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Keywords: Updating aquarium museums - Renewing spaces - Redesigning - Educational environment - Sustainable design - museum development - Integrating technology.

Title: The role of interior design in the redevelopment and rehabilitation of Aquarium Museum in Qaitbay Citadel (Alexandria)

ABSTRACT It is a historical building that includes many fossils and extinct aquatic fish. It provides many different services that serve the individual, and reflects culture in all its stages, as it provides a suitable environment for carrying out various cultural activities, making optimal use of technological development, and achieving all the building's requirements in terms of providing architectural form. The external and the treatment of its internal emptiness.

العنوان:

دور التصميم الداخلي في اعاده تطوير متحف الاحياء المائية بقلعه قايتباي (بالإسكندرية).

الخلاصة : هو مبني تاريخي يضم الكثير من الحفريات والاسماك المائية المنقرضة ، حيث يقدم العديد من الخدمات المختلفة التي تخدم الفرد، ويعكس الثقافة بكل مراحلها حيث يوفر بيئة مناسبة لمزواله الأنشطة الثقافية المختلفة ، والاستفادة على الوجه الامثل من التطور التكنولوجي، وتحقيق كل متطلبات المبني من توفير الشكل المعماري الخارجي ومعالجة الفراغ الداخلي له.

Introduction:

A museum is a building that collects and houses collections of exhibits and valuable objects for the purpose of examination and study.

Museums have become a cultural mission and have multiple functions, including scientific, cultural, social, educational, behavioral, and others. In the modern era, museums have become one of the most prominent architectural elements of the twentieth century, where architects find a great opportunity to demonstrate their artistic vision. Studying the interior design of aquatic

museums, what they contain, and their relationship to technological development is based on the interior design of these museums, making optimal use of technological development, and achieving all the requirements of the building, including providing the external architectural form and treating its internal space. Nowadays, many aquatic museums have been built and developed in a good manner using modern techniques and technology. The Aquatic Museum in Alexandria appeared for the first time in the 1930s next to the historic Qaitbay Citadel, becoming the oldest marine museum in the Middle East. It offers its visitors a collection of skeletons of mummified marine creatures, and a collection of live and rare fish, some of which lived in the Mediterranean Sea and others in fresh rivers

المقدمة :

المتحف المبني الذي يجمع ويأوي مجموعات من المعروضات والأشياء الثمينة بقصد الفحص والدراسة .

أصبحت المتاحف ذات رسالة حضارية ووظائف متعددة تشمل العلمية والثقافية والاجتماعية والتربوية والسلوكية وغيرها، وفي العصر الحديث أصبحت المتاحف من أبرز العناصر المعمارية في القرن العشرين حيث يجد فيها المهندسون المعماريون فرصة كبيرة لإظهار رؤيتهم الفنية ودراساتهم التي تتناسب مع الطراز المعروض، وقد تم تصميم وبناء العديد من متاحف الأحياء المائية العامة في جميع أنحاء العالم .

إن دراسة التصميم الداخلي للمتاحف الأحياء المائية وما تحتويه وعلاقتها بالتطور التكنولوجي على التصميم الداخلي لهذه المتاحف، والاستفادة على الوجه الأمثل من التطور التكنولوجي، وتحقيق كل متطلبات المبني من توفير الشكل المعماري. و في وقتنا الحاضر تم بناء الكثير من المتاحف الأحياء المائية وتم تطويرها بصورة جيدة و استخدام التقنيات الحديثة والتكنولوجيا .

ظهر المتحف الأحياء المائية في اسكندرية لأول مرة في ثلاثينيات القرن الماضي بجوار قلعة قايتباي التاريخية ليصبح أقدم متحف بحري في الشرق الأوسط، ويقدم لزواره مجموعة هياكل لكائنات بحرية محنطة، ومجموعة أسماك حية ونادرة، بعضها كان يعيش في البحر المتوسط والبعض الآخر في أنهار عذبة.

Research Sample:

The research sample focuses on presenting designs for the redevelopment of the museum of mummified aquariums and the optimal exploitation of technology, with an emphasis on reviving the concept of sustainability in the materials and resources used.

The Scientific Methodology of the Research: Descriptive-analytical approach.

Research Problem:

With the increase in technological development in Egypt, this results in the fact that many existing museums must be developed to keep pace with the developments of the times using modern technologies, and one of the museums that must be developed is the Museum of Stuffed Aquariums in Alexandria. Due to the lack of capabilities in Alexandria, the museum of mummified aquatic organisms in Alexandria lacks many of the capabilities and modern technologies that should be available, and this helps to develop tourism and interest in aquatic biology to a greater extent.

Developing the interior design of the Mummified Aquarium Museum in Alexandria, which lacks interior design capabilities such as ceiling and floors. Developing the display method to be a better way to display exhibits through the use of modern technologies.

And expanding movement corridors inside the halls.

Research Objectives:

The research aims to redevelop and rehabilitate the interior design of the Museum of Mummified Aquariums in Alexandria and to clarify the role of technology and modern techniques in the interior design of the museum through:

- Study the interior design of the site well.
- Emphasizing the importance of using modern techniques and technology in developing the museum's interior design.
- Monitoring the influence factors through the development of treatments and ideas for the determinants of the museum's internal space

Research Hypotheses:

In building the museum, specialization and harmony between the museum and the exhibits must be taken into account, while also taking into account the form of the building. It may be composed of several parts or wings in which the exhibits are distributed, and it must be taken into account that the transition is easy from one wing to another .

- It is better for the museum to have a wide horizontal spread, and for its layers to be few to prevent noise and to smooth the flow of traffic within the museum

When building the museum, it must be taken into account that it is capable of possible expansion over time. - Providing public facilities, services and accessories necessary to coordinate administrative and technical work together Providing public facilities, services and accessories necessary to coordinate administrative and technical work together. Movement paths must be taken into account by providing good movement paths suitable for use and taking into account green spaces .

