



NATIONAL INSTITUTE OF TECHNOLOGY, HAMIRPUR
ARCHITECTURE DEPARTMENT
DESIGN-O-CRATS

UNDERWATER CITY

Abstract

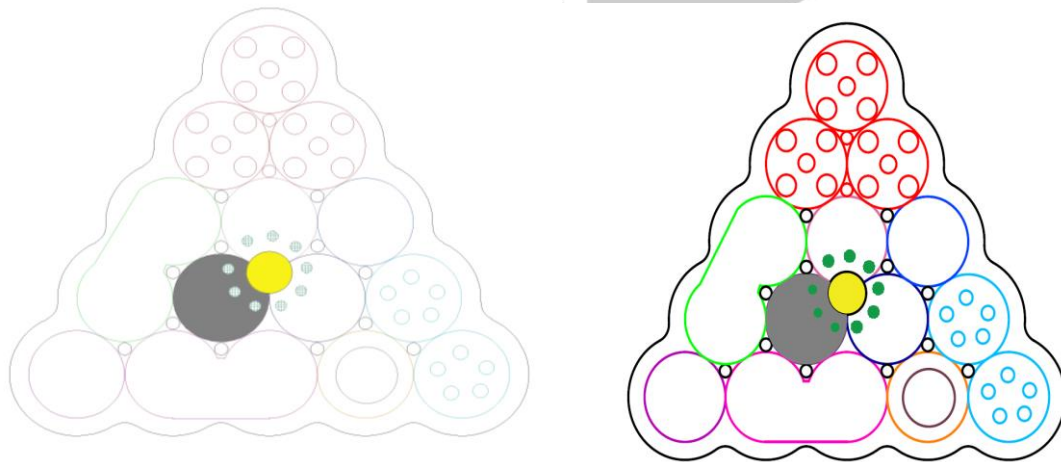
Population in India is increasing rapidly and reached approximately 127 crores with average growth of 1.6% every year. Traffic Congestion is one of the major problems that India is facing and it has a massive impact on the quality of air, time of travelling, trade and cost. It has been noted that the government are trying their best in order to come up to this problem by creating structures such as Tunnels, Subways, Flyovers and Bridges. But unfortunately it fails as does not match up with the increase of population and due to less amount of land available for the construction. In this report there is a study on the construction of the buildings and structures with a new technology of constructing under the water. It has been noted that the underwater buildings exist since year 1960 but no one was aware of it. The underwater construction of the buildings can be advantageous to the people and the environment if proper techniques are used and if people get success in achieving such structures. If such technology is adapted everything can be built underwater such as buildings, houses, shopping complex, museums, entertainment hub, restaurants, hotels, sports stadiums etc. This can lead to a progressive and a luxurious life to the people and they can even enjoy their holidays at such places. Encouragement of underwater building is provided by the glamorous view beneath the water of fishes, sea beds, different creatures and coral reefs. This paper discuss about the materials which should be used for the construction of underwater buildings, ways of building and special requirements, the possibility of such constructions, advantages and disadvantages of underwater buildings, the impact of such buildings on environment, effect on the social life and transportation.

Introduction

Underwater buildings are structures which are built under the water and each constructing built has a specific motive related to it in keeping with the type of its construction. The idea of the underwater production become started with through the construction of underwater research stations through Jacques Cousteau's team inside the 1960's. To a layman, he has by no means notion of going to an underwater constructing and through the development of underwater homes it is a new improvement and enhancement of the generation.

Underwater construction is the destiny goal or future foundation so that you can have an splendid impact on the environment, it will additionally lead to some of the troubles to the surroundings which will be confronted because of the application of this technology but if we get fulfilment in reaching it will be a tremendous gain to the environment which is getting crowded day by day due to the growing populace. Approximately 3/4th of the earth's floor is protected with the aid of water and water our bodies. For this reason the development closer to the underwater production technology will be useful to the mankind.

CONCEPT



The concept consists of circular island clustered together in groups of 15 to form a 50000sqm for the underwater city is supposed to reach the 100 meters depth and cover as much as 750,000 square meters for 1200 residents, and then again to form an archipelago home to 5000 citizens.

