

JEDDAH INTERNATIONAL PASSENGER SEAPORT TERMINAL

Jumana Bin Mahfouz¹, Ahlam Mostafa², Harith Aldabbegh³

^{1,2,3}College of Architecture and Design, Effat University, Qasr Khuzam St., Kilo.2, Old Mecca Road. P.O.BOX 34689, Jeddah 21478, Saudi Arabia

E-mail: 1jbinmahfouz@effatuniversity.edu.sa, 2aamoustafa@effatuniversity.edu.sa, 3haldabbegh@effatuniversity.edu.sa

Received: 15.04.2020

Revised: 18.05.2020

Accepted: 12.06.2020

Abstract

Jeddah has been referred to as Red Sea pride. Nevertheless, to facilitate sea travel facilities, it lacks a high-quality seaport terminal. Thus, this work proposes the development Jeddah Islamic Passenger Seaport Terminal at Jeddah, Saudi Arabia. This work has analysed two case studies related to the architecture of seaport terminal. Based on the case study analysis, for the proposed seaport terminal, the estimated net area is 34258 m² and total project area is 50016.68 m². Furthermore, this seaport terminal is comprised of few zones, such as gathering area, departure terminal, arrival terminal, passport control screening area, waiting area, event hall, baggage handling system area, parking area and mosque. The proposed seaport terminal will be constructed at a site that is located near Corniche Road in Al Ruwais District, the city center of Jeddah's seaport. In terms of design, the seaport terminal was designed based on diversity concept, which has integrated the diverse element into the architecture. This new seaport terminal will allow national and international visitors to discover Jeddah and other parts of Saudi Arabia in a variety of ways, highlighting one of the main attributes of Jeddah, and its strategic location by the Red Sea.

Keywords-- terminal, seaport, passenger, port, Jeddah, Saudi Arabia

© 2020 by Advance Scientific Research. This is an open-access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)
DOI: <http://dx.doi.org/10.31838/jcr.07.08.87>

INTRODUCTION

Seaport terminal plays a significant role in global trade, affecting regional, domestic and international markets due to its advocacy and flexible manner of shipping products [1]. Additionally, when it comes to worldwide logistics, ocean shipping and transport is the mainstream option. Thus, ocean transport places imperative prominence on seaports and their governance to improve their infrastructure that would improve shipping and transport efficiency [2]. Seaport activities are complicated and is dependent on several factors such as architecture facilities, governmental legislation, climate, economic effects and strong rivalry from other methods of transport, whenever efficiency, performance and expenses are taken into consideration [3]. Furthermore, the skylines of most of the world's main seaports are defined by spectacular cargo cranes, industrial plants and towers. The development of production buildings in most seaports across the globe has been motivated by architectural innovation and logistical developments [4].

Jeddah is considered one of Saudi Arabia's most important cities, but even in the past it has always maintained its historical importance, as it was a port city even before Islam appeared in the region [5]. Strategically located on the Red Sea coast, it is one of the country's main urban centers. Furthermore, Muslim pilgrims from all over the world come to Jeddah, as it is the main gateway to the two most important holy cities, Makkah and Madinah [6]. In the past, maritime travel and passenger port terminals have undoubtedly been an essential means of transportation to and from Jeddah [7]. Nevertheless, the significance of Jeddah as a seaport has now been marginalized due to the development of other transport links [8]. The main reason is that Jeddah's existing port is more focused on cargo shipping, which means that the port fails to meet the much-needed requirements and needs of regular tourists and pilgrims [9,10]. Nonetheless, Jeddah still has the vast potential to fulfil its status as one of the world active seaport, which is subjected to new architectural development.

Therefore, the need for a competent seaport is essential, especially with the rapid growth of trade, trade and financial

development in Saudi Arabia. Hence, this work proposes the development of Jeddah Islamic Passenger Seaport Terminal at Jeddah, Saudi Arabia.

CASE STUDIES

For the development of Jeddah's seaport terminal, two case studies have been analysed. The case studies details are stated as follows.

- a. Kaohsiung Marine Gateway Terminal
- b. Yokohama International Port Terminal

Kaohsiung Marine Gateway Terminal

Kaohsiung Marine Gateway Terminal is located at Taiwan (Figure 1). It was designed by Asymptote Architecture which was established from a partnership of Lise Anne Couture and Hani Rashid. The terminal is located between the city's hub and the port, and this contemporary statue-like building integrates the designed passenger experience and engineered coastal activity. The terminal facilities includes departure lobby, domestic arrival, international arrival, international waiting area, check in area, baggage claim and passengers loading bridge. Furthermore, it also has exhibition space, parking space, event space, two towers, administration offices and commercial zone.



