

INTRODUCTION TO NET ZERO ENERGY RESIDENTIAL BUILDING

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Abstract -The main object of this paper is to study and analysis of the building in existing building to make it a proper “net zero energy residential building”.the acute problem of the carbon dioxide emission reduction into the atmosphere becomes more important due to the fact of the planetary change. As the result it is possible to get CO₂ atmosphere emission reduction due energy consumption reduction. In present the lack of conventional energy source give support in the developing “net zero energy residential building”. According to the net zero energy residential here are few chance of the green house effect or natural hazards because here is the use of renewable energy resources for the production of electricity and use hollow bricks. According to the survey country is developing day by day electricity consume power is very high.

Keywords- NZERB, INDIAN STANDARD CODE, PLANNING, DESIGN.

INTRODUCTION

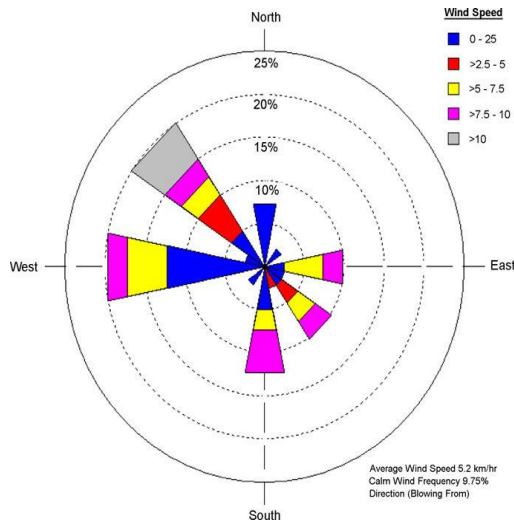
A zero energy residential building also known as a zero net energy (ZNE) building, net zero energy building(NZERB),or net zero building, is a building with zero net energy used by the building on an annual basis is roughly equal to the amount of continual enery.in India’s buildings consume 30-35% of total global energy usage, an average commercial buildings usage of approximately 260 kwh/sq.mt of electricity in a year out of which 50-60% is used by

air conditioners, 20-35% is used by lighting and 20-35% by other equipments. To avoid such energy wastage buildings need to used low cost locally availably resources. The Indira building in Gurgaon is one such example of a net zero energy building a building which generates more energy then it consumes combining design and technically innovation. It has solar panels waste water recycling specially design window shape insulated walls. Net zero energy residential building is define as the building with zero energy consumption. The main aim of the net zero

Energy residential building is create net zero energy by the use of renewable energy resources

Site selection and climatic condition

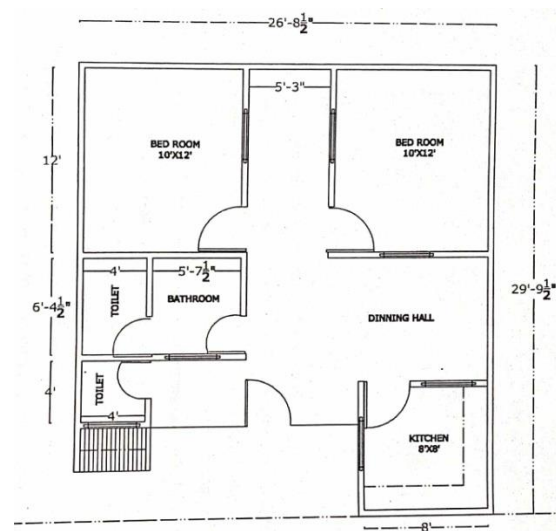
Site selection for the net zero energy residential building should be made according to the solar energy availability at which sun light is available for harness. The hottest part of the year is starting of May to early June in the Gurgaon India. Wind is the major mechanism of the wind driven ventilation for the supply and removing air through indoor space without ant mechanical system. Also keep it in mind if a site is not optimal for solar PV, it still can be utilized for a zero energy home especially if the home is fabricated and design for passive solar. The path of net zero energy is available on every site where power companies offer a renewable energy option.



