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Environment Friendly Architecture-Study of Designs without Disturbing Nature

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ABSTRACT: "Embrace the nature, love the nature. Then, she will never betray you." rightly quoted by Frank Lloyd Wright, American Architect.
Today is the need of Architects who design such buildings which are constructed without disturbing a nature because nature is our primary factor that should not be disturbed. Buildings should be designed along with the functional harmony and natural resources. Today's new technology improves existing methods of construction and creates architecture with positive effect on the human health and friendly environment. These buildings satisfy all principles i.e. Aesthetics, function, form, nature. The Descriptive method of Research is used for this paper.
The aim of writing this paper is to save our environment by saving nature. The objective of writing this paper is to respecting the way of design by saving natural resources & saved environment such as trees, rain water harvesting, sustainable optimum & toxic reduction. The Falling Water & Sal Wood Resort in Dehradun is appropriate examples to explain nature friendly buildings. The analysis will help in catering the demand of nature friendly buildings, which can be overcome the environment problem.

Key Words: Environment, Nature, Case Study, Architecture.

I. INTRODUCTION

"Live simple Survival so that others may simply live."[Earthship Biotecture] Over 80% OF world's population lives in urban areas and account for 70% greenhouse emission through their activities which results in global warming. "We make a living by what we get, but we make a life by what we give" as rightly said by Winston Churchill relates to our activities which harm the nature since decades human being has polluted air, water, soil, land, light and sound various activities for his betterment resulting the deterioration of mother earth. One of which is migration of people from rural to urban areas the demand of housing in urban areas is increasing day by day. For construction of increased demand of shelters land is cleared by cutting of trees and CO2 burden from material production for construction of buildings on the earth is increasing continually. The climate changes Act by United Kingdom targets to reduce the greenhouse gases emission by emission by 80% in 2050. [Climate change Act 2008, Chapter 27] The time has come when this adds on to the burden on architects and builders where along with innovative and attractive designs they have to focus on building techniques which consumes lesser resources and lower the greenhouse gas emission. This poses an increasing challenge on architects and a big responsibility towards the nature. A future challenge is not only search for those techniques and material which can be reused or recycled but also design such possible buildings which are built without disturbing the nature . Now time has come when Architects can no longer afford to ignore the affects of their work on the environment and the architect is obliged to responsible, environmental architecture the growing concern with environment led to my paper and case studies of nature friendly building designs for the better growth of future.

Nature friendly buildings are those environment friendly sustainable buildings which are built without disturbing the nature and natural sources. Additional emphasis should be done on nature friendly buildings without decreasing comfortable living standard. The time has come when the burden on architects and builders where along with innovative and attractive designs they have to focus on building without disturbing nature.

In this paper case study of two nature friend buildings are Falling water built in 1939 & Sal wood resort in 2015 is done.

II. EXAMPLES OF ARCHITECTURE COOPERATING WITH NATURE

Falling water: Building with nature: Built in 1935

One of the examples of architecture cooperating with nature is "Falling Water "great building. Falling water or the Kaufmann Residence is a house designed by architect Frank Lloyd Wright in 1935 in rural southwestern Pennsylvania in the United States, 43 miles southeast of Pittsburgh. It is a very special house built over a natural waterfall and makes the part of their everyday life. Frank Lloyd Wright, America's most famous architect, designed the house with the concept harmony with nature. It was designated a National Historic Landmark in 1966.[3] In 1991, members of the American Institute of Architects named the house the "*best all-time work of American architecture*" and in 2007, it was ranked 29th on the list of America's Favorite Architecture according to the AIA. There are wild animals live near it and surround by trees. A cantilevered structure was used in it. Wright used only four materials to build Fallingwater— sandstone, reinforced concrete, steel and glass.

