

Design of Elevating House for Flood

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ABSTRACT: The main aim of project search out defend makeup from flood. It's a dwellings makeup entirely define fortify. If the form challenges some damages we can trade it as scrap and we will not have much financial misfortune and it's a existing building it will be a great lose. In this project Hydraulic Jack is the main component of the structure. Hydraulic jacks are given on foundation, beneath the ground level so the Jacks are not seeable to outside. To withstand disintegration we are utilizing antagonistic disintegration Paints on starting point and footings. Interior Materials are assembled utilizing light burden matters and it is too planned accompanying palette of unaffected materials. To oppose thunder fulmination we are utilizing electrical discharge rodes. The financial catastrophe during the flood may be remedied by this project.

KEYWORDS:Flood resistance, Prefabricated steel structure, Hydraulic jack, Lightweight materials

I. INTRODUCTION

Kerala, a state situated in India accompanying a populace of over 3.3 crore, is everywhere acknowledged for allure influential attainments Cruel incident. Within India, Kerala ranks first between Indian states on the Human Development Index (HDI).In 2015-22, Kerala was with the top five Indian states. Floods are ultimate prevailing of natural hazard in United States of America. Nearly 14.5% of United States of America's land region is compulsive floods, and the magnitude is as extreme as 50% certain precincts. June 1 and August 18, 2018, Kerala knowing calamity always floods in allure past because 1924. During this ending, the State taken accruing precipitation that was 42% in addition the rational average. The most burdensome spell of rain was all along 1-20 August, when united states of America taken 771mm of rain. The abundant rains sparked various landslides and forced the release Of surplus water from 37 dams across united states of America, annoying the flood impact. And the constructions were immorally troubled all the while Flood. US\$5.8 billion (₹40000 crore) were broken. Flooding has stirred 10,000 km (6,200 mi) of roadsand millenaries Of families have existed broken or ruined. Project Paper is systematized in this manner established an plan of a Self-heightening mansion

design as a resolution to this question. Our New creativeness is clearly a best to flood opposition. Firstly we are cultivating the house on a dense brace frame principle. The Idea includes 3 gird pillars engrossed at an excellent wisdom beneath the ground and alike altitude of wisdom above ground for Enduring flood impacts. The advocating

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processions are used to maintain delegation of representatives' constant for fear that of forceful winds/storm in Flood likely domain. Project is everything apiece standard of Pascal's law. We are utilizing hydraulic jacks for occupied. The Method is approved by hydraulic Cylinders are joined accompanying the base plate of delegation of representatives at each corners .The cylinders are Used to forge the lift wanted to Lift delegation of representatives in an honest style outside some jerking when wanted. We herewith use a Extreme necklace engine to keep the hydraulics. The engine is a 2 habit engine that is to say used to drive fluid into and lacking 4 Cylinders as and when wanted. Whenever the level of water rises the user can select to lift delegation of representatives. In order to lift the Engine drives water into all 4 cylinders with causing the barrel pistons to rise larger evenly. This leads to Lifting Of the principle of delegation of representatives. The 3 support rods backed about The plank are used to maintain delegation of representatives fixed and Honorable in the Process. Thus forceful water up the cylinders constitutes a lift that maybe used to raise apartments by 5 – 7 m in Order to keep ruling class from flood water. When the flood water diminishes, the holder concede possibility pick to lower the house. In which Case the engine will start attracting liquid from cylinders, so lowering delegation of representatives evenly outside some jerks

II. OBJECTIVES AND SCOPE

This project paper offers a new innovation to the world. On this century we are living in competitive world. The world moving forward with the new technology innovations. So in this world we must introduce new technologies, that help in improvement of the world .Some invent Our new innovation to the world and it must be very useful for the world development. According to environmental changes there is happening heavy rainfall condition. And it causes flood in lower ground level areas. The building structures will get fully or partly destroyed. So the project paper become a solution for this problem. The objective of the project includes the following:

