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Студенттер мен жас ғалымдардың
«ҒЫЛЫМ ЖӘНЕ БІЛІМ - 2018»
XIII Халықаралық ғылыми конференциясы

СБОРНИК МАТЕРИАЛОВ

XIII Международная научная конференция
студентов и молодых ученых
«НАУКА И ОБРАЗОВАНИЕ - 2018»

The XIII International Scientific Conference
for Students and Young Scientists
«SCIENCE AND EDUCATION - 2018»



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ARCHITECTURAL SOLUTIONS OF BIOCLIMATIC DESIGN

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This work includes the description of techniques for maintenance and conservation of bioclimatic solutions as architecture building structure, orientation, lighting, ventilation, and shading.

Introduction. The essence of bioclimatic design is to create a favorable microclimate both inside the building and outdoors through the application of architectural techniques [1]. “Bioclimatic architecture involves looking at the big picture, shrinking the scale of the observer’s perception over the construction site and resolving core problems in order to allow such manifestations to evolve naturally” [2].

Methodology. The study presented in this paper investigated design approaches focusing on the study was conducted through literature review.

Architecture building structure. The most suitable form for the house is extended on an axis the east-west, it provides the big surface area of the south for collecting solar heat in winter months. The biggest side of the house and the biggest expositions have to be focused to the south, and respectively on north side of the building there have to be solid walls and the smallest possible openings. Walls of the building have to be bulky and are made of solid materials for the best protection against changes of temperature. Respectively, glass surfaces of openings of the house are the simplest solar collector. Openings in the house have to provide cross ventilation (mainly in the direction the North-South), and for this reason it is extremely important to have northern radiation of the house. Ventilation through passage provides natural cooling in summer months. The use air veil and double entrances can bring to energy efficiency. The double entrance reduces "thermal losses thanks to infiltration and heat conductivity". The entrance knot formed by small entrance space with doorways on both parties functions as a transitional zone between cold external space and a warm interior.

Orientation of the building depends on the climatic zones. Designs approaches for the sub-tropics climate cannot suit temperate climate zone. At the hot dry climate long wall projected on the south side with maximum openings to take the prevailing summer wind. The north side have small openings, which attached with courtyards and verandahs.

In the temperate climate zones, the largest wall must be oriented to the south in order to maximize the advantages of the solar.

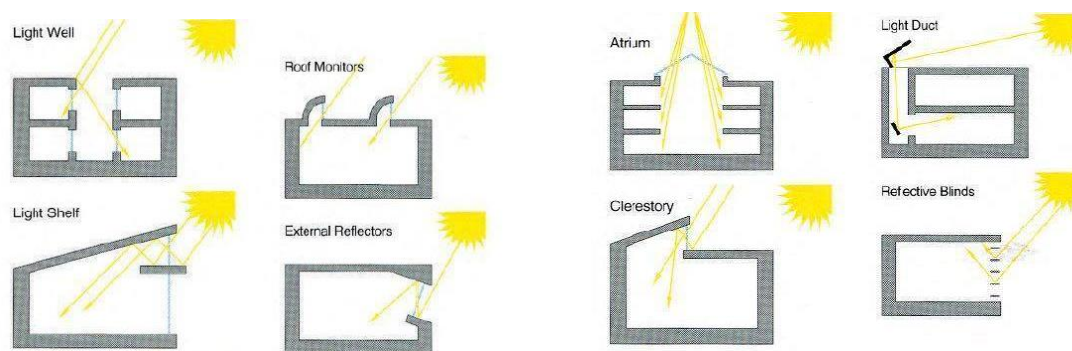


Figure 1. Lighting

Lighting. Optimum use of a natural daylight, especially in buildings used generally in the afternoon, can, having replaced artificial light, to make significant contribution to increase in energy efficiency, visual comfort and wellbeing of inhabitants. Such strategy it is necessary to consider the potential of increase in heat and preservation, economy of energy due to replacement of artificial light and more subjective advantages of natural light and external views which residents use.

The good system of day lighting has a number of elements, the majority from which it is necessary to include in the building at an early stage of his design. It can be reached by consideration from a daylight, below-mentioned concerning frequency building:

- orientation, organization of space, function and geometry of the spaces which are subject to lighting;
- arrangement, form and sizes of openings through which there will pass the daylight;
- location and properties of a surface of internal sections which reflect a daylight and participation in his distribution;
- location, form and sizes, etc. mobile or the constant devices providing protection from excessive light and patches of light;
- optical and thermal characteristics of glazing materials.

