

# ECO FRIENDLY CONSTRUCTION AND ITS BASIC TECHNIQUES, BENEFITS

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## ABSTRACT

*There is need to maintain the potential of the environment for the future generation. Conservation is essential for adequate supplies of natural resources for present and future generation. It is stated that building and their services use 40 to 50 percent energy such as mechanical, electrical, heat and nuclear energy. It is highly essential to adopt changes in design and method of construction of building for energy and water conservation (environmental protection)). Eco friendly construction cannot help to create a better outdoor environment, it can also help to build healthier indoor environment.*

**Keywords:** Cavity resonators, Water conservation, Windows, Sun, Heating, Ecology.

## I.INTRODUCTION

Eco-friendly, or ecological, construction is building a structure that is beneficial or non-harmful to the environment, and resources efficient. Otherwise known as green building, this type of construction is efficient in its use of local and renewable materials, and in energy required to build it, and the energy generated while being within it. The eco-friendly construction has become a must with the series of rising trends and events including an increase in demand for corporate responsibility on the environment, the agreement of the international community on the New Climate System after 2020, and the increase in potential for companies to create values through the environment-friendly business model. Highly regarding environmental protection and respect for life as the overriding values of corporate management, Daewoo E&C strives to become a global ecofriendly construction leader by continuously expanding its eco-friendly business as well as making effort to prevent global warming.

## II.BENEFITS OF ECO FRIENDLY CONSTRUCTION

### 2.1 ENVIRONMENTAL MANAGEMENT

- Accomplish zero violation of environmental laws and occurrence of environmental accidents
- Reassign roles and responsibilities of environment managers
- Raise the level of environmental management in operation sites through

the implementation of HSE One Stop Service

- Achieve the target to reduce costs of waste disposal compared to sales:  
0.20%
- Accomplished zero penalty and sanction for violation of environmental laws
- Reestablished the roles and responsibilities of environment managers
- Implemented HSE One Stop Service
- Achieved the target to reduce costs of waste disposal compared to sales:  
0.18% (calculated with estimated sales at the end of November 2015)
  
- Enhance job competency of environment manager
- Prepare to convert to ISO 14001:2015
- Achieve the target to reduce costs of waste disposal compared to sales: 0.19%

## **2.2 RESPONSE TO CLIMATE CHANGE**

- Assess estimated amount of GHG emission and set objective and strategy for reduction
- Increase disclosure of environmental information, win CDP (Carbon Disclosure Project) Sector Winners, participate in the environmental information disclosure initiative by the Ministry of Environment
- Expanded public disclosure of environmental information: Won CDP (Carbon Disclosure Project) Sector Winners Award
  - Conduct consistent training and promotion on GHG reduction
  - Actively respond to public disclosure on environment information

## **2.3 ECO FRIENDLY BUSINESS**

- Develop optimal technology and construction process to build high-rise zero energy houses
- Develop DECO2 (Daewoo Elimination of CO2) integrated process optimal technology and seek methods to commercialize carbon capture byproducts
- Secured core technologies to accomplish Green Premium roadmap and established zero energy house (ZENERHEIM)
- Became the first in Korea to develop DECO2 integrated process optimal technology and design a direct synthesis for CO2 integrated process plant

- Design and install the first year lay out design for a direct synthesis pilot plant for CO<sub>2</sub> integrated process
- Enter new market for domestic/overseas new renewable energy business and secure performance



### **2.1.1 WATER QUALITY PROTECTION**

Proper landscaping reduces nitrate leaching from the soil into water supply and reduce surface water runoff, keeping phosphorus and other pollutants out of our water ways and preventing septic system overload.

### **2.1.2 REDUCE HEAT BUILDUP**

Trees in parking lot can reduce on site heat buildup decrease runoff and enhance night time cool down Tests in a mall parking lot of Huntsville, Ala. Showed a 31\*c difference shaded and unshaded areas.

### **2.1.3 IMPROVED AIR QUALITY**

Trees, shrubs, turf remove smoke, dust and other pollutant from air. One tree can remove 26 pounds of Co<sub>2</sub> from atmosphere and release enough O<sub>2</sub> for a family of four to breathe.

### **2.1.4 GREEN ROOFS COOL URBAN HOT SPATS**

Led by cities such as Chicago and Toronto as well as number of universities, Evidence is mounting that green roof (i.e. – Proof totally or partially covered with vegetation), can play an important role in saving energy, reducing urban heat island effect and adding more green space to build environment.

## **2.2 ECONOMIC AND AESTHETICS BENEFITS**

### **2.2.1 BUSINESS BENEFITS**

Roadside studies by universities of Washington started that drivers indicated it was easier to locate roadside business when they were framed by trees and vegetation, rather than having green material removed.

### **2.2.2 PARK IMPROVE PROPERTY VALUE**

This is significant link between the value of property and its proximity to park, greenbelts and other green spaces. Studies of three neighborhood in boulder, Colorado indicates that property value decreased by \$4.20 for each foot away green belt.

### **2.2.3 ECO FRIENDLY CONSTRUCTION HELPS DECREASE AIR CONDITIONING COST**

Here are some useful references, according to California energy commission: “planning correct tree, shrubs, vines and ground cover can make your home both warmer in winter and cooler in summer. In fact, the right type of tree can reduce your summer cooling cost by 20 to 40%”. Computer model devised by U.S. department of energy predicts that the proper placement of only three trees will save an average household between \$100 and \$250 in energy cost annually. The cooling effect of an average size lawns is equal to about 9 tons of air conditioning.

### **2.2.4 PROTECTS DRAINAGE SYSTEM**

The crown of a large trees is a freestanding anti floor reservoir, in some cases intercepting so much rainfall that more than 1500 gallons a year evaporates instead of hitting the ground. Chap down the tree, and you increase the volume of storm water a city must manage something that especially affects older cities with aging drainage system.

