental parameters, particle number concentrations of each indoor activity and mass concentration of indoor particle.
3.2.1 Study Area

This study was conducted in the Block A2 office building of Universiti Malaysia Pahang in Gambang. The building is a 3-story office building situated within Universiti Malaysia Pahang beside a road carrying low to medium traffic flows. Printers, photocopy machines and sprays are located in various places in the building, with almost every rooms have one. Smoking is prohibited in the building. The building has both open areas and small offices used for administrative and clerical work. The measurements were conducted in two different offices located at the ground floor of the building. The layout design of ground floor of Block A2 building can refer Appendix A. The offices selected as research location were the main office of Faculty Technology Engineering (FTeK) and the Occupational Safety and Health Management Office (OSHMO). Figure 3.1 and 3.2 shows the plant layout of the offices.

Figure 3.1: Plant layout of Faculty Technology Engineering (FTeK)
3.3 SAMPLING STRATEGY

This study started with the selection of location of office, which were office FTeK and OSHMO. A preliminary walkthrough observation was carried out to observe the indoor environment of offices selected in order to identify the sources such as natural or man-made sources; and the pathway of sources which produce particulate matters. Presence of human, HVAC system, building materials, as well as the different indoor and outdoor activities such as walking, printing, photocopying and cleaning were potential sources of particulate matters. Information such as on the number of occupants, number and models of printers, photocopy machines and sprays used and furnishing were recorded. Besides that, air change rate was measured using tracer gas method after office hours when there had no occupant in the offices.