

INTERNATIONAL CRUISE TERMINAL

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Abstract

Since the beginning of the fall in oil prices and the problems arising from international foreign exchange markets, Saudi Arabia has witnessed one of the slowest economic growth rates in the world. Accordingly, the government designed a plan to cover the period up to 2030, part of the program required diversification of the economy. Thus, this work presents the development of the International Cruise Terminal in Jeddah, as part of the diversification process, which aims to open up Saudi Arabia to economic growth and to expose the economy to rigorous development. In this work, three case studies related to cruise terminal were analysed. Based on the analysis of the case studies, the estimated the estimated gross area for the cruise terminal is 29908 m². The cruise terminal is designed to comprise several zones, such as departure area, arrival area, administration department, building general area, maintenance, passport control, other facilities, clinic, commercial, outdoor area and parking area. The terminal cruise will be developed at a development site located at Jeddah Al Kornaysh road near to Al balad. The International Cruise Terminal is designed with modern facilities and it is expected to diversify and contribute to the economy of Saudi Arabia.

Keywords-- Cruise, terminal, tourism, Jeddah, Saudi Arabia.

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INTRODUCTION

Tourism cruise has become the world's top-rated company, producing approximately \$17 billion annually in passenger spending [1]. Terminal cruise for tourists opens up the economy and encourages industrial growth and development in any particular country [2]. Furthermore, the growth of the cruise tourism business has led to an increase in the amount of travel vessels, and the travel packages including cruise ships have been modified to suit the growing number of travel guests [3]. The port terminal is a port which caters the function of a cruise ship, where these tourist ships can dock and transfer individuals to different districts. This provides an improved access to land which increases the value of the town. Cruise ship ports are generally intended to luxuriously target individuals looking forward to pleasant ocean travel [4].

The fall in oil prices has raised a serious economic threat to the Kingdom of Saudi Arabia. This is because the future of Saudi Arabia relies on the price of oil it generates as a significant economic commodity [5]. To order to facilitate the growth outlook referred to as the 2030 vision the Government of Saudi Arabia has defined infrastructure development as an economic pull factor [6]. Tourism and the development of tourism related infrastructure allow the flow of income and economic generation and it helps to ensure that the economy of Saudi Arabia regains positive vertical growth in a different field [7].

Ports and docking centers are the main terminals for water transport. Ports in Saudi Arabia are typical of ports in that they are located at strategic points in the water transport system [8]. The port of Saudi Arabia is located on a shipping route that is considered to connect the Middle East and North Africa [8]. This port is of strategic economic importance to Saudi Arabia. Upgrading the port therefore means opening up the country's economic system and promoting the movement of goods and services [9,10,11]. This would ensure the inflow and outflow of key technologies in Saudi Arabia, opening up space for economic development in Saudi Arabia. Stimulating economic entry points requires the upgrade of ports which are strategic entry points [11].

Furthermore, Saudi Arabia's Jeddah City is a tourism destination that can stimulate economic growth and development when the terminal cruise is revamped. Therefore, this work proposes the development of International Cruise Terminal at Jeddah, Saudi Arabia.

CASE STUDIES

This study analyzed three case studies that were similar to the proposed work. Details of each case study are presented as follows:

- Kai Tak Cruise Terminal
- Yokohama International Passenger Terminal
- The West Terminal 2

Kai Tak Cruise Terminal

Kai Tak Cruise Terminal is located at Hong Kong, China (Figure 1). This terminal was designed by architects from Foster and Partners. This terminal has a site area of 52 000 m². The capacity of this terminal is 8400 passengers. Kai Tak Cruise Terminal in Hong Kong split into two bays and a terminal structure. The first berth and the terminal building were installed in June 2013, while the second berth became functional in September 2014. The cruise terminal can accommodate two super cruises with 400 travelers and 200 crew members. The first dock is about 455 m long x 35 m high, while the second dock is about 395 m long x 35 m broad. The structure is a three-story building with a height of 40 m. Cruise facilities include supermarkets, travel stores, reception rooms, restaurants and cafes. The ground floor has an apron, an entrance hall, a waiting room, a bag handle area, a customer hall, an atrium, an office area, a coach sitting area. The first floor has a landscaped deck, a public area, an immigration hall, a chick in the hall, a waiting room and an atrium. The second floor has a commercial area, a landscaped deck, a skylight and an atrium. The percentage of space distribution within the cruise is comprised of arrival hall (6%), departure hall (6%), waiting area (11%), office (15%), services (3%), baggage hall (11%), terminal operator (10%), commercial area (8%), and landscape plaza (30%). The total area of space within the terminal is 76000 m².