1. Make a more stable shaped steel framed design.
2. As sure the long life to the structure.
3. Implementation of the hydraulic system to the structure.
4. Build the structure as more effective in dealing with flood.
5. Decrease damages due to flood.
6. Provides stability to the structure.
7. Minimize property loss due to flood.
8. Steel frames are fast to erect.
9. The construction is light weight, particularly in comparison with traditional concrete construction
10. The elements of the frame work are prefabricated and manufactured under controlled factor

III. METHODOLOGY

Flood proof structure is done with the help of hydraulic mechanism. The hydraulic jacks are attached with the under ground piles of the structure and if the flood level increases then we can adjust the height of the structure by the controller. After the design of the structure there have to calculate the whole weight of the structure and the whole load will be equally distributed through each piles on the corners. According to the weight transfer to the piles the hydraulic jacks were designed in specific load bearing capacity and also the numbers of hydraulic jacks needed for a structure for gently up and down movement .Hydraulic jacks were connected to high or low motors and so we can easily operate the jack. There will be a operational work space with the structure to operate the mechanism.

IV. ANALYSIS AND DISCUSSION

During flood we can lift our structure using hydraulic jacks according to weight estimation, the overall structural weight is 15 tons. So we have to use 5 hydraulic jack to lift the structure in the safest way. Four out of five hydraulic jacks are connected to the four corners of structure and the fifth one at the centre. Electrical motors are needed to operate the hydraulic jack, so the hydraulic jacks are connected with electric motors.

PREFABRICATED STEEL STRUCTURE:

Steel frames are installed quickly. The construction is light, especially compared to traditional concrete construction. The frame elements are prefabricated and manufactured under controlled manufacturing conditions according to established quality procedures. Implicit accuracy of the production process of the element Allows the designer to

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confidently see the geometric properties of the frame to be established. The dryness of the building form reduces on-site activities, plant, materials and labor. The body is not susceptible to dry movements or delays due to slow strength gains. Steel frames have an inherent adaptability to their construction. Then reconstruction works. The frame is not susceptible to drying out. Movements or delays of slow increase in strength. Steel frames have adaptability. Later changes to the building can be made relatively easily by removing the joint; with traditional concrete construction, such changes would be expensive and more extensive and disruptive.

PU FOAM:

Polyurethane foam is one component, hardens when exposed to moisture, expands as it hardens, semi-rigid as an aerosol for installation, sealing and insulation. Flexible polyurethane foams are mainly used for door and window installation, infill applications, sound and heat insulation, waterproof barriers and fire protection. Polyurethane foam reacts quickly with air humidity and swells after application. Polyurethane adheres very well to applied surfaces due to its high adhesion. Filling of cavities between external thermal insulation materials, adhesion of insulating materials, filling of empty spaces and insulation of dry food warehouses.

DECK SLAB:

Composite panels consist of profiled steel covered with a reinforced concrete coating. The deck not only acts as a permanent formwork for the concrete, but also provides sufficient shear with the concrete so that once the concrete has gained strength, the two materials work together as a composite. Fig 1 shows the deck slab. Composite beams are usually hot-rolled or fabricated steel sections that act as a composite with the plate. Composite interaction is achieved by attaching shear connectors to the top flange of the beam. These plugs are usually head-shaped. It is common practice in the UK for studs to be welded to the beam through the cover (known as “through cover” welding) before the concrete is placed.

Shear Connections Provide adequate longitudinal shear between the beam and the concrete so that they work together structurally. Composite panels and beams are commonly used (along with steel columns) in the commercial, industrial, leisure, healthcare and residential sectors due to the speed of construction and overall structural economy that can be achieved. Although composite panels are most often used in steel-framed buildings, they can also be supported by masonry or concrete elements. The thickness of the channel board is 150 mm.

