

## Solution for Floating houses, a Plastic

*K.Shubham<sup>1</sup>, P.Sumedh<sup>2</sup>, M.Sushant<sup>3</sup>*

<sup>1,2,3</sup>Students,

Department of Instrumentation Engineering,

PVPIT , BATU University , Maharashtra, India.

**Abstract:** A experiment was made to build a plastic made floating house in consideration to the increasing amount of plastic around the globe from past few decades. The prototype house considered for this study was given a load bearing capacity of approx. 1800 kg with enough free board and for other essential matters. Plastic was considered as a main base and preferring the reusable type of plastic (i.e most commonly the excessive or un-cycled plastic can be used for building of houses rather than to be dumped for the marine life). This type of experiment help us to replace the basics of house , building item's with plastic and it may also help as a long time solution. It may future wise help us for the situation like Floods etc.[4]

**Keywords :** Floating House , Plastic , Floods.

### Introduction

The Invention of plastic has been considered as a revolutionary one ,so that the importance of it has been increased to a greater extent. Over these past years the need for the same has been increased equally . There has been a huge production of Plastic past years .The below given table shows production of plastic from the **world view** for past few years.**Table[1]\***

| Year | Plastic Produced ( World Wide )<br>(in tonnes) |
|------|--|
| 2015 | 322 million tonnes                             |
| 2016 | 280 million tonnes                             |
| 2017 | 348 million tonnes                             |
| 2018 | 359 million tonnes                             |

From the country wise perspective there has been an growth in the plastic production in **India** too.

The below table shows the total amount of plastic produced in **INDIA** . **Table [2]\***

| Year | Plastic Produced ( In India )<br>(in tonnes) |
|------|--|
| 2015 | 9.5 million tonnes                           |
| 2016 | 14.8 million tonnes                          |
| 2017 | 16.0 (approx.) million tonnes                |
| 2018 | 16.5 million tonnes                          |

As there is production of plastic at a huge rate equally are its adverse effects, the table given below shows the countries with the high wastage rate approx. (per year) : **Table[3]\***

Followed by Brazil ,Japan , Pakistan , Russia etc.

| Countries | Plastic wastage (in tonnes) |
|-----------|-----------------------------|
| China     | 59.8 million                |
| U.S.A     | 37.83 million               |
| Germany   | 14.48 million               |

### Floating Houses :

Floating house is a unique mechanism of living on a buoyant force platform without the fear of sinking and get afloat with the rising ups and downs according to the water level. It is not a house boat , but an actual house that’s designed to float. Different type of modern constructional materials are used in modernize floating structure and providing all the amenities required in the house. Two type of floating house are basically designed. One sits permanently on water as boat and another is an amphibious house that stand on dry land but in the event of flood able to rise with water. [4]

Hence the present study was conducted with a view to address the following objective :

1. To design a plastic based floating house suitable for all the year round .
2. To analyze the stability of the designed house.
3. To make a good use of plastic.

### Methodology

Assuming that the base of the floating house is made up from Plastic i.e in the shape of cuboid.

**With** Consideration to an ideal floating house , assuming a four member family to fit in as 60kg, 55kg , 40kg , 15 kg and 10kg i.e total 180 kg.[4]

### Considerable incoming loads in the house

For design purpose the weights are considered as given below :

The total weight of family members = 180 kg

Weight of food (one month ) = 250 kg

Weight of seed of different crops = 200 kg

Self weight of the structure = 900 kg

Weight of stored drinking water = 70 kg

Weights of the utensils ,cloth and others = 200 kg

Total Weights

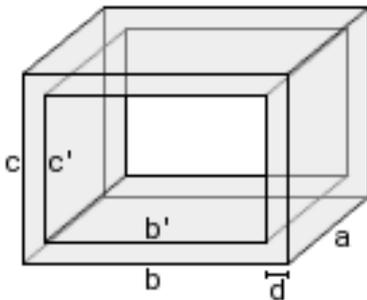
= 1800 kg

### Design Consideration

Considering the design of floating house with assuming the base made up in the form of plastic cubes or cuboid. Following calculations are done with the details of the plastic cube or cuboid .

• **Calculation:-**

Some theoretical values of one cuboid



Length (a)-2.5 M

Thickness (d)-0.25 M

Outer Edge(b)-3.5 M

Inner Edge (b')-3 M

Outer Edge (c)-2.5 M

Inner Edge (c')-2 M

Surface Area (A)= 60.5 sq.meter

Volume (V)= 6.875 m<sup>3</sup>

Surface to volume ratio (A/V)= 8.8

[5]

**\*So the assumed floating house has an base of above mentioned cuboid shaped plastic with the above given values.**



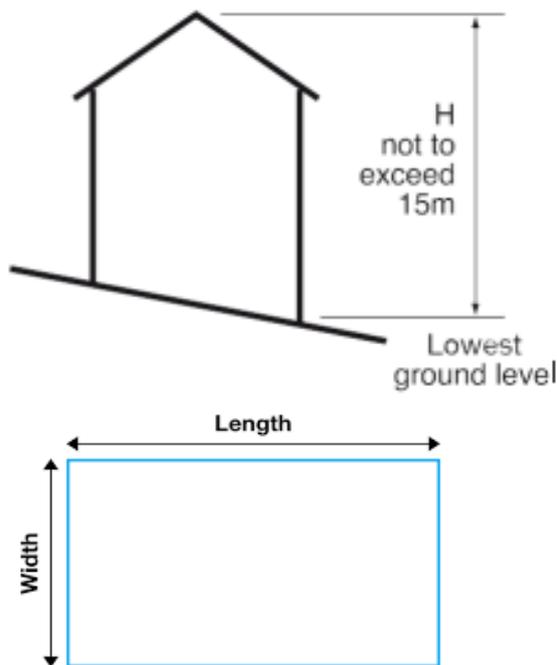
[6]

**Determination of Center of Gravity of a Floating Body**

Since , the whole floating body mentioned in this experiment consist of different segment having different weight and shape so center of gravity is to be determined following the law of composite body[4]

Following Calculations are done to give a glance about periphery about the house :

- Home structure for family of four :-



Length (L) = 8 M

Width (W) = 5 M

Hight (H) = 4 M

Volume of house = 160 m<sup>3</sup>

Hence , Volume of house = Volume of 25 plastic cubes.

[5]

## Result and Discussuion

Hence the study says that **Approximately 25 cuboid should be require to build a ideal floating house.**

## Conclusion :

The designed , plastic based floating house has been found stable from engineering point of view and it is a best way to recycle the unused plastic and it may also arise as a remedy for construction purpose in the future. If the house was constructed practically then the merits and demeritsof this house may come out more basically[4]. The designed floating house is suitable for flood hit areas and providing a permanent addressfor dwelling in a home like environment to landless people and gypsies[4].The information and the design facts of such floating house should reach to the concerned communities through different media towards fostering them to use this functional live saving invention[4].

## References

[1] Table no .[1][www.darrinqualman.com](http://www.darrinqualman.com)

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