

Urban renewal of heritage sites and re-planning of waterfronts in historical areas “case study of the vicinity of the historic Qaitbay Citadel in Alexandria – Egypt”

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Abstract:

The rehabilitation of heritage sites in line with the revival of the historical waterfronts. The study focuses on the Qaitbay Citadel area as an urban model as one of the most important historical cultural tourism areas in Alexandria and how to maintain the continuity and development of tourism with its cultural heritage value. Within an integrated framework for preserving the urban heritage of historic waterfronts, a new design proposal has been conducted to preserve the urban heritage, while keeping pace with the functional tourism requirements of the area. Furthermore, it reviews the analysis of the physical and design conditions based on old maps, photographs, questionnaires and a SWOT for rehabilitating the area to be an economic center and a tourist attraction. Major results of the study include; the redevelopment process aims to preserve the remaining heritage to revive the identity, restore and improve landscapes that have changed and deteriorated due to human activity, enhance and improve the landscape to revitalize the tourist waterfront. The waterfront was designed using flexible elements that allow it to adapt to the new variables to support the long-term development and success of the waterfront redevelopment and to enhance visual interest. It was concluded that coastal cities can create a distinct sense of place by preserving valuable heritage and historic buildings to attract visitors and investors. Therefore, new developments or major improvement must be complemented by the old urban fabric while preserving their distinctive features to support the city's identity.

Keywords:

Waterfront, Landscape Design, planning approaches, public place, Urban renewal, Heritage sites, Restoration policies sustainable development

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Introduction:

Cities represent a dynamic and vibrant entity that changes in line with the continuous changes and requirements of redevelopment. Cities differ according to their location and characteristics. Either coastal cities that have geographical features with a view over the coast, where the sea always represents a major part of the societal culture and an element of the landscape through which the city is formed (Erkilic 2019), or historical cities that have a heritage value.

waterfront design are important issues that have a strong impact on the mental image of the city. Urban coastal areas are defined as "urban areas in direct contact with water." which is generally defined as the sphere of interaction between urban development and water (Timur 2013).

They can also be defined as general urban spaces that would give the city a better quality living environment, as shown in Fig. 1. (Orianna Giovinazzi 2010)

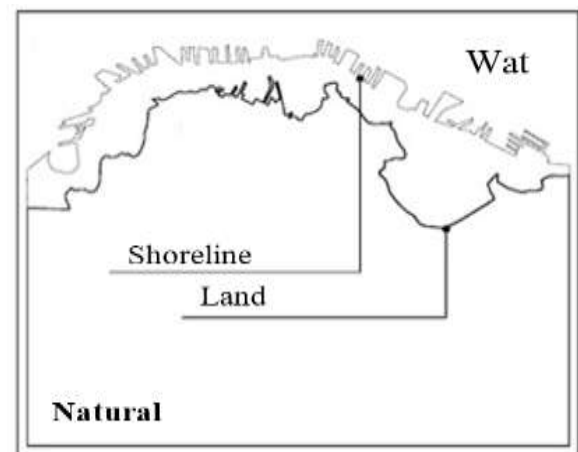


Fig. 1: Natural Edge for waterfront

Over the past two decades, there has been more interest in developing waterfronts around the world to improve the image of coastal cities, as the renewal of the waterfront is capable of linking with the past and the future in addition to providing opportunities for development.

In spite of the challenges that the historical cities

face in developing waterfronts, the effective planning of these cities focuses on the possibility of making use of public spaces while preserving their historical value many problems have recently resulted in the ineffective planning of the policies followed by some cities, which showed that the urban quality of the waterfronts was not suitable in most cases (Cialdea 2020).

The main goal of redeveloping the waterfront of historical cities is to increase the number of tourist

attractions. Therefore, the design focuses mainly preserving the cultural and historical values and trying to meet the growing demand for the provision of recreational and commercial activities, while ensuring the constant survival of natural resources and preserving the historical character of the site.

In order to reach design solutions and principles, the problem must be defined in light of the resources and methods considered in Table (1).

