

# An examination and evaluation of YTU library and documentation building in terms of building biology

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## Abstract

The physical and social characteristics of internal and external environments of the YTU Library Building were examined and the results were compared with the required levels and standards. Negative characteristics which may cause health problems on temporary and permanent users were determined, and potential health risks due to those characteristics were identified.

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## 1. Introduction

The basic function of a building is to meet the biological, psychological and social requirements of users. Those requirements are met by physical and social features of indoor and outdoor environments of the building. Negative characteristics of physical and social indoor and outdoor environments will cause failure to meet the users' requirements. Therefore they turn into negative environmental factors which might affect all users' well-being and lead to possible health problems, directly or indirectly [1].

Health problems which are caused by buildings are subject of Building Biology which is a scientific study the

objectives of which are to prevent the negative effects that influence people's lives, by establishing the relationships between the building, its environment and people; to produce and control the decisions which lead to the design, construction and use of buildings in terms of people's health [1].

For some times, it has been observed by the authorities and librarians of Yıldız Technical University (YTU) that the YTU Library and Documentation Building shows poor performance in terms of working conditions and users' interests. This led a group of researchers to propose a research project on all detailed performance analysis of YTU Library and Documentation Building to find out the reasons of this poor performance. The research group consisted of different specialisations (building construction and materials, building physics, environmental engineering, library science, health physics/nuclear physics). In 1999 the proposal of the research project was accepted and supported by YTU Research Foundation, and the project was completed in 2002.

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The research was based on the following assumptions:

- Poor working conditions and users’ interests can be the result of failure to meet users’ requirements due to some of its poor environmental characteristics.
- Physical and social indoor and outdoor environmental characteristics of the library building, health risks and users’ satisfaction can be analysed by a systematic research methodology.

In order to identify and establish the connection between environmental characteristics and health risks within the library building a model to examine and evaluate the buildings in terms of Building Biology was applied. The applied model, which was previously proposed by Balanli and Ozturk [2] to analyse environmental characteristics of a building in terms of building biology, has the following steps which also indicate the basic concept:

- the negative factors within the indoor and outdoor environments of a building,
- the negative conditions due to those negative factors,
- the harmful impacts of those negative conditions on health,
- the health problems which might be caused by those harmful impacts.

These steps were modified to determine the existing environmental conditions of the library building. It has been thought that the results will be important and beneficial to improve the environmental conditions within the library building, and to lead the design of new library buildings.

**2. The YTU library and documentation building**

The Library Building was opened in 1986, and is situated on the edge of the campus and near the junction of two main traffic roads in Yildiz-Besiktas in Istanbul.

The building which has reinforced concrete frame structure is mainly constructed of brick and reinforced concrete internal walls, and aluminium and glass curtain wall. These structural and constructional characteristics are commonly used in Turkey.

The floor plans and an elevation of the building are shown in Fig. 1. The library building has five floors. The main spaces within the floors are as follows.

- Basement floor: Reading rooms, storage and toilets
- Ground floor: Entrance, computer room, offices
- 1st, 2nd and 3rd floors: Reading rooms and offices.

A gallery void which starts from the floor level of the 1st floor and reaches to the ceiling level of the 3rd floor

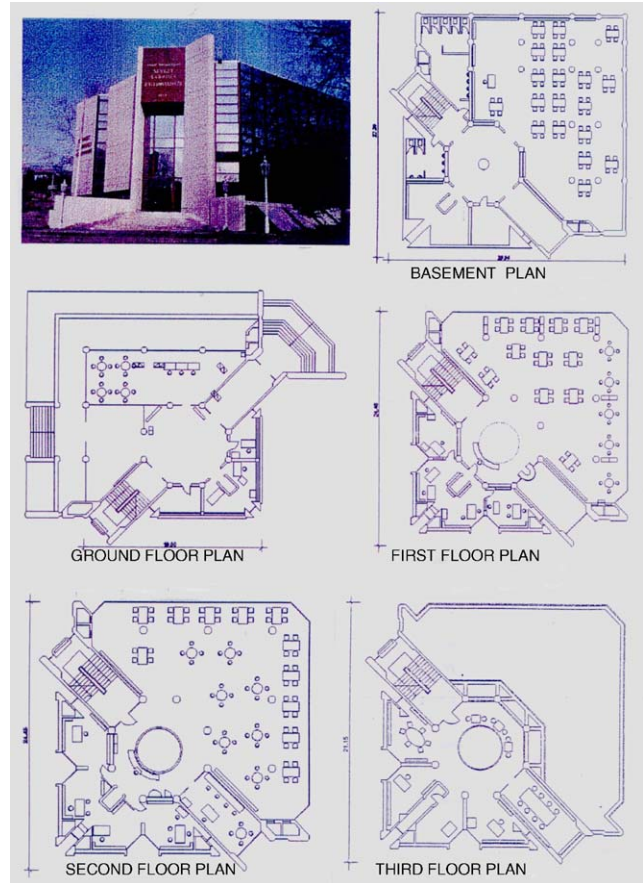


Fig. 1. The floor plans and an elevation of the building.

connects the reading rooms between the 1st, 2nd and 3rd floors. The offices have also been used as book storage. The circulation between the floors is provided by a staircase and a lift.

**3. Conceptual analysis and findings**

The principal steps in the analysis for the research are as follows:

*Identifying*

Indoor and outdoor environmental characteristics

1. Physical indoor environmental characteristics
  - Spatial and formal features
  - Visual features
  - Auditory features
  - Tactile features
  - Atmospheric features
2. Social indoor environmental characteristics

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