



Assessment of Urine-Diversion Dehydration Toilet Designs with Respect to Construction Materials Used and Associated Costs

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About this brochure

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ABBREVIATIONS

- AC Asbestos Cement
- BOQ Bill of Quantity
- CBB Country Burned Brick
- CHB..... Cement Hollow Block
- CM..... Cement Mortar
- CT..... Composting Toilet
- ESF Ecosan Services Foundation (Indian NGO)
- FC..... Ferro Cement
- FRP Fibre-Reinforced Plastic
- NGO Non-Governmental Organisation
- PCC..... Plain Cement Concrete
- PVC Polyvinyl Chloride
- RCC..... Reinforced Cement Concrete
- RRSM..... Random Rubble Stone Masonry
- SLF..... Slab Foundation
- STF..... Strip Foundation
- UDD..... Urine-Diversion Dehydration





1 OBJECTIVES OF THIS BROCHURE

Various organisations and individuals, amongst them Ecosan Sevices Foundation (ESF), a Pune-based NGO (non-governmental organisation), are implementing Urine-Diversion Dehydration (UDD) Toilets in India.

The objective of this paper is to assess different UDD-toilet designs with respect to the construction materials used (e.g. country burned bricks, cement hollow blocks, ferro cement, etc.) and their associated construction costs. Optimization and cost estimates are based upon the assessment of various designs of UDD-toilets applied in India and bills of quantity (BOQ).

2 INTRODUCTION

2.1 Urine-Diversion Dehydration Toilets vs. Composting Toilets

In India UDD-toilets are sometimes referred to as "composting toilets" (CT). This is misleading as UDD-toilets and CTs operate in slightly different ways.

Urine-Diversion Dehydration Toilets:

UDD-toilets divert all liquids (i.e. urine and anal cleansing water, if applicable) from the faeces to keep the processing chamber contents dry. Adding wood ash, lime, etc. after each defecation helps in lowering moisture content and raise the pH. The system thus creates conditions of dryness, raised pH and time for pathogen die-off [1].

Composting Toilets:

In composting toilets human faeces, or in some cases faeces plus urine (and anal cleansing water), are deposited in a processing chamber along with organic household and garden refuse and bulking agents (straw, peat moss, wood shavings, twigs, etc.).

A variety of organisms in the pile break down the solid into humus – just as eventually happens to all organic materials in the natural environment. Temperature, airflow, moisture, carbon materials and other factors are controlled to varying degrees to promote optimal conditions for decomposition. After a certain retention time (normally 6 to 8 months) the partly decomposed material can be moved to a garden compost or an ecostation for secondary processing through high temperature composting [1].





(source: [1])

figure 1: Conceptual sketches of a Double-Vault UDD-toilet (left-hand side) and a Single-Vault UDD-toilet with moveable containers (right-hand side)

2.2 Urine-Diversion Dehydration Toilets

UDD-toilets make use of desiccation (dehydration) processes for the hygienically safe onsite treatment of human excreta. Therefore, if wet anal cleansing habits should prevail in a community, anal cleansing water must be diverted (e.g. by providing a separate washbowl) for practical reasons (figure 2).

There are two distinct types of UDD-toilets viz., Double-Vault UDD-toilets (figure 1, lefthand side) and Single-Vault UDD-toilets (figure 1, right-hand side). In order to facilitate collection of the finished "compost" (desiccated faeces and cover material), the former ones are designed to operate in batches whilst the latter ones provide only one collection cum storage compartment for containment of faeces. Therefore, secondary storage or other types of treatment (e.g. co-composting, etc.) have to be planned for.





In general, UDD-toilets are built entirely above ground to provide for easy access to the processing chambers which are placed on a solid floor of concrete, bricks or clay and the floor is built up to at least 10 cm above ground so that heavy rains do not flood it [1].

2.2.1 Double-Vault Urine-Diversion Dehydration Toilets

Present-day designs of Double-Vault UDD-toilets are based on the Vietnamese Double-Vault Dry Toilet, which was developed in the 1960s by local authorities [1]. Adapted to local needs and climatic conditions (e.g. toilet seats, anal cleansing water diversion, etc.), Double-Vault UDD-toilets have been introduced, amongst other countries, in Bangladesh, China, Ecuador, El Salvador, Guatemala, India, Mexico, the Philippines, South Africa, Sweden, Vietnam, Yemen, but also cold-climate countries such as Mongolia, Nepal and Romania as cost-effective sanitation component in rural, peri-urban and urban settings.