Table (1) defining the problem and studying resources and methods

Defining the problem	Resources and methods
<ul style="list-style-type: none"> The development of the urban waterfront on a large scale is considered the beginning of a contemporary urban development with the aim of attracting investment. Furthermore, it is highly challenging to develop waterfronts that have a historical character where they represent a design problem by creating a design identity with a new vision while preserving its general character. Restoring the design identity of the study area. This requires knowing the importance of having a comprehensive plan for the waterfront to avoid the previous design mistakes in the future (Frederick R. Steiner 2006). 	<p>The policy of upgrading heritage areas is based on two main approaches:</p> <ul style="list-style-type: none"> The first approach: preserving the existing heritage entities. In order to implement this approach, the facades of all the built-up blocks must be reformulated in line with the general heritage of the area in order to unify all the spatial character of the design. The second approach: enhancing and raising the efficiency of the present solid and void spatial entities and finding design solutions to provide new jobs and spaces to improve the various types of public use and tourism in the area.

Therefore, the research paper aims to raise the efficiency of heritage areas in the city, especially waterfront areas, through the development of an integrated proposal that follows a conservative approach to redevelop heritage areas. Therefore, it is possible to produce horizontal and vertical designs that have a reciprocal relationship between heritage and contemporary buildings in line with the country's approach for comprehensive development since the early 2000s to upgrade the seafront heritage area. This can be applied to the area of Qaitbay Castle in Alexandria, Egypt, while preserving the character and urban identity of the area, Fig. (2).



Fig. 2: The ancient Citadel of Qaitbay, Alexandria

The research introduces the Analytical Hierarchy

Process to develop a design proposal for the heritage waterfront with the aim of preserving it, achieving sustainable development and develop the design proposal for the study area, taking into account the ecological dimension of water bodies as well as suggesting multiple new uses along the waterfront emphasizing the identity and authenticity of the site by following five points as shown in Table (2). (Frederick R. Steiner 2006)

Table (2) Process Hierarchical Analysis

1	Conducting a questionnaire to find out the requirements for environmental, social and physical activation and community involvement	Analytical Hierarchy Process
2	Doing a SWOT analysis to identify the study area	
3	Identifying the types of tourist attraction waterfronts	
4	Interpretive Analysis (Analyze the Citadel Qaitbay Area): Using standard urban design analysis techniques to analyze the area in terms of (a) Character (b) Continuity and enclosure (c) Quality of the public realm (d) Ease of movement (E) Legibility (f) Adaptability (g) Diversity	

- The implementation phase and the practical design of the study area based on three principles and standards for sustainability (social, environmental and economic standards) as follows:
 - a. **Alternative Concepts**
Developing a series of alternative urban design concepts -based on documentation and analysis- which are represented in the design form.
 - b. **Illustrative Design and Guidelines:**
Establishing a set of urban design guidelines for this area, which takes into account all the negatives and problems that existed in the study area, according to the questionnaires.
 - c. **Lavout: Urban Structure**
How to connect roads and open spaces together
 - d. **Landscape**
The nature and appearance of the earth, including its shape, natural features, colors, and the way these components are combined. This includes all open spaces.
 - e. **Density and Mix**
The range of development and uses that can affect the vitality of the place.
 - f. **Scale: Height**
The scale is the size of the building in relation to its perimeter, especially in relation to the size of the users of the different spaces.
 - g. **Scale& Massing**
The accumulative effect of the arrangement, size and shape of the building and the relationship of the buildings' functions in relation to other buildings and spaces.
 - h. **Appearance: Details**
Building techniques, interior design and architecture, lighting patterns for exterior buildings or surfaces.
 - i. **Appearance: Materials**
Texture, color, pattern, durability, materials and their usage as the building's richness lies in its use of materials that contribute to its attractive appearance and suit the nature of the area.

➤ **A case study of the study area, Qaitbay Citadel area :**

The Qaitbay Citadel waterfront represents a façade full of rich history that is represented by archaeological buildings which adds a historical value to the area that the visitors enjoy **Fig. (3)**. On



Fig. (3): The ancient Qaitbay area, Pharos Island - the eastern port, Al-Gomrok neighborhood (Al-Anfushi).