Figure 1. Kaohsiung Marine Gateway Terminal

Yokohama International Port Terminal

Yokohama International Port Terminal is located at Tokyo Bay, Japan (Figure 2). It was designed by Foreign Office Architects. The main concept behind this project is to assert the site as an open public space, making the building's roof an open space extended from the two parks in Tokyo. The port is extended from the waterfront into the sea, making it more convenient for multiple ships to park on the port at the same time. The facilities of this port includes machine room, parking spaces, passenger terminal, entrance , lobby, customs, immigration and quarantine facilities, halls, rooftop plaza, outdoor plaza, visitor decks, and boarding bridges.



Figure 2. Yokohama International Port Terminal

PROGRAM ASSUMPTION AND SPACE DETAILS

For the proposed seaport terminal, the estimated net area is 34258 m² and total project area is 50016.68 m². Table 1 shows the zone net area. Table 2 shows the total project area. Based on Table 1, the seaport terminal is comprised of several zones, such as gathering area, departure terminal, arrival terminal, passport control screening area, waiting area, event hall, baggage handling system area, parking area and mosque.

Table 1. Space details

Zone	Area (m ²)
Gathering area	936
Departure terminal	5075
Arrival terminal	8225
Passport control screening area	1640
Waiting area	4802
Event hall	3350
Baggage handling system area	1530
Parking area	7700
Mosque	1000
Net Area	34258

Table 2. Total project area

Zone	Area (m ²)
Net area	34258
+6% construction	2055.48
30% circulation	10277.4
10% HVAC system	3425.8
Total project area	50016.68

PROPOSED SITE AND ANALYSIS

In this work, the proposed site will be located near Corniche Road in Al Ruwais District, the city center on Jeddah's seaport (Figure 3). The site has an area of 66625 m².The Corniche Road is a busy road and is a favorite seaside route mostly used for

commercial purposes due to its important location. The chosen site has potential for development, as much of the land around the area has not yet been developed. For maintenance and safety reasons, the proposed new seaport terminal is relatively close to the existing port terminal. Furthermore, it should be easily accessible for international and national sea travel routes. The seaport terminal for passengers should be away from the cargo terminal to avoid visual and environmental pollution, which should improve the site and avoid congestion. Likewise, there are numerous landmarks that overlook the site, but the most popular is the King Fahd Fountain, which is located inside the Red Sea and directly overlooks the site. In terms of climate, during the summer the temperature becomes very hot rising up to 40 °C in the afternoon and dropping to 30 °C in the evening. While in winter, the weather remains relatively warm, yet cooler than summer, ranging from 15 °C to 25 °C. Rainfall throughout the year is rare and occurs in small amounts in December. Figure 4 shows the zoning at the proposed site.

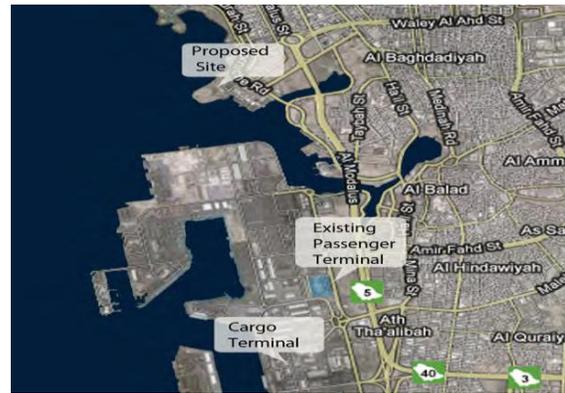


Figure 3. Location of the proposed site



Figure 4. Zoning of the proposed site

PROJECT DESIGN

The proposed new seaport terminal at Jeddah is designed based on diversity as it has brought together people from different backgrounds for the purpose of trade, pilgrimage and tourism. Thus, numerous forms and design in the building are unique and integrated into each other. The overall design represents the diverse people who has stepped to this land. Figure 5 to Figure 8 shows the proposed design of the seaport terminal. In addition, the design emphasized the importance of Jeddah's seaport as a valuable component of the city by showing how it can serve as a convenient means of transportation. Likewise, it enhances the historical value of the seaport of Jeddah and makes it an important city attraction. Based on Figure 8, the function and accessibility of this port is comprised of terrace, departure terminal, arrival terminal, commercial zone, mosque, hotel, electric shuttle and vehicular circulation.



