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Study for designing a sustainable mall

Key Words: integrated sustainability, foundation of design, development effects, sustainable malls and design criteria.

CHAPTER ONE

• 1. Introduction

A shopping center, shopping mall, or shopping plaza is the modern adaptation of the historical marketplace. The mall is a collection of independent retail stores, services, and a parking area. They may also contain restaurants, banks, theatres, professional offices, service stations, etc. According to the epidemics of today like corona virus we need to use natural resources, local materials for construction, green courtyards, and solar panels to make the mall sustainable. So can we make the shopping malls sustainable ?

1.1. The research problem in how to integrate sustainability and the foundations of the design of traditional malls, where they must keep up with the current era and its developments, and how the development effect on the building spaces and its shape. This idea is new for the people, so how do people know about it, how do they use it in their lives, how do the sustainability malls attract the people, and how do the people will be interested in sustainability of malls.

Sustainability improves the quality of our lives, protects our ecosystem and preserves natural resources for future generations. Why should people go to sustainability and we must work with it in all new buildings because it is a future

direction of architecture and people will conserve resources such as electricity, so it will preserve the environment and reduce the risks facing the environment now, and this is one of the most important needs that represent a danger to humans.

1.2. The aim of the report is to have awareness of this type of building and that it is a principle that they will follow in their whole life and all the buildings that will be built in the future.

1.3. The objectives :

- to increase culture of sustainability
- to decrease the energy consumption by sustainable technologies
- to Improve sustainable design performance

1.4. Methodology:

Chapter one: Introduction

Chapter two: literature review

Chapter three: analytical examples

Chapter four: conclusion

CHAPTER TWO

2. Literature reviews

2.1. History of malls

Victor Gruen was the first to have designed the USA's first shopping malls in the early 1950s. He thought of them as complete communities. He said they were supposed to "provide the needed place and opportunity for participation in modern community life that the ancient Greek Agora, the Medieval Market Place and our own Town Squares provided in the past."

2.2.Fundamentals of designing commercial malls

The commercial activities of malls depend on the number of visitors and shoppers, which means that the flow of visitors is the main engine on which the activity and success of the mall is evaluated. When mentioning the large influx of visitors makes us think about the capacity of the entrances and corridors, it must be commensurate for an organized walk and a comfortable experience.

The entrances to the mall must be clear, and what is required is that they have a luxurious design and the most important aesthetic element in the overall design, so that high-quality materials and creativity are used, and the element of landscaping and plantings is used to enhance the view and importance of the mall. Also, the dimensions of the entrance in terms of height and width must be

consistent, because if it is low and not well lit in order not to cause disturbance to shoppers and to have an external distinction.

2.2.1. The area design

Determining the area is one of the foundations and steps of designing a commercial mall, as the engineer must address all matters in order to build an integrated mall.

When an individual builds a commercial mall that includes 26 stores, he needs a land of about 1,000 square meters, as the space depends on the size of the required mall.

The shape of the space must be rectangular so that the process of forming it is easy in the form of two rows, there is a corridor separating both rows, and the width of the corridor is 5 meters.

The area of the store shall be five meters, and thus the width of the land shall be 15 meters and not less than this, and also not more than 20 meters so as not to use an exaggerated space.

2.3. Mall design standards

The foundations and steps of designing a shopping mall and the design criteria depend largely on the flow of customers or customers, so that the corridors and entrances must be suitable for the entry and exit of customers in a comfortable and orderly manner.

It is important that the entrances to the mall be clear and designed in a luxurious manner, and it is possible to use plantings and landscaping in order to enhance the appearance of the mall, and the materials used must be of high quality.

The dimensions of the entrance, such as width, length, and height, are important to be consistent with each other, as they must be well lit and not low, as these things cause inconvenience to customers.

2.4 mall elements

The elements of the mall are among the foundations and steps of designing the mall, all of which must be available inside the mall. These elements are:

Entrances: These entrances should appear clearly and should be luxurious because they are a transitional place to the interior, and for this reason they should be distinguished greatly.

The main entrance hall: This area contains musical performances and movement paths also meet in it. It is possible that there are a number of cafes in it, and the floor of that area must bear the loads on it.

The elements available within the public spaces within the commercial centers: within this area there are guiding means as well as internal gardens in addition to children's play areas, and within that area there is water, which is very attractive.