The weaknesses of this area were summarized in the following points:

- The absence of the visual contact between the visitors, the castle area and the beach due to the high fence.
- The lack of an architectural identity of the surrounding buildings and the use of materials and elements that cause visual distraction
- Overlapping of vehicle and pedestrian traffic lanes which leads to insecurity
- The lack of suitable seating for the visitors of the area
- Failure to provide sale units for the vendors in a

the contrary, the buildings on the opposite side are modern buildings that do not have a distinctive character or different uses." Therefore, the main idea of the redevelopment of this area is to create a cultural and touristic point that adds a distinctive sense to the urban space, **Fig. (4)** (**CEAlex 2020**)

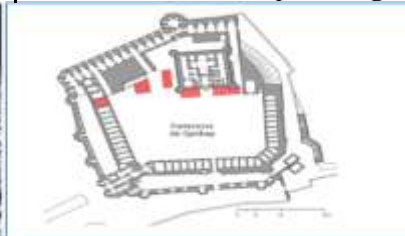


Fig. (4): Plan of the Citadel site with archaeological soundings

manner that follows a well-studied design methodology.

The research proposes an integrated development of the study area, taking into account the provision of all design capabilities to make maximum use of the surrounding areas, restore the tourist value of the area and make it more luxurious.

1. Documentation and Analysis

The initial analysis process for the development of the vicinity of Qaitbay citadel begins with the Analytical Hierarchy Process by conducting a questionnaire that includes different groups of the local community in Alexandria Governorate. The target sample included site users, whether sellers or

renters of various commercial spaces, in addition to the site visitors from different groups to reach the optimal needs and involve the local community in the decision-making process. The researchers made a field visit to the heritage area and its surroundings, listened to and made questionnaires for different groups of visitors and frequent site users (from residents of the area, local visitors, and tourists).

▪ **The questionnaires results can be summarized as follows:**

- The lack of stable and secure sales units for the street vendors around the castle
- The lack of green spaces, kid's areas, and a pedestrian path.
- The lack of seating and umbrellas.
- The lack of an administrative building for informational support and tourism agencies.
- Remodeling, restoration and redevelopment of the buildings in the study area (Clubs Building, Research Centers....).
- The lack of parking spaces for cars and tourist buses.
- The lack of service and tourist areas (yachts berths - a diving center - restaurants - cafeterias) due to the presence of the castle in the area

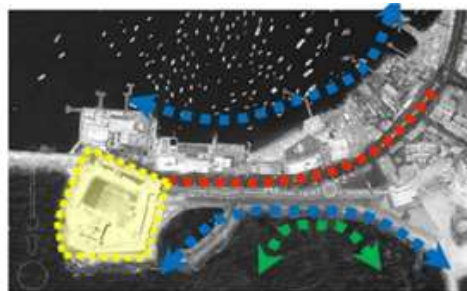


Fig. 5: The relationship of Qaitbay Citadel to the surrounding environment

2. Conducting a SWOT analysis; "an analytical decision-making method" to determine the characteristics and potentials of urban areas
3. **Ecological design:** the study area represents a waterfront of a special nature, as the location of the castle on the edge of the sea gives an opportunity for innovation in design and the provision of surfaces for recreational uses for the visitors of this area. The distinctive location of the castle, its relationship with the water rim and the presence of buildings on one side gave an open view angle to the other side of the waterfront, (Breen and Rigby 1996) which does not represent a direct connection to the visitors of the study area with the surrounding buildings. Thus, the visitors of the area and the waterfront can be separated from the visitors of the service buildings on the opposite side. The other side under study represents an open angle to view the sea, which gives enough space to construct and design multi-use functional surfaces. By studying the current situation, it becomes clear that there are three main tracks:
 - Pedestrian path (green)
 - Car lanes (red)
 - The presence of stairs that obstruct the view of the sea (yellow color)



Fig. 6: The three paths in the current position (pedestrian path – car lanes – (vertical staircase path)

S Strength	W Weakness	O Opportunit	T Threat
<ul style="list-style-type: none"> - The area has a historical identity. - A privileged location close to the city center and the city's distinct landmarks. - Easy access to the site and also to the waterfront by public transport. - Tourist attraction. - The proximity of the site to the sunken antiquity zone. 	<ul style="list-style-type: none"> - The deterioration of the architectural character of the buildings near the study area. - Renting bicycles to a large number of visitors to ride. - Its proximity to the fish market - The spread of street vendors. 	<ul style="list-style-type: none"> - The area can be developed culturally and economically. - A site that is a good investment and tourist attraction. - An opportunity to increase the cultural, heritage and civilizational awareness of the city. - Finding opportunities to provide recreational facilities in the area. 	<ul style="list-style-type: none"> ○ Decreased levels of awareness among the residents and the spread of royalties and bullies.