## **2.3 SOCIAL AND PSYCHOLOGICAL BENEFITS**

### **2.3.1 RECREATION AND WELL BEING**

People satisfy mostof their recreational need within the locality where they live finding by Nical and Blake in 2000 show that over 80% of U.K. population live in urban areas and thus green spaces in urban areas provide a sustainable proportion of total outdoor leisure opportunities. A study conducted by Helsinki, Finland indicated nearly all (97%) city residents participate in some outdoor recreation during the day. Urban green space serves as near reservoir for relaxation.

### **2.3.2 HUMAN HEALTH**

People who are exposed to natural environment the level of stress decreased rapidly as compared to people who were exposed to urban environment, their stress level remained high. In some review patients in a hospital whose room were facing a park had a 10% faster recovery and need 50% less storage pain relieving medication as compared to patient whose room were facing a building wall. This is a clear indication that urban green spaces can increase the physical and psychological wellbeing of urban citizens. In other research conducted in

Swedish cities (Malmo & Lund) show that more time people spend outdoor in urban green spaces, the less they are effected by stress.

### **III. CHALLENGES TOWARDS MANAGEMENT OF ECO FRIENDLY CONSTRUCTION**

#### **3.1 SOCIO ECONOMIC AND DEMOGRAPHIC FACORS**

High urbanization and high pace of social and economic development in Asia resulting from increase of population of cities, lack of infrastructure, congested traffic, environment degradation and a housing shortage are major issues faced by cities in Asia in their sustainable development. The great threat to health and safety in cities comes from water and air pollution. Those who are poor and do not have adequate ventilation system, air pollution is hazardous for them women and children because they expose regularly and water borne disease are found most commonly in low income groups because of inadequate sanitation, drainage and solid waste collection services. Another most important challenge facing in Asia region due to over urbanization is conversion of agricultural land and forest for urban uses and development of infrastructure in urban areas. As a result widespread removal of vegetation to support urban ecosystem, ground water overdraft and but additional pressure on nearby areas may be ecologically more sensitive and may even increase the higher frequency of flooding in urban areas.

Cities covers 2% of land space worldwide but 75% of all resources.

#### **3.2 QUANTITATIVE ASPECT OF ECO FRIENDLY CONSTRUCTION**

Understanding relationship between urban population and amount of green spaces is particularly important in evaluating their functionality and of course future planning for population density and cities have a loss of natural areas and natural resources. In addition to medium size cities have relatively high score on natural green factor due to availability of natural green areas. It is important to preserve the green areas either urban green or natural green. **Table 2** Shows the availability of natural and urban green spaces. As most cities especially in developing world, continue to grow in population there is seeming continued decrease in urban space at expense of built up areas. Despite the trend studies shows that people are willing to pay high prices for green space increment.

#### **3.3 QUALITATIVE ASPECTS OF ECO FRIENDLY CONSTRUCTION**

The evaluation of recreational green space has to be centered on variety of qualities available, sufficiently satisfying and interesting place to stay and enjoy being there. A study conducted in western Canada(USA) shows that people enjoyed varied physical and social opportunities in green space. The benefits people desire can directly be linked to a particular recreational activity and physical, social and management for their provision. Commonly used terms to refers to quantity of green spaces or eco-friendly construction, green space coverage and green space area per capita. It is difficult to measure appropriate amount of required land and allocation of land and calculate distance from residential areas and especially to implement the measurement can building up urban green space with proper services in highly populated countries. Table 1 shows the standard of

minimum sizes of various type of green spaces in urban areas as of 26 cities from 15 European countries considered 4 groups of 26 cities, according to their population size such metropolis, big cities, medium size cities and small cities. Consider the four groups of variables such as urban green areas, forest agricultural areas and water, another factor analysis shows the two categories of cities included in study “Natural Green Areas” (N) (Such as forest and agricultural areas), and “urban green areas” (U) (Such as urban green and water). Finally the study concludes that the metropolis and big cities have a high score on urban green factor. Because the cities are old, the cities have highSetting characteristics. Most people cited getting away from daily demand of life and relieving stress as reason of visiting green spaces.

#### IV.FACT AND FIGURES

##### 4.1 MINIMUM STANDARD FOR ECO FRIENDLY CONSTRUCTION

Functional level	Maximum distance from home(meter)	Minimum surface area (Hectare)
Residential green	150	
Neighborhood green	400	
Quarter green	800	10(Park: 5 Hectare)
District green	1600	30(Park: Hectare)
City green	3200	60
Urban green	5000	>200(Smaller towns) >300(Big cities)

Source: Herzale and Wiedemann

U: Urban green, N: Natural green

Source: Tuzin and others 2002.

Cities responsible for most of consumption of world’s citizen as well. Green space is part of and also represents habitat and ecosystem.

## **V.CONCLUSIONS**

Eco friendly construction fulfill many functions in urban context that benefit peoples quality of life. There is therefore a broad consensus about importance and value of urban green space in cities towards planning and constructing sustainable or eco-cities of 21<sup>st</sup> century. Steadily growing traffic and urban heat, especially in developing countries is not only damaging the environment but also incur social and economic cost. The economic benefit bestowed in green space which range from protecting and maintaining the biodiversity to helping in migration of change can't be overlooked in today's sustainable planning. Inner city green spaces are especially important for improving air quality through uptake of pollutant gases and particulates which are responsible for respiratory infection. Green spaces also help in reduction of energy cost of cooling building effectively. Further more due to amenity and aesthetics green space increases property value. Green space need to be uniformly distributed throughout the city should be large enough to accommodate city population needs.

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