

Ecological Design Concept of Korean Traditional Architecture

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ABSTRACT: Landscape and architectural elements of traditional Korea architecture has been communicating well enough with nature, human, architecture and oriental thoughts. These make Korean traditional architecture more unique and elegant compare to those of other countries. This paper discusses about the various kinds of Korean landscape and architectural elements in the ecological points of views. Through this kind of discussion, applicability of tradition to modern architecture with the harmony along the ecological tradition elements of Korean architecture will be accomplished in the near future.

Keywords: landscape elements, ecological concept, Korean traditional architecture

1. INTRODUCTION

Greenhouse effect has become crucial issue around the globe and its environment since human have realized what they had done to their natural circumstances.

Facing these serious problems, one of the important solution have emerged from our controversy is the investigation on traditional wisdoms bring us the methods of living with nature and designing ecological concepts to the man-made structure.

Based on these concepts, this paper discuss about the sustainable details of Korean traditional architecture for excluding ecologically wise concepts and designs.

2. PHILOSOPHICAL BACKGROUND

Major philosophical background for formation of Korean traditional architecture is the oriental thought such as

Confucianism, Buddhism, Taoism, Shamanism and the Feng shui .

Feng shui affects the layout plan of buildings. Generally, mountains are located in the backside of the buildings which protect the cold wind from the north side while the water flows in the front side.

It is the typical theory of Feng shui in which orientations of houses and natural elements are dealt with based on its concepts.

Also, worship for nature and Taoism have affected the symbolic elements, paintings, and carving patterns on the traditional architectural elements.

Daily life culture, layout plans of buildings, ceremonial architecture and palaces were influenced by Confucianism while Buddhism strongly affects the temple architecture.

These cultural and philosophical elements are closely related with decorations and symbolic elements of Korean traditional architecture.

3. LANDSCAPE ELEMENTS

3.1 Garden

The meaning of designing Korean traditional landscape architecture is the effort for living with the nature.

For example, if the garden's earth consists of wet soil, then proper trees for wet land are planted instead of changing the soil and using drains for the ground.

Likewise, designing road in garden rather follows the existing ground condition than alters the shape of land, which preserve the natural condition of the land.

Unlike Chinese and Japanese gardens, no giant stones, large-scale architectures, specific greeneries have not been applied to the landscape design of Korean garden [1]. Judging from these features of landscape design, traditional Korean landscape architecture shows the untouched beauty in human scale design.

Since Korea is located on the northern hemisphere, northwest wind has great affect on the land in the winter, while western south wind prevails in the summer.

Considering climatic variations, proper types of trees are planted to afford comfort environment during the seasonal change.

3.2 Village forest

Village forests are designed by the people in the village or by the natural ecosystem forming band types, which are located in the entrances, hills and streams around the villages. Zelkova, hackberry, and pine trees are main tree types.

Traditional village forest affords the emotional relief, communication space, wind protection, flood prevention and maintaining biological diversity. There are still up to 500 village forests around the country [2].

3.3 Pavilion

Pavilion makes the people familiar to the nature. Since it is immersed in the nature sitting along the roadside under the old tree,

riverside, inside of garden space and viewpoints on the high hillside, pavilion is the place for resting and enjoying the beautiful scenery.

Deck space in the pavilion, sometimes, turn out to be the cooling space in the summer due to the cool accent current exfiltrated through the slatted deck floor panels from the shaded space down below.

3.4 Water resources

Pond, reservoir, public well, water channel provide various roles for environment and human. Those are used for growing fish and sightseeing, controlling water level and microclimate, managing rainwater, storing water, supplying water to the rice fields, in case of fire, dry season, farming as well as resting.

In feng shui theory, water is regarded as the wealth and live energy implying Yin, which is essential for architectural design.

3.5 Wall

Wall is made of earth, stone and wood, sometime designed with tile roof on the top of it. It is not only differentiating the interior and exterior space but also provides wishes for the health and long life by applying religious decorations on the wall surface.

Wall is often designed with timbers, while people plant the living hedges around their houses in old Korean villages.

4. ARCHITECTURE ELEMENTS

4.1 Space planning

Generally, houses in traditional villages are located along the less inclined low hillside, which took advantage of natural land condition without destruction of existing terrain.

Feng shui theory is often applied to layout of buildings which in turn resulting ecological harmony among human, wind and water.

In the traditional houses, buildings are facing the south, while mountains are

located backside of buildings in the north. In case of floor plans of civil house, layouts of rooms are following the climatic conditions due to the regional variations of the country.

Open space often refers to the communication space for the occupants in villages. Courts in the house are used for playing folk games, preparing food and farming products, planting flowers. Sometimes, courts can be the proper field for natural convection caused by the temperature difference between the front and rear court [4].

4.2 Building designs

Roof structures with projected eaves of the Korean traditional architecture are capable of controlling the sunlight during the seasonal variations, in which yellow earth are filled, resulting high thermal capacity comes into effect [3].

As another roof material, straw is good for controlling humidity and natural ventilation. It shows efficient function for retarding solar radiation[5].

Walls are commonly made of yellow earth together with wood frames which resists against the heavy road from the roof and acting as a efficient capacitive insulation. Pine tree, oak tree and fir tree are main wood species.

Windows are made of papers with wood thin frames control the humidity and diffuse direct sunlight with absorbing reflected sound from the interior space[5]. Floors are also made of the earth keeping high thermal capacity in which traditional radiant heating systems- Ondol- are equipped.

Basements, made of granite stone, are highly lifted up above the ground that makes the interior space free from the excessive humidity and cold draft.



Figure 1: Pond & pavilion



Figure 2: Village forest



Figure 3: Traditional garden



Figure 4: Traditional residential house



Figure 5: Ceremonial architecture



Figure 9. Thatched roof and stone wall



Figure 6. Traditional palace wall



Figure 7. Traditional roof



Figure 8. Eaves and rafters

5. CONCLUSION

Traditional architecture of Korea has been providing ecologically harmonized environment to the nature and human. We can learn the sustainable concepts from its' design elements and should reinterpret the ecological concepts to apply the tradition to the contemporary architecture.

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