In addition to the waterfront's lack of attractive urban design elements, such as green spaces, seating benches, umbrellas, water and night lighting units, in addition to studying how to

use the front yard in front of the castle.

Interpretive Analysis: When analyzing the study area according to the principles of urban design.

Table (3) Analysis of the study area according to the principles of urban design

Character(a)	Continuity and enclosure (b)
<ul style="list-style-type: none"> ▪ The area has a distinct identity as most of the surrounding buildings have different uses and functions <ul style="list-style-type: none"> ○ Cultural and educational buildings such as the Faculty of Marine Sciences ○ Recreational buildings such as Al-Saied (Shooting) Club building and the Greek Club ○ Public buildings and private buildings. These buildings range in height from 3 to 15 meters. <p>The general design condition of these buildings is poor, both in terms of the finishing materials and their lack of an architectural character that is upgradeable and compatible with the architectural character of Qaitbay Citadel. Thus, their presence in their current status reduces the importance of the study area, which confirms the importance of a complete design redevelopment.</p>	<p>The study area, in its current condition, is not clearly distinguished by the public and private spaces of the existing buildings facing the castle. The yard is open with no current limitations.</p>

Proposal Design:

The historical importance of the Qaitbay Citadel building was taken into account. Thus, it represented the top point in the design proposal. In addition, the distribution of the proposed facilities

within the design space was taken into account in accordance with their functional proposal so that they do not form any visual obstruction that obstructs the view of the Qaitbay Castle building. **Fig. 7-A-B** represents the research proposal.



Fig 7: Proposed Building Height Map (the researcher)



current situation

(the researcher)

Fig. 8: The solid and void percentage, and the percentage of green areas in the study area

Despite the presence of the castle as a tourist attraction area, the percentage of the blocks built in the Solid and Void plan shows that the space ratio is large. In addition, the area lacks green spaces, which are confined to specific places either inside the castle building, inside Al-Saied (shooting)club or in the castle café, which indicates the need to increase the green areas. So The presence of the castle as a tourist attraction area as the percentage

of the built blocks to the Solid and Void block plan proposed during the research application was taken into account in addition to the balance of the void percentage for the proposed design blocks, that the space surfaces as the walkway is the main path, the distribution of green areas in a balanced manner depending on the functional surfaces proposed in the design.

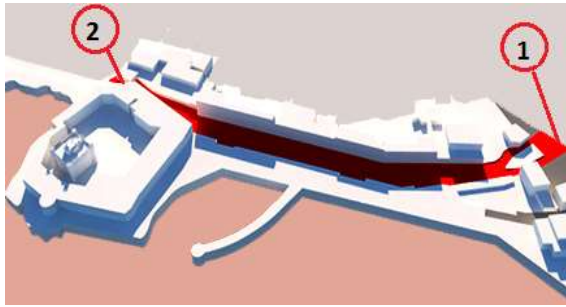


Fig. 9: How to access the proposed study area

There is a main entrance to access the study area through which it is possible to reach all the buildings to the end of the ancient castle. This entrance provides the opportunity to park private cars due to the presence of a garage.

Design proposal: To reach the study area, shows the presence of two main entrances; one at the beginning of the site and the other at the castle area where all the buildings can be reached to end up at the ancient castle. In addition, the entire waterfront surface was raised to provide a garage that can accommodate 250 cars. Therefore, the opposite marine clubs area was used as a commercial and entertaining tourist spot. **Fig. 9**

The study area has the ability to diversify in selection and design solutions by blending compatible design developments and uses to create viable spaces that meet the local needs. Some of these attempts appeared negatively in many aspects. For example, afforestation and green spaces reduce negative participation, help encourage visitors to the area and increase interaction with the environment as a whole. (Arnett 1994)

-The study area lacks adequate light treatments, except for the few lighting units

