ECOLOGICAL APARTMENT BUILDING

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1, Shandong Institute of Architecture and Engineering regards innovation and development as priority work. Its campus covers a total area of 160 hectares with a construction area of 670,000 m2, and nearly 20,000 full-time enrolled students.
2, Due to the scientifically plan and wonderful design, it is full of sustainable concepts and buildings around the central lake and mountain in the campus.
3, The principal concept of design is to harmonize the relationship between human and buildings, between buildings and environment, especially the landform.
4, The main plan concept is a central greenbelt in campus which is named "ecological corridor" to gather sustainable concept and resources including architectural style, art expression & civilizations.
5, The all-important concept of architecture is to utilize the advanced technique and construction to realize sustainable building and energy conservation.
6, The leading concept of construction is to seek the high efficiency, high quality, low pollution, which could build a new comfortable situation for the campus. That is called "rebuilding the environment".

THE ECOLOGICAL APARTMENT BUILDING

1, The ecological apartment building jointly constructed with Canada is the first ecological building among all universities in China. That is a student dormitory which are full of sustainable concept and equipments that are useful for saving energy.
2, The sustainable concept equipments include: Solar Wall System, Solar, Chimney, Natural, Ventilation, Automatic Solar Tracker, etc; indicated that we can create better architectural environment and consuming less energy by using proper technology and make full use of the solar energy.
3, The Solar Wall System is a new project produced by the cooperation of Canada and USA which could apply fresh air and comfortable temperature to the room and also could be used widely in heating, warm-up, drying and dehumidify.
4, That is the first time in China among universities to use the Solar Wall System as the air-condition to realize the effective ventilation
5, Natural Ventilation System is used for reducing the indoor temperature, promote comfortable air environment and reducing the working charge of air-conditions through the appropriate design of ventilation, proper leading of the airflow.

THE PUMPING-UNDERGROUND-HEAT TECHNOLOGY

1, The pumping-underground-heat technology invented by our institute is applied to the library and academic lecture hall.
2, That is the first time in China to use the pumping-underground-heat technology to control the temperature in the room.
3, The pumping-underground-heat technology system is the better way to keep the temperature of the room and utilize the underground-heat effectively. I
4, Due to the balanced temperature of the deep land, Water could be the medium through the pipeline to take heat in summer (cold in winter) into deep land to change caloric.

ENERGY EFFICIENCY IN UNIVERSITY BUILDINGS

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Explanation: The thesis has being developed on the Architecture and Energy PhD programme of Polytechnic University of Catalonia (UPC), Barcelona, Spain. The research deals with the energy consumption at universities centres and the energy audit methods to achieve the efficiency and sustainability of their buildings.
The study proposes an evaluation of the recents proceedings and methods adopted by the UPC to include the sustainable principles at the UPC's Master Plans, following some previous researches developed in the framework of Laboratori REAL (Pla de Medi Ambient) of the University.
The main objective is to propose a methodology to integrate all aspects involved in the energy consumption of buildings at universities centres and their relation with the management of natural and economics resources.
The premise to the study is that the energy consumption is related to 3 main factors: building location (outdoor and indoor conditions) and building characteristics (architecture and construction); systems and infraestructures and, finally, the management of use and occupation (intensity and space-time distribution).
Besides the UPC, the methodology should be applied to another contexts with same characteristcs of use, in this case to the South Brazilian University of Passo Fundo (UPF). The application must contextualize both climate, cultural, social and economy situations.
At the conclusion of the study it will be possible to improve the method as an operational tool, to help taking decisons during the whole process of design, construction and use of buildings. Also, as an environmental and economical assessment of building performance, it will be useful to optimize the efficiency of existing buildings.

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