Solution for Decrease In Land Due To Global Warming By Construction Of Very Large Floating Structure In Water Body

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Abstract: During the last couple of decade the term Global warming is generally refer to the change in the climatic condition. But it actually means that the temperature of our earth surface is increasing day by day, due to greenhouse effect, greenhouse effect is the behavior of our atmosphere in which the atmosphere dose not reflects back heat coming from the sun, due to presence of carbon dioxide in atmosphere. Our earth's ocean act as the temperature controlling body or the radiator system on our planate it take the heat from the atmosphere near the equator and transfer to the poles of the planate due to which the planate maintain its temperature. But as the average temperature of the earth is continuously increasing the ocean are passing more heat to the poles and the water present in the form of ice caps is melting and, which lead to the raze in the sea level of our oceans.

1. Introduction

As mention in the abstract the global warming is the rise in average temperature of the earth surface due to greenhouse effect. Greenhouse effect can be explain by the following figure.

Fig.1 Greenhouse effect

The diagram show the energy emitted by the sun is entering in the atmosphere and most of it is reflecting back but some of the energy is not reflecting it is caught by the carbon dioxide present in the atmosphere. This result in the increasing of sea level due to melting of the atmosphere. A another factor also contribute to increasing temperature is the pollution which I emitted by the industry and the cars, truck, locomotive etc.

The idea of the project to create the very large flouting structure by the use of the Archimedes principle this stay that "The upward buoyant force that is excreted on the body immersed in a fluid whether fully or partially submerge, is equal to the weight of the fluid that the body displace and act in the upward direction at the center of the mass of the displaced fluid."

Purpose of Very large flouting structure

1. Acquiring the scientific knowledge specific to the naval building project and more   generally to any floating structure.

2. To provide artificial land after or before submerge of the land due to global warming.

3. To provide a base camp to naval force of nation to guard the water boundary.

4. To use the great plains of sea & wind power to generate electricity.

2. Related Work

Sciencedirect(2015) Very Large Floating Structures: Applications, Research and Development [1]

Hydro elastic response:

Pontoon-type very large the floating structures (VLFS) are like giant plates resting on the sea surface. As these structures have a large surface area and the relatively small depth, they behave elastically under wave action. This type of the fluid-structure interaction has being termed hydro elasticity. Hydro elastic analysis is thus necessary to be carried out for the VLFS design in order to assess the dynamic motion and stresses due to wave action. There are two approaches used in the performing the hydro elastic response of the VLFS, i.e. the frequency domain approach and a time domain approach

Applications of VLFS

From 1995 to 2001, the Japanese constructed and the studied a performance of the Mega-Float (a 1 km long floating test runway in Tokyo bay, see Figure 1) in order to develop and to investigate the soundness of a VLFS technology for use as a floating airport. The conclusion of a study is that VLFS is indeed feasible for floating airports, even with the stringent requirement that the radius of curvature of the runway be kept at 30,000 m. Some of the other applications of VLFS in Japan are the floating fuel storage bases at the Shirashima island and Kamigoto island (see Figure 2), and floating ferry piers at Ujina port, Hiroshima.

Hibeyuki Suzuki (2007) [2]

The National Research & Council (NRC 1993) promotes reliability-based design for such structures. A VLFS is an the innovative structure by most any definition. The Preliminary MOB Classification Guide (ABS 1999a and 1999b) requires and the Technical Guideline of Mega Float (TRAM 1999b) recommends a risk-based evaluation of safety for VLFS. The risk diagram shown in Figure 18 is based on large-scale engineering projects (Whitman 1984) and was instrumental in clarifying the annual target probability of Pf failure for VLFS. The ordinate is a historical probability of failure rate while the abscissa is consequence in \$'s and associated fatalities. Assuming that the cost of a VLFS is approximately \$10B, the corresponding annual Pf should be roughly $10-6$ according to this data.

While engineers explicate target reliability level and its relationship to cost, it is for policymakers finally to decide upon the target reliability. An example is found in the Canadian   government's setting the target reliability for the Prince Edward Island Bridge project (Pirie 1997 and MacGregor et al. 1997).

3. Methodology

In this chapter, analysis of the weight of the building which is going to construct on the pontoon, this include thee calculation of the dead load of the structure, lice load coming on the structure. As well as other consideration by using a detail drawing of the structure, which include set of drawing of plan of different floor, Cross section of the structure as well as plan for placement of different column, trace, and a detail estimate of the structure which include the different quantity of material on the structure. The weight analysis will be done by using the excel sheet with the formula provided in it.

