

Investigation and Optimization of Water Pipeline Construction Procedures and Methods in Plant Rooms

Mr WONG Tsz Kit, BEng (Hons) in Building Services Engineering,
Faculty of Science and Technology

Supervisor: Dr ZHOU Yang Phil, Lecturer

Background

Hong Kong has more guidelines to discuss how to install water pipes. However, when water piping is installed during construction, it is more costly. Usually, the procedures and methods for the construction of water piping in the server room are based on the experience of engineers.

Research Objectives

- (i) optimized the water pipeline construction procedures and methods in plant rooms.
- (ii) quantify the manpower saving potential related to the water pipeline construction.
- (iii) quantify the carbon emission related to the water pipeline construction.

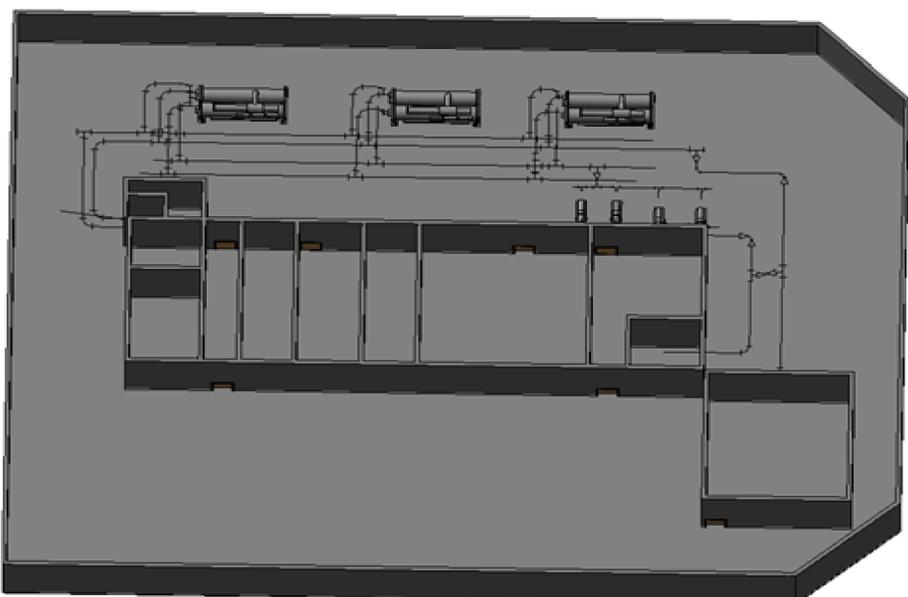
Methodology

- (i) Water pipeline analysis -Building Modeling Information (Revit)
- (ii) Chilled water pipeline selection and energy analysis – E-20
- (iii) Job date of the manpower

Results & Analysis

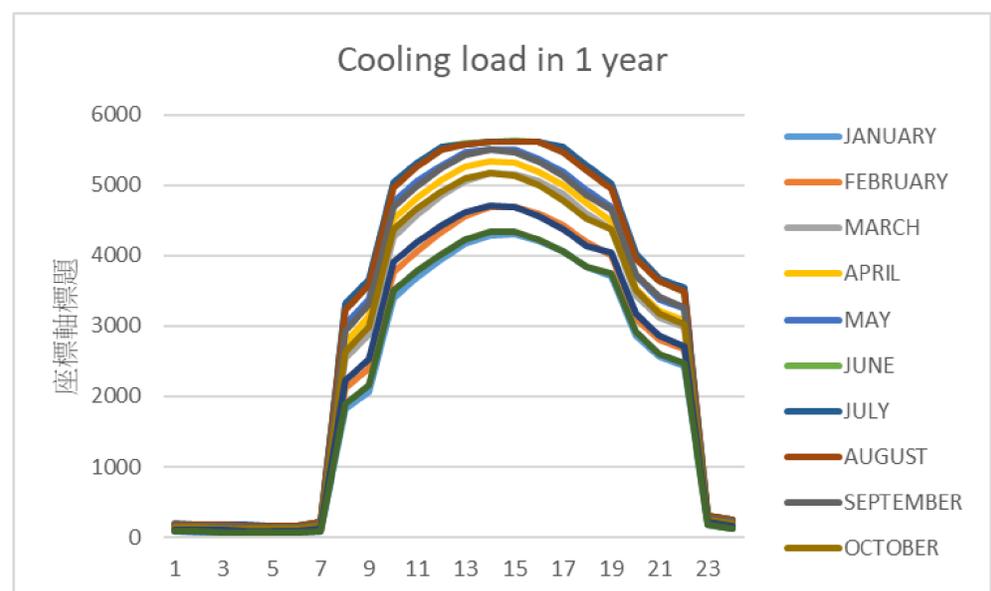
Using BIM Modeling

- (i) can list the pipe type for ease of installation.
- (ii) the piping table has listed the cost of each size of chilled water pipe to estimate
- (iii) approximately \$400,000.



Chilled water pipeline selection and energy analysis – E-20

- (i) Find the plant load -5000KW
- (ii) Find the energy used in each session



Job Date of the manpower

Name of the worker	Working day	Salary (\$)
AAA	22.5	36000
BBB	19	28500
CCC	26	39000
DDD	18.5	29600
EEE	12.5	18750
FFF	18	28800
GGG	15	18000
HHH	25	22500
	Total	264650

Conclusion

- (i) Using BIM modeling – estimate the pipeline installation
- (ii) Estimate the manpower of the construction Using the environmental good pipe