Expected Research Outcomes:

1. Using eco-friendly materials to make the museum environmentally friendly, ensuring it does not impact future generations.
2. Integrating modern technology such as interactive screens and smart spaces to stimulate the learning and creativity process.
3. Providing a practical model that can be applied in real life.

The Road Under Study :

By examining the site, we find that it is located next to Qaitbay Citadel in Alexandria and is surrounded by the Mediterranean Sea on all sides.

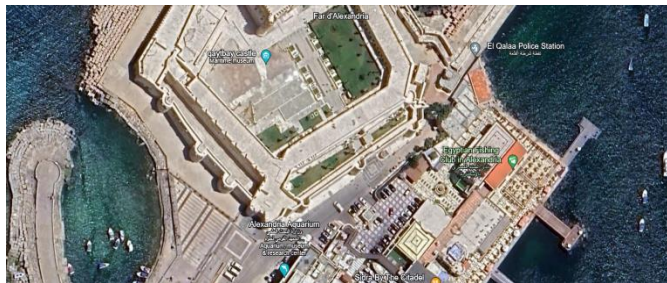


Figure (1) The geographical location of the museum shows the mummified aquatic organisms

Geographical Location:

It is located in the Al-Anfoushi neighborhood next to Qaitbay Citadel on the eastern coast of the city of Alexandria in the Arab Republic of Egypt. It was established in 1930 AD, and it includes an institute for research related to aquatic life next to it.



Figure (2) illustrates the geographical location of Aquarium Museum in Qatibay Castle in Alexandria.

History of aquarium museum in qatibay castle:

The building of the Aquarium Museum is distinguished by its historical status thanks to its proximity to Qaitbay Citadel, and this distinguishes it from other data due to the privacy present in the building, which makes the interaction attractive and effective in attracting visitors in the two areas of the museum and the citadel.

Nature of Activity:

As the place has the smell of heritage and nobility, as it is generally associated with the military and historical style of Qaitbay Citadel, as it is based on the design idea being part of the citadel, and thus the Aquarium Museum is classified as the most famous sea castles not only in Egypt, but in the entire Arab region.

It was built in a military style and symbolizes the antiquity of the place.

Therefore, the museum has a distinctive facade with a historical style. This facade must be exploited for the benefit of the building through good design and the use of modern technologies in developing it without changing its hobby.

Nature of the Buildings Surrounding the Site:

Next to the aquarium (stuffed) museum is the Qaitbay Walk

It is considered a tourist walkway with a large number of merchants for sale, and it is close to the building site, which leads to noise

Due to the congestion of the walkway, this is considered one of the problems facing the building, and a solution must be found for it.

On the other side there is the Aquarium Museum and the Scientific Research Institute

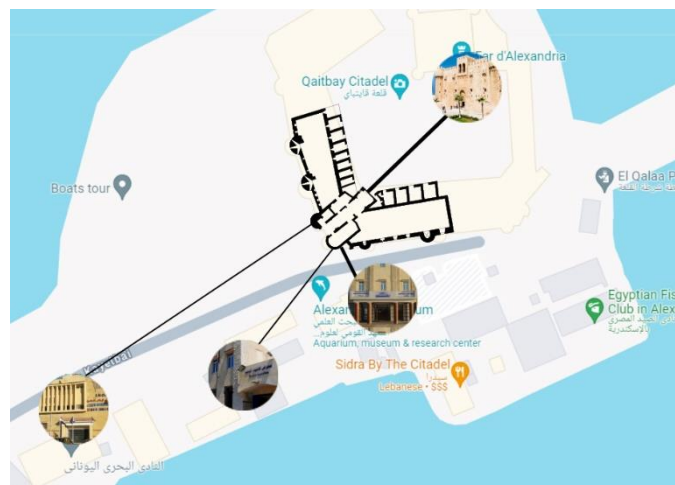


Figure (3) illustrates the surrounding environment.

Climate:

Alexandria is characterized by a moderate climate, as the Mediterranean climate prevails, which is characterized by hot, dry summers and humid, moderate, and rainy winters.

The prevailing winds in Alexandria are northwesterly winds

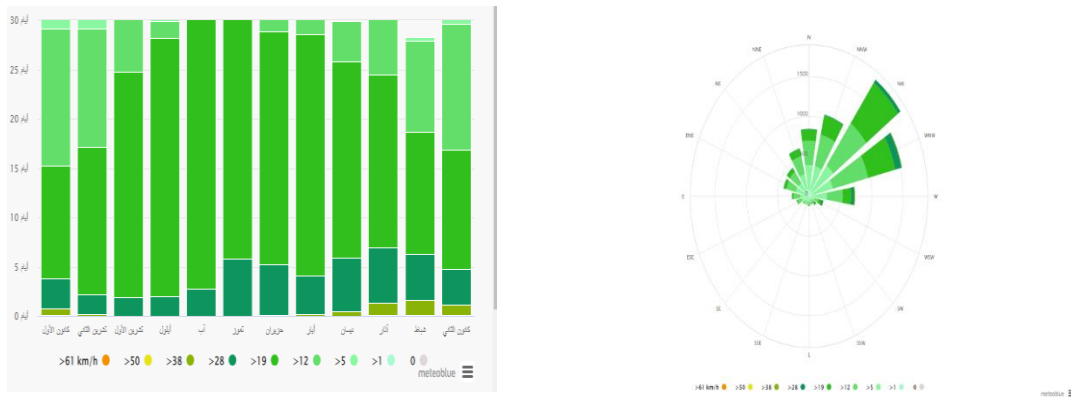


Figure (4) illustrates the climate of alexandria, Egypt.

Building Issues:

There is noise in many buildings surrounding the site, such as the tourist walkway, the castle, and next to restaurants and cafes

Therefore, the design and development of the museum must take into account finding a solution to this problem, such as making sound insulation from specific materials, such as sustainable materials.

