

MEBS6004 Built Environment

<http://ibse.hk/MEBS6004/>

Assignment 01: Thermal environment and human comfort (2022-2023)

The University of Hong Kong (HKU) has implemented the development plan for the High West Site located at 142 Pok Fu Lam Road, adjacent to the University Hall. The project will provide two 19-storey towers on a single-storey common podium. It will provide at least 938 student places including living accommodation for management staff, common space, canteen and supporting facilities. In addition, the project will also redevelop two 20-storey towers of senior staff quarters.

As the specialist building services consultant, you are asked to perform a technical investigation of the climatic factors, thermal environment and human comfort for the project so as to develop professional advice and recommendations to support the planning and design of the built environment for the project. The basic information of the site is given below.



Figure 1. Location map of the High West Site (source: <https://www.estates.hku.hk/>)

Information about the High West Site Development (西高山地段發展計劃)

<https://www.estates.hku.hk/project-management/project-profile/high-west-site-development>

<https://cnews.hku.hk/2021spring/?p=377>

<https://mic.cic.hk/en/ProjectsInHongKong/16>

<https://greenbuilding.hkgbc.org.hk/projects/view/58>

<https://www.alkf.com/en/projects/project-detail/?pid=5922>

<http://www.fckgroup.com.hk/en/project/detailed.html?id=182>

Major Tasks

You are required to evaluate the important climatic factors of the site, analyse how the thermal environment may affect the building envelope design, and assess the building design strategies for achieving and enhancing human comfort.

You should identify the important information from relevant sources and evaluate the critical issues for the project. If necessary, you may make reasonable assumptions and suggestions to support the technical analysis and assessment. The outcomes of this technical investigation will provide useful guidance for planning and designing the built environment for the project, including strategies for microclimate design, passive/bioclimate building design, solar control and ventilation strategy.

Submission Requirements

You should prepare a technical report of not more than 20 nos. of A4 pages to explain the key findings of the technical investigation in a systematic and logical manner. The contents of the report shall address the following aspects. Other important issues may also be included.

- (a) Evaluation of the important climatic factors and implications to site planning, building design and renewable energy resource potential.
- (b) Analysis of the thermal environment and influence on building envelope design.
- (c) Assessment of the building design strategies and requirements for human comfort.
- (d) Recommendations on planning and design of the built environment for the project.

The report shall be submitted in electronic PDF format to the Moodle of the course. The assessment criteria of the report include quality of the content, organization, clarity of thought, and report writing skills. The report will be evaluated on synthesis of information during the course and from your own reading/study, and evidence that you have thought about the subject and the lecture topics in some depth. A clear structure and a logical argument is important and you should provide evidence of critical thinking, originality and effective writing.

Report submission (via Moodle): **on or before 22 October 2022 (Sat)**

Useful References

- Aksamija A., 2013. *Sustainable Facades: Design Methods for High-performance Building Envelopes*, John Wiley & Sons, Inc, Hoboken, New Jersey.
- Bradshaw V., 2006. *The Building Environment: Active and Passive Control Systems*, 3rd Edition, Wiley.
- Heerwagen D., 2004. *Passive and Active Environmental Controls: Informing the schematic designing of buildings*, McGraw-Hill Higher Education.
- Liedl P., Hausladen G. & Saldanha M., 2012. *Building to Suit the Climate: A Handbook*, Birkhäuser.
- Szokolay S. V., 2014. *Introduction to Architectural Science: the Basis of Sustainable Design*, Third edition, Routledge, Abingdon, Oxon and New York, NY.