How to design solar energy in high-rise buildings

Analyzing case studies illustrate that applying solar passive strategies in high-rise buildings have a meaningful effect on reducing the total annual cooling and heating energy demand. These strategies can be applied and adapted to high-rise buildings by using direct solar gain, indirect solar gain, isolated solar gain, thermal storage mass and ...

Results showed great potential of reducing energy consumption of high-rises by enhancing envelope design parameters (up to 78.9%), optimizing plan layout (up to 17%), and ...

But in these studies, the problems of geometric modeling of high-rise buildings are considered when using only passive form of solar energy (accumulation of solar heat and light).

Sustainable buildings have become a key issue for many developing and developed countries in the twenty-first century. The global population is expected to rise from 7.7 billion in 2019 to 9.7 billion in 2050 and will reach more than 10.9 billion by the end of this century [1].This increase in the global inhabitants will correspondingly increase the demand for water, ...

To optimize the integration of solar thermal devices in high-rise buildings, it is important to take into account a set of design parameters, including parameters of surface shape and...

Historically, solar energy harvesting has been expensive, relatively inefficient, and hampered by poor design. Existing building-integrated photovoltaics (BIPV) have proven to be less practical ...

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Design of solar systems in high-rise buildings Alexander Kolosov1*, Dmitry Chudinov1, ... which can be compared with multi-level apartments in high-rise buildings. The need for thermal energy is carried out either by the traditional system of power supply (I option), or by a combination of solar and traditional systems (II option). The system is equipped with solar collectors with a total ...

Discover how to seamlessly integrate solar energy into building design and reduce your energy costs. A comprehensive guide for architects and builders.

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These strategies can be applied and adapted to high-rise buildings by using direct solar gain, indirect solar gain, isolated solar gain, thermal storage mass and passive cooling systems. On the other hand, considering active solar technologies can also add extra potential by providing part of the building necessary energy demands. Although this ...

Mitrex solar systems can be integrated within a building envelope in order to generate power while simultaneously enhancing the spatial, aesthetic, and functional qualities of a project of...

Many efforts have been done to design or retrofit high-rises in an energy efficient and sustainable way to decrease their significant environmental impacts. A high number of studies have been conducted on reducing the energy demand or carbon emission of High-Rise Buildings (HRB). This paper presents a review of 48 previous studies regarding ...

It is shown that the realization of the advantages of solar energy when integrated into high-rise buildings should be based on integrated design, taking into account the natural-climatic,...

Innovative high-rise buildings are built instead of morally and physically obsolete houses, where non-traditional renewable energy sources are used to the fullest extent, under the effect of which they are located. The possibility to use solar systems with variation of ...

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