

The prospect of building underwater environmental sciences essay

[Health & Medicine](#), [Beauty](#)



Population in Egypt increased in the last 10 old ages and reached 80 million with mean one-year growing 2.04%. Traffic congestion is the largest job that Egypt faces, and it has a great consequence on air quality, going clip, concern, and cost. The authorities ever tries to work out the congestion by constructing new Bridgess, overpasss and metros, but unluckily it fails due to the addition of population. In this study there is a survey on edifice with a new engineering which is constructing underwater.

Although submerged edifices exist since 1960 but no 1 have heard about it. Constructing underwater will be advantageous to the environment if people win in accomplishing it. Everything can be built submerged like Houses, hotels, watering place, eating houses a^| etc. to allow people hold a good life or holiday. The glamour position underwater of fishes, coral reefs and different animals encourages people to construct and populate at that place.

This study will discourse the possibility and the advantages of submerged edifices. The first subdivision will specify what submerged edifices are, and demo the advantages and credence of them. The 2nd will discourse the consequence of submerged edifices on the environment. The 3rd one will discourse the consequence of submerged edifices on societal life and the agencies of transit. The 4th will discourse the stuffs used, ways of edifice and particular demands. The fifth will present the jobs which face the submerged edifices. The 6th will demo the airing systems that are used. The 7th, will be illustrations of bing and approaching submerged edifices that make the reader able to visualise the thought good, and able to link all the parts of

study together. Finally, the decision will back up and urge edifice and life underwater to diminish congestion and pollution on the surface of the Earth.

1. Introduction

What are submerged edifices? Harmonizing to Dr. Khaled Abdelhady (Professor in architecture technology, Shoubra University) , submerged edifices are constructions built submerged for different intents each harmonizing to the type of edifice constructed (personal communicating, 2010) . It all started in the 1960 's by Jacques Cousteau 's squad in the signifier of submerged research Stations (submerged home ground, 2006) . Submerged edifices already exist, but have you of all time thought approximately traveling to an underwater edifice?

Underwater edifice is the future foundation that has a great impact on the environment, we will be confronting some jobs while using this engineering but if we win in accomplishing it, it will be advantageous to our environment as it gets populated. It is true what was written in the `` Evolo '' magazine: `` Approximately 71 % of the Earth 's surface is ocean, even more if climate alteration has its manner ; hence it is merely natural patterned advance that we will dwell the seas someday. '' (Water-Scraper: Underwater Architecture, 2010) .

1. 1 Background on submerged edifice types

When Dr. Khaled Abdelhady was asked about the types of underwater edifices he talked about the undermentioned types:

1. 1. 1 Infra Structures

He said that infra constructions are termss of edifices made under the H₂O to allow the edifice itself above the H₂O, for illustration the Bridgess linking metropoliss like the aureate gate p shown in figure 1. 1 when you can see the base of p placed under the H₂O (personalcommunication, 2010) .

Figure 1. 1: Aureate gate p (beginning: www. google. com)

1. 1. 2 Research centres

Second, Dr. Khaled talked about the research centres underwater. He said that there are two types of centres, foremost is an submerged lifes research centre which examine and observe animals submerged, and 2nd there are scientific centres which search for crude oil in the underside of seas and oceans (personal communicating, 2010)

1. 1. 3 Tunnels

As for submerged tunnels Dr. Khaled Said they are passage ways constructed underwater. There is a type made for cyberspace chief overseas telegrams to be divided all over the universe, telephone lines, and others. Other type is made for autos to travel through submerged channels but for short distance rivers or H₂O transitions like tunnel `` Ahmed Hamdi " at the Suez Canal in Egypt (personal communicating, 2010) .

1. 1. 4 Museums

As for museums underwater, Dr. Khaled said there are 2 types, foremost one are museums made to see the submerged lifes without holding to travel through the dangers of diving and for really old grownups to be able to see

them excessively, 2nd there are museums made to see the old sunken memorials, why underwater? So that you can see them they exact manner they were found in a beautiful originative manner. And it has already been constructed like in `` Vasa Museum '' in Stockholm (personal communicating, 2010) .

