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USE OF WASTE PLASTIC BOTTLES INSTEAD OF BRICKS

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Abstract: One of the greatest inconveniences of building a world house is the exorbitant cost of the structure. The significant expense of building houses beneath the destitution line is quite possibly of the main human issue. Then again, expanding urbanization increments squander, particularly non-inexhaustible ones. A fitting way to deal with such a circumstance is to utilize a piece of the family squander as important materials for the development of the house, and furthermore to guarantee an agreeable space and satisfactory intensity for the occupants of the house. A plastic jug is viewed as a family squander that has strength properties and can be utilized as a material in house development rather than an ordinary material like block. The motivation behind this paper is to explore the utilization of plastic jugs as [1,2] civil waste in one structure and how this can prompt supportability. It likewise makes reference to far to set up and protect them concerning intensity and sound, and a few positive focuses that this material has over others. At last, it was reasoned that plastic jugs can be more productive contrasted with some regular structure materials, for example, block, concrete and ceramic block as far as different factors, for example, lead time, cost, conveying limit, adaptability, waste and energy proficiency.[5,6]

Index Terms **– Plastic Bottle, waste material, bricks, binding material.**

I. INTRODUCTION

A lot of waste is generated every day in various industries. Plastic bottles, as a type of everyday waste, can be used instead of some building materials, such as bricks. It is so interesting to note that plastic bottles are as strong as bricks, ceramic block and concrete block, but with the difference that the plastic bottle has disappeared. As mentioned before, this innovative idea was first presented by Andreas Froese, who also founded ECO. -TEC was established to advise on environmental management and solid waste disposal. Green building ECO-TEC technology is used to replace brick with a single-use plastic bottle. Since plastic can remain on the ground as waste for a long time due to its slow decomposition process, plastic recycling can be an effective solution to this problem. The main advantages of these alternative innovative materials compared to traditional materials such as brick can be: [7]

- **Good Construction-** Good construction ability Walls built from these bottles are lighter than walls built from bricks and blocks, which makes these buildings very resistant to earthquakes. Because the fillings are compacted in each bottle, the load capacity of each bottle is 20 times greater than that of a brick. And these compressed fillers prevent the plastic bottle from penetrating the shot, which makes the building bulletproof. [8,9]
- **Cheap Building-** A house from plastic bottles used in walls, roof beams and concrete pillars offers us a 45% discount on the final cost. A breakdown of the cost components shows that using local labor to produce bottle panels can reduce costs by up to 75% compared to building walls from bricks and concrete blocks. It should be noted that a highly developed workforce can also reduce construction time and relative costs decrease.
- **Proper Temperature Behavior-** To insulate these panels against heat transfer, an innovative solution is to fill each bottle with three layers. The front and back of the bottle should be filled with sand and dense gravel, and the center of the bottle with cork or wood particles.

II. WHEEL REDUCTION SYSTEM

Waste system plan similar to Australia where people have three bins where they put recyclable, recyclable and organic waste. They are then emptied into a larger bin that covers certain areas of land and houses. This would help solve the current waste problem without offending people's intelligence. [10,11]

Advantages:

- Meets training and management criteria.
- Reduces health risks from litter everywhere.
- Could bring tourism by reducing litter on roads/rivers.
- It would be sustainable for future generations, the information/system would be easily transferable.
- Small and cheap, recycled materials could be used to produce the container and waste area.
- Compost could be used as fertilizer, recycled materials could be sold, both would save the family money.

Disadvantages:

- Can be dangerous due to flooding, compost bins can spread bacteria into the water and other bins can tip over and flooding can spread debris.
- The Vietnamese may not accept this as a "clear and simple" idea.
- May not be suitable for the area - it may be difficult to build the system in houses if they are very small and have only one area.
- Customs duties may conflict.
- Durability can be an issue.

DISPOSAL OF HUMAN WASTE

Advantages:

- The sanitation problems of the residents of the area would be solved if implemented on a large scale.
- Potential economic benefits as human manure can replace commercial fertilizers (if properly processed).
- Improved waterways free of human waste.
- Better drinking/swimming water quality.
- Better food production.

Disadvantages:

- Potential health effects caused by the use of human waste in food production.
- Possible opposition from the Vietnamese community to the idea of using human waste for food production.
- Total cost of WC.
- Attract pests to the toilet system.
- Communities may need training on how to use the system safely and effectively.
- Widespread use may not be possible.