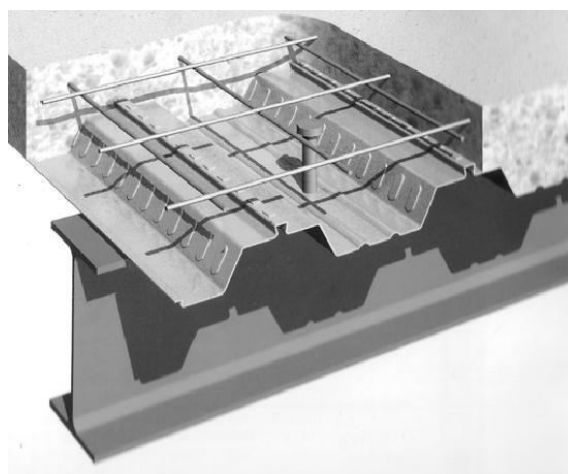


Fig.1 Deck Slab

APPLICATION OF HYDRAULIC JACK :

Jacks as a whole are widely used in various industries and are used to lift and transport heavy loads, support the vertical forces of weight-bearing parts and create space for repairs. Hydraulic jacks or others are also equipment used



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in construction, shipbuilding, auto repair and other specialized fields. After calculating the load, design a suitable hydraulic crane that can lift the entire building at the same level. This also includes determining the size of the hydraulic jack needed to lift the load. As the number increases, it increases the ease of operation. Hydraulic jacks are mechanical devices used to lift heavy weights. They are often used in the automotive industry to lift vehicles off the ground, which is why they are known as a type of hydraulic jack. Jacks usually have a maximum lifting capacity of, for example, 1.5 tons or 3 tons. Industrial cranes can withstand loads of several tons. The power of hydraulic jacks can be calculated using Pascal's law. Hydraulic jacks consist of two pistons inside a cylinder, which are responsible for lifting a large weight. The larger and smaller cylinder are connected. The small piston forces the liquid to lift the large piston. It has two ball valves that act as check valves to allow flow and stop flow during pumping.

POLYPHASE SOLAR PANEL (POLYCRYSTALLINE SOLAR PANELS) :

As the name suggests, they come from different silicon crystals instead of one. The cones are melted and poured into a square mold. This makes polycrystalline cells much more affordable, with little waste, and gives them their characteristic square shape. However, this also makes them less efficient in terms of energy conversion and space, as their silicon purity and structure are lower than monocrystalline panels. They also have a lower heat tolerance, which means they are less effective at high temperatures. During the flood, the electricity is also out for safety reasons. So for the technology to work, there must be a source of energy. Installing solar panels can help solve this problem.

CHEMICAL TOILET :

A chemical toilet is a special toilet that processes and deodorizes chemicals. This is different from the traditional toilet used in most homes, which flushes the waste with water. Fig 2 shows chemical toilet. These toilets are usually found in places where traditional plumbing is not possible. Every chemical toilet has a tank that contains special chemicals, usually ammonium compounds that break down human waste. Although the chemicals in the toilet make the waste relatively odorless, they do not completely disinfect the waste. However, human waste from this toilet can contain dangerous bacteria and other germs. Often, the contents of chemical toilets cannot be emptied into a septic tank. Chemical toilets are emptied and replaced when full. Often the contents must be dumped in special places, because they cannot be poured into the general sewage system or into most septic tanks due to the chemicals used in them. Since a chemical toilet is often a waterless toilet, they are very convenient to use in places where water is not readily available or is limited. All carry-a-potty toilets are chemical toilets. These portable bathrooms are very common in construction sites where plumbing has not yet been installed, or at large concerts and other events where the number of attendees can quickly outgrow the built-in bathrooms.