1. 1. 5 Hotels eating houses and amusements

Another type that Dr. Khaled Abdelhady talked about was the amusement types of edifices. There are hotels, watering place, and eating houses built underwater so that people could hold a nice a holiday, a massage or a repast while watching the fishes and animals underwater. There are besides games made underwater like in Disney land roller coaster as shown in figure 1. 2 when you can see people acquiring into the H2O while on the roller coaster (personal communicating, 2010) .

Figure 1. 2: Disney land roller coaster (Beginning: [www. google. com](http://www.google.com))

1. 2 Advantage and credence of submerged edifices

Underwater edifices have a batch of advantages to people in Egypt. It will take down the crowded topographic points above land. It will increase the engineering use to be able to construct it. It will assist better touristy as people will come from all over the universe for amusement under the ruddy sea, and enjoyment of the amazing legion sorts of fishes and corals, and in same clip conserve the corals from being touched and hurt by people plunging.

After inquiring a big figure of people if they would accept traveling to an submerged metropolis for amusement, holiday or touristry, it was surprising that most people accepted the thought. This means that if the thought really gets complete, it will be widely spread between people so rapidly and it will be successful in Egypt. And as you can see in figure 1. 3 the figure of people accepting is about trebling the figure of people declining.

Figure 1. 3: Chart shows the figure of the credence and declining people

3. Social facets

Overcrowding is considered the universe 's job, which is turning invariably and leads to many other jobs. This serious quandary prompted people to believe about the colonisation of the oceans, which led them to believe about the submerged edifices. As we know, H₂O covers 70 % of the Earth 's surface, while land countries form a really little per centum. Taking a expression at the Earth from outer infinite, we will happen that the bluish colour dominates, and this will raise a batch of inquiries about how to work these countries. From this point, people begin to analyze the possibility of edifice underwater and do usage of such great surfaces.

Let 's happen out if people will welcome the thought of life underwater in the hereafter, or it will be a useless undertaking. Due to high cost, these submerged edifices will be limited to a certain degree of people, and may be considered as a sort of prosperity. However, if we take into history that the engineering progresss, so there will be a manner to cut down the cost. But if complete metropoliss were built submerged, would people accept such

alteration in their life. Some people can non populate without the Sun and do non conceive of themselves in a topographic point slightly isolated. Others want truly to seek this new life, and bask the composure and the glorious vision. In decision, populating underwater may go a world if its benefits overcome its troubles and jobs.

3. 1 Means of transit

After seeking for the possible agencies of transit to populate under H₂O, it was found that there are two possibilities. First, as many people will believe, pigboats would function as the chief mean of transit. For illustration, believing about its cost and pertinence, we will happen that it is the suited 1. Let 's move to the other possibility, at a larger graduated table, and speak about submerged tunnels. There are some bing submerged tunnels, which would be really effectual to achieve a certain submerged edifice or complete metropolis in the hereafter. For illustration, in Dubai, Hydropolis is an submerged hotel, but it is still under building. As it is described in figure 3. 1, the developers of this undertaking explains: `` It will include three elements: the land station, where invitees will be welcomed, the connecting tunnel, which will transport people by train to the chief country of the hotel, and the 220 suites within the undersea leisure composite. `` (Joachim Hauser, N. D.)

Figure 3. 1: The land station of Hydropolis (Source: Design construct, ND.)

4. Construction and construction facets

4.1 The stuff used

Although many stuffs exist for edifice, the 1 that meet the demands with the lowest costs are to be chosen. At this degree the cost will be minimized. . When taking the stuffs to be used in the building, it is of import to guarantee that the weight bound is non exceeded. (Carl T. F. Ross & A ; Mark El-Hajj...)