III. MANUFACTURING PROCESS OF PLASTIC BOTTLE BRICK

Step No. 1: Gather INORGANIC WASTE MATERIAL

Start by gathering all inorganic waste material (whatever isn't biodegradable) that could squeeze into a plastic jug. This incorporates plastic packs, plastic coverings, plastic cross section, curve ties, plastic covered paper, receipts, and cigarette butts, produce stickers, and so on need to try not to get natural matter and dampness into the container however much as could reasonably be expected, yet a smidgen of extra scraps or dampness isn't an issue. On the off chance that have plastic material that is covered in food, you can clean it and hang it up to dry prior to stuffing it in a jug.[12]

There are two fundamental ways of making a jug block. One way is to gather all dry inorganic waste and afterward stuff the containers later. The alternate way is to forget about a jug in kitchen, in vehicle, in work environment, and stuff as.

Step No. 2: Get A PLASTIC Jug!

Plastic jugs are sadly pervasive in our general public; no real reason to not is having the option to see as one. Try not to have to purchase a plastic jug - strike a nearby reusing receptacle, visit your neighborhood exercise center, or take that one right out the road. Caffeinated drink bottles - they make the best container blocks in view of their more extensive mouth. Contingent upon the utilization of container blocks, its ideal to have them generally be a similar size. Plastic water bottles are flimsier yet can be utilized close by the sturdier. Bottles Need to remove the plastic name and stuff it before really utilize the jug block.

Step No. 3: Begin STUFFING!

Stuff all that plastic waste into the jug and utilize a durable stick or the finish of a wooden spoon to stuff it in! It's vital to stuff as you go so you limit air space and expand how much waste you can fit in. More modest bits of junk work better, so assuming that you have huge pieces get a few scissors and chopped them down first. Try not to lose the jug cap since you'll require that eventually! In the event that you're stuffing as you go, leave a stick or spoon convenient by the jug.

IV. COMPRESSIVE STRENGTH TEST

This test is finished to know the compressive strength of jug block. It is additionally called pulverizing strength of jug block. By and large 3 container blocks are taken to lab for testing and tried individually. In this test a jug block example is placed on pressure testing machine and applied pressure a definitive strain at which bottle block is squashed is considered. Each of the three jug block examples are tried individually and normal outcome is taken as block's compressive/squashing strength."

The compressive strength tests were directed in Construction Testing Research facility the PC controlled pressure driven pressure testing machine comprises of burden outline, oil source control bureau, PC and printer. It takes on a water driven load, oil pressure transducer to quantify load, as well as PC-water driven extent innovation to auto control the testing system. [13]

The compressive strength test was done for every model. The surface area of which the heap/stress (estimated in kilo newtons) was applied to is known as the bed face region. The model to be tried was set in the compressive testing machine, and burden was applied at a pace of 0.1 seconds. At the point when burden is continually being applied on a construction, it will ultimately turn out to be sufficiently enormous to make the part become unsound. Huge flighty misshapenness can then likewise be caused when further burden is being applied, which could prompt total loss of burden conveying limit. At the point when this happens, the part is said to have clasped or to have disfigured. [14,15]

At disappointment is the heap esteem at the disappointment point where a sharp drop in the heap happens after the fundamental piece of disfigurement and energy retention. Contingent upon conditions, for example, temperature, condition of pressure and stacking rate, most materials can bomb in a weak or flexible way or both. On account of our models, our disappointment will be in a fragile way as concrete is a non-versatile material.

Pressure test is done to test the compressive strength of 250 ml, 1L jug. Since the area of contact of 250 ml bottle block and 1L container block are not in ordinary shape like jug block. There region is determined by utilizing sporadic shape equation. From the testing greatest power applied on the jug.