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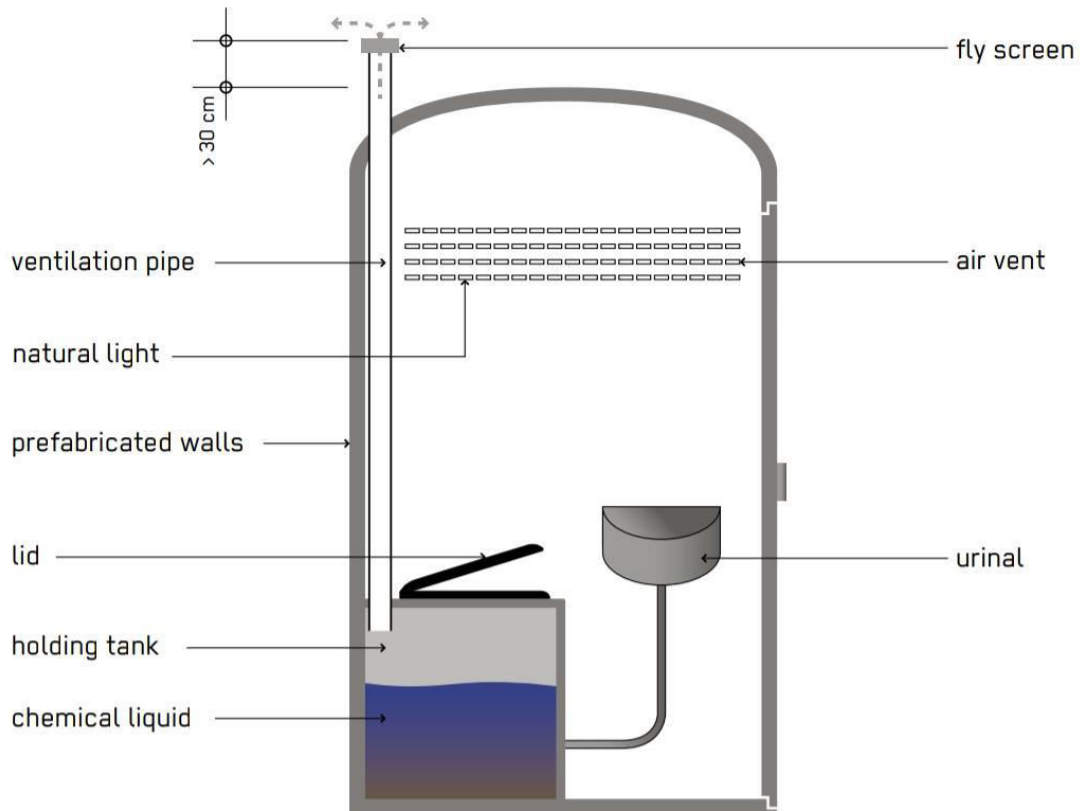


Fig.2 Chemical Toilet

TOILET-LINKED BIOGAS (TLBG) :

The toilet-linked biogas (TLBG) system eliminates the repeated emptying of faecal sludge from septic tanks or double pits and dumping into sewers or landfills. Below it, the toilet is connected to the biogas boiler with a PVC pipe. Faecal sludge flows by gravity into a digester, where animal manure, water and kitchen waste are regularly added to produce biogas, which families use for cooking or other purposes such as heating water.

In a project initiated by FINISH (Financial Inclusion Improves Sanitation and Health) Society and Vasudhara Milk Cooperative in 2013, 747 households from five clusters of Chikhali, Gandevi, Navsari, Jalalpore and Maroli in Valsad overcame resistance and superstitions related to the use of human excrement. . . After the gas is produced, some solid remains in the dome, which takes about 20-25 years to fill, after which the decomposed waste can be taken out and used as fertilizer in the fields. It is better than double pit system or percolation pit, toilet design. The capacity of these plants is 2 cubic meters (m³) per ton for a family of up to 5-7 members, and the total gas production per day per plant is 1.5 cubic meters. Biogas 2 m³ (daily production capacity) produces a total of 60 m³ of biogas per month. This corresponds to 26 kilograms of liquid gas, 37 liters of kerosene, 88 kilograms of coal or 210 kilograms of firewood.