We have based it on this modular idea of a circular island. Artificial island is fully designed by manmade trees are vertical gardens that generate solar power, vent air for the nearby

conservatories, and collect rainwater (range from 25 m in height). Our existing landmass on earth has been built up so extensively that the remaining free land is under extreme pressure and preserved as much as possible.

The basic construction unit of resistance zone is a prefabricated block of 60m and 50 m length in elevation.

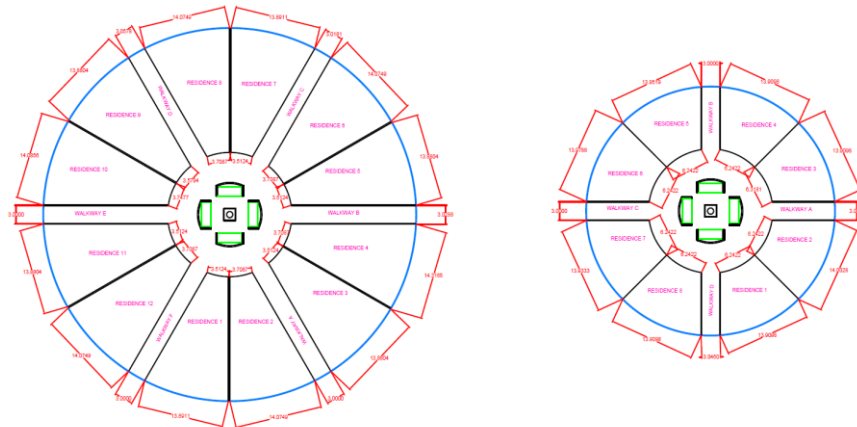
The floating city has a perfect internal and external traffic system, linking it within but also with the outside world. A cruise dock serves giant ships, a yacht dock serves private vessels and civilian submarine traffic. Submarines and electric vehicles are the main means of transport on the island – keeping the island free from air pollution and congestion caused by automobiles. The main traffic flows are facilitated via the water canals above and below the water surface. The peri-urban area house farm, hatchery and garbage recycling centre.

Vertical gardens are interconnected with the public greenery system above and below the water.

The large commercial and entertainment centre is located above water level.

Tourists can experience the fabulous underwater world whilst passing through the underwater hotel and coming up to the harbour city.

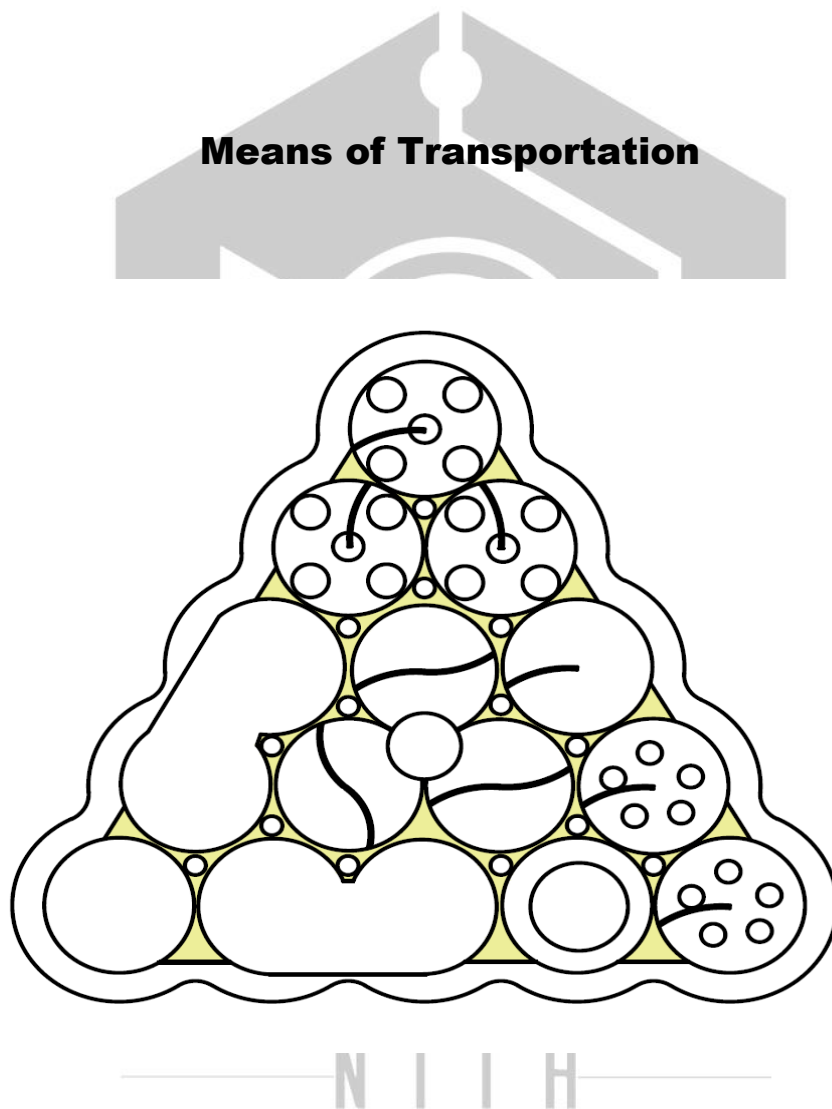
Underwater tunnels with walkways and roads permit horizontal communication and access between the islands and buildings that comprise the floating city.