2.4.1. Mall interface

Facades are one of the foundations and steps for designing a shopping mall, which must be consistent with all mall buildings, whether they are shops and offices, in addition to the rest of the buildings.

The entrance to the building is one of the most important things that receives the customer, as it is located within the facade of the building, and therefore the entrance must be distinctive, with a luxurious and elegant design, and it must be made of high-quality materials.

In the event that the mall contains 26 stores, the general shape of it will be 3 rows, equal in width and length, "a row in the middle for the corridor and two rows for the shops".

CHAPTER THREE

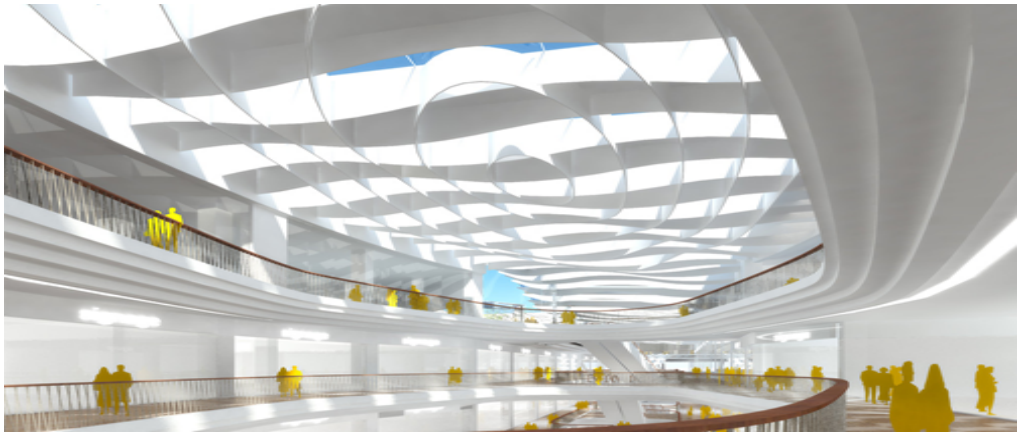
3. Analytical examples

3.1. Beirut city centre:

is a regional shopping mall located on Damascus Road in Hazmieh Quarter. Enclosed on all four sides by the adjacent highways, the project tries to maximize site usage with multiple levels of underground parking and a hypermarket, shops, restaurants and cinemas arranged over four floors above.

windows and activation. A concrete fin facade was developed that plays with the perception of the building from the adjacent highway flyover and creates an animated, ever-changing curtain of colour,

light and shadow during day and night.



The interior design of the mall creates a single unifying identity through the use of varying stone finishes, stepped slab edges, alternating bridges and escalators to allow visitors to perceive the entire length of the atrium space. An undulating steel rooflight constructed from structural fins provides daylight to all four retail levels and allows for views of the sky while providing shading and diffusion to prevent excessive solar gain. providing shading and diffusion to prevent excessive solar gain.

Project Info

Size 1,037,723 sq ft

Certification type	Level	Points	Certification date
LEED 2009 Core and Shell	Gold	62	December 09, 2013

The centre complies with the necessary qualifications to help reduce pollution, increase the effectiveness of energy sources such as electricity and water and encourage recycling processes.

- 18% improvement on baseline building performance rating
- 35% green power purchase

3.2. Green pea mall in Turin (Italy)

Green Pea is a sustainable shopping mall that opened its doors for the first time last month in Turin. It's a great destination to buy eco-friendly fashion and home goods.The building's inauguration took place on December 8th, 2020. The new shopping mall occupies 15,000 sq. meters on five floors and only stores sustainable products responsibly made in harmony with nature. Green Pea aims to change your relationship with energy, movement, home, clothing, and leisure. It describes itself as a place of beauty and respect to give birth to a new way of consuming.