Figure 5. Overall view 1 of the seaport terminal

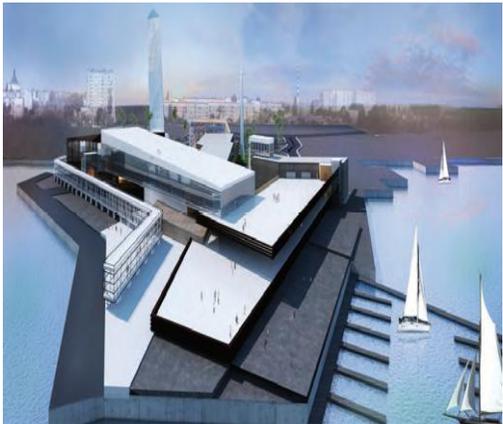


Figure 6. Overall view 2 of the seaport terminal



Figure 7. Side of the seaport terminal

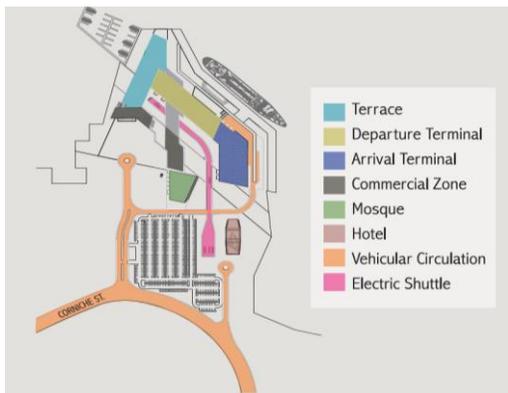


Figure 8. Zone of the seaport terminal

CONCLUSION

This work has presented a proposal on developing a Jeddah Islamic Passenger Seaport Terminal at Jeddah, Saudi Arabia. For the proposed seaport terminal, the estimated net area is 34258 m². This seaport terminal is comprised of few zones such as gathering area, departure terminal, arrival terminal, passport control screening area, waiting area, event hall, baggage handling system area, parking area and mosque. The development of this seaport terminal is expected to promote the possibility of traveling by sea, especially in a city where such a noteworthy sea port should be a monument of pride and admiration. Furthermore, this seaport terminal will be a point of attraction at Jeddah and it will contribute to the overall economy of Saudi Arabia.

REFERENCES

1. Ensslin L, Dezem V, Dutra A, Ensslin SR, Somensi K. Seaport-performance tools: an analysis of the international literature. *Maritime Economics & Logistics*. 2018 Dec 1;20(4):587-602.
2. Kuipers B. The Industrial Seaport. In *Ports and Networks* 2017 Aug 22 (pp. 267-281). Routledge.
3. Ambrosino D, Bernocchi L, Siri S. Multi-objective optimization for the train load planning problem with two cranes in seaport terminals. *IFAC-PapersOnLine*. 2016 Jan 1;49(3):383-8.
4. Rezik I, Elkosantini S, Chabchoub H. A case based heuristic for container stacking in seaport terminals. *Advanced Engineering Informatics*. 2018 Oct 1;38:658-69.
5. Mira M, Choong Y, Thim C. Mediating role of port supply chain integration between involvement of human resource practices and port performance in Kingdom of Saudi Arabia. *Uncertain Supply Chain Management*. 2019;7(3):507-16.
6. Ekiz E, Öter Z, Stephenson ML. Tourism development in the Kingdom of Saudi Arabia: Determining the problems and resolving the challenges. In *International Tourism Development and the Gulf Cooperation Council States* 2017 Jul 14 (pp. 124-139). Routledge.
7. Albarakati AM, Aboobacker VM. Wave transformation in the nearshore waters of Jeddah, west coast of Saudi Arabia. *Ocean Engineering*. 2018 Sep 1;163:599-608.
8. Mayerle R, Al-Subhi A, Jaramillo JF, Salama A, Bruss G, Zubier K, Runte K, Turki A, Hesse K, Jastania H, Ladwig N. Development of a coastal information system for the management of Jeddah coastal waters in Saudi Arabia. *Computers & geosciences*. 2016 Apr 1;89:71-8.
9. Hussain, A., Mkpojiogu, E.O.C., Jamaludin, N.H., Moh, S.T.L. (2017). A usability evaluation of Lazada mobile application. *AIP Conference Proceedings*, 1891, art. no. 020059,
10. Elentably A. Strategic and Operational Plan Implementation of Seaports (Utilization Jeddah Port). *TransNav: International Journal on Marine Navigation and Safety of Sea Transportation*. 2015;9.