Table 1: Compressive Strength of bottle brick bricks

Bottle Brick	D (mm)	L (mm)	Failure Load (N)	Load (N/mm)
Sand filled Bottle Brick	70mm	200mm	3820 N	0.338 N/mm²
Sand & Mortar filled Bottle Brick	70mm	200mm	2500 N	0.223 N/mm²

OUR Choice

A plastic jug house or utilization of plastic containers for the establishments and walls has been executed all over the planet, and has been an incredible achievement. The reused plastic container houses are famous as they have comparable solidarity to traditional development. The reused house, our favored plan choice, apparently covered each rule with the exception of one. This one standard was the removal of natural waste. The schooling plan for squander the board was nearly settled on over the reused house however had another model that was not fulfilled in the plan that was advanced. It didn't address Environment for Mankind's qualities and objectives as well as the reused house as lodging is a significant piece of their vision and a palatable answer for the non-reused materials couldn't be found. [16]

The waste administration latrine was not picked as it supposedly cover an excessive number of the rules, or one more choice canvassed this specific model in a superior way. The models that were not covered by this choice were the general expense, it would be difficult to execute effectively into the general public, it just tended to the removal of natural waste, and could present critical wellbeing dangers to the people because of the possible pervasion of bugs and sickness in the fertilizing the soil region.

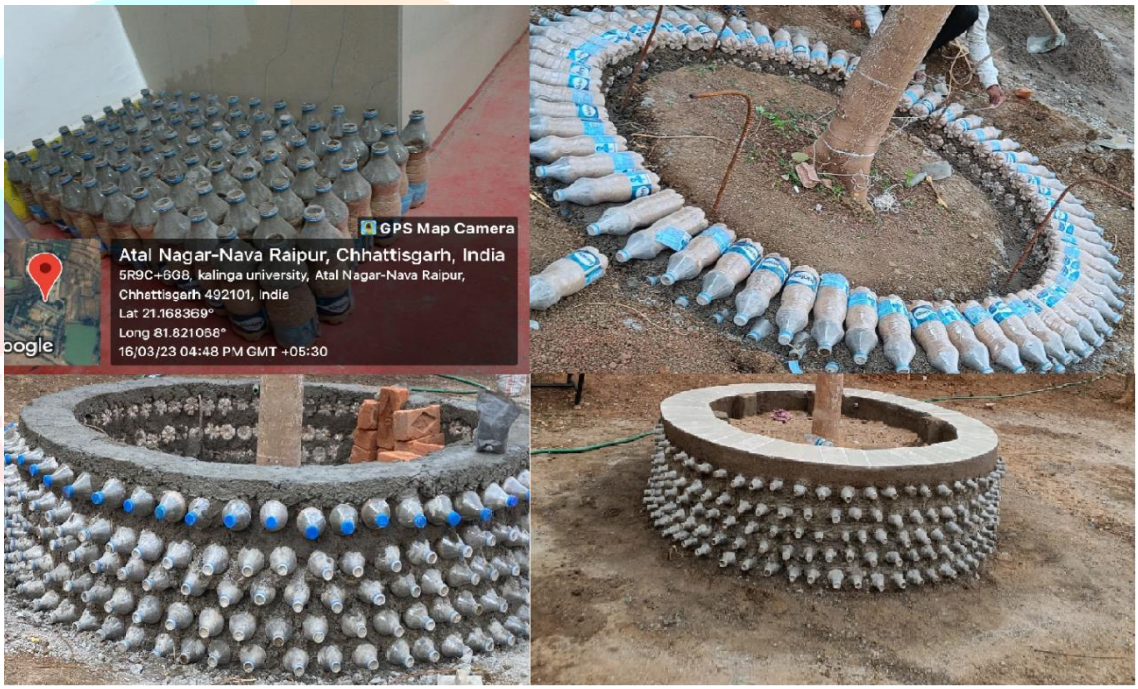

Figure No. 1: Construction from Bottle Brick

V. CONCLUSION

Plastic containers are viewed as a non-degradable waste that can affect the climate. Then again, the utilization of non-inexhaustible regular assets can't prompt supportable turn of events and prompts exhaustion of normal assets, which can be an overwhelming worry for the group of people yet to come. It was demonstrated the way that plastic jugs can be utilized in certain pieces of the structure like walls, rooftop, and so forth. Reusing plastic containers as a structure material can fundamentally influence the energy reserve funds of a structure by utilizing them rather than blocks. walls and decreasing CO2 discharges in concrete creation by lessening the level of concrete utilized. It was viewed as one of the green activities of the establishment and pulled in the consideration of the design and development industry. By and large, the jug rooms are bioclimatic, and that implies that when it is cold outside, it is warm inside as well as the other way around. The utilization of practical imaginative materials, for example, plastic containers can enjoy huge benefits, like tracking down the best streamlining of energy utilization nearby, diminishing ecological contamination, making the right primary way of behaving of the structure, for example, making gentility. Applied in the development task of structures thought about transitory.

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