Social aspects

Over population is considered as the sector problem that is increasing at a high pace and this result in big quantity of issues. And we understand that the blue colour dominates the earth therefore these motives have let the humans consider the opportunity of the underwater constructions. Now, the point is will people accept the notion of living underwater in future or this project will turn out of no use. because of the high price of construction those underwater building may also get confined to the sure amount of people who are capable of find the money for it and this will be considered because the signal

of wealthy human beings. allows think that if the era gets development there might be the discount, however, if entire cities are built underneath the water it'd be difficult for the human beings to accepts the sort of alternate and to live there, due to the fact some people wishes solar and as this underwater cities are some distance faraway from regular world some human beings might think that they would get remoted. Others may additionally actually need to strive the brand new lifestyles and revel in the calmness, peace and fantastic view of nature.



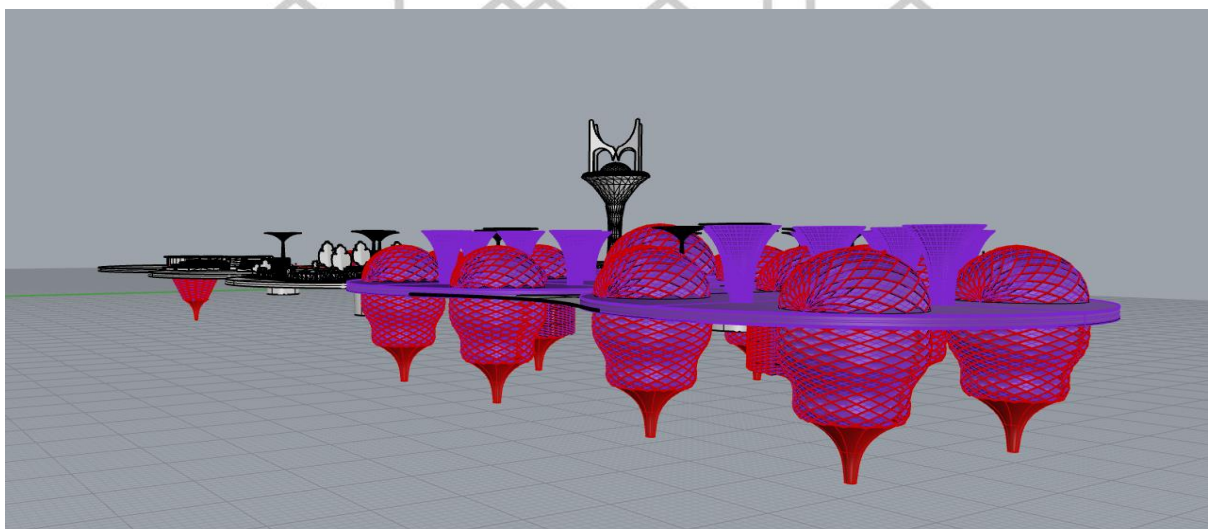
After questioning the possibility of underwater constructing, one of the most critical issue that comes in mind would be the approach of transportation. There are basically possibilities, first as most of people would assume a submarine may be the primary mean of transportation but whilst considering the application and price we find it is appropriate. If we communicate about the large scale, the idea of underwater tunnels can be taken into consideration. There are by now present some underwater tunnels