- The scarcity of outdoor furniture with its various functions, paving materials and public art. All these elements have an important role in creating a distinctive environment

There are some stairs in the front yard of Qaitbay Citadel, the dimensions of which are designed according to the proportions of the human scale. However, the materials used were not well chosen, which exposed them to the factors of erosion and the effect of climate change. Thus, they eroded and became incompatible with the standard design scale, resulting in uncomfortable (Ahmad 2008)

By studying the level of urban outdoor furniture, the current situation was limited to the presence of some seats that do not bear any design identity and were placed in a boring repetitive manner without any distinctive design. In addition, the direction of sitting along the waterfront gives a negative experience as its function is limited to only sitting facing the sea. One of the most non-urban manifestations is the presence of bazaars, stalls and street vendors in randomly and unorganized

manner, as there are no places designated for them, but rather each seller chooses the right place to display goods without considering the areas designated for pedestrians, which causes overcrowding in some areas. **Fig. 10**



Fig. 10: The direction of the seats in the study area (current situation)

Boundaries: low-rise concrete blocks distributed along the seafront, which are used as security borders for the edge of the waterfront. In addition to some revolting iron fences used in order to separate the spaces, which differ in height. This simple design is intended to randomly separate the scope of vision. (Lysien 2019)

Public ART: The artistic elements were limited to the presence of a mosaic mural called the mural of the castle narrator (Orianna Giovanazzi 2010)

After reviewing the design problem, a case study was carried out for the redevelopment of the specific area on Corniche Street to Qaitbay Citadel, bordered on the eastern side by a group of public buildings, and on the western side by Al-Anfushi Bay. The proposed design is based on the redevelopment and preservation of the identity and heritage character of the area. It aimed to achieve spatial and visual continuity in the area in addition to achieving unity between the urban elements and the various installations in the area. The idea was built on the basis of transparency between spaces and structures, whether horizontally or vertically in order to enhance the identity of the area that represents the waterfront image for visitors. To achieve these goals, the following was taken into account in the proposed design:

- Opening axes of vision to connect the spaces with the paths of movement by studying the paths of movement and building stairs that connect the spaces instead of the vertical fence in order to enhance the visual interest in the waterfront.
- Separating vehicle and pedestrian traffic paths by creating two different levels for each path and adding a safe movement path for pedestrians from the outside to the inside of the castle area.
- Making an underground garage to provide suitable underground service spaces by

providing:

A Bus Station - a bus station with an area of 200 m² as an external / internal space that includes waiting umbrellas, ticket booths, public toilets (for

both sexes).

A Parking lot - a parking lot for buses and cars with a space range of 420 cars and 10 buses as an outdoor / indoor space range.