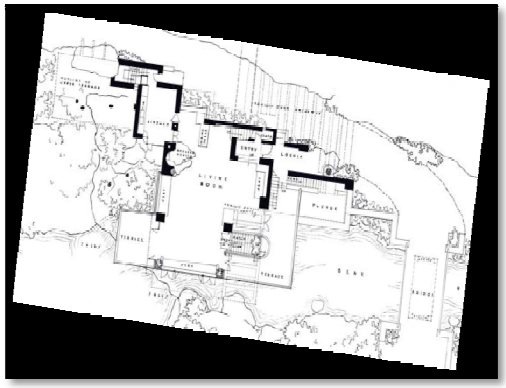

Fig. 1. Plan of Falling Water.

Fig. 2. View of Falling Water with water fall

Case Study of Sal Wood Resort: Dehradun, Uttarakhand, India – built in 2015

It is one of the best examples of building without disturbing nature in India. Resort was inaugurated in March, 2015 and designed by an Architect Ar.Nisarg Trehan. It is comprises of 26 cottages, restaurant, reception, Swimming Pool, Gazebo & Gardens, natural water fall, landscaping, adventures kids zone, conference hall, employee area , spa & Jacuzzi. Spread over 4 acres, set deep within a beautiful jungle away from the hassles of the city life, the property helps you with a full rejuvenation of the body and the mind.

Location

The Sal Wood Resort, Dehradun is located in the Galzari village in Sahaspur; Dehradun Uttarakhand. It is located 11.5 km from Dehra Dun Railway station and 22KM from the famed Mall Road in Mussorie.

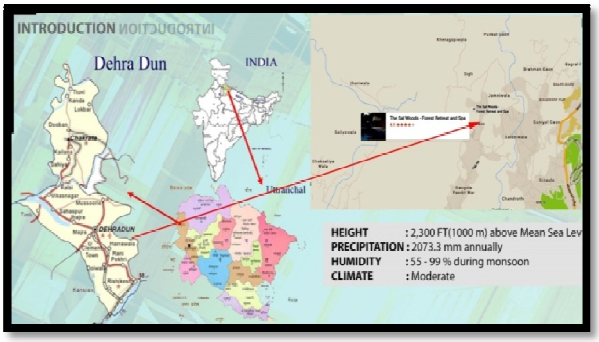

Fig. 3. Location of Sal wood Resort……Google map.

Fig. 4. Sal woods resort entrance.

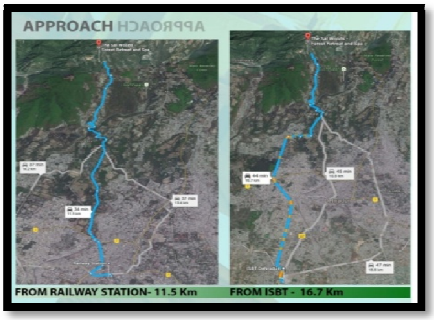

Fig. 5. Google map of resort.

Site planning

The site of Sal wood resort measures 10,900 sq. m or 14.15 Bigha. The contoured site has a slope towards south, which allows orientation of the cottages. It is surrounded by forest all around. The site has the entrances from the Sahaspur – Dehradun road. The Sal trees are mainly found here. The site comprises of horticulture zone, animal husbandry, and floriculture and the natural endowment of slopes and the watercourse.