With Double-Vault UDD-toilets faecal matter is collected and stored in twin pit compartments, which are used alternately. Daily deposits are made into one of the compartments. After each use, a handful of cover material (wood ash, saw dust, soil, etc.) is sprinkled over the faeces to absorb moisture and help in speeding up the dehydration process. When "full" (which should take roughly one year), the respective compartment is sealed while the other compartment is put in use. The storage time is counted from the date of the last faecal matter contribution to a compartment, and should be at least 6 months to one year to provide sufficient time for desiccation and hygienization.



(source: UNESCO-IHE) (photo: M. Wafler)

(photo: ESF)

figure 2: Different solutions for source-separate collection of urine, faeces and anal cleansing water: provision of separate wash bowl (left hand side), squatting pan made from PVC or FRP with integrated wash bowl (centre) and pan made from ceramic with separate or integrated wash bowl (right hand side)





Urine and anal cleansing water must be diverted for practical reasons; urine may be collected separately and be applied as nitrogen-rich liquid fertilizer to agricultural land, and water used for anal cleansing may be infiltrated locally into the soil. The finished "compost" can be applied to agricultural land as a soil amendment in order to increase the organic matter content, improve the water-holding capacity and increase the availability of nutrients.

Advantages and limitations of Double-Vault UDD-toilets are summarized in table 1.

table 1: Advantages and limitations of Double-Vault UDD-toilets

Advantages:			Limitations:			
•	suitable for hard rock soil areas, high ground water levels and areas prone to flooding;	•	increased surface area for construction of toilet (compared to Single-Vault UDD-toilet);			
•	no contamination of groundwater sources due to contained processing of human faeces	•	possibility of smell if too much liquid (urine, anal cleansing water, etc.) enters the processing compartment			

table 2: Advantages and limitations of Single-Vault UDD-toilets with moveable containers

Ad	vantages:	Limitations:			
•	suitable for hard rock soil areas, high ground water levels and areas prone to flooding;	•	regular shifting of containers;		
•	no contamination of groundwater sources due to contained processing of human faeces;	•	transport of unsanitised human excreta to secondary storage and/or processing site;		
•	reduced construction costs (compared to Double-Vault UDD-toilets);	•	possibility of smell if too much liquid (urine, anal cleansing water, etc.) enters the processing compartment;		
•	more flexible than Double-Vault UDD- toilets in the communal setting;				





2.2.2 Single-Vault UDD-toilets

Single-Vault UDD-toilets, unlike Double-Vault UDD-toilets, provide only one collection cum storage compartment for containment of faeces. Therefore, secondary storage or other types of treatment (e.g. co-composting, etc.) are necessary. The most common design of Single-Vault UDD-toilets is to provide moveable containers. Urine and anal cleansing water diversion is equally important for Single-Vault UDD-toilets as for dehydration toilets with twin compartments.

Advantages and limitations of Single-Vault UDD-toilets are summarized in table 2.

3 BASIC DESIGN ASSUMPTIONS

With Double-Vault UDD-toilets the required volume of each processing compartment depends upon the anticipated number of users, specific storage capacity (i.e. volume of faeces excreted and cover material spent per person per day) and the desired resting period. Specific storage capacity may vary from place to place due to the different amount of faeces excreted and kind and amount of cover material used.

The minimum clear inner dimensions (i.e. length, width, height) of a single processing compartment are set with 1.15, 0.60 and 0.6 metres, respectively. But, depending on the nominal size of construction materials used, actual dimensions of compartments (especially the height) may vary.

Processing compartment volumes of ca. 400 litres provide for a storage time of at least 6 months from the date of the last faecal matter contribution to a compartment if a family of 4 to 5 heads uses the UDD-toilet on a regular basis.

4 CHARACTARISTICS OF DIFFERENT BUILDING MATERIALS AND TECHNOLOGIES

4.1 Strip foundation vs. slab foundation

Two footing types, viz. strip foundations (STF) and slab foundations (SLF) have been assessed. With strip foundations 2 different construction materials are considered (i.e. country burned brick masonry and random rubble stone masonry).





4.1.1 Brick masonry foundation in cement mortar

50 cm wide and 38 cm deep footing trenches have to be excavated for a 35 cm wide country burned brick (CBB) foundation in cement mortar (CM). A trench depth of 38 cm will provide for a 15 cm high Murum layer (at the base) and a 25 cm high brick foundation.

4.1.2 Random rubble stone masonry foundation in cement or mud mortar

Random rubble masonry is extensively used as foundation at places where stones are readily available and an 18" (45 cm) foundation base is adequate for most soils and single or double storey buildings [2].

40 cm wide and 50 cm deep footing trenches are excavated for a 40 cm wide random rubble stone masonry (RRSM) foundation in cement or mud mortar.