which might be operative for some future underwater buildings. We can take the example of the underwater hotel "Hydro polis" of Dubai, which is still under construction. It has been explained by the developers of this project that: "It will be inclusive of three elements: the land station, where guests will be welcomed, the connecting tunnel, where the guest will be transported to the prime area of the hotel by the means of trains, and the 220 suites within the submarine leisure complex."

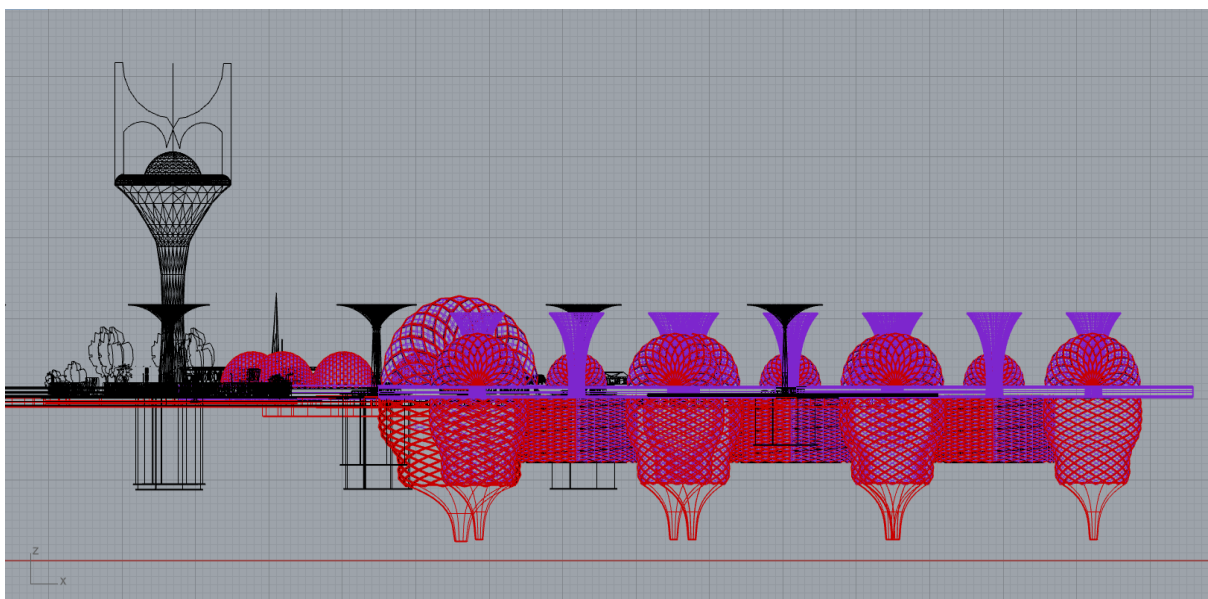
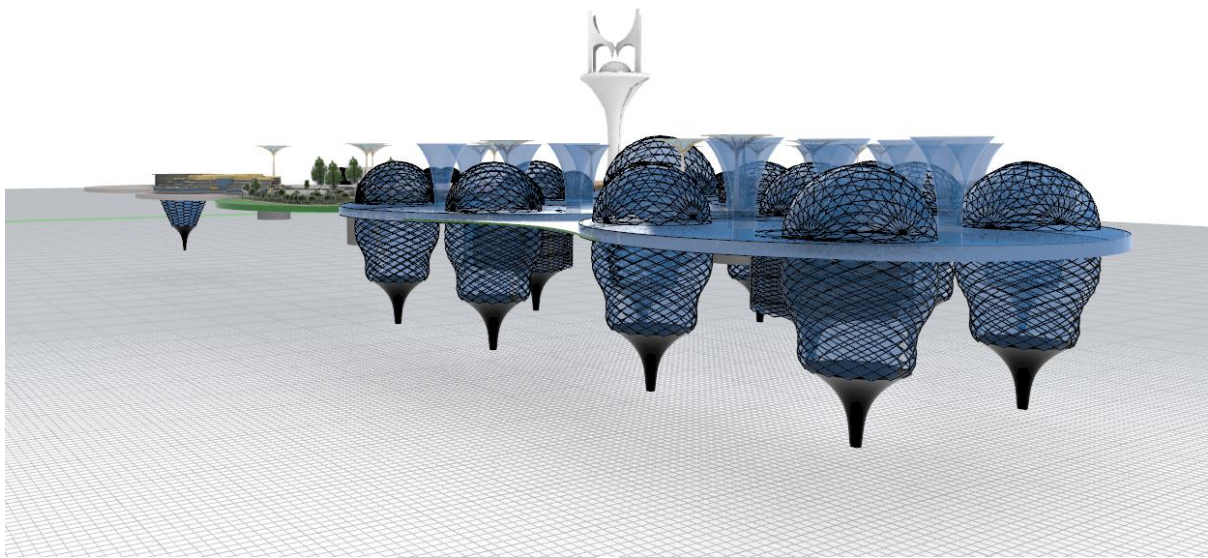
Materials