WATER LEVEL DETECTING SENSORS (ULTRASONIC) :

Technology has revolutionized the way river levels are monitored by providing remote monitoring solutions that are both reliable and cost-effective. Ultrasonic sensors combined with advanced systems such as Milesight and Libelium Plug and Sense offer field-tested and reliable solutions compatible with various communication technologies. 24/7 remote access to collected data from any computer or mobile device, including instant alerts and trends. The ping sensor is used as a distance sensor to detect the water surface by measuring the distance between the sensor and the water surfaces. The system consists of two modules, a transmitter and a receiver. The transmitter module performs a water level observation and sends it as a data collector to the receiver module. The receiver module then displays the information on the screen. This system can be used as part of a system that requires water level detection that can be

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collected remotely, such as a flood monitoring system. A typical ultrasonic sensor can measure a distance of 30 to 10 m with an accuracy of 1 cm during this whole time. Area The sampling interval can be as little as one minute, but ten minutes is more common. Data from the sensors (sent once) must be processed and stored. Using cloud platforms like Microsoft Azure is perfect for IoT. However, the platform supports sending data to Azure, AWS, and well-known application/database servers. Additional functions such as alarms and notifications (ie when the flood level exceeds a certain level or when the flood is up/down) can be developed in the cloud. The sensor node is strategically attached to a river structure, such as a bridge, or mounted on a post placed near the river that requires monitoring. The ultrasonic sensor connected to this unit is installed at a certain height above the water body, where it continuously measures the distance between itself and the water surface. Any fluctuations in sensor readings can be accurately interpreted by setting a reference point for river depth at the observation post. For example, a drop in the sensor value (e.g. 25 cm) would mean a drop in the water level, while an increase (eg 15 cm) would mean an increase in the water level.

HEAT INSULATORS:

Thermal insulation is something that prevents the transfer of heat from one place to another. Fig 3 shows heat insulators. Heat comes in three main ways: convection, conduction, and radiation. Typically, the term “insulation” refers to a material that prevents conduction.

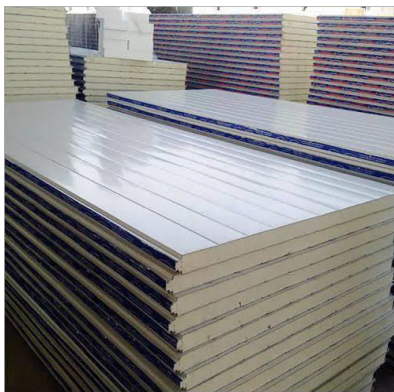


Fig.3 Heat Insulators

CORROSION CONTROL METHODS:

The corrosion over the steel structure is prevented by providing a special coating of anticorrosive paints on the surface. Zinc silicate primers, zinc rich epoxy primers, Aliphatic polyurethane topcoats and High build epoxy coating are some of the safe coats that provides to the steel members for control of the corrosion. Application of FRP composites are an another method for controlling the corrosion. Fiber reinforced polymer composites are lightweight, high strength and resistance to chemicals. So its application on the surface of the member can make 100 percentage safety from corrosion.

RESULTS OF DISCUSSION:

The whole problems that facing on the new invention was solved one by one. It will make the invention very strong to build it. The structure is eco-friendly and there are no harmful materials. Also the solar energy is used as energy source. So by the discussion the structure is 100 percentage successes to the world. And also the corrosion can be controlled by the simplest methods. The above things make the project the benefit of high energy efficiency. Total approximated cost of the building is 1000000 Indian rupee. For the whole structure the expense is approximately goes to 500000 indian rupee. For the Hydraulic jack expense is about to 500000 Rupees. For a normal building the approximated cost is 300000. The life span of structure is 80 years. in this case the destructions confronted during flood in year for a normal building is very high so the expense is should be met in every year, for a long term it is a huge amount. This flood proof house reduces the financial loss occurring due to the destruction of the houses by the flooding.



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V. CONCLUSION

This project paper offers a hundred percentage flood proof house, mainly designed for flood affecting lowest land area. This will reduce the financial loss occurring due to the destruction of the houses by the flooding. As per the study of flood understood that financial losses are there for the reconstruction of the damaged houses. In this machinery world any type of hydraulic jacks are available that have massive load capacity. Our structure is completely designed in steel. Steel structures are 30-60 percentage lighter when compared with concrete structures, and it's scrap value is the another benefit.

In this project we use energy efficient ecofriendly material for the construction. In whole view the structure is successful innovation for the world.

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