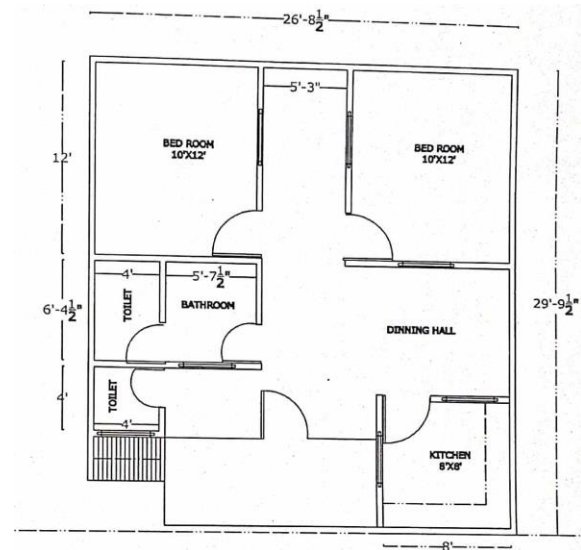
Weather plays an important role in the planning of the net zero energy residential building, affecting everything from safety issues to the day by day running of any building site. Climatic data should be studied for the design of the NZERB.

Panning for NZERB- The planning for the net zero energy residential building involves the following steps.

- Start with smart design.
- Use energy modeling.
- Super-seal the building envelope.
- Super-insulate the building envelope.
- Heat water wisely.
- Use highly insulated windows and doors.
- Use the sun for solar tempering.
- Create an energy efficient, fresh air supply.
- Select an energy efficient heating and cooling system.
- Install energy efficient lighting.
- Select energy efficient application and electronics.
- Use the sun for renewable energy.



Ground floor plan



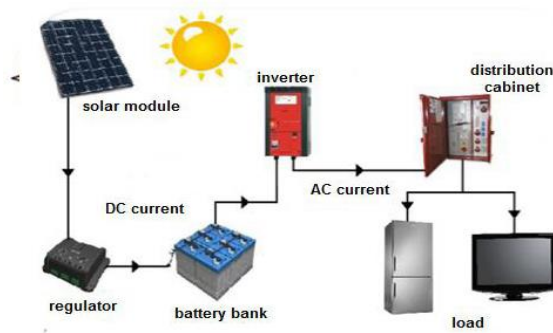
FIRST FLOOR PLAN

The allocations of the bedrooms, kitchen and bathroom in the plan have been done with consideration of sun light harness as per the requirement of zero energy building. Plan has been made by Auto-cad software.

Structural designing for NZERB- Proper designing and alignment of the building made cheaper than the conventional types of building. The use of hollow bricks and the avoidance of the column inside the building are helpful in the lowering of the temperature inside the building.

- Design of slabs.
- Design of hollow bricks wall.
- Design of footing.
- Design of solar panels.

Solar panels and its components design- solar panels (PV) absorb sunlight as a source of power to generate electricity. A photovoltaic(PV) modules is a packaged, connected assembly of photovoltaic solar cells available in different voltage and wattages. photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential application.



In this system DC is converted into AC by the inverter, DC stored in the DC storage batteries. solar panel has solar regulator which is connected to the DC battery bank. AC can be directly used by the application. the total cost of the solar panel is approximately one lakh fifty thousand for this building.

Estimation- Total cost of the net zero energy residential building is lower than the conventional building due to its design. Estimation is based on PWD.

Future scope of the NZERB- The building is made according to the net zero energy. In these building renewable energy resources are used to produce electricity. It is helpful in the saving of a large amount of electricity bill. NZERB is also helpful in the reduction of natural hazards. It would release zero

carbon that would help in controlling global warming and environmental hazards.

CONCLUSION

In this research paper we have completed the design of net zero energy residential building by the using of hollow bricks and solar panels. The comparison between the conventional building and net zero energy residential building completed by the use of infrared thermometer with was found to be 38°C less in zero energy building compared to conventional building.

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