There are many materials to be had for the building but our selection should be such that the material fulfils our requirement and to be had with a minimal price. Whilst choosing the materials to be used inside the manufacturing, it is critical to make sure that the burden restriction is not exceeded. The principle fabric used for construction underwater changed into a unique kind of steel and acrylic. The acrylic fabric is used specifically for visibility, on the same time because the steel is used for reinforcements (enables). Excessive energy steel is used as it is in particular reasonably-priced, and has its immoderate yield electricity. It isn't always additionally a terrific conductor of power and warmth. It's far an excessive corrosion resistance. Acrylic fabric is used in preference to glass; it is better than glass due to being much less dense, and it's also has higher effect electricity than the glass. Acrylic gives the herbal duration and colourings of the encompassing materials than glass. It's also proper insulator of strength which is good in searching out the fitness and safety of clients and underwater creatures.

Construction of The Building

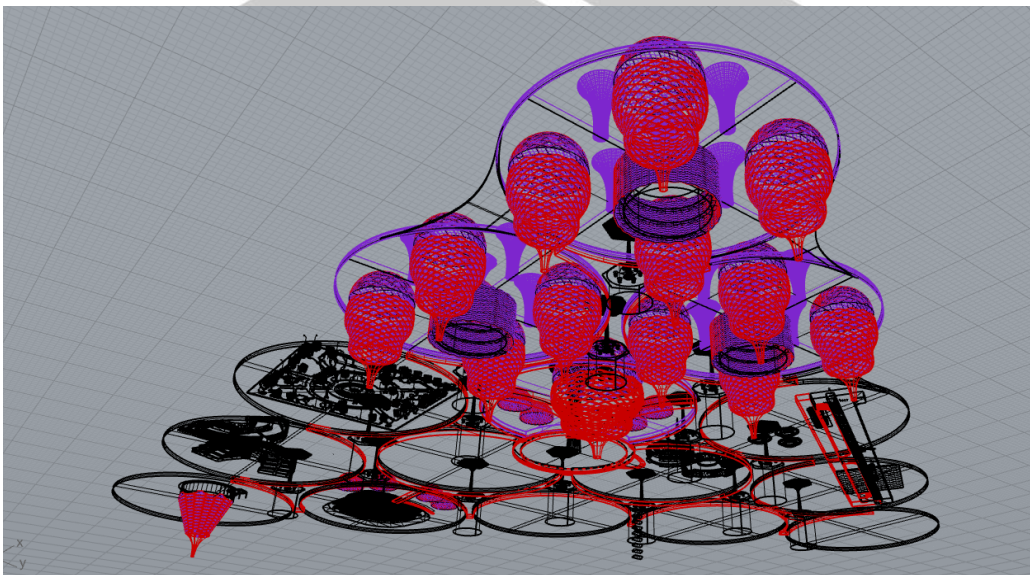


Its miles stated that the pays for underwater creation might be more than on land manufacturing, because of the difficulty faced inside the path of the running underwater. Some other hassle would get up; the building is large in size. For solving those issues, they divide the building into elements and constructing every part on land then assemble them under the water.