Since the museum is surrounded by the sea from all directions, this means that there is high humidity in the place that must be overcome and resolved well so that it does not affect the exhibits and other display units inside the museum.

Openings must be made inside the museum in the walls from above to allow air to reach all parts of the museum's rooms, and artificial ventilation must be created inside to get rid of unpleasant odors.

Make these openings in the direction of the strong wind.

To avoid undesirable winds, it is possible to place plant elements in the courtyards of the building

Zoning :

The current spaces are:

- Reception hall
- Ticket room
- Storage Room
- Electrical Room
- Show rooms
- Hall
- Gift shop
- Manager room

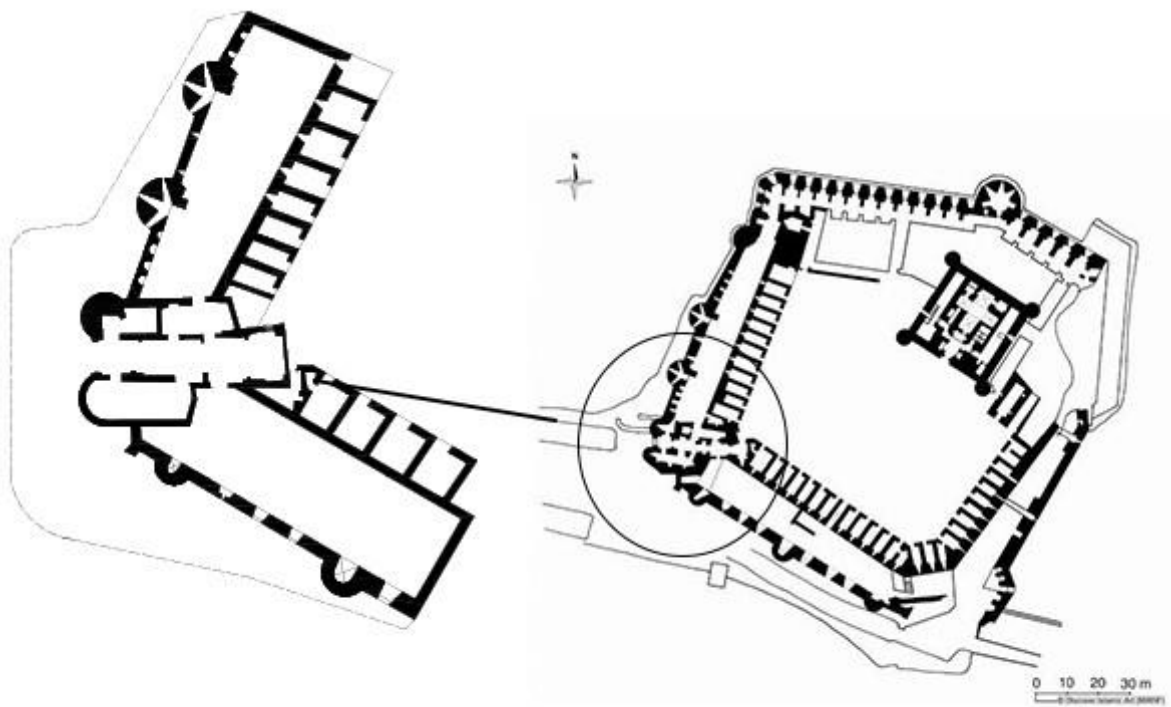


Figure (5) The floor plan of aquarium museum in Qaitbay castle in alexandria

Architectural Details:

The Design: The building is characterized by its complicated form, featuring straight lines and sharp angles and disordered lines

Materials: Steel around the supporting structure

Use sound insulation to prevent noise in the place because there is a lot of noise in the surrounding buildings

Tempered glass: Tempered glass is characterized by its resistance to moisture and exposure to water, and it can be used in coastal areas to form windows and doors.

Gypsum: is used to achieve fluidity in interior design and to highlight abstraction and simplicity in design.

Colors: The colors used are inspired by the color of the facade of the Aquatic Museum in Qaitbay Citadel and the color of the skeletons

Units that must be available at the Performing Aquarium museum in Qaitbay castle :

The Performing **Aquarium museum** requires the provision of a variety of units include:

1. show room.
2. Hologram area
3. Reception
4. Café and restaurant
5. Manager room
6. Activity room
7. Shark skeleton area
8. Whale skeleton area
9. Storage Rooms
10. W.c

Impact of Sun Movement on the Interior Space:

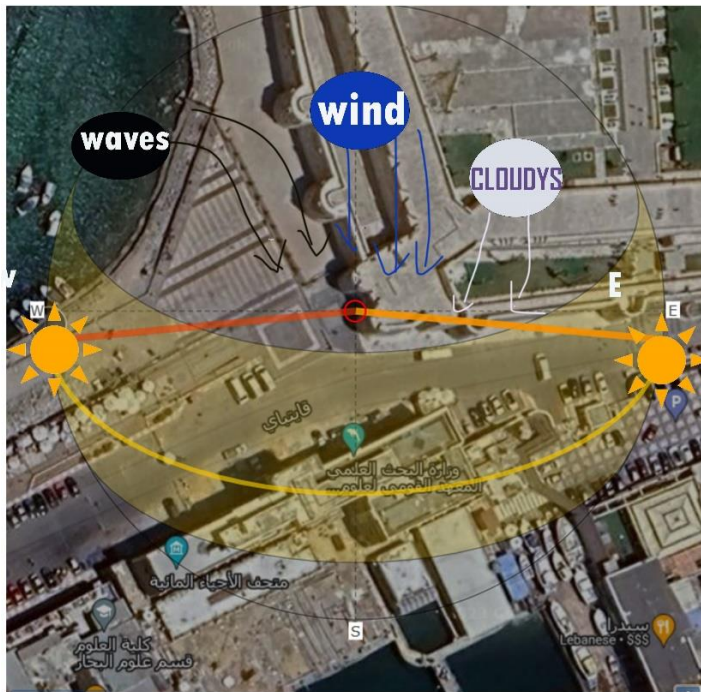


Figure (6) illustrates the effect of the sun's cycles on aquarium museum in Qaitbay castle in alexandria

