



DESIGN, FABRICATION, DEVELOPMENT AND CONSTRUCTION OF LOW COST LAVATORY

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Abstract— It is evident that, in India, approximately 30% rural people live below the poverty line. In this context, assuring basic hygiene for one and all is a major task. Further, poor sanitation affects the health of the people and also the development of the nation. Also, it is observed that, in India, rural community lives housing without toilets due to their poverty. In this paper, an attempt is made to show the solution for sanitation of rural people by providing them with a low-cost lavatory, developed in such a way that, it can be affordable by a common man. The main aim of this work is to promote better human health and improve quality of life among people living in rural areas through improved sanitation measures.

Keywords-Rural India; Sanitation; Low-Cost Lavatory.

I. Introduction

In India, 80% of the population resides in 6, 00, 000 villages spread across the country. In rural areas, people live in adverse conditions of sanitation without having adequate facilities for defecation, due to their poverty and ignorance. People require safe and hygienic facilities for excretion. In this connection, it is important to consider several technological aspects such as affordability, space, cultural habits, availability of water and labour for construction etc., to maintain sanitation for rural people. The present paper deals with design, fabrication

development and construction of Low-Cost Lavatory for Rural India.

II. Need of the Study

In India, many villagers go barefoot for open air defecation due to which ailments such as dysentery, diarrhea and cholera spread over.

Despite several programs have been taken up by government on sanitation, adverse effects of insanitation and its impact on human health, rural people are still neglecting safe mode of defecation system. Generally, rural people prefer low-cost, location specific and acceptable design and technologies depending on their socio-economic status. Hence, there is a dire necessity to have a lavatory system which is cost effective.

III. Fabrication and construction of Low Cost Lavatory

For the construction of a model design of Low-Cost lavatory, the site nearby workshop area of S. R. Engineering College, Warangal was chosen. The site is cleared from debris and leveled. A soak pit (5' depth and 3.5' diameter) was excavated and cement rings were dropped slowly into the pit with the help of rope to stop collapse sides of pit (Fig. 2).

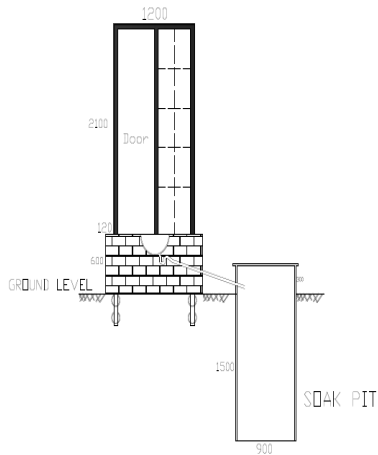


Fig. 1. Front view of Low-Cost Lavatory.

For the construction of lavatory, the prefabricated steel cage was used. The legs of the cage were driven into the pits (2’ depth and 4’ apart) and concrete was poured into pits for firm gripping of the legs. A basement with cement bricks is constructed and the set up for Indian water closet was arranged. This arrangement is connected to soak pit to facilitate the passage of digested waste (Fig. 1 and 2).

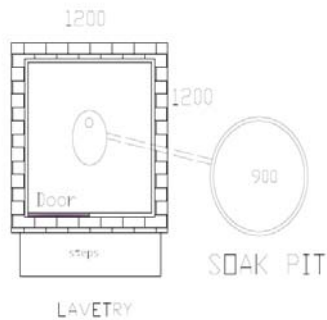


Fig. 2. Top view of Low-Cost Lavatory.



Plate 1. Students at work

The cage was enclosed with the Fiber Reinforced Plastic (FRP) sheets for privacy. This sheet is fixed to steel anglers with nut and bolt system to get the final shape of the lavatory (Plate 1). The surrounding ground is leveled for accessibility.

IV. Salient features of Low-cost Lavatory

- Less time of construction.
- Superstructure is made from steel giving rise to high strength.
- Low cost of the construction (**less than INR 10,000**) (Table 1).
- Suitable for local festival places/people gathering.
- Trouble-free to empty the pit when it fills.
- Apt for construction where limited space is available.

v. Advantages of Low-Cost Lavatory

- Prevents spreading of infections and diseases (diarrhea, dysentery, dehydration and cholera) due to open air defecation.
- Reduces the rate of dropping out school going girl children.
- Hygiene of surroundings can be maintained.
- Contamination of soil is also avoided.
- Decomposed material in soak pit can be utilized as manure (natural fertilizer) for growth of crops.

vI. Cost Estimate

Table 1. Estimation of the cost incurred in the construction of Low-Cost Lavatory

S.No.	Description of Item/Work	Quantity	Unit Cost (INR)	Total Cost (INR)
1.	Earth work Excavation for pit (5’ depth, 3’ diameter)	L.S.	---	650
2.	Cement Concrete Rings (3’ diameter)	6	180	1080

	and 1' height)			
3.	Cover Slab for Pit	1	410	410
4.	Cement	3	325	975
5.	Mason Charges	L.S.	---	1000
6.	L- Angulars, Steel Strips	60 kg	45	2700
7.	Welding Charges	L.S.	--	300
8.	Indian Water Closet	1	400	300
9.	Plumbing Items (PVC pipe, P-Trap)	L.S.	---	250
10.	FRP Sheet	112 sft	10/sft	1120
11.	Cement Bricks, Sand and Aggregate	L. S.	---	550
Total Cost				9335
(Rupees Nine Thousand Three Hundred and Thirty Five only)				

vII. Conclusions

Low-Cost Lavatories promote better human health and also improve the quality of life of rural people through improved sanitation measures. As these lavatories can be constructed to serve for various purposes such as house hold, public places, institutions, at the places of religious festivals etc., the hygiene could be maintained. *Further, they serve the society and support in order to have a **cleaner India** to achieve **Swach Bharath** to fulfill the dream of our **Honorable Prime Minister, Mr. Narendra Modi.***

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