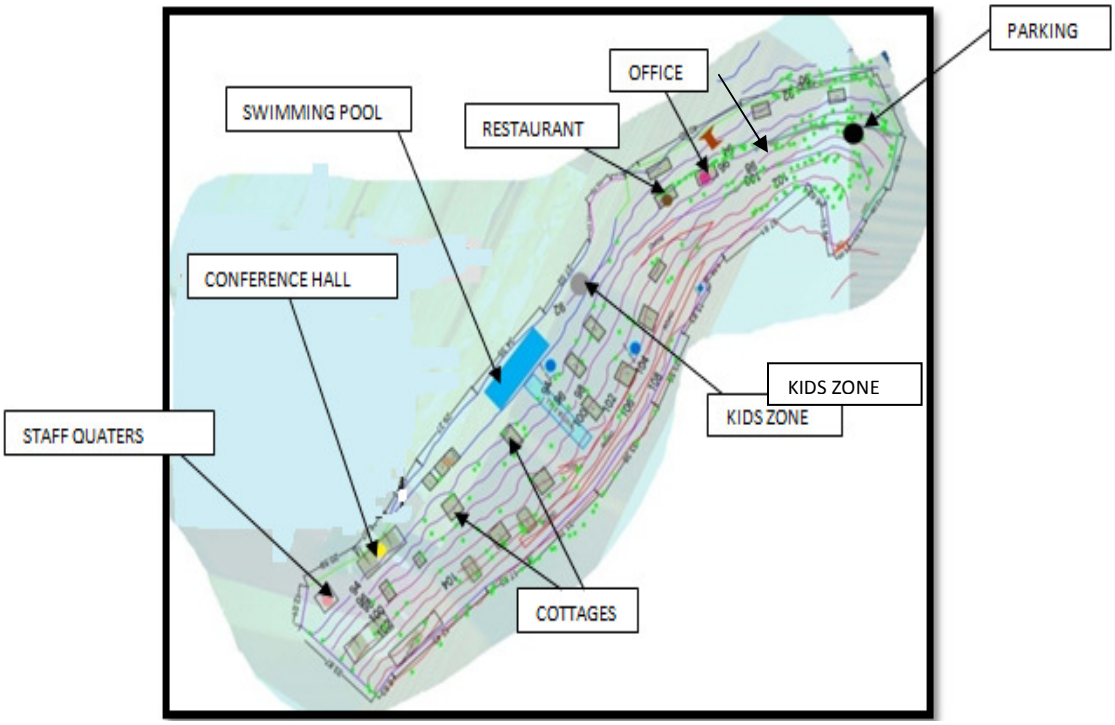

Fig. 6. Site plan of Resort.

Fig. 7. View surrounding the Resort.

Architectural nature friendly key design features

- The Architecture of the Sal wood resort is respond to the composite climate of DehraDun and its natural beauty.
- The concept of the design is based on simple, low-maintenance construction, environment friendly techniques, recycling of water (use of rain water), use of natural forests, carefully use of contours.
- Its true example of harmony in nature.
- The primary strategy is cooperating with nature. Construction is made possible without disturbing any natural element.
- The main planning starts from the Centre and moves to the outer part.
- Sal trees all around the site. Not a single tree was cut during construction process.
- Natural water falls are in the centre.
- The planning of the resort is based on maximum double storey blocks.
- All blocks or cottages are built around outdoor natural elements and on contours.
- Natural Trees are made part of the cottage i.e. tree house cottages.
- Outside Kids' adventure zone is built using natural rocks.
- The parking is at the front from the south side DehraDun-Sahaspur road.
- The steep slope 18' wide road towards the reception.
- Structure is built using materials mild steel, timber, boards etc used.
- Minimum use of concrete in construction work emphasis on natural beauty.
- Proper pathways gradients and use of contours.
- Combination of ramp and steps
- No rainwater blockage; proper slope for rainwater.
- The employee Area at the back.

- Double storey cottages by giving proper entrance
- Beautiful Outdoor sitting area.
- Blocks are on slits on main soil.
- Large sized windows are used. Colored glass on Jacuzzi.
- Butterfly roofs are of mild steel sheets to store water are of green color.
- Outside pathways are of natural stone.
- The spa & Jacuzzi r carefully planned with timber floors
- Swimming pool is heart of the resort
- Smaller pockets between buildings, benches under the shelter of trees and low walls to sit and places for informal sitting.

View of Entrance

15' wide down the road slope towards reception block surrounded by trees both sides.

Fig. 8. view of Sal woods Resort from entrance.

Fig. 9. Reception block Way to reception.

Fig. 10. Side view of the reception block.

Wooden Cottages. In resort there are 26 cottages. They are one or two room sets. Some of them are single storey and some are double storey.

Cottage with Tree inside: One of the cottages in Resort is built with nature inside the room. Tree is in centre of the cottage and at terrace is taken as it in the planning.

Rain water harvesting : Butterfly roofs are built from which rain water collected in underground open water tanks and recycled for waterfalls.

