

Design and Spatial Characteristics of Health Buildings

**Case Study
"Oncology Hospitals in Egypt"**

**By
Iman Mohamed Youssri Hassan
B.Sc. Civil Engineering, Cairo University, 2000**

**A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Science
Department of Environmental Engineering**

**Institute of Environmental Studies and Researches
Ain Shams University**

2010

APPROVAL SHEET

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Abstract

Environmental pollution problem became very critical and essential all over the world and especially in Egypt. This problem caused the increasing in number of peoples infected by cancer.

This thesis deals mainly with efforts to decrease environmental pollution especially in cancer treating hospitals and organizations as an approach to help curing and complete treatment of cancer patients through applying green buildings principles and concepts.

Starting with an introduction about the importance of providing specialized facilities for cancer patients and to frame design principles through four chapters that provided a guideline to: design environmental health facilities, some departments specialized to treat cancer, and the principle of design green healthcare facilities.

By shedding the light of the importance of National cancer institute and its role in treating cancer patients in Egypt through over 40 years till now, also this study provide some suggestions for the main problems that affects the building performance and to enhance the environmental prospect, those were based on the green guide for designing healthcare facilities.

The thesis ends with giving few recommendations for different organizations through following green buildings concepts that would finally help in providing a healthy environment that will help in treatment and curing procedures for cancer patients.

Summary

Greater Cairo area has the worst air pollution in Egypt and became on the top of world's cities that has the highest particulate pollution levels in air, as a result cancer patients are increasing day after day and patients need a special attention due to the type of treatments and the repeated number of visits until they cured. The role of environmental design to that special health facilities is to provide a suitable healing environment from well-planned interior spaces, and an abundance of natural light that will serve nurses, physicians and patients.

The building performance is being affected by the overcrowdings, also location needs to be reconsidered because of the traffic density which results in various degrees of inaccessibility to health facilities. Those types of facilities considered to be an environmental load according to the impact of the building.

This thesis main objectives are to prepare an environmental guideline for designing hospitals that specialized in cancer treatment, to Draw the attention to the main problems that affect the health building performance and to give some ideas about how to apply green design concepts on new or existed facilities in Egypt.

Chapter (1) gives an outline about major environmental design considerations, fundamental principles of sustainable design, and the main types of health buildings and Site Design Considerations.

Chapter (2) includes main design criteria for some departments in cancer healthcare facilities, Special requirements for Corridor (width – windows – finishes- etc...), exterior design criteria and roofing systems beside this chapter give a brief outline about the waste stream in healthcare facilities.

Chapter (3) includes main guideline and design criteria for green hospitals.

Chapter (4) includes the case study of "National Cancer Institute" in Cairo, Egypt, also shows the importance of the building and discusses the main problems that affect both the building performance and the users. A questionnaire is made on over 120 patients and employees to measure some important environmental engineering factors such as "circulation pattern, ventilation, lighting, cleaning, colors and acoustic isolation". Through the analysis of data resulted from the questionnaire some solutions were given to the main problems that appeared in this study.

The recommendations were directed to four directions, the first was to the government by :helping in reducing the noise surrounding the building by adding traffic signs to prevent using horns in this area, increasing the awareness of protecting that building from pollution to maintain a healthy environment for patients, the second was to engineers by: increasing the awareness to "green buildings' design" especially healthcare facilities , making regular maintenance to the institute's main utilities (bath rooms & kitchens) –ventilation system- lighting systems – floors, walls and ceiling especially in patients rooms, making the building more efficient with energy by utilizing green technology. The third was to the society by: encouraging nongovernmental organizations efforts to build more cancer hospitals, and Contributing in pollution prevention that surrounds the institute. The fourth was to the medical professions by: measuring the performance of the building and its effect on patients to enhance it, Follow up maintenance work, and participating in people awareness about cancer and how to implement green building concept.

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