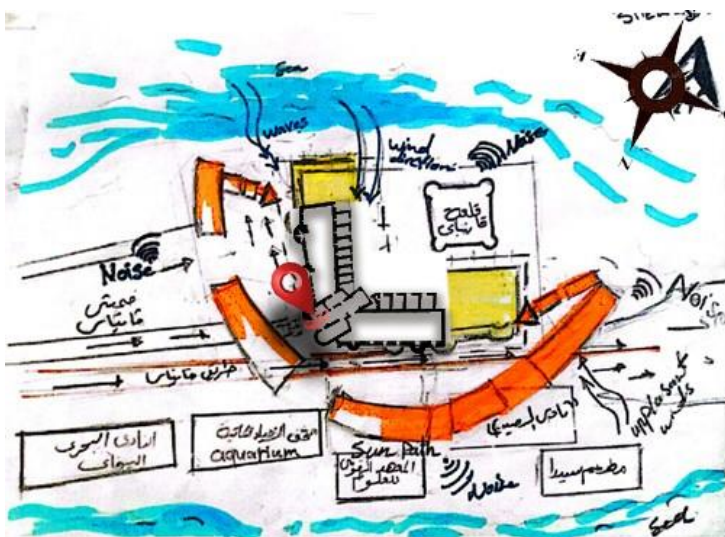


Figure (7) An illustration showing the buildings surrounding the site, the direction of the sun, favorable and unfavorable winds, and noise aquarium museum in Qaitbay castle in alexandria

Case study: National Museum of Qatar / Ateliers Jean Nouvel

The project covers an area is 52,000 square meters. The National Museum of Qatar is located in Doha and was opened in March 2019. The building was designed by architect Jean Nouvel, inspired by the famous desert rose crystal in Qatar.



Figure (8) National Museum of Qatar



Figure (9) It shows the general location of the Qatari Museum and that it is surrounded by the sea from all directions

The Design Concept:

The concept behind the design of this monument is as noble as the motivation behind its construction. It is inspired by the **desert rose**. In the words of Pritzker Laureate: “The desert rose, a flower-like cluster of mineral crystals found only in arid coastal regions



Figure (10) illustrates the Design Concept of the National Museum of Qatar

Matairals :

Since the new museum is dedicated to the history of Qatar, it is designed to evoke the eternal dimension and fluidity of the desert. Taking the Desert Rose as a starting point, the team designed a 350-metre-tall building with a series of large inward-curving discs. These distinctive discs define the museum's formal approach and its spatial experience throughout

The building skin is made of high-performance fiberglass reinforced concrete that has the same color as the sand inside and outside the building.

It consists of large interlocking discs with large interlocking discs of different diameters and angles that form supports.

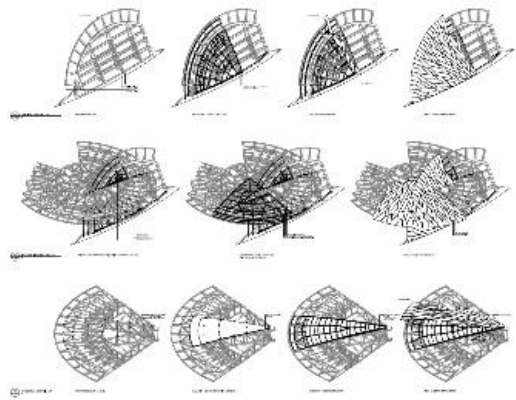


Figure (11) Explains the idea of interlocking disks

Zoning:

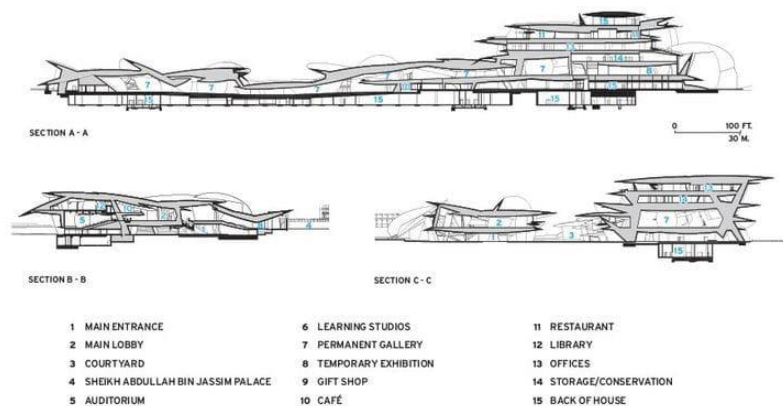


Figure (12)
It shows the vertical plans of the Qatari Museum and the division of zones and spaces.

Original plan :

