

**FACULTY OF ARCHITECTURE, PLANNING AND SURVEY
BUILDING SURVEY DEPARTMENT**

A STUDY OF CHILLER SYSTEM AND ITS COST EFFECTIVENESS

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Prepared by: ASRUL IZHAM B. MUHD. ALIAS
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Abstract

Air Conditioning and temperature control is a big element in producing a pleasant environment in an enclosure building. That is why people always keep the temperature control and air conditioning matters in high priorities. Here in Malaysia where the climatic condition is occasionally hot and wet, the air conditioning matters always had been a critical factor to a building owner.

In small houses or room people tend to have fans or rather smaller unit of air condition to coolant the environment but what it takes to turn down the heat in a 5000square meters area? Bigger unit or bigger system are needed in order to supply cool air to those massive area and one of the favorite system that had been use massively in Malaysia and all over the world is the Chiller System.

Chiller System is a centralized air conditioning system that consists of a compressor, condenser and evaporator that generates the whole system with the help of other supporting element such as cooling tower, air handling unit and metering device to produce cool air to coolant a big enclosure area.

When the system is that big, we might think of the kind of money that we could spend in order to keep the system in a good shape and working accordingly to our needs. This is why it is so important to study weather the system is such cost friendly or effective compared to other type of air conditioning system that we have in Malaysia such as the split unit system or others. And the main goal of this study is to determine weather the system is cost effective enough to use in all area of elements such as price of the system, maintenance cost, and powering cost and so on and so forth.

The clean room air conditioning system for a commercial building has changed considerably due to the requirements for the high performance (improved cleanliness, impurity removal, etc.) of clean rooms as the integration of services increases. On the other hand, companies have been responding to the necessity of energy saving, because total costs had to be decreased amidst severe price competition in the commercial market, and energy consumption had to be decreased to solve global environmental problems. In many commercial buildings, power consumption exceeds 100 million kWh per year.

One factor that increases the power consumption of an air conditioning facility is the air conditioning facility operation for air cleaning inside a clean room. Air cleaning is required because air quality free of impurities is demanded; therefore, this is closely related to micro fabrication and quality of semiconductor devices. For air cleaning, temperature / humidity control, room air-pressure control and cleanliness control have respective requirements, for which enormous electric energy is necessary. To insure cleanliness for cleanliness control, the number of times of air circulation in a clean room must be increased, which consumes a lot of power.

For an air circulation system to maintain cleanliness of a clean room, an FMU (Fan Module Unit) system and FFU (Fan Filter Unit) system is more frequently used than an RCF (Recycle Fan) system, because of energy saving and maintenance saving.