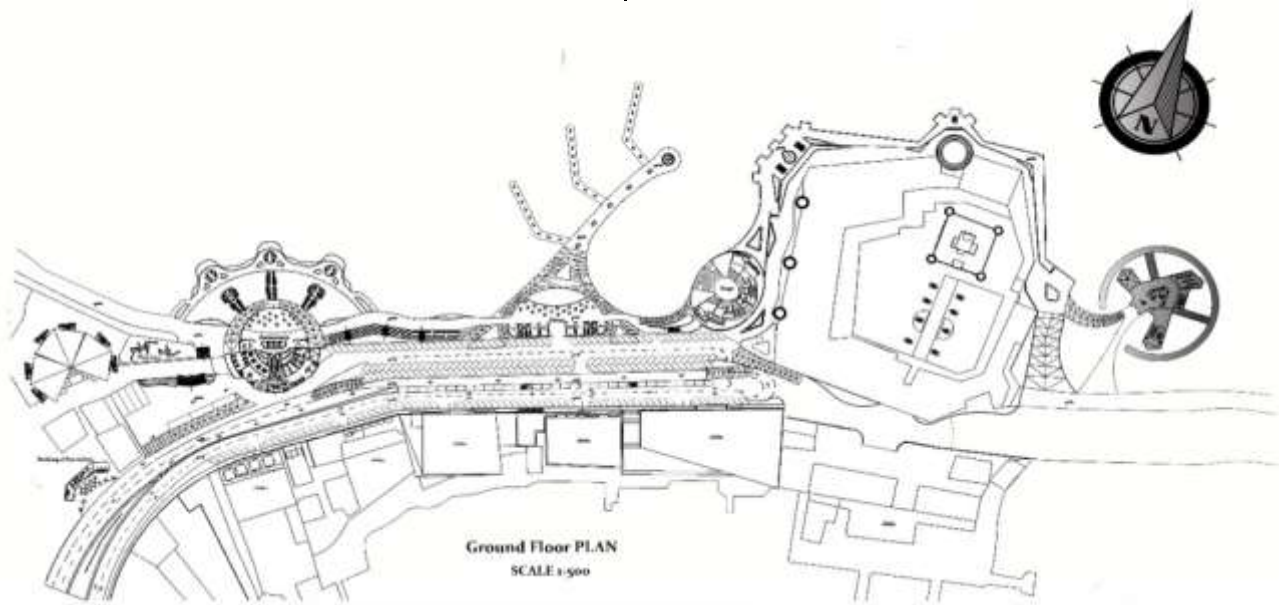


Figure 11: The horizontal projection of the ground floor and a vertical sector showing a parking area for 420 cars and a bus station (the Researchers)

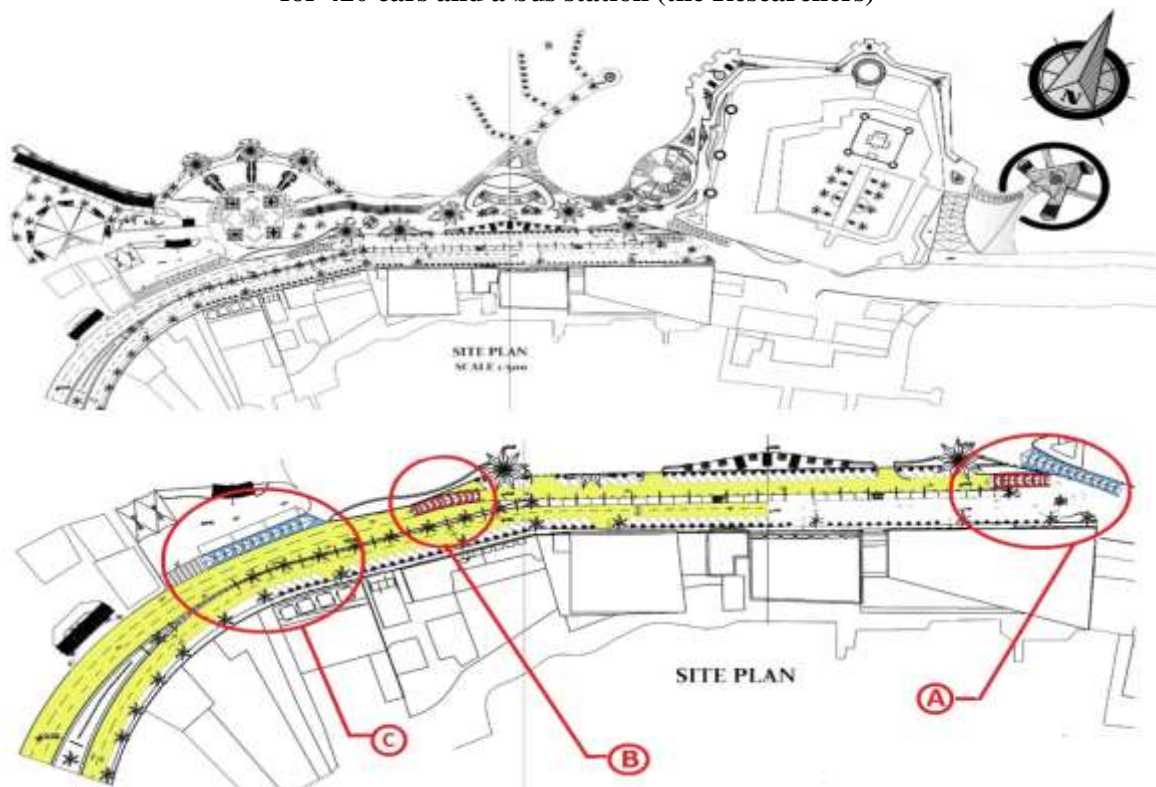


Fig. 13-1 shows the traffic path of cars and garage entrances, where the ground level was reduced by 1.50 cm and the level of the ground floor was raised by 1.50 cm to provide a large space for cars that does not obstruct or waste functional surfaces, separate car lanes were designated, in yellow. Area A represents the car entrance in red and the second entrance for pedestrians in blue Fig. 13-2.