Figure 1. Kai Tak Cruise Terminal

Yokohama International Passenger Terminal

Yokohama International Passenger Terminal is located at Yokohama, Japan (Figure 2). This terminal has an estimated area of 44000 m². It was designed by architects FarshidMoussavi and Alejandro Zaera-Polo. The port was extending from the waterfront to the sea. Because the architects recognize it a communal space, they have agreed to have the roof of the building as an accessible central square linked to the surface of Yamashita Park, as well as the Akaranega Park. The terminal has 3 floors, which is first floor, 2nd floor and the roof top floor. The first floor is comprised of parking spaces, ramps and elevators. The 2nd floor is comprised of cruise deck, lobby, glass curtain wall, plaza, lounge, shops, restaurants, Osanbashi hall and coffee shop. The rooftop is comprised of roof top plaza, visitors deck and outdoor event plaza. In terms of spacing, the percentage of space distribution is comprised of basement (15 %), passenger terminal (10%), rooftop plaza (30%), visitors decks (23%), outdoor event plaza (5%) and berth zone (17%). The total area of these spaces are 30100 m².



Figure 2. Yokohama International Passenger Terminal

The West Terminal 2

The West Terminal 2 is located at Tyynenmerenkatu 14, Helsinki, Finland (Figure 3). This terminal was designed by PES Architects. This terminal has an estimated area of 12900 m². The terminal was specifically designed to alter the speed of departure and landing. Passengers' walking distances square measure minimized, sectionalizing the rapid transfer of huge numbers of passengers to and from ships. Despite the focus on efficiency, the design also has a high standard of quality and comfort. The public spaces are bright, comfortable and safe. Materials have been chosen for wear resistance so that the building retains its attractiveness throughout its life cycle. In addition to passenger

waiting areas, the building includes ticketing and office spaces, customs facilities, cafes and auxiliary and technical facilities. The terminal building is divided functionally into two main components. Traffic is on the ground, wherever the world around the glass entrance is as compact as possible. They leave most of the pier to the queuing vehicles on board the ferries. The doorway is designed for quick passage through and additionally provides for vertical connections. The waiting lounge is located 10 m above ground level, between the berths, so that there is only a short distance to the ships on either side. In addition, the complicated terminal includes traveler boarding corridors and bridges that connect the terminal to the ships — these square structures measure cold (unheated) areas. In terms of spacing, the percentage of space distribution is comprised of arrival hall (5%), arrival corridor (1%), departure hall (7%), lounge area (6%), office (15%), services (5%), exhibition space (15%), check in hall (16%), landscape plaza (30%).



Figure 3. The West Terminal 2

PROGRAM ASSUMPTION AND SPACE DETAILS

For the proposed International Cruise Terminal in this work, the estimated gross area is 29908 m². Table 1 shows the details of measurement for each space. Based on Table 1, the cruise terminal is comprised of departure area, arrival area, administration department, building general area, maintenance, passport control, other facilities, clinic, commercial, outdoor area and parking area.

Table 1. Space details

Zone	Gross Area (m ²)
Departure area	5525
Arrival area	5525
Administration department	285
Building general area	4290
Maintenance	2195
Passport control	2520
Other facilities	1030
Clinic	255
Commercial	3235
Outdoor area	1336
Parking area	3712
Total	29908

PROPOSED SITE

Proposed site: Site 1

For site 1 (Figure 4), this site is located at Jeddah Al Cournach. This site has a total area of 34009 m².

Proposed site: Site 2

For site 2 (Figure 5), this site is located at Jeddah Al Kornaysh road near to Al balad. This site has a total area of 47200 m².



Figure 4. Site 1



Figure 5. Site 2

SITE EVALUATION AND ANALYSIS

In this work, for the proposed International Cruise Terminal, two site were suggested as the development site. Thus, site evaluation analysis was done to select the most suitable site. For the site evaluation analysis, weighting factor (WF) were utilized, where 1 = not very important, 2 = somewhat important, 3 = important. The sites were evaluated based on few criteria's, such as site capacity, shape/ proportionality, access/traffic, view, utilities, security and safety, future development plans, surroundings, topography, noise, visual quality and demographic patterns. The site evaluation results is shown in Table 2. Based on the results in Table 2, site 2 exhibited the highest score of 94, compared to site 1, which exhibited score of 93. Thus, site 2 was selected as the proposed development site.

Table 2. Site evaluation

Site criteria	Weighting factor (WF)	Site 1	Site 2
Site capacity	3	12	15
Shape/ proportionality	3	15	9
Access/traffic	3	12	12
View	2	6	8
Utilities	1	3	4
Security and safety	2	8	6
Future development plans	3	6	12
Surroundings	2	6	8
Topography	1	3	2
Noise	2	8	6
Visual quality	2	8	8
Demographic pattern	2	6	4
Total	-	93	94