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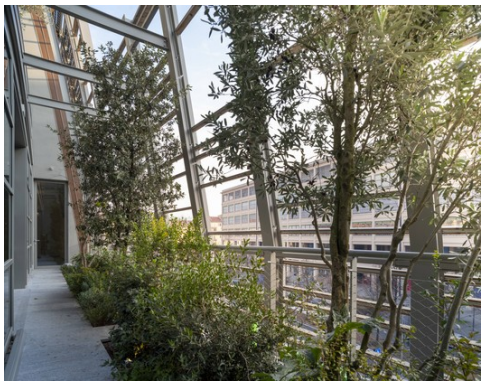
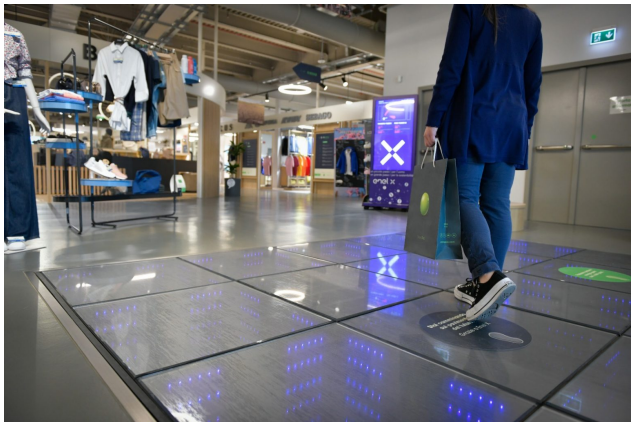
highly sustainable building, a manifesto built with new technologies and natural materials to convey, through architecture, the idea of respect for the environment and harmony with nature. The organic volume, with a particular multifaceted shape, is spread over five floors for a height of 25 m in continuity with the existing building line and extending the façade of Eataly. The North-South orientation and the flared shape of the top floor are designed to adapt to climatic and environmental conditions so ensuring the best distribution of solar radiation. The external envelope consists of a double level of surfaces.

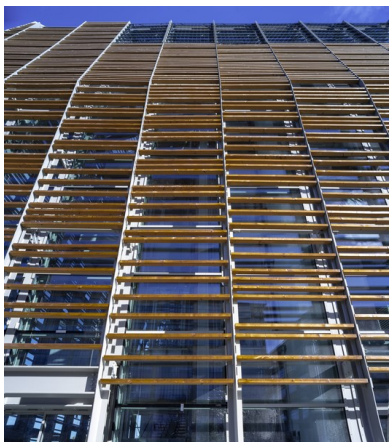


The interiors feature traditional materials such as natural lime and wood combined with luxury materials such as leather and velvets. The parquet is made with wood already felled for natural causes and then picked up along the river beds of the Val Varaita. The painting material neutralizes pollutants, prevents the growth of mold and microbes, and eliminates germs. From the plant engineering point of view, Green Pea offers a broad panorama of the different ways of producing energy through renewable sources: geothermal wells, photovoltaic panels, solar panels, mini wind turbines, smart flowers, up to piezoelectric floors capturing kinetic energy generated by the passage of users.

The entire building is built from sustainable materials, recycled parts and innovative sustainable solutions. Think of recycling natural resources like rainwater, or energy from the sun through solar panels, which feature over the entire construction. The mall also houses foods and clothing brands with a sustainable character.

By walking on the tiles, shoppers' weight produces energy which is used for all Green Pea activities that require electricity. For example, the energy that is generated can be used directly to charge battery packs for smart phones that visitors can use for free in the food court.





CHAPTER FOUR

4.1 Conclusion

In conclusion, sustainable architecture is crucial as a modern building technology because it has been demonstrated that using the technology reduces environmental degradation. Materials such as wood cannot be used in a sustainable manner because wood does not have renewable components. However, material such as steel can be used for renewable purposes because steel contains renewable components. Studies conclude that recyclable materials can be used for green construction that provide many benefits that include storm water management, efficient and good quality water usage, good indoor air quality, optimal use of energy, and improved health of the people. Despite financial, market, performance, green risks, architecture provides a better quality living and ecofriendly environment. In addition, the construction costs of the principles of green ensure low cost operational and insurance premiums are incurred by the users. However, the sustainable buildings are usually energy efficient making sustainable architecture the option to go for.

4.2 references

- https://architecturerealestate.wordpress.com/2019/05/02/principles-of-designing-a-shopping-mall/
- https://ongineering.com/ar/articles/shopping-mall-design
- https://www.greenpea.com/en/
- https://www.archdaily.com/955542/green-pea-retail-park-acc-naturale-architettura-plus-negozio-blu-architetti
- https://energy-floors.com/portfolio/green-pea-mall-sustainable-shopping/
- https://www.citycon.com/sustainability/sustainability-at-citycon/the-sustainable-shopping-centre