The chief stuff used for building underwater was a particular type of steel and acrylic. The acrylic stuff is used chiefly for visibleness, while the steel is used for supports (supports) . (Carl T. F. Ross & A ; Mark El-Hajj...)

High strength steel is used as it is comparatively inexpensive, and has its high output strength. It is non besides a goodmusicdirector of electricity and heat. It is a high corrosion opposition. (Carl T. F. Ross & A ; Mark El-Hajj...)

Acrylic stuff is used alternatively of glass ; It is better than glass due to being less dense, and it is besides has higher impact strength than the glass. Acrylic gives the natural size and colourss of the environing stuffs than glass. It is besides good dielectric of electricity which is good in seeking the wellness and safety of clients and submerged animals. (Carl T. F. Ross & A ; Mark El-Hajj...)

4.2 Construction

It is known that the rewards for submerged building would be greater than on land building, due to the trouble faced during the on the job underwater. Another job would originate ; the edifice is big in size. For work outing these

jobs, they divide the edifice into parts and edifice each portion on land so piece them under the H₂O. (Carl T. F. Ross & A ; Mark El-Hajj,)

4.3 Care

The care procedure is a dearly-won procedure particularly when covering with an submerged care. The below figure shows us how this job can be solved, by splitting the edifice into parts that can be separated from the whole edifice ; these parts can be transferred to set down so that a cheaper care can take topographic point. (Carl T. F. Ross & A ; Mark El-Hajj...)

Figure 4. 1: The care procedure (Beginning: Carl T. F. Ross & A ; Mark El-Hajj)

The crystalline portion of the edifice should be ever clean, so that the clients can see the marine clearly in all the clip. This state of affairs can be achieved by an machine-controlled system which uses a ego cleaning surfacing known as the smart stuff. (Carl T. F. Ross & A ; Mark El-Hajj...)

5 Problem which face underwater edifice

5.1 Cost

Constructing under H₂O is a really expensive procedure due to the machines, instruments and skilled workers. Constructing under H₂O besides contains some of public assistance as figures (5. 1, 5. 2) illustrate and it needs to immense budget.

Figure 5. 1: Example of under H₂O 's public assistance (Beginning: blog. hotelclub. com/top-five-underwater-hotels/)

`` Dreams, nevertheless fabulous, remain unrealized without the hard currency to back up the committedness ; the hardest portion of the procedure was happening sponsorship to the melody of a, -550m. That 's what brought me to Dubai. Still, it was a conflict which took two-and-a-half old ages and proved tougher than developing the undertaking itself. No bank would pay such an sum. It 's a hazardous investing, as there are no pilots. We had to convert investors that it is safe and will convey returns on investing. " (Hauser, ND) , so companies accept to co-operate with its challenger to finish under H2O edifice undertaking.

5. 2 The job of Erosion

Erosion is the procedure of weathering and conveyance of solids (deposit, dirt, rock and other atoms) in the natural environment or their beginning and deposits them elsewhere. It normally occurs due to transport by air current, H₂O, or ice so applied scientists should take the appropriate stuffs for under H₂O edifice.

5. 3 The location of crude oil

Figure 5. 2 shows that any accident may go on in the sea to the boring machines and machinery for seeking for oil or to any ship in the sea may harm the design of the edifice and it is out of control.

Figure 5. 2: The accident of the boring machine (Beginning: hypertext transfer protocol: //Oc-Po/Petroleum-from-the Ocean. htmlhttp: //www. waterencyclopedia. com hypertext transfer protocol: //www. waterencyclopedia. comHYPERLINK `` hypertext transfer protocol: //blog.

hotelclub. com/top-five-underwater-hotels/ " HYPERLINK `` hypertext transfer protocol: //blog. hotelclub. com/top-five-underwater-hotels/ " hypertext transfer protocol: //www. waterencyclopedia. comunderwater-hotels/)

5. 4 The job of heat of H₂O

The temperature of the H₂O is extremely variable over the surface of the H₂O, it is heated from the surface downward by sunshine, but at depth most of the H₂O is really cold. (Martha R. A Scott, ND)

5. 5 The job of force per unit area

Pressure plays a large function in act uponing the foundations of the edifice besides workers face troubles either during the building procedure or during the care procedure.