4.1.3 Plain cement concrete slab foundation

The area to be excavated for providing a slab foundation has to exceed the projected outer dimension of the superstructure of the toilet by 10 cm on all sides. Excavation has to be done to a depth of 15 cm. The excavated area is filled with Murum (15 cm height) on top of which the plain cement concrete (PCC) slab is cast in-situ. The size of the PCC slab must exceed the projected outer dimension of the superstructure of the toilet by at least 5 cm on all sides. The height of the PCC slab is set with 10 cm.

4.2 Country burned brick masonry vs. cement hollow block masonry, Ferro Cement and sun-dried Adobe bricks

For construction of the processing chambers and the superstructure four main construction materials are considered (i.e. country burned bricks, cement hollow blocks, Ferro Cement and sun-dried Adobe bricks).

4.2.1 Single-brick masonry in cement mortar

With CBB having nominal size of ca. 230 x 110 x 70 mm (9" x 4" x 3"), single-brick masonry walls have a nominal thickness of 230 mm.

4.2.2 Half-brick masonry in cement mortar

Half-brick masonry walls have a nominal thickness of 110 mm using CBB having a nominal size of ca. $230 \times 110 \times 70 \text{ mm} (9^{\circ} \times 4^{\circ} \times 3^{\circ})$.





4.2.3 Cement hollow block masonry in cement mortar

Cement hollow blocks (CHB) come in different sizes (e.g. 290 x 100 x 190 mm, 290 x 150 x 190 mm, 290 x 200 x 190 mm, 390 x 100 x 190 mm, 390 x 150 x 190 mm, 390 x 200 x 190 mm, etc.). Nominal size of CHBs considered in construction of the UDD-toilet is ca. 290 x 100 x 190 mm.



(source: http://www.dancement.co.in/)

figure 3: Cement hollow block (left-hand side) and cement solid block (right-hand side)

4.2.4 Ferro Cement

Ferro cement is basically a 3:1 sand and cement mixture with chicken wire used as rebar.

4.2.5 Sun-dried mud brick masonry in mud mortar

Earth has always been the most widely used material for building in India and is a part of its culture. Traditionally, mud wall construction varies enormously with topography, climatic conditions and needs of different regions. The common methods used for earth construction are cob, wattle and daub, rammed earth, adobes or "sun-dried mud bricks" and cut blocks.

table 3:	Composition of soils that make good adobe brick

Soil Texture Name	Sand [%]	Clay [%]	Silt [%]
Loamy Sand	70 to 85	0 to 15	0 to 30
Sandy Loam	50 to 70	15 to 20	0 to 30
Sandy Clay Loam	50 to 70	20 to 30	0 to 30
		1	

(source: adopted from [3])





Adobe bricks are made of native soil and possibly an organic additive. Desirable soils for brick making are those classified as loamy sands, sandy loams or sandy clay loams. These textural names are given to soils that contain sand, clay, and silt within the ranges of percentages shown in table 3.

Cement, slaked or un-slaked lime, straw, cow dung, gum arabic, sugar and molasses, oil plant juices and bitumen are commonly used stabilisers in adobe production. A special point about cement, lime or oil (e.g. coconut oil) stabilisers is that you may need hardly any stabiliser from the strength and stability point of view, but your mud may easily absorb any dampness or moisture. So in such cases very often only a small amount of stabiliser is enough to prevent this damp absorption [4].

Walls must be plastered for protection from rain and erosion. Experience has revealed that a first layer, with a sand/clay mortar at a 3:1 proportion is best. Its thickness should be just enough to have a flat surface. Then, a finishing coat with a lime mortar (lime/sand = 2:1) is applied with a thickness not exceeding 2 mm [5].

4.3 "Fixed covers" vs. "removable covers"

For sealing the processing compartments two different approaches have been considered. "Fixed covers" come as brick or hollow block masonry and have to be "broken" to get access to the processing compartment (e.g. for removing the finished "compost"), while "removable covers" are non-destructively removable, for e.g. emptying purposes.

4.4 Urine-diversion squatting pan and washbowl

The centrepiece of any UDD-toilet is the urine-diversion pan/pedestal and in case of wet anal cleansing habits an additional washbowl allowing for the diversion of cleansing water.

4.5 Door, jalies and ventilation system

Doorframes are not actually required and avoiding them considerably reduces the cost of timber. The simplest and cost effective door can be made either of a galvanized plain steel sheet fixed on a frame of vertical and horizontal battens or of vertical planks held together with horizontal or diagonal battens. This can be carried by 'holdfast' carried into the wall [2].

Pre-cast cement concrete "windows" (so-called jalies) shall provide for light and ventilation of the cubicle.





Each processing compartment must be equipped with a straight ventilation pipe ($\emptyset \ge 110$ mm) that runs above the roof (at least 50 cm), is screened against flies and capped against rain. To avoid that the roof leaks during the rainy season, the vent pipes shall not be installed inside the cubicle but be attached to the outside wall. Like this, they do not penetrate the roof.