The good design of a daylight not only will lower costs of the electric power connected with artificial lighting, but also will reduce requirement for mechanical devices for cooling of rooms, effective electric lighting fixtures.

Shading. Due to the correct design and an arrangement of a pergola or other systems of shading with automation, protection of the building against overheating during the summer can be reached.

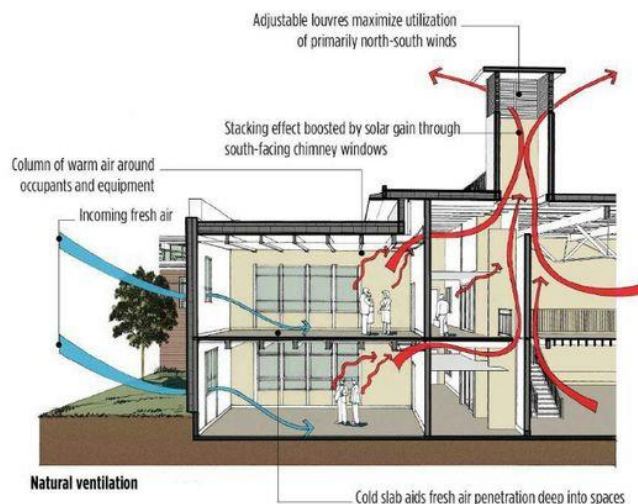


Figure 2. Natural ventilation. Picture from <https://dsignsomething.com/>

One of the crucial elements that can establish the success of a bioclimatic designed environment is natural ventilation and the way it serves every room in the building, using planted/shaded surfaces to provide cool air intakes which is later disposed of when becoming hot through vents placed in the superior part of the elevation (Figure 2) [3].

Conclusion. Based on the presented findings, strengthened with the best practices of literature review, recommend implementation of the bioclimatic passive principles as:

- thermal protection of buildings in winter and summer with the help of proper insulation and reduce the thermal conductive properties of building envelopes and openings;
- The use of solar energy for heating buildings in the winter and natural lighting throughout the year. This is achieved by the correct orientation of the space, the competent placement of window openings, and the location of the rooms, depending on their needs for thermal energy and lighting;

- protection of buildings from the summer sun, mainly through shading, but also by other available means;
- removal of heat from the building in the summer time in a natural way to the external environment by passive cooling methods, such as natural night ventilation;
- ensuring sufficient natural light and uniform distribution of light within the premises;
- improvement of the surrounding building of the territory and of the whole anthropogenic environment.

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УДК 721

АНАЛИЗ ВЗАИМОВЛИЯНИЯ АРХИТЕКТУРНЫХ ФОРМ ПРОШЛОГО И НАСТОЯЩЕГО ВРЕМЕНИ НА ПРИМЕРЕ ГОРОДА АСТАНА

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В данной статье рассматривается влияние и взаимодействия форм и стилей архитектуры прошлого и настоящего. Сравниваются фасады старого города, и ново возведённого, разбирается связь многозаменательной стройки с зодчеством новейшего столетия. Согласно формированию мегаполиса возникают новейшие необходимости в функциональности, в строительных конфигурациях и изменениях в зрительном виде мегаполиса. На формирования внешнего вида города во многом влияет культурные ценности и традиции народа.

Ключевые слова: архитектура, взаимодействия форм и стилей, зрительный вид мегаполиса, влияние культурных ценностей.

Культура имеет колоссальное влияние на жизнь любого народа, проявляя себя во всех сферах. Она может отражаться на внешнем облике города, и формировать его стиль.

Главной связевой силой между духовным восприятием и материальными ценностями является архитектура. Своими изломленными линиями и неповторимыми формами архитектура диктует образ города. Современная архитектура вливается в атмосферу старого города, и придаёт ей новый облик при определённом образном звучании сооружений. А так же изменения национальных архитектурных традиций в нынешнюю градостроительную структуру, создаёт национальный архитектурный колорит, который позволяет увидеть национальные ценности, и традиции [1].

Уникальное сочетание абсолютно непохожих, разностильных сооружений, которые несовместимы по композиционным понятиям, присуще всем современным городам. Именно это является доказательством развития архитектуры города.

Главная идея в формировании города заключается в том, что из всех архитектурных сооружений оставляли и сохраняли лишь лучшие из них, представляющие большую культурную и архитектурную ценность. Много жилых и общественных сооружений массовой за-