**CHAPTER III**

**ENGINEERING ECONOMIC ANALYSIS, OBSERVATIONS, COMMENTS AND RECOMMENDATIONS**

**ENGINEERING ECONOMIC ANALYSIS**

In the real world, the majority of engineering economic analysis problems are alternative comparisons. In considering the design for Air Conditioning System, we must be technical in finding the right alternatives for choosing an equipment. There are some factors that you need to consider in selecting an equipment including the initial cost, the variety of design and also the capacity of that equipment. In the design of Air Conditioning System, it is a lot of work things to do and a very complex process.

The main of the Air Conditioning Design is to provide correctly sized heating, ventilation and air conditioning system for the building. The required heating or cooling load is largely determined by the area of the space. After calculating the heat load or cooling load, the next step is to use this basis for the design in selecting equipment. The chosen equipment depends on the capacity that the space need in the system.

After having the A/C capacity of each floor’s air conditioning unit, the next step would be the equipment selection. A catalogue of A/C unit serves as the basis of choosing equipment appropriate for each area which is presented at the appendix. A combination of fan coil units and hair-handling units are selected with respect to their capacity.

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| **SUMMARY of A/C Capacity for each floor** | | | | |
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| **FLOOR** | **DESIGN TEMPERATURE** | | |
|  | **24°C** | **22.5°C** | **22°C** |
| **GROUND FLOOR** | 59.0828 kW | 92.4161 kW | 17.8804 kW |
| 16.0086 TOR | 25.9472 TOR | 5.0844 TOR |
| **SECOND FLOOR** | 33.1554 kW | 160.153 kW | 38.1973 kW |
| 9.3089 TOR | 45.5408 TOR | 10.8617 TOR |
| **THIRD FLOOR** | 47.4593 kW | 159.5619 kW | ----- |
| 13.4954 TOR | 45.3726 TOR |
|  |  | **TOTAL** | 607.9062 kW |
|  |  | 172.8627 TOR |

This table shows the summary of A/C Capacity for ground, second and third floor with under different temperatures. The computed total capacity of this hospital is about 608 kW or 173 TOR. The Air Conditioning system that was selected for the design is packaged air conditioning system due to the need of the human comfort of the person staying inside the desired space.

Through observation and analysis of the floor plan, it was noticed that bed rooms or private rooms are placed in areas relatively close to each other to make ducting works easier and reduce the cost in ducting.

Selected equipment for the packaged air conditioning system of this hospital was based on the result of series of calculations and procedural calculations of total cooling load and the requirements needed to be observed and maintain in a clinical structure of building.