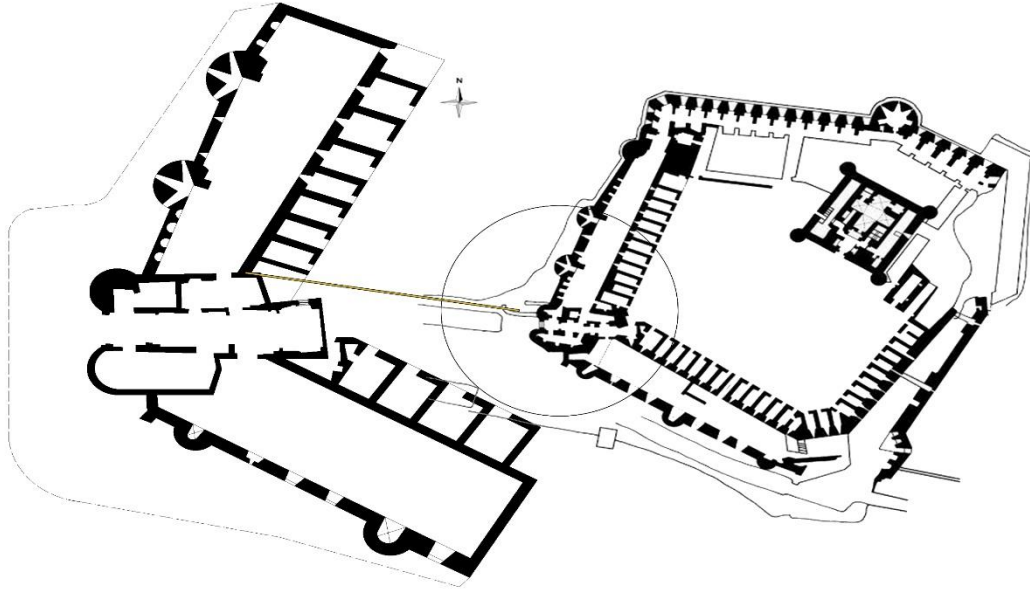


Figure (13) illustrates the original floor plan of Aquarium museum in Qaitbay castle in Alexandria.

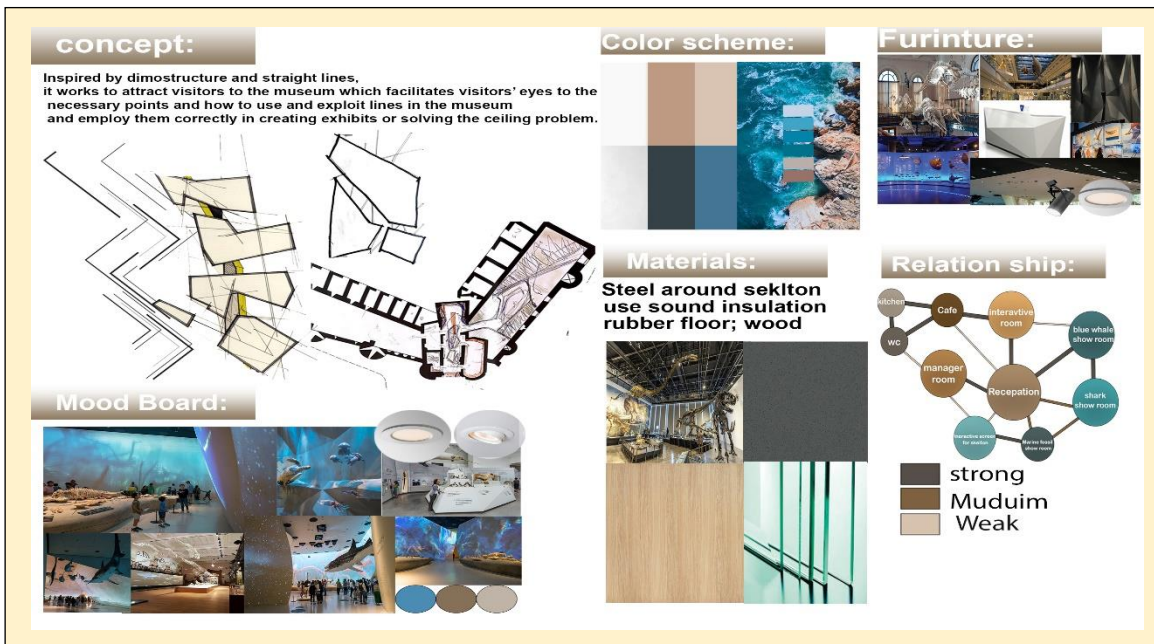


Figure (14) illustrates the mood board, materials used, and furniture and concept and relationship in the Aquarium museum in Qaitbay castle in Alexandria.

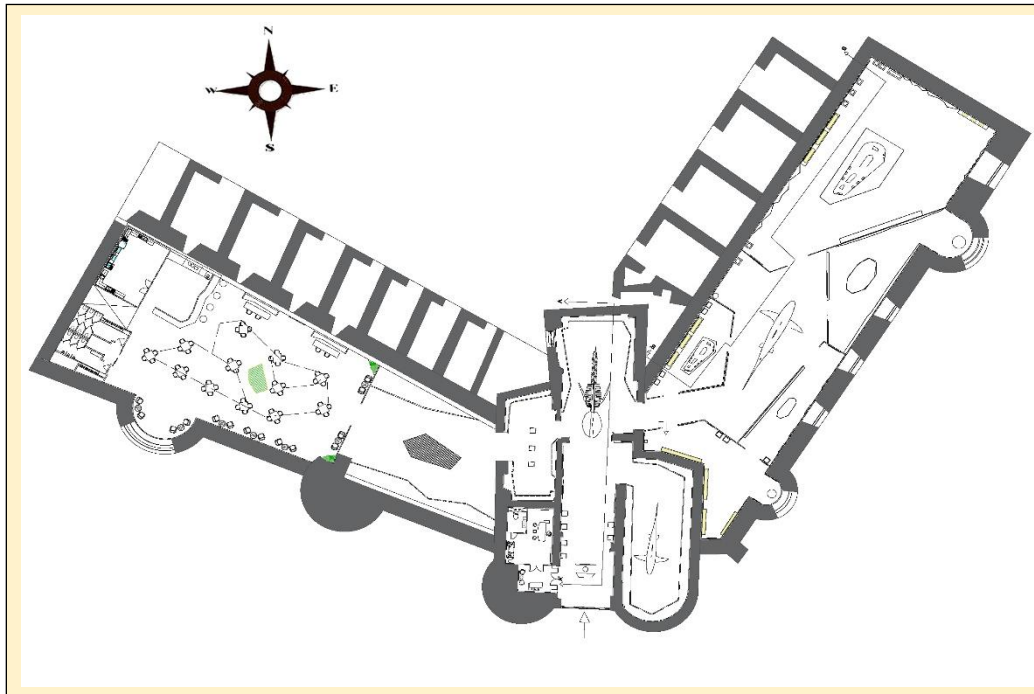


Figure (15) The plan of aquarium museum in Quitbay after development.