5 BRIEF DESCRIPTION OF DIFFERENT UDD-TOILET DESIGNS

Classification of designs is first of all based upon the main construction material (i.e. the construction material of the processing compartments and the superstructure) and secondly upon the kind and type of footing (e.g. PCC slab foundation, RRSM strip foundation, brick masonry strip foundation, etc.).

5.1 Design 1 – Cement hollow block masonry atop slab foundation

Footing:

The footing is made from a 10 cm thick PCC slab that is cast in-situ atop a 15 cm thick layer of Murum. The top of the PCC slab shall protrude at least 10 cm above the surrounding ground, thus preventing stagnant water from entering the processing compartments.

Processing compartments:

The processing compartments are made from 10 cm (4") wide CHBs and provide a volume of ca. 0.4 m³ (i.e. 400 litres) each. The clear length, width and height of each compartment are 1.15, 0.60 and 0.60 metres, respectively.

The elevated squatting platform is made from a pre-cast 7.5 cm (3") reinforced cement concrete (RCC) slab that is fixed atop the processing compartment walls.

The openings for removal of the desiccated material are sealed with CHB masonry. The cover has to be broken for removal of the material and redone again afterwards in order to prevent insects and rainwater form entering the processing compartments. Mud mortar may be used instead of cement mortar.

Neither the inner nor the outer walls of the processing compartments are plastered.





Staircase:

The steps leading to the elevated squatting platform are made from cement solid blocks (CSB, nominal size: 290 x 100 x 190 mm) in cement mortar.

Superstructure (cubicle, door, roof, etc.):

The superstructure, which is 180 to 190 cm in height, is made from 10 cm (4") wide CHBs. Neither the inner nor the outer walls are plastered.

Two jalies provide for light and ventilation of the cubicle.

The door is made from a galvanized plain steel sheet (75 x 180 cm) that is fixed on a wooden frame. The frame is made of wooden battens (50 x 25 mm) and its outer dimensions are 175 by 70 cm.

The roof is made from 2 corrugated asbestos cement (AC) sheets (105 x 150 cm, each) that are fixed between pairs of horizontally laid bamboo sticks (about 5 cm in diameter). The lower bamboo sticks are fixed to the superstructure with steel bar hoops (\emptyset 6 mm), while the upper sticks are tied to the lower ones using ropes.

Other hardware:

A prefabricated fibre-reinforced plastic (FRP) urine-diversion squatting pan and washbowl are installed for collection of urine in a 20 litres plastic tank and diversion of cleansing water to a planted infiltration bed.

A wall-mounted washbasin is provided inside the toilet for proper washing hands after using the same. The greywater from the washbasin is drained to the same infiltration bed as the cleansing water.

Two buckets (ca. 10 litres capacity, each) are provided inside the toilet. The first is used for storage of cover material that is sprinkled over the faeces after defecation in order to absorb moisture and help in speeding up the dehydration process, the second for storage of water.

5.2 Design 2 – Ferro cement arched superstructure atop cement hollow block masonry processing compartment and slab foundation

Footing:

Refer to chapter 5.1.





Processing compartments:

Refer to chapter 5.1.

Staircase:

Refer to chapter 5.1.

Superstructure (cubicle, door, roof, etc.):

Drawing inspiration from the so called ArchLoo (refer to [6], [7]), a V.I.P. latrine featuring a superstructure in the shape of an inverted catenary arch (i.e. a shape that under equal load distribution is under pure compression), a UDD-toilet superstructure made from FC and allowing for wall thicknesses that can be as low as 25mm has been designed.

The Archloo superstructure is produced by draping (stapling) course hessian between two catenary forms (e.g. the front and rear wall of the toilet or two wooden forms). This hessian is then painted with a thin slurry, and then a thin layer of plaster is added. Up to 3 layers of plaster are added, allowing drying time (4 - 7hrs) between layers. Once the outside layer has gone off, the structure is already self supporting, and the wooden forms can be removed [6].

Otherwise, refer to chapter 5.1.

Other hardware:

Refer to chapter 5.1.

5.3 Design 3 – Bamboo superstructure atop cement hollow block masonry and slab foundation

Footing:

Refer to chapter 5.1.

Processing compartments:

Refer to chapter 5.1.

Superstructure (cubicle, door, roof, etc.):

The superstructure and the roof is made from bamboo sticks that are tied together to act as supports for bamboo mats.





Using a plastic tarpaulin, the roof can be rendered waterproof in rainy season.

The door is made from a bamboo mat that is fixed on a wooden frame.

Other hardware:

Refer to chapter 5.1.