6. Environmental edifice facets

No uncertainty that the first thing that comes in our head while speaking about submerged edifices is the job of airing. Ventilation is defined as a: " procedure of providing fresh air to an enclosed infinite and taking from it air contaminated by olfactory properties, gases, or smoke `` . Therefore, there must be a beginning of renewable air that helps in external respiration, and acquiring rid of unwanted gases, like C dioxide and others. Let 's research a solution, for the airing job, that was applied while constructing Holland tunnel, an submerged tunnel. Tunnels, specifically, have a great job with airing, due to gases produced by trains and cars. This job was addressed by Clifford Holland, the tunnel 's interior decorator. His purpose was to happen

ways to unclutter exhaust exhausts and pump in fresh air, accomplishing this by utilizing airing towers, like the one illustrated in figure 5. 1, and fans to travel air in and out. Finally, air can be renewed every 90 seconds.

(Howstuffworks, ND.)

Figure 6. 1: Inside a Holland Tunnel airing tower (Beginning: Eric and Edith Matson, ND.)

The airing systems that can be applied while edifice, can be divided into two methods: natural airing and mechanical airing. Natural airing depends on an unfastened window if the architecture permits, so it can non be used in submerged edifices. Therefore, mechanical airing is applied to air out these edifices.

The most of import thing is the manner to acquire O needed for take a breathing. Breathing under H₂O could go on in several ways ; such as hydrolysing the sea H₂O, change by reversaling osmosis, or suctioning methods through air pumps. (Chamberland, ND.) . Oxygen can be extracted from saltwater since people will populate underwater, and it will be a practical method. Rearward osmosis is an effectual method used in H₂O intervention ; and in the hereafter it will be used to acquire O, while populating underwater. Suctioning O, utilizing air pumps, would assist in both acquiring O and supplying good airing.

7. Examples

7.1 Dubai Underwater Hotel

It is still under development. The hotel location will be 33 pss submerged. Its entire cost is over \$ 550 million. The land station will be connected with the submerged subdivision with a 515 metre long tunnel through which an automatic train will transport people to the submerged hotel. It is 260 hectares country consisted of 220 suits bubble shaped 20 metres underwater.

The hotel will besides hold several security steps. It has a series of watertight doors in instance of any ecstasy. It will besides hold its ain missile defensive system in instance of any terrorist onslaught.

7.2 UNDERSEA RESORTS- Poseidon Mystery Island

The thought was for the American applied scientist Bruce Jones. The Poseidon Resort 's Mystery Island shown in figure 7. 1 could be reached by lift. It is a 1. 1 million square pes, 40 pss under H₂O. Room standard country is 550 square pes. (wayfaring, 2007) .

The budget of the undertaking is \$ 100 million.

Figure 7. 1: Poseidon Mystery Island (Source: www. wayfaring. info)

7.3 Ithaa underwater eating house

It is the 1st of its sort in the universe. It is 16 pss below the surface of Indian Ocean. It is encased in clear acrylic.

The Ithaa eating house can be reached by a wooden paseo shown in figure 6.2 from over the H₂O. It was difficult to construct it on the beach of Rangali due to proficient challenge, limited resources and quality jobs. (Wikipedia, 2010)

It was constructed in Singapore. Its building began in May 2004, and it was completed in October 2004 including installing of the acrylic arches, air conditioning and electric canals. Its life span is 20 years.

Figure 7. 2: Ithaa underwater eating house (Beginning: World Wide Web. Wikipedia. com)

7. 4 Jules Undersea Lodge

It is the world's first submerged hotel, originally built in the early 1970s. It was opened to the public in 1986. (hotelclub, 2007) . The entryway to the hotel is 21 meters underwater on the sea floor. The Lodge is fully stocked with fresh air.