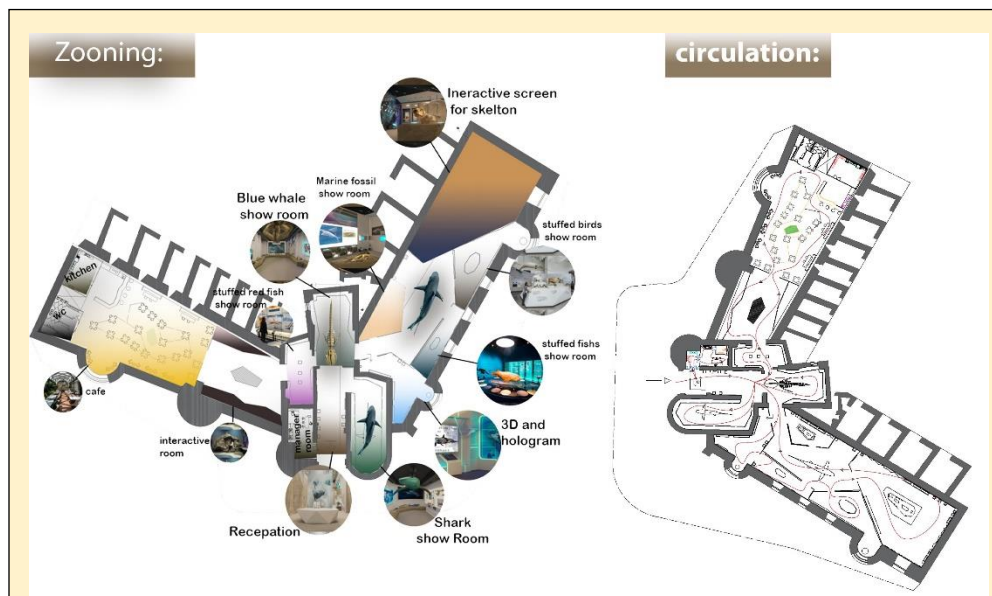


Figure (16) zoning and circulation of the of aquarium museum in Quitbay after development.

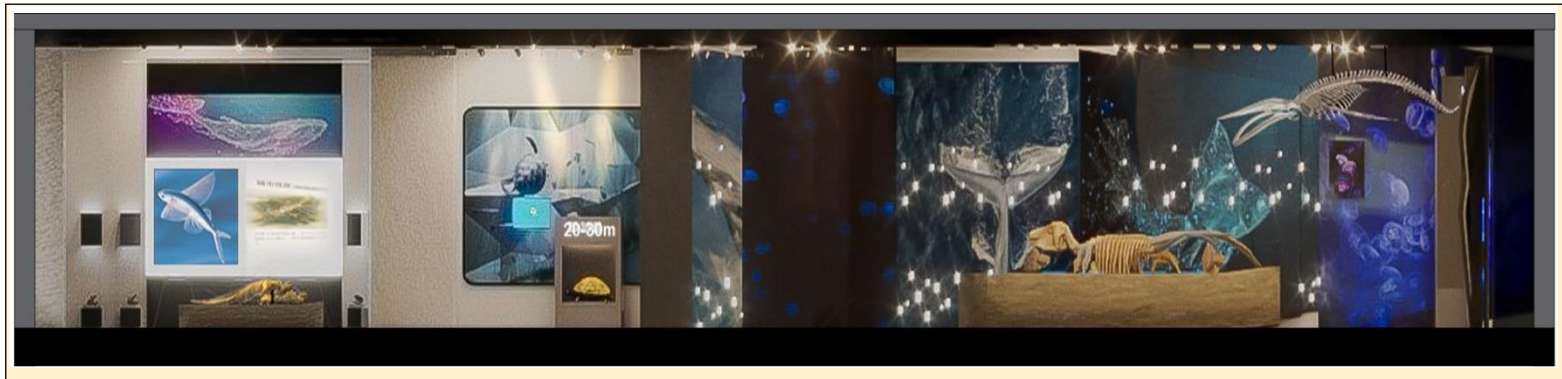


Figure (17) illustrates the longitudinal section of design A-A aquarium museum in Quitbay after development.