Fig. 13-2 Entrance to the car garage and pedestrian area A

Area B represents the car exit in red color. **Fig. 13-3** shows that there is no visual obstruction to the general view of the site, or any movement obstruction between pedestrian and car traffic. Area C represents the main pedestrian entrance in blue

The study area in its current condition is not clearly distinguished by the public and private spaces of



Fig. 13-3 Car garage exit, area B, there is no visual obstruction to the general view of the site

Fig. 14 (1): An upper garage has been established on a smaller area on the upper floor near the outside sales areas



Fig. 14 (2): The areas of tourist activity and the site visitors path have been separated from the service areas such as the garages, ticket booths and bus stops



The study area lacks the suitable light treatments except for a few lighting units. Therefore, the proposed design suggests using a hybrid energy system lighting units, which use with electricity in addition to being equipped with panels and solar cells to make advantage of the full brightness of the sun in the area as shown in **Fig. 14 (1-2)**.

the present buildings facing the castle. In addition, the yard is open with no borders, which has been addressed in the proposed design by separating the areas of tourist activity and the movement of the site visitors from service areas as the garages, tickets booth and bus stops. Furthermore, a smaller upper garage area has also been



Fig. 13-4: A perspective shot showing the relationship between the entrances and exits of the garage area, the recreational areas, sales stalls and berth yachts

The study area lacks the outdoor furniture with its various functions, paving materials, and public art. These elements have an important role in creating a distinctive environment, which has been addressed in the proposed design to provide seating surfaces, solar-powered shading units and fixed seating units **Fig. 15 (1-2)**



Fig. 15- (1): Solar powered shading units were designed and utilized to illuminate the shading unit at night in addition to fixed seating units.



Fig.16- (1-2): The lighting units were designed in a simple way to suit the design of the place where it works with a hybrid energy system, using electricity in addition to panels and solar cells for the optimal use of sunlight in the area.



There were some stairs in the front yard of Qaitbay Citadel, the dimensions of which were designed according to the proportions of the human scale. However, the materials used were not well chosen, which exposed them to the factors of erosion and the effect of climatic changes. Thus, they eroded and became inconsistent with the standard design scale, resulting in uncomfortable heights. Currently, the level of the urban outdoor furniture was limited to the presence of some seats that do not bear any design identity and were placed in a boring repetitive manner without any distinctive design. In addition, the direction of sitting along the waterfront gives a negative experience as its

function is limited to only sitting in front of the sea. {Almaz, 2017 #18} The proposed design suggests distributing the seating areas and linking them to the afforestation areas, where the shading units are distributed over more than one point.

The current situation: The bazaars, stalls and street vendors are randomly located and not organized. As there are no places designated for them, each seller chooses a suitable place to display goods without considering the areas designated for pedestrians, which causes overcrowding in some areas. This has been taken into account in the proposed design .



Fig. 17: It has been designed to distribute the seating areas and connect them to the afforestation areas where the shading units are distributed over more than one point.

Fig. 18 The stairs were designed to be used as fixed seating units and the area was reinforced with afforestation elements to provide a source of shading. The choice of granite material to resist erosion and corrosion factors has been taken into account to ensure continuity. (The Researchers)



(4)

(3)

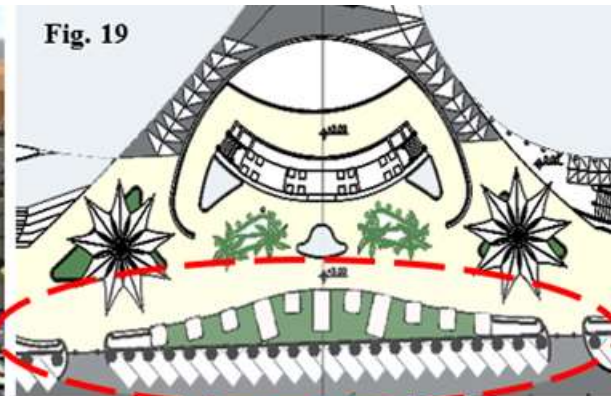
(2)

