HYDRAULIC FLOOD PROTECTION FOR HOMES

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Abstract*:* One of the most frequent and significant natural events that affect people's lives worldwide is flooding. About 2.2% of people on Earth, or about 2.9% of the total, reside in places where there is a 10% probability of flooding every 50 years. You are capable of more. During a flood, a house cannot be saved. In order to address this issue, we are creating a system that will be able to save your home in the event of flooding. This technique prevents floods in certain situations by using water pressure to raise the house in accordance with the water level. Three steel bars are buried at least three metres below and three metres above ground as part of the design to withstand the effects of flooding. In flood-prone areas, employ supports to stabilise the house during heavy winds or storms.

Keywords: high torque motor, cylinder pistons, and hydraulics.

1. INTRODUCTION

Floods are one of the most common and important natural phenomena that disrupt the lives of people all over the world. Almost 2.9% of the world's population, or about 2.2%, lives in areas with a 10% chance of flooding every 50 years. In addition, it is said that increased global warming will further increase the number of floods shortly.

Floods cause loss of life, but the greater loss of property because, unlike people who can climb to higher ground, the property is immovable. If there is a flood in your area, saving your home is

completely impossible. To solve this problem, we are developing structures that can save houses in case of flooding. This system uses water pressure to lift the house according to the water level to prevent flooding in these cases. This is a futuristic concept where you can work before you build a house.

2. OBJECTIVES

The objective of hydraulic flood protection for homes is to provide a reliable and effective solution to prevent or minimize flood damage to residential properties. This involves using hydraulic systems and engineering techniques to divert flood waters away from homes and other buildings, and/or to protect them from flood waters through the use of physical barriers. The goal of hydraulic flood protection is to prevent or reduce the impact of flooding on homes, which can cause extensive damage and put people's lives and safety at risk. By implementing effective flood protection measures, homeowners can minimize the risk of property damage, protect their personal belongings, and ensure the safety of their families during times of flooding. Some specific objectives of hydraulic flood protection for homes might include:

Designing and installing hydraulic systems that can effectively divert flood waters away from homes and other

buildings. Build physical barriers, such as flood walls or sluice gates, to prevent flood water from entering your home. Construction of a drainage system to remove excess water from around the home and reduce the risk of flooding. Provides a flood warning system that can warn homeowners of potential flooding and give them time to prepare and take action. Development of sustainable and environmentally sound flood protection measures that minimize impacts on natural ecosystems.

3. RELATED WORK

There are several related works and approaches for hydraulic flood protection for homes,

including:

Floodwalls: These are physical barriers that can be constructed around homes to prevent floodwaters from entering. Floodwalls can be made of various materials such as concrete, steel, or sandbag

Floodgates: Similar to floodwalls, floodgates are barriers that can be deployed to prevent flood waters from entering homes. Floodgates can be manually or automatically operated and can be made of various materials. Sump pumps: Sump pumps are devices that can be installed in basements or crawl spaces to remove water that accumulates during flooding. Drain pumps can help prevent flooding in low-lying areas of your home. Drainage Systems: Drainage systems can be designed to drain excess water around the home and reduce the risk of flooding. This may include making trenches, installing French drains, or designing permeable surfaces.

4. WORK PLAN AND METHODOLOGY

Developing a work plan and methodology for hydraulic flood protection for homes involves several key steps, including:

Site assessment: Conducting a thorough site assessment is essential to understand the potential risks of flooding and the

specific characteristics of the property. This can involve reviewing flood maps, analyzing local drainage systems, and assessing the topography and soil type of the property. Risk analysis: Based on the site assessment, a risk analysis can be conducted to identify potential flood hazards and the level of risk to the property. This analysis can help inform the design of flood protection measures.

Design development: The design development phase involves developing a detailed plan for hydraulic flood protection measures. This can include designing physical barriers, drainage systems, and other flood protection measures based on the site assessment and risk analysis.

Implementation: The implementation phase involves installing the hydraulic flood protection measures according to the design plan. This can involve excavating and grading the site, installing drainage systems and constructing physical barriers such as floodwalls or floodgates.

Testing and commissioning: Once the flood protection measures have been installed, they should be tested to ensure that they are functioning as intended. This can involve testing drainage systems, operating floodgates or other physical barriers, and conducting water flow tests. Monitoring and maintenance: After the flood protection measures have been implemented, ongoing monitoring and maintenance are essential to ensure that they remain effective. This can involve regular inspections of the drainage systems and physical barriers, as well as ongoing maintenance and repairs as needed.

Fig.1 Block Diagram

5. EXISTING SYSTEM

There are several existing systems of hydraulic flood protection for homes that are currently available, including:

Flood barriers: There are a variety of flood barriers available that can be used to protect homes from flooding. These include permanent floodwalls, temporary flood barriers such as sandbags, and inflatable barriers that can be quickly deployed in the event of a flood.

Sump pumps: Sump pumps are often installed in basements or crawl spaces to remove water that accumulates during flooding. Sump pumps can prevent flooding in low-lying areas of homes and are often used in combination with other flood protection measures.

Drainage systems: Drainage systems can be designed to remove excess water from around homes and reduce the risk of flooding. This may include making trenches, installing French drains, or designing permeable surfaces.

Overhanging Foundation: Homes may be built with raised foundations to prevent flood water from entering. This could include raising a house above flood level or building a platform to keep a house above flood level.

6. PROPOSED SYSTEM

Home hydraulic flood protection systems can be designed to provide flood protection with a combination of a hydraulic barrier and a pump. Suggested hydraulic flood protection systems include:

Hydraulic Barrier: The first line of defense is a hydraulic barrier that can be installed around the perimeter of your home. These barriers can be made of aluminum, steel, or reinforced concrete and must be at least 1.5 meters high. Barriers prevent flood water from entering your home, but they must be waterproof and able to withstand the pressure of water.

Pumps: In case of heavy flooding, a series of pumps must be installed to remove water from the protected area.

The pump must have a high capacity and be able to pump water out of the protected area faster than it enters. It should be automatically activated by the flood sensor. Backup Power Supply: A backup power source, such as a generator, must be installed to keep the system running in the event of a power outage.

7. RESULTS AND DISCUSSION

Because the established floodproofing measures were precisely defined, a cost-benefit analysis (CBA) for houses and cultivated areas could be used to evaluate their costs. Damage studies for all scenarios showed how each intervention might directly lessen the adverse effects of floods in low floodplains based on its location, features, size, etc. We examined two preventive methods (i.e., reducing the vulnerability of existing buildings to flooding) and evaluated how cost-effective they were. One popular and well-established form of intervention that has demonstrated a means to considerably lower the anticipated flood damage is the installation of concrete dams. However, as this reduction would require a substantial investment, this mitigation is not warranted in this specific situation. Accordingly, it is evident from the CBA analysis that it is not feasible to find the function's minimal value in this particular situation.

REFERENCES

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These resources provide a range of perspectives and insights on hydraulic flood protection for homes, and can be useful for understanding the design, implementation, and effectiveness of these systems in protecting homes against floods.