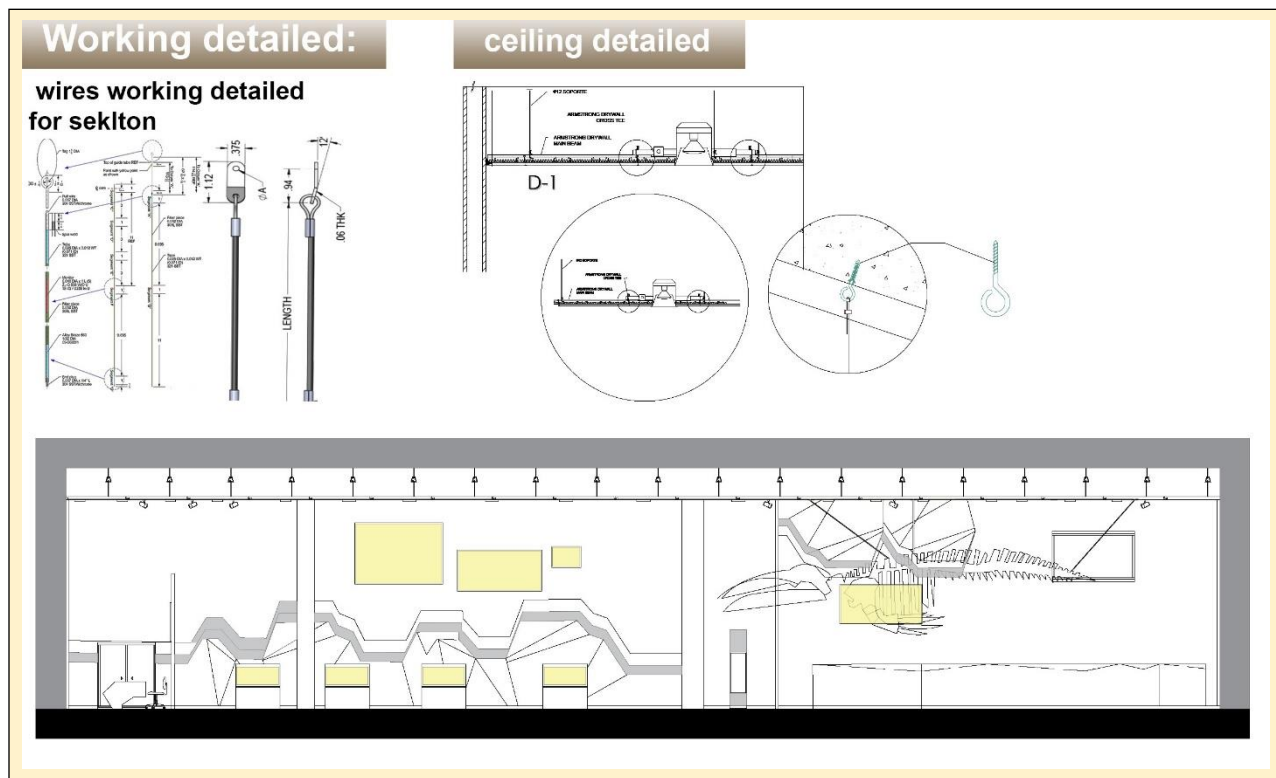


Figure (18) illustrates the longitudinal section of design B-B of aquarium museum in Quitbay after development.

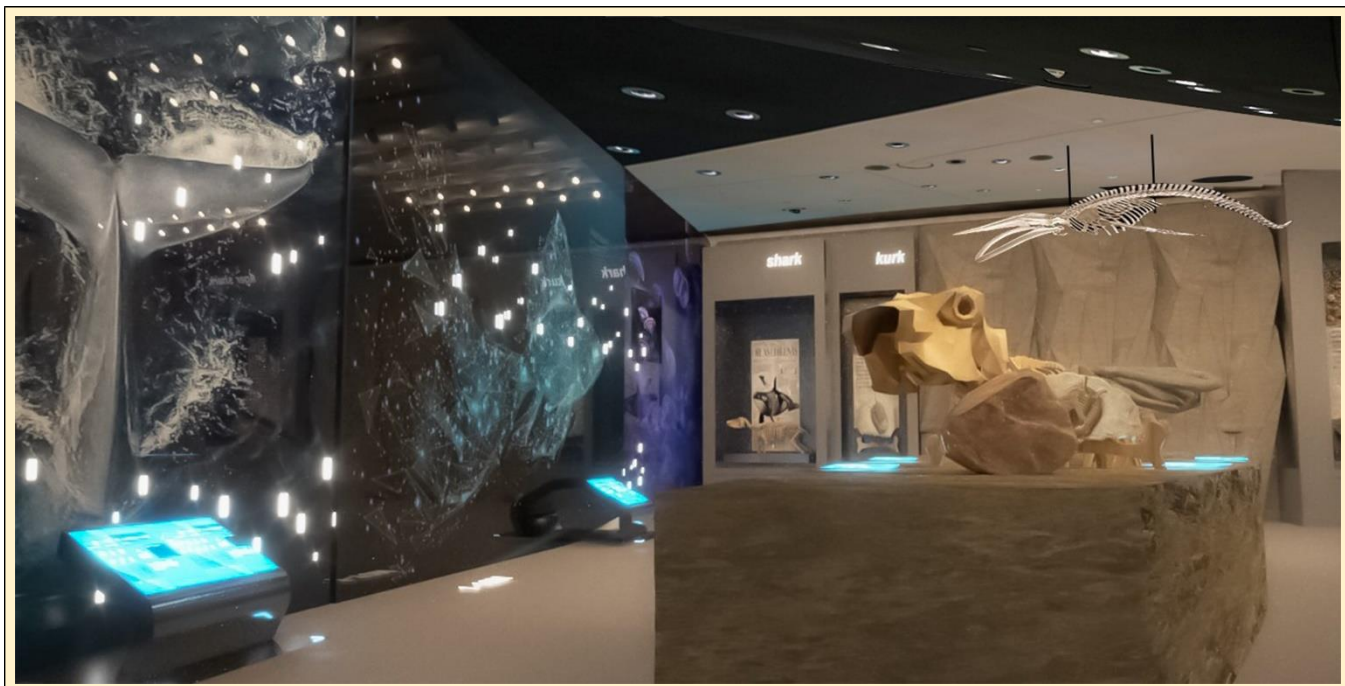


Figure (19) illustrates Interactive screen for skeleton of aquarium museum in Quito after development.



Figure (20) illustrates reception area of aquarium museum in Quito after development.



Figure (21) illustrates shark skelton area of aquarium museum in Quitbay after development.