(1)

As in the horizontal projection only, specific areas have been allocated for sale where they were combined with seating units and a garage for bicycles which act as poles for commercial and recreational activities to create a shopping environment {[Lamit, 2013 #4](#)}. The units took a direction opposite to the sea and not to the main road, and thus the movement of the site visitors was separated from the cars paths . The design of the sales units follows the origami concept so that they

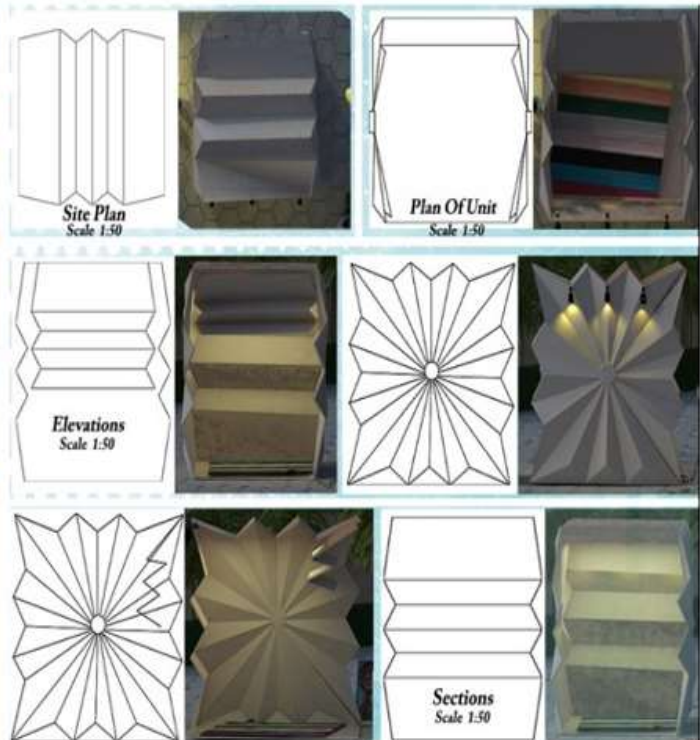
could be opened and closed. Therefore, the vendors do not need to transport their goods on a daily basis, which is one of the negative points that were highlighted in the survey process.

The design of the sales units is inspired by the shape of the sunflower plant where the display and storage units are fixed in the unit's structure and the external façade of the unit is designed to be foldable so that it is easily opened and closed.



Further units were attached to sales units which represent shaded seating units and a bicycle parking area. The design takes the exterior landscape and afforestation areas into account. In addition, the focus was not on a specific area for the distribution

of sales units, but rather it was integrated with the design and distributed in an orderly manner to avoid random distribution as in the current situation.



In conclusion, Qaitbay waterfront enjoys a different sensory experience due to its historical background and features which enabled the redevelopment of the area to create a better multi-use visual experiences in an attractive outdoor environment due to the open spaces that preserve the waterfront view {[Balsas, 2014 #17](#)}.

Results

- The redevelopment process aims to preserve the remaining heritage to revive the identity, restore and improve landscapes that have changed and deteriorated due to human activity, enhance and improve the landscape to

revitalize the tourist waterfront.

- The waterfront was designed using flexible elements that allow it to adapt to the new variables to support the long-term development and success of the waterfront redevelopment and to enhance visual interest.
- Coastal cities can create a distinct sense of place by preserving valuable heritage and historic buildings to attract visitors and investors. Therefore, new developments or major improvement must be complemented by the old urban fabric while preserving their distinctive features to support the city's identity.
- Social, societal, economic and functional aspects, street planning, and open space design should be taken into account. The functional spaces of the activities, whether commercial or non-commercial, should be considered in promoting and improving the economic development of the tourist places.
- The development of shapes that help to create these characteristics that take into account scale, density, use of appropriate materials and attention to details which are represented in the following: -
 - Appropriate artworks and street furniture, such as seats, pedestrian lighting, and interior architecture elements designed to be comfortable and durable.
 - Providing parking areas for all transportation in addition to a well-designed, paved, brilliant and durable walkway patterns.

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