5.4 Design 4 – Cement hollow block masonry atop random rubble stone masonry foundation

Footing:

The footing is made from 40 cm wide and 50 cm deep RRSM. The floors of the processing compartments are made from 10 cm thick PCC slabs that are cast in-situ atop 15 cm thick layers of Murum. The top of the PCC slab shall protrude at least 10 cm above the surrounding ground, thus preventing stagnant water from entering the processing compartments.

Processing compartments:

Due to the actual height of the CHBs (see chapter 4.2.3) the clear height of the processing compartments is ca. 0.70 metres.

Otherwise, refer to chapter 5.1.

Staircase:

Refer to chapter 5.1.

Superstructure (cubicle, door, roof, etc.):

Refer to chapter 5.1.

Other hardware:

Refer to chapter 5.1.

5.5 Design 5 – Country burned brick masonry atop slab foundation

Footing:

Refer to chapter 5.1.





Processing compartments:

The processing compartments are made from single-brick masonry (i.e. 23 cm or 9" width) and provide a volume of ca. 0.4 m^3 (i.e. 400 litres) each. The clear length, width and height of each compartment are 1.15, 0.60 and 0.60 metres, respectively.

The openings for removal of the desiccated material are sealed with CBB masonry. The cover has to be broken for removal of the material and redone again afterwards in order to prevent insects and rainwater form entering the processing compartments. Mud mortar may be used instead of cement mortar.

Both, the inner and the outer walls of the processing compartments have to be plastered (average thickness of the plaster is set with 4 mm).

Staircase:

The steps leading to the elevated squatting platform are made from CBB in cement mortar.

Superstructure (cubicle, door, roof, etc.):

The superstructure, which is 180 to 190 cm in height, is made half-brick masonry (i.e. 11 cm or 4" width) and the roof is made from 2 corrugated AC sheets (105 x 250 cm, each).

Otherwise, refer to chapter 5.1.

Other hardware:

Refer to chapter 5.1.

5.6 Design 6 – Country burned brick masonry arched superstructure atop country burned brick masonry processing compartment and slab foundation

Footing:

Refer to chapter 5.1.

Processing compartments:

Refer to chapter 5.5.

Staircase:

Refer to chapter 5.5.





Superstructure (cubicle, door, roof, etc.):

Refer to chapter 5.2, but construction material is country burned bricks.

Other hardware:

Refer to chapter 5.1.

5.7 Design 7 – Country burned brick masonry atop brick masonry foundation

Footing:

The footing is made from 35 cm wide and 38 cm deep CBB masonry. The floors of the processing compartments are made from 10 cm thick PCC slabs that are cast in-situ atop 15 cm thick layers of Murum. The top of the PCC slab shall protrude at least 10 cm above the surrounding ground, thus preventing stagnant water from entering the processing compartments.

Processing compartments:

Refer to chapter 5.5.

Staircase:

Refer to chapter 5.5.

Superstructure (cubicle, door, roof, etc.):

Refer to chapter 5.5.

Other hardware:

Refer to chapter 5.1.

5.8 Design 8 – Adobe masonry atop country burned brick masonry processing compartment and brick masonry foundation

Footing:

Refer to chapter 5.7

Processing compartments:

Refer to chapter 5.7





Staircase:

Refer to chapter 5.7

Superstructure (cubicle, door, roof, etc.):

The superstructure, which is 180 to 190 cm in height, is made from adobes of ca. 330 x 150 x 100 mm (13" x 6" x 4") nominal size. Inner and outer walls are plastered for protection from rain and erosion. A first layer, with a sand/clay mortar at a 3:1 proportion is used to provide for a flat surface (average thickness of the plaster is set with 6 mm). Then, a finishing coat with a lime mortar (lime/sand = 2:1) is applied with a thickness not exceeding 2 mm (refer to chapter 4.2.4.).

The roof is made from 2 corrugated AC sheets (105 x 250 cm, each).

Other hardware:

Refer to chapter 5.1.

5.9 Design 9 – Adobe masonry atop random rubble stone masonry foundation

Footing:

The footing is made from 40 cm wide and 50 cm deep RRSM in mud mortar. The floors of the processing compartments are made from a 5 cm thick mud layer atop 15 cm thick layers of Murum. The top of the mud slab shall protrude at least 10 cm above the surrounding ground, thus preventing stagnant water from entering the processing compartments.

Processing compartments:

The processing compartments are made from adobes of 9" x 9" x 4" nominal size laid in mud mortar and provide a volume of ca. 0.4 m^3 (i.e. 400 litres) each. The clear length, width and height of each compartment are 1.15, 0.60 and 0.60 metres, respectively.