The International Cruise Terminal has must be a unique and welcoming building for city visitors from all over the world through the sea. This is why this location surrounded by a great tourist attraction, such as King Fahd's Fountain, the tallest fountain in the world, and the Saudi Flag Roundabout, also gives the terminal cruise a very high-quality image as it is in a significant location in the city. The location is easily accessible by standard means of transport, such as buses, trucks and cars, as well as by a large number of users. It is located 15 minutes away from the Islamic port of Jeddah and is easily accessible from AL-Andalus Road. The view from this site focuses mainly on the sea view from inside to outside. In addition, the side view will have a peak for terminal cruise visitors to see King Fahd's Fountain, the highest fountain in the world. The area has the highest temperatures of around 32.0 ° C in July and the lowest temperatures of around 20.2 ° C in January. This is the lowest average temperature per year. The most humid conditions have been experienced for 7.4 months in a year. This is usually from April 12th to November 25th. In particular, the comfort levels are unbearable and take approximately 25% of these months. August is probably the most humid month, with the moist day being August 18, with the moist surroundings taking 80% of the time. The least wet day is usually the 20th of January. Wind speed in Jeddah as measured on an hourly basis is subject to endless variations depending on seasons throughout the year. Usually, the area experienced moderate wind conditions from 1 December to 11 April. This approximately rests at an average wind speed of more than 8.7 miles per hour. The month with the highest incidence of windy conditions, in general, is January with a speed of 9.8 miles per hour. On the other hand, the area also enjoys calmer weather conditions, from April 11 to December 1. October 1 is known to be the calmest day of the year with a wind speed of 7.6 miles per hour. This site can easily be accessed by ordinary means of transport, such as buses, trucks and cars, as well as by a large number of users.

PROJECT DESIGN

The design concept of the International Cruise Terminal is based on the provision of facilities that give the city of Jeddah a landmark. It also intends to give the tourist a spectacular experience from an architectural point of view. Furthermore, The concept of the International Terminal Cruise is to provide facilities for transport to and from Saudi Arabia and to encourage accommodation in Jeddah City as part of the significant accommodation facilities that allow tourists to use the facilities while on pilgrimage. The design is intertwined with the philosophy of religious activities in Mecca and other parts of Saudi Arabia. The vertical window of the accessibility stand determined the leveling relationship between the vessel and the cruise terminal. The first floor component will be used for handling the baggage to provide an easy way to carry the luggage from the terminal to the ship. The second floor will be a queuing for ticketing to create a smooth and organized flow. The third floor of the departure lounge will take the passenger from the terminal to the vessel through the passenger boarding bridge with a maximum incline ramp of 8.33 % to match the vertical access window. The horizontal accessibility stand consists of a baggage break, a providential break, a passenger break and a crew break from the ship to the cruise terminal. Passenger queuing and processing lane stander had a minimum distance from the front of the line waiting for the line closest to both the front of the line around 2.1 m and a minimum distance from the rear of the line to the demarcation of traffic at 23 m with a minimum circulation at 3.6 m. Passenger boarding bridge is used to carry the flow of passengers from the final cruise to the ship at the time of departure, and on the other hand, the passenger will be taken from the vessel to the cruise terminal, and the passenger bridge height will be around 4.5 m with a total maximum length of 27.5 m. The lounge area is the departure lounge for the tourist waiting area before boarding the vessels. The deplaning zone is mostly a roped path or a detached

corridor that leads straight from the loading bridge to the passenger's gear or apron to the pub in the corridor separating the rest of the departing lounge to avoid interference and congestion between the deplaning passenger and those waiting to board the cruise. Furthermore, the roadblock within the parking lot is prefaced to be one-way traffic to avoid hazards. For the screening and ticketing lobby, it is designed with extensive open space with a predetermined number of sections. For the post check in seating hall, the check-in lounge, together with the ticketing hall, will ideally have a seating limit of between 2500 and 3000 passengers, ideally. For the baggage handling drop off areas, the area will be in the building area in the vicinity of the transit campaign and in the vicinity of the bus and taxi / auto drop-off zones. In addition, the passenger waiting area is located near to the ferry ships to allow passengers to board in a quick manner. In terms of environmental sustainability design, the terminal has been designed to allow natural sunlight into the interior of the ship. Furthermore, green planting is done throughout the building to improve air quality. In addition, the cruise terminal is fitted with grey water recycling system for toilet flushing and irrigation. Likewise, rainwater is used for irrigation of plants. Figure 6 to Figure 9 shows the design of the International Cruise Terminal.



Figure 6. Overview of International Cruise Terminal.



Figure 7. Side view International Cruise Terminal.



Figure 8. Side view International Cruise Terminal.



Figure 9. Top view International Cruise Terminal

CONCLUSION

This paper has presented the development of International Cruise Terminal at Jeddah, Saudi Arabia. For the cruise terminal, the estimated gross area is 29908 m². Furthermore, the cruise terminal is comprised of few zone, such as departure area, arrival area, administration department, building general area, maintenance, passport control, other facilities, clinic, commercial, outdoor area and parking area. The International Terminal Cruise in Jeddah, Saudi Arabia, is a government project aimed at promoting tourism and opening up the economic gates of the city. The terminal is part of the solution to economic problems as it will help to diversify the economy of Saudi Arabia by leaning towards tourism, trade and entertainment.

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