

SUSTAINABILITY TECHNIQUES IN CIVIL CONSTRUCTION

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Abstract. This research aims to present and present the theme Sustainability Techniques in Civil Construction, the benefits of sustainable materials will be presented in the construction, civil, for example; soil-cement brick, wood with certificate of origin, solar energy system for water heating, rain collection system and fluorescent lamps, which make it possible to carry out a work in a sustainable way, and contribute to the environment.

Keywords: Cement-based brick, wood with certificate of origin, solar energy system for water heating, rain collection system and fluorescent lamps, sustainability, sustainable works

1. INTRODUCTION

From the history of mankind, it can be shown that civil construction always existed to supply our basic needs, so there was no need to improve the technique. Thus man became qualified and to transform and innovate in his techniques. Sustainability is defined by man-made actions to meet the needs of the population without harming the environment, ie, sustainability is directly related to economic and material development without harming the environment, using the maximum of natural materials, taking advantage of what the environment itself offers us as a benefit.

Consequently, there are buildings that have technical characteristics that allow the construction of a building with ecological standards that aim at adapting to the air, positioning the façade with regard to the spring/sunset of the sun and among others.

The main objective of the work is to present the sustainability techniques that are being widely used in civil construction, which is an innovative way of executing a building that maintains the same with respect to the environment.

It is important to emphasize that with the introduction of the use of sustainable means it will be possible to minimize the issues that involve the interference of man in nature, thus the human being begins to obtain more respect and to properly plan his constructions that aim at the preservation of the environment.

Sustainability is a term used to define human actions and activities that seek to meet the present needs of human beings without compromising the future of the next generations. That is, sustainability is directly related to economic and material development without harming the environment, using natural resources intelligently so that they will stay in the future.

2. BACKGROUND KNOWLEDGE

Sustainability is currently one of the main themes as our natural resources are becoming increasingly scarce. The idea is not only to design something sustainable, but to design something where you can have a development cycle where you have rain-water harvesting, where you have vegetation to keep the climate fresh and humid, a place where you can educate children from an early age and even adults from the correct use of the environment we live in and that is a finite good.

The inclusion of sustainable means and practices in civil construction is being increasingly applied as an alternative in the market. This is leading companies to have a new vision of how to produce and manage their works, thus respecting the acting environment.

The concept of sustainability must be present throughout the construction phase of the building, or even in deconstruction or demolition. With this, you can have a concrete idea of what environmental impacts that work can generate, and from that get solutions and ways that provide a sustainable deployment and a sustainable model.

From this we can mention some forms of sustainability that are:

- The exploitation of plant resources from forests and forests in a controlled manner, ensuring replanting where necessary.
- Total preservation of green areas not intended for economic exploitation, thus preserving the boundaries of APP (Permanent Preservation Area) areas.
- Actions aimed at encouraging the production and consumption of organic foods, as these do not harm nature as well as being beneficial to human health.
- Exploration of mineral resources (oil, coal, ores) in a controlled, streamlined and planned manner.
- Use of clean and renewable energy sources (wind, geothermal and hydropower) to reduce the consumption of fossil fuels. This action, besides preserving the reserves of mineral resources, aims to reduce air pollution.
- Creation of personal and business attitudes towards the recycling of solid waste. This action, in addition to generating income and reducing the amount of litter in the soil, makes it possible to reduce the withdrawal of mineral resources from the soil.
- Development of sustainable management in companies to reduce waste of raw material and development of products with low energy consumption.

In recent times, sustainability has been the main theme of a project, both in architecture and civil construction. There are many discussions about the advancement of sustainability in relation to several professional areas where at times they seek to work together to find solutions to environmental issues.

Much of this concern about the degradation of the environment is the effect of man's actions on the environment in which he lives. In architecture and engineering, a number of factors are helping to make the project a natural one in all construction planning, as technology is increasingly environmentally friendly. A sustainable project goes beyond the use of rainwater, natural ventilation and the use of solar energy. To receive the title of sustainable enterprise, the project must be ecologically correct, economically viable, socially fair and culturally accepted.

In this sense, we can say that the ecologically correct project is in the rational use of all resources that the environment, minimizing the negative ecological impacts and potentiating the positive ones in all stages (design, work, delivery, and maintenance).

According to the Brazilian Association of Architecture Offices (AsBEA) and the Brazilian Council of Sustainable Construction (CBCS) and among other institutions, it is necessary to use some basic principles for sustainable construction. And obeying these evaluation criteria we can mention:

- Relation of the building to its surroundings.
- Integrated choice of products, systems, and building processes.
- Construction site with low environmental impact.
- Energy and water management.
- Management of waste from the use and operation of the building and its maintenance, thus using the concept of the 3R's trilogy (Reuse, Reuse and Recycle).
- Acoustic, visual, olfactory and hygrothermal comfort (temperature and humidity).
- Sanitary quality of the environment, air, and water.

In terms of sustainable practices, it is possible to mention the use of green roofs (green roofs) that are high in the market, since this technique has as objective the replacement of the tiles by the vegetation. With the green roof, it is possible to have excellent thermal insulation thus combating the heat islands of large urban centers, in addition, to absorb carbon dioxide emitted from cars and industries through the vegetation and also can absorb much of the rain waters that consequently go avoid flooding.

We can also mention other sustainable means such as:

Soil-cement brick.

This type of brick dries in the sun without the need to go to the wood oven. So this option for this type of brick saves the burning of trees. Its price may be around 380 reais (1,000 bricks), twice the price of the common version, but this brick does not require finishing with a running mass that will not imply anything in the budget of the work.

Wood with the certification of origin.

It is the wood that comes with a seal certifying that it was extracted from a reforested forest. Its cost is around R \$ 2,500 (the ipê, per cubic meter), but it is 15% more expensive than the same wood without the certification seal.

Solar energy system to heat the water.

With the use of a solar energy system, this can spend 30% less electricity. Its cost is approximately 5,000 reais.

Rainwater harvesting system

Rainwater can be easily stored in cisterns and water tanks to be used in domestic services such as washing the floor or the use of toilets. The price of a capture system is approximately 2,500 reais (for a house of 100 square meters).

Fluorescent lamp.

The fluorescent lamp consumes about 80% less energy than an incandescent lamp and has a longer shelf life than the conventional one. Its cost is approximately 15 reais (the 20 watts).

3. CONCLUSION

Therefore, we can conclude that in view of all the factors cited, sustainability comes to raise awareness in all areas of civil construction to preserve the environment in which we live, thus stabilizing the union between construction and the growth of cities without damaging soils, springs, forests.

The construction market is increasingly developing sustainable resources to assist us as concrete, paints, among other novelties that are being a more effective and conscious means for the execution of a work, and making its use more common in buildings.

A building where sustainability is the main focus brings many benefits both to the environment and to all the people around that building, thus making the environment in which it is most agreeable to all.

4. REFERENCES

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