The openings for removal of the desiccated material are sealed with mud brick masonry. The cover has to be broken for removal of the material and redone again afterwards in order to prevent insects and rainwater form entering the processing compartments.

Both, the inner and the outer walls of the processing compartments have to be plastered (refer to chapter 4.2.4.).





Superstructure (cubicle, door, roof, etc.):

The elevated squatting platform is made from stouts, locally available sticks (e.g. bamboo, etc.), laid in a crosswise manner. The sticks are then covered with mud.

The door is made from a bamboo mat fixed on a wooden frame.

Otherwise, refer to chapter 5.8.

Other hardware:

Refer to chapter 5.1.

6 COST ESTIMATES

Cost estimates for the above-described designs are based upon BOQ and common costs for construction materials to be paid in Pune, Maharashtra, in November 2008. The findings are summarized in figure 4 to figure 12.

A brief summary of construction materials/technologies applied with the different designs is summarized in table 4.

Design	Foundation	Processing Compartment	Superstructure
Design 1	P.C.C. Slab	Cement Hollow Blocks	Cement Hollow Blocks
Design 2	P.C.C. Slab	Cement Hollow Blocks	Arched Ferro Cement
Design 3	P.C.C. Slab	Cement Hollow Blocks	Bamboo Mats
Design 4	Rubble Stone	Cement Hollow Blocks	Cement Hollow Blocks
Design 5	P.C.C. Slab	Country Burned Bricks	Country Burned Bricks
Design 6	P.C.C. Slab	Country Burned Bricks	Arched C. B. Bricks
Design 7	Country Burned Bricks	Country Burned Bricks	Country Burned Bricks
Design 8	Country Burned Bricks	Country Burned Bricks	Adobe
Design 9	Adobe	Adobe	Adobe

table 4: Summary of construction details





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					3	546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2	52	Ne	22.00	1 100 00
		Mortar (1:4) Cement Sand	0,0069	m3/m2 kg/m3 m3/m3	11 0.03	kg m3	5,30 1,060,00	58 DO 32 DD
	R.C.C. S	Slab (1:2:4)	0,15	m3	0,00	115	1.000,00	52,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 DO 74 DO
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290 x	(190×100) Hollow Block Masonry Cover	0,72	m2				100000000
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	.382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	PVC Pipe (4", 20 ft long)			2	No	300,00	600 DO
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
З.	Supers	structure						
	4" (290 x	190×100) Hollow Block Masonry Hollow Block (200 × 100 × 100)	8,70	m2 No (m2)	1.45	Na	22.00	2 100 00
		Montar (1:4)	0,0089	m3/m2	145	ka	22.00 6.20	150.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85,00
	Door	Wooden Battens (56 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel BarHinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148.00 405.00 8.00
	Jalies	Jolian (200 v 460 mm)			2	No	110.00	220.00
	Roof				-	110	110,00	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	(190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other I	Hardware				No	1 000 00	1 000 00
		Washbasin Grevwater Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250.00	60,00 500,00
		Clean sing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6	l abou	r						
υ.	Labou	Skilled Unskilled			4	da ys da ys	300,00	1.200,00
	Subtet	al Labour			U	2019	100,00	2 400 00
	Subiol							2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80 D0	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	mЗ	200,00	84,00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry	3,15	m2	50			
		Holiow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement Sand	0,0089 382,33 1.070	m3/m2 kg/m3 m3/m3	53 11 0.03	kg m3	22,00 5,30 1,060,00	58,00 32,00
	R.C.C. s	lab (1:2:4)	0,15	m3	0,00		1,000,000	02,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244,00 74,00
		Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530 DO 41 DO	69,00 246,00
	4" (290x	190 x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72	m2 No/m2	12	No	22.00	264.00
		Mortar (1:4) Cement	0,0089 362,33	m3/m2 kg/m3	2	kg	5,30	11,00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilati	on System PVC Pipe (4", 20 ft long) PVC "T" Piece (4")			2	No	300,00	600,00
		PVC Pipe Cover (4")			2	No	40,00	80,00
	Subtot	al Processing Compartment					-	2.975,00
3.	Supers	structure						
	4" (290x	190 x100) Hollow Block Masonry	3,60	m2 No(m2	60	NIa	22.00	1 200 00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	12	kq	5,30	64.00
		Sand Water	1, <mark>070</mark> 191	m3/m3 I/m3	0,03 6	m3 I	1.060,00 0,00	32,00 0,00
	Ferro Ce	ement (1:3)	0,16	m3 ka/m3	79	ka	5 30	419.00
		Sand	1,070	m3/m3	0,17	m3	1.060,00	180,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	1 48 00 405 00 8 00
	Jalies	Islies			1	No	110.00	110.00
	Subtot	al Superstructure					-	2.686.00
							-	
4.	Stairca	se		i seri				
	Excavat	ion Excavation	0,06 1,00	m3 m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5.	Other I	Hardware			1	No	1 000 00	1 000 00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00 100,00
		Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	LS	150 DO 300 DO	300,00
	Subtot	al Other Hardware						2.520,00
6.	Labour	Skilled				dave	300.00	1 200 0.0
		Unskilled			10	days	150,00	1.500,00
	Subtot	al Labour						2.700,00
	Grand	Total						12.227,00

figure 5: Cost estimate for "Design 2"