This chapter also contents the check the feasibility of a normal conventional structure on the pontoon with respect to the weight of the structure and the lateral stability. And if it is feasible on the pontoon than to check the overall dimension (volume) it is going to be required to construct of the structure. By using the basic Archimedes principle and calculation.

To design the pontoon on the small scale and check the feasibility of the material as well as to check the concept of the project. The construction of the project will be on a small scale and the self-weight to weight caring capacity ratio can be checked.
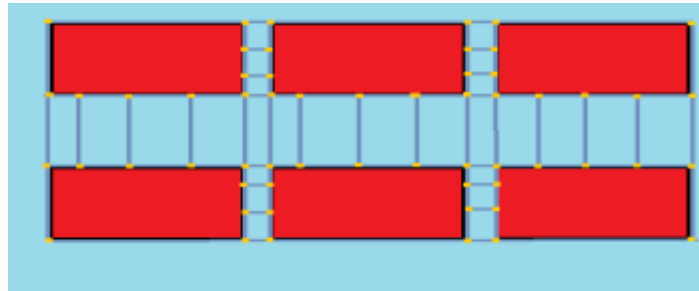

Fig. 2 Inter connection grid system

Check the density of the material.

For the above table shown in the pages. There is the column known as the density which is use to find out the weight of the materials use in the building. But the value of each material was inaccurate, That we found find on the various sources that's why we find the density of the core material that we are going to required.

Procedure of finding the density.

The density of the material is defined as its mass per unit volume. Also: density, ratio of the mass of a substance to its volume, expressed, for example, in units of grams per cubic centimeter or pounds per cubic foot.

Tools required in the excrement

- Beaker of 2000 ml volume
- Beaker of 150 ml volume
- Aggregate 5 kg
- Sand 5 kg
- Water
- Weight scale

Procedure of finding the density

Steep 1) take the sample of the material of which density has to check

Steep 2) weight the sample on weight scale and name it as (A)

Steep 3) Fill the beaker of volume 2000 ml up to 250 ml mark and place the sample in the beaker

Steep 4) Now fill the second beaker of 250 ml up to mark of 250 ml

Steep 5) put the water from the 250 ml beaker to the 2000 ml beaker up to mark of 500 ml mark

or up to the mark above the already present water level.

Steep 6) now check the amount of the water added to bigger beaker by smaller beaker.

Steep 7) subtract the 250ml +the water added with the smaller beaker from 500 ml mark and you   will get the volume of sample.

Steep 8) divide the weight of sample by the volume of it to get the density.

4. Results

In this chapter we are going to check the concept of the pontoon design by the model which we have make. We are going to calculate the depth of the pontoon which is sunk in the water and the portion above the water leavel. The depth below the water level will give the self weight of the structure and height above the water level will give the weight carring capacity of the structure.

Fig. 3 Flooting pontoon

Result analysis

This are the observation result from the model of our ponton.

Table 1 Result analisis

SR.NO	Depth under water level	Self weight of the structure	Height of structure over water level	Load can carry
1	50 mm	8.405 kg	360 mm	60.516 kg
2	52 mm	8.741kg	358 mm	60.179 kg
3	60 mm	10.08 kg	350 mm	58.835 kg

We found that as the size of the pontoon is increased the weight of the pontoon will increase but the weight caring capacity of that pontoon increase in the multiple of that pontoon.

Table 2 Size and weight comperiasion

SR.NO	Dimension of the structure	Weight of the pontoon	Weight carying capacity of pontoon
1	30*30*30 (cm)	32 kg	27 kg
2	60*60*60 (cm)	162 kg	216 kg
3	90*90*90 (cm)	729 kg	364 kg

5. Conclusion

1. From the analysis of pontoon subjected to the floating body is under have been studied and these factors are shown as per the discussion of the previous chapter results it is conclude that.

2. The construction of the traditional building is possible from theory point of view but it is impossible by the practical point of view as the other non-conventional structure can be more lighter in weight and the cost of construction for both building and the pontoon can be reduce

3. The construction of small size pontoon with the actual material is not possible as the concrete not gain the strength and it will continue to break.

4. The principle of the Archimedes will work in case of the pontoon and the pontoon will flout if the calculation is right and there is sufficient air pocket.

5. The pontoon can be stabilize by the help of anchor and other structure. The shape of the pontoon and the position of the mass play important role in the placing of center of gravity low

References

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