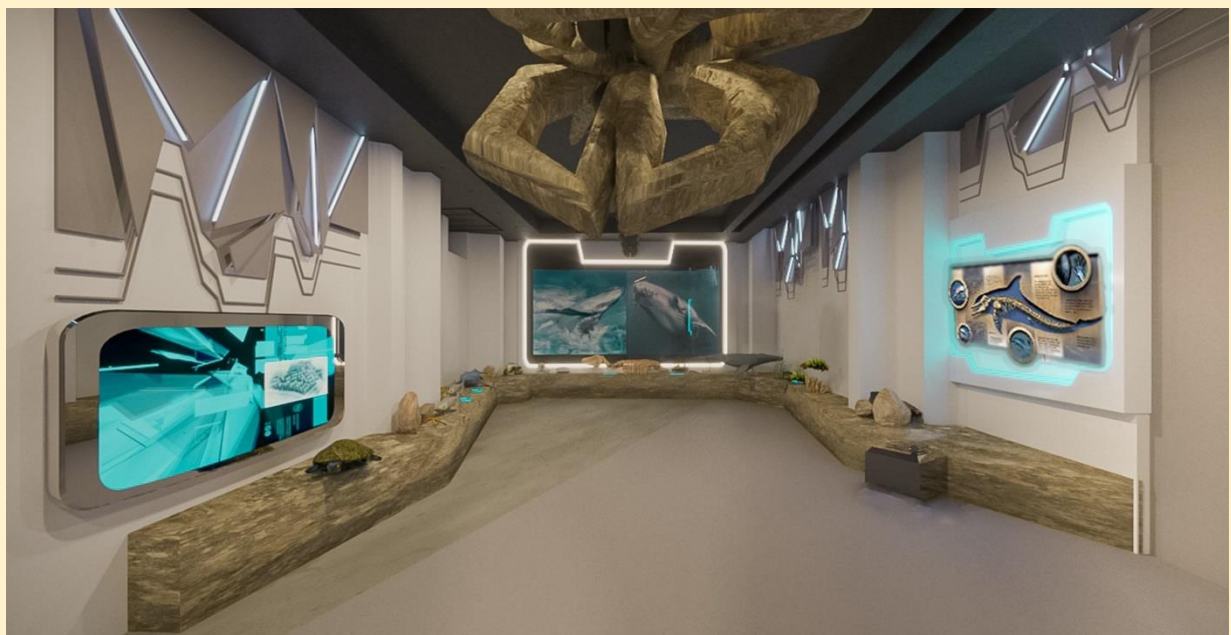


Figure (22) illustrates blue whale skelton area of aquarium museum in Quitbay after development.



Figure (23) illustrates marine fossil for hologram area of aquarium museum in Quitbay after

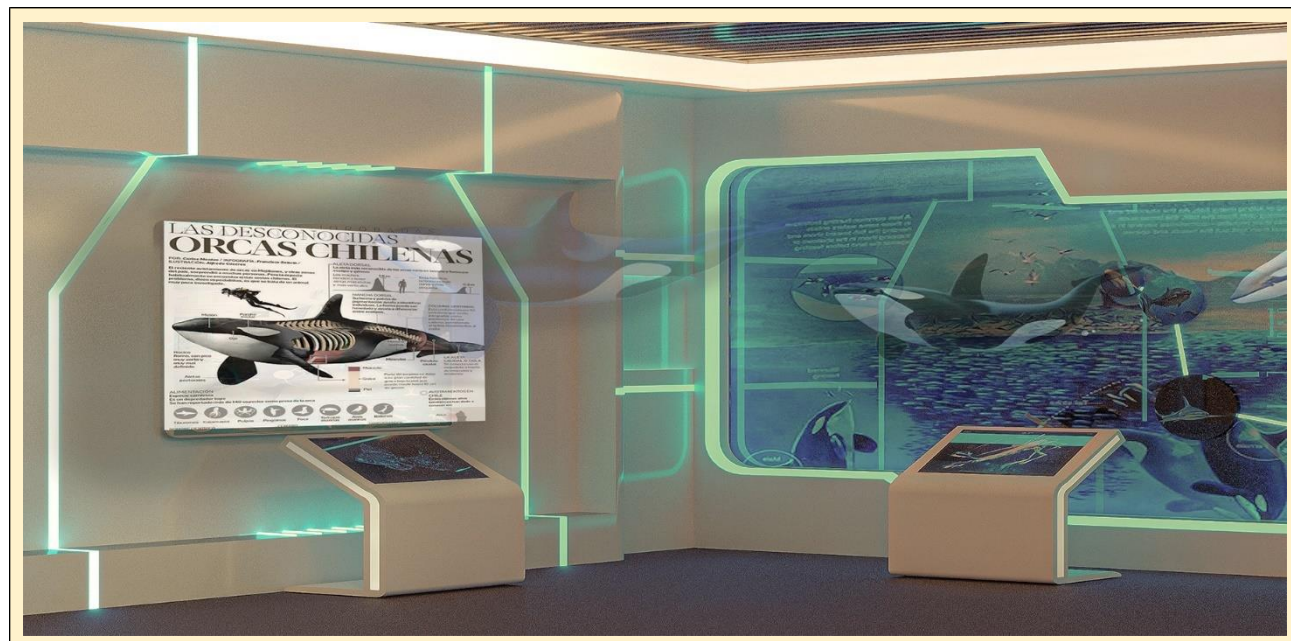


Figure (23) illustrates 3D and Hologram area of aquarium museum in Quitbay after development.

Design Standards for Achieving Sustainability through the Use of Natural Materials in Interior Design for Aquarium museum .

1. Selection of Natural and Sustainable Materials:

- Use renewable resources such as **wood**, **bamboo**, and **cork**.
- Opt for durable materials like **natural stone** and **concrete** that require minimal maintenance and have a long lifespan.

2. Promoting Local Sourcing:

- Use materials sourced locally to reduce transportation emissions and support the local economy.
- Highlight regional craftsmanship and techniques to connect the design with the local culture.

3. Non-Toxic and Eco-Friendly Finishes:

- Avoid materials treated with harmful chemicals. Instead, use non-toxic finishes like **natural oils** or **water-based sealants**.

4. Maximizing Natural Lighting and Ventilation:

- Incorporate materials that enhance the use of natural light, such as **glass partitions** and **light-colored surfaces**.
- Pair natural materials with designs that support cross-ventilation, reducing reliance on artificial cooling systems.

5. Water-Resistant and Low-Maintenance Materials:

- Use materials like **treated natural wood** or **bamboo** in spaces prone to moisture.

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