	2	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtotal Foundation						546,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm) Mortar (1-4)	3,15 16,67 0.0089	m2 No/m2 m3/m2	53	No	22,00	1.166,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58,00 32,00
	R.C.C. Slab (1:2:4) Cernent Sand Aggregate Reinforcement	0,15 308,53 0,440 0,88 40	m3 kg/m3 m3/m3 m3/m3 kg/m3	46 0,07 0,13 6,0	kg m3 m3 kg	5,30 1.060,00 530,00 41,00	244,00 74,00 69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72	m2 No/m2	12	No	22.00	264.00
	Mortar (1:4) Cement	0,0089 382,33	m3/m2 kg/m3	2	kg	5,30	11,00
	Sand Ventilation System	1,070	m3/m3	0,01	m3	1.060,00	11,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						2.975,00
3.	Superstructure						
	• Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400,00 1.300,00
	Subtotal Superstructure					-	2.700,00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3 m3/m3	8	kg	5,30	42,00
	Subtotal Staircase	1,070	шэлцэ	0,02	1115	1.000,00	800.00
5	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bow Washbasin Greywater Pipe Urine Pipe Urine Collection Container (20 I) Cleansing Water Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration	1		1 2,5 1,5 2,5 1 1 1	No M m No No LS	1.000,00 160,00 40,00 250,00 40,00 150,00 150,00 300,00	$\begin{array}{c} 1.000,00\\ 160,00\\ 000,00\\ 500,00\\ 100,00\\ 150,00\\ 150,00\\ 300,00\\ \end{array}$
	Subtotal Other Hardware						2.520,00
6.	Labour						1 000 07
	Skilled Unskilled			4	days days	300,00 150,00	1.200,00
	Subtotal Labour						2.400,00
	Grand Total					-	11.941,00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3			100.00	
	Stones Mortar (1:4) Cement	1,06 0,3 382.33	m3/m3 m3/m3 ka/m3	U,91 100	m3	400,00 5,30	364,00
	Sand	1,070	m3/m3	0,28	m3	1.060,00	297,00
	P.C.C. (1:4:8) Cement Sand Aggregate	0,15 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	24 0,07 0,14	kg m3 m3	5,30 1.060,00 530,00	127,00 74,00 74,00
	Subtotal Foundation					2 2	1.561,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	4,20	m2 No/m2	70	No	22.00	1.540.00
	Mortar (1:4) Cement	0,0069	m3/m2 ka/m3	14	ka	5.30	74.00
	Sand	1 070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Sano Aggregate Reinforcement	0,88	m3/m3 ka/m3	0,13	m3 ka	530,00 41.00	69,00 246,00
	4" (290×190×100) Hollow Block Masonry Cover	0,84	m2	10.00	3		1000000
	Hollow Blocks (290 × 190 × 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Sand	362,53 1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilation System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4")			2	No No	300,00 60,00	600,00 120,00
	PVC Pipe Cover (4")			2	No	40,00	00,08
	Subtotal Processing Compartment					2	3.424,00
3.	Superstructure						
	4" (290×190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100 mm)	8,70 16,67	m2 No/m2	145	No	22,00	3.190,00
	Mortar (1:4) Cement Sand Water	0,0089 382,33 1,070 191	m3/m2 kg/m3 m3/m3 l/m3	30 0,08 15	kg m3	5,30 1.060,00 0.00	159,00 85,00 0.00
	Door	3.53				2002	
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	n)		0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm, 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)) cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure					194999999 1	4.846,00
4.	Staircase						
	Excavation	0,05	m3	0.05		90.00	400
	Murum	0,05	m3	0,00	110	00,00	400
	Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	4 (250×150×160) Solid Blocks (290 × 190 × 100 mm) Motar (1:4)	24 0.02	No m3	24	No	30,00	720,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	8 0,02	kg m3	5,30 1.060,00	42,00 21,00
	Subtotal Staircase					2	797,00
5.	Other hardware						
	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00	1.000,00
	Urine Pipe Urine Collection Container (20.0			1,5	m	40,00	60,00 500,00
	Cleansing Water Pipe Bucket (Cover Material)			2,5	m	40,00	100,00
	Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtotal Staircase						2.520,00
6.	Labour						
	skilled unskilled			4 8	daγs daγs	300,00 150,00	1.200,00 1.200,00
	Subtotal Labour						2.400,00
	Grand Total						15 548 00