Fig. 11-13. Different view of cottages.

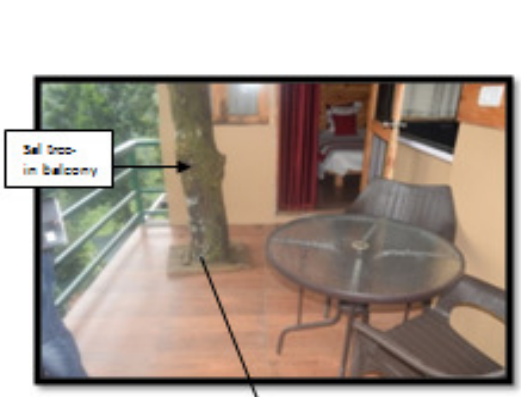

Figure 14: view of natural tree in balcony

Figure 15: sal tree inside the house

Figure16: plan of cottage has a natural tree inside

Fig. 17. View of toilet.

Fig. 18. View of Bed Room.

Swimming Pool : Swimming pool is one of the attractions of the resort. The kiosk on it increases the beauty of the resort and photo point of it. Location of swimming pool is excellent from all the side.

Spa & Jacuzzi: Spa & Jacuzzi are constructed together. It consist of reception, massage room, sauna & steam room. Wooden floor is provided in it.

Fig 19: view of Butterfly Roofs

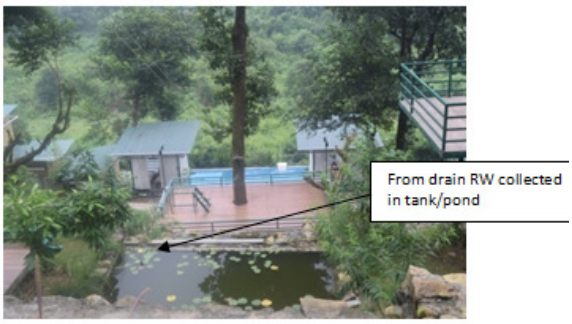

Fig 20: Underground open water tank/pond

Fig 21: Water falls from recycled rain water

Fig 22: lotus in rainwater pond

Fig 23: view of swimming pool

Fig 24: kiosk on the swimming pool

Fig 25: view of entrance of spa & Jacuzzi

Fig 26: outer view of Jacuzzi

Restaurant

Fig. 27-28. Interior view of Restaurant.

Play area: Archery, Mountain biking, Zip-line, Trampoline, Burma bridge, Jumaring, Tree climbing, Rock climbing, Croquet green, Putting green are there

Pathways 6' wide pathways are built of natural stone with slope so that no rain water stops /collects and easily move out.

Fig 29: view of entrance to indoor kids plays area

Fig 30 & 31: view of adventures games

Materials

- Mild steel structures , Metal Tin Roofs
- New Zealand pine wood for interior & Bison board for exterior of cottage (huts).
- PVC & CPVC water pipes lines & waste lines.
- Concrete on floors of toilets

Figure 32 &34: View of different pathway

Figure35: View of Gazebo outside sitting area

Fig 36-38: materials used in construction in Sal woods Resort

CONCLUSION

From the viewpoint of society needs, it is necessary to ensure the further development of buildings on the one hand, and, on the other hand, to reduce the environment contamination and to ensure the environment protection. The architectural artistic creation is the high degree of proficiency. The present period can be characterized as the era in which the humans incessantly start turning the higher merry-go-round of substances and energies in order to satisfy their needs, with reality that the bulk of these substances is growing much faster than the human needs. On one side it displays deficiencies of resources and energy and on the other side it wastes with resources and with energy.

To face the latest environment issues now days Architects, building owners and government worldwide have to focus strictly on nature friendly designs.

In India also nature friendly buildings have been constructed in last few years. Present work is an attempt in the direction to make people, communities and general public aware about the advantages of architecture with nature for sustainable environmental development and management. We must plan and build big structures. At the same time, we must consider the impacts of these constructions on the environment and human health.

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"Live simple Survival so that others may simply live."

Thanks