

**Mini Design Project (2017-2018):  
HVAC System Design for A Proposed Hotel Building**

A proposal is made to transform and change the VTC Student Dormitory at Tsing Yi into a hotel building with a centralized HVAC system. The proposed hotel building is targeted at a four-star rating to achieve a deluxe guest experience. The construction/renovation work should commence as soon as possible so that the hotel building can be opened and used in 2019. Figures 1 and 2 shows the location and outlook of the current building.

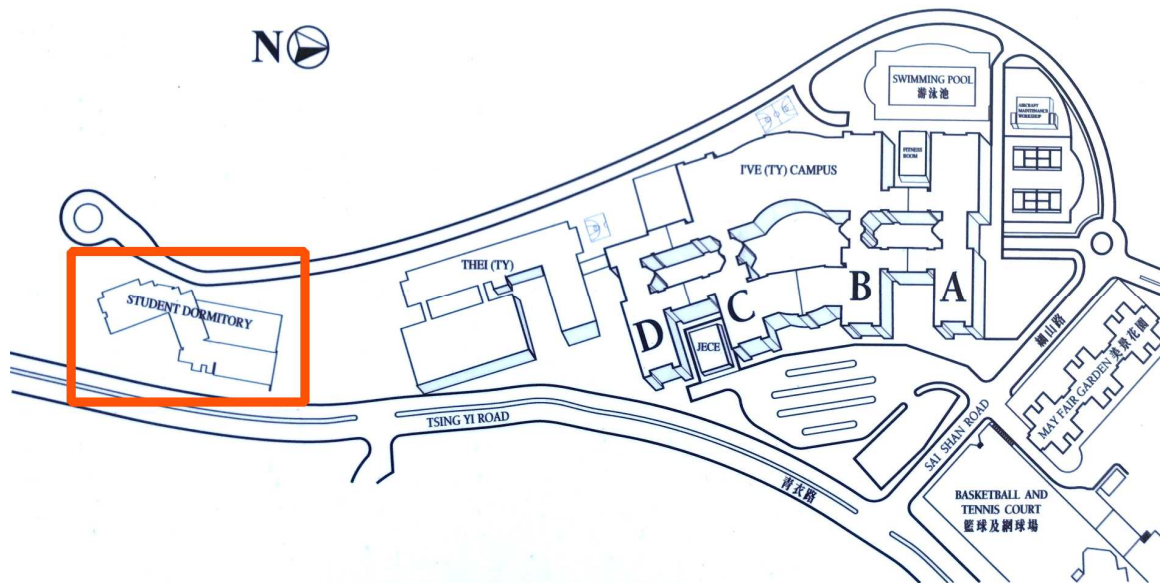


Figure 1. Location of the VTC Student Dormitory at Tsing Yi



Figure 2. Outlook of the VTC Student Dormitory at Tsing Yi

**Objectives:**

The main objective of this mini design project is to develop the HVAC system design for the proposed hotel building at the conceptual design stage and evaluate the key design concerns for achieving good energy and sustainability performance of the building. The students should study the important factors and limitations affecting the planning and design of the HVAC and other related building services systems.

## **Methodology**

This mini design project is intended to strengthen what you have learned during the lectures, by conducting system design and developing practical experience with planning the HVAC sub-systems. To develop the technical skills for HVAC system design, students shall form a team of 4 to 5 persons to carry out the mini design project and develop the HVAC design information in a professional and effective manner.

## **Major Tasks**

The major tasks for the mini design project are shown below to give clear guidance for students to develop their design information in a systematic way. The students may also suggest other issues and they should discuss with the teaching staff to confirm.

### **1. Design appraisal and system selection**

- 1.1 Study of site conditions, client requirements and objectives
- 1.2 Examination of constraints, feasibility and design options
- 1.3 Evaluation and selection of suitable HVAC systems and sub-systems

### **2. Technical design of HVAC sub-systems**

- 2.1 Water-side system
- 2.2 Heat rejection system (including cooling towers)
- 2.3 Chiller plant and refrigeration system
- 2.4 Energy recovery systems and energy code compliance

When considering and designing the HVAC sub-systems, the students should investigate and develop the following design information. They should organize the information in a logical and systematic way. Unnecessary details should be avoided at the conceptual design stage in order to focus on the major design thinking and issues.

- Site environment, design criteria and targets
- System selection and evaluation of design options
- System description and design concepts
- System design schematic diagrams, zoning and conceptual diagrams
- Initial layout plan and plant space requirements
- Design calculations and key assumptions

## **Report Submission and Assessment**

Each student group should prepare a technical report based on the design information generated during the mini design project. The report shall not exceed fifty (50) A4 pages (including report body and appendices) and should be submitted as an electronic copy in PDF format through the Moodle system.

Submissions of reports should be punctual. Late submission may receive reduction in marks. The assessment criteria include quality of the content, organization, clarity of thought, teamwork skills, communication skills (oral, graphic and written), and report writing skills.

The report should be neat and properly formatted and organised so that a reader with little time can find things readily. Proper credit and referencing should be provided to the information sources. Students making direct copy of the information in other publications (plagiarism), if found, will be disqualified.

## References

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