Maintenance

The maintenance method is a high-priced gadget especially when dealing with an underwater protection. This hassle may be solved, by way of dividing the constructing into components that can be separated from the complete building; those additives can be transferred to land in order that a less high priced renovation can take area. The apparent a part of the constructing want to be usually clean, so that the customers can see the marine surely in all the time. This situation can be executed through an automated gadget which may be used as self-cleansing system



The Problems Confronted by Underwater Building

[1] Budget

Building beneath water is a very costly way because of using heavy machinery, devices and professional employees. Building below water also includes some of welfare and it desires to large price range.

[2] Erosion

Erosion is the method of weathering and delivery of solids (sediment, soil, rock and different rock particles) in the natural surroundings or their source and deposits them someplace else. It normally takes place because of transport with the resource of wind, water, or ice so engineers ought to pick

out appropriate materials for beneath water building.

[3] Location of fuel

Any coincidence may also be possible when the driller machines and other machinery are trying to find out oil or to any ship also can damage the outlook and structure of the building it's far out of manage.

[4] The hassle of warmth of the water

The temperature varies reasonably over the surface of water, it is heated from the ground from the below by the usage of daylight hours, but at depth maximum of the water may be very cold.

[5] The problem of pressure

Stress performs a large characteristic in persuading the guidelines of the constructing additionally people come to problems one or the other at some stage in the development system or at some

[6] Environmental building elements

No doubt that the primary problem that is to be had in our mind at the equal time as talking approximately the development of underwater systems is the problem of aeration. There need to be a supply of renewable air that helps in respiratory, and removing unwanted gases. Permits discover a solution, for the air flow hassle, that changed into implemented at the same time as the development of the underwater Holland tunnel. Tunnels, in particular, have a exceptional trouble with ventilation, due to gases produced thru trains and cars. This hassle modified into addressed with the aid of Clifford Holland, the tunnel's clothier. His intention was to find ways to easy exhaust fumes and pump in clean air, reaching this with the aid of manner of the usage of aeration towers, and enthusiasts to transport air in and out. In the end, air can be transformed each ninety seconds.

What Are the Main Obstacles to Living Underwater?

Living underwater comes with a host of challenges.

You have to worry about the immense pressure, the freezing temperature, as well as the lack of oxygen. There's also the fact that underwater living could wreak havoc on the human body.

The depth of the ocean puts an enormous amount of pressure on the body, which causes gases such as nitrogen to dissolve in the blood. So, if the diver swims to the surface, gas bubbles could form in the blood, ultimately leading to life-threatening embolism.

To address this issue, Canadian inventor, Nuytten invented an armored suit that eliminates decompression. The suit ensures that conditions in depth of up to 600 meters remain the same as on

Instead of importing food from the surface, underwater colonies must figure out how to grow their food. Possible options include algae farming

Is it Viable?

Building underwater cities may be one of the most complex projects humans have to undertake.

That's because it's not enough to live deep in the blue ocean, science and engineering must also ensure that we can stay there for as long as we want. That means creating viable solutions for issues of sustainability, safety, as well as energy production.

Rather than travel all the way to space for refuge, we could one day devote our full time to floating under the sea

Conclusion

This record analysed a present day generation of construction of structures beneath the water.

Constructing building under the water is the future establishment that has a superb effect on the environment. This document has shown up what underwater buildings are. It has mentioned the impact of underwater constructions on environment and social existence. It has tested the materials which can be utilized in underwater constructing. It additionally has described the problems that are faced during the construction of structures below the water. It has described the air flow structures which are used. It has higher the reader with a few examples of underwater constructions that have been built or under manufacturing, in order to mesmerize him with the appealing view and the magnificence of buildings. So this document acclaims the reader to don't forget this technology of building, and convince him to stay down there.

N I M B U S
— N I T H —