figure 7: Cost estimate for "Design 4"





		c	Juantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,57 1,00	m3 m3/m3	0,57	m3	80,08	46,00
	Murum	Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:	4:8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtota	l Foundation						798,00
2.	Process	sing Compartment						
	Brick Wo	rk (Single Brick)	0,83	m3	070	NG	2.50	1 222 00
		Mortar (1-4) Cement Sand	455 0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	378 78 0,22	kg m3	3,50 5,30 1,060,00	413,00 233,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Wo	r k (Half Brick) Cover Bricks (230 x 110 x 20 mm)	0,72	m2 No./m2	38	No	3.50	133.00
		Mortar (1:4) Cement Sand	0,023 382,33	m3/m2 kg/m3 m3/m3	6 0.02	kg m3	5,30	32,00
	Plaster (1	1:3)	0,04	m3				100.00
		Carnent Sand	493,03	m3/m3	20 0,04	кq mЗ	5,30 1.060,00	42,00
	ventilatio	PVC Pipe (4", 20 ft long) PVC "T"- Piece (4") PVC "T"- Piece (4")			2 2 2	No No	300,00 60,00	600,00 120,00
	Subtota	I Processing Compartment			2	NO	40,00	4.023,00
	-	-						
3.	Superst Brick Wo	ructure rk (Half Brick)	11.00	m2				
	Diriok IIIo	Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	583	No	3,50	2.041,00
		Cement Sand	1,070	m3/m3	0,27	ка mЗ	5,30 1,060,00	286,00
	Plaster (1	1:3) Cement Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	1 48,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 cn Bamboo Sticks (ca. 4 cm dia, 18 ft long) Sheel Bar Hinges (6 mm dia)	n)		5,0 3 1,4	m No ka	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Staircas	5e						
	Excavatio	on Formation	0,06	m3	0.00		90.00	E 00
	Murum	Lacavalion	0,06	m3	0,00		200,00	12.00
	Brick Wo	rk (Single Brick)	0,17	mormo m3	оµю	mo	200,00	12,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4) Cement	465 0,246 382,33	No./m3 m3/m3 ka/m3	77	No ka	3,50	270,00 85.00
		Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Plaster (1	l:3) Cernent Sand	0,01 493,03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	l Staircase						452,00
5.	Other H	ardware				No	1 000 00	1 000 00
		Washbasin Greywater Pipe			1 2,5	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250,00	60,00 500,00
		Bucket (Cover Material) Bucket (Water)			2,5	No No	40,00 150,00 150,00	150,00 150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	u Uther Hardware						2.520,00
6.	Labour	Skilled			6	days	300,00	1.800,00
	Subtota	Unskilled			12	days	150,00	3,600,00
								10.000,00
	Grand 1	otal						16.361,00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	m3	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0,470	m3 kg/m3 m3/m3 m3/m3	55 0,16 0.22	kg m3	5,30 1,060,00 530,00	292,00 170,00 170,00
	Subtotal Foundation	0,95	marma	0,32	ma		798.00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm) Montar (1-4)	0,83 455 0.246	m3 No./m3 m3/m3	378	No	3,50	1.323,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	78 0,22	kg m3	30, 30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
	Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Work (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72 53	m2 No./m2	38	No	3,50	133,00
	Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00	32,00 21,00
	Plaster (1:3)	0,04	m3	20		5.00	105.00
	Sand Ventilation System	1,070	m3/m3	0,04	m3	1.060,00	42,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						4.023,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 x 110 x 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	110 0,31	kg m3	5,30 1.060,00	583,00 329,00
	Plaster (1:3) Cement Sand	0,08 493 D3 1,070	m3 kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 160 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure						4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	Brick Work (Single Brick)	0,17	m3	77	Na	3.60	270.00
	Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	16	kg	5,30	85,00
	Sand Plaster (1:3)	1,070 0,01	m3/m3	0,04	m3	1,060,00	42,00
	Cement Sand	493 J 3 1,070	kg/m3 m3/m3	0,01	kg m3	5,30 1.060,00	27,00
	Subtotal Staircase						452,00
5.	Other Hardware Unne-Diversion Squatting Pan & Cleansing Bowl Washbasin Greywater Pipe Unne Collection Container (20 I) Cleansing Water Pipe			1 2,5 1,5 3 2,5	No No m No m	1.000,00 160,00 40,00 40,00 250,00 40,00	1.000,00 160,00 100,00 60,00 750,00 100,00
	Bucket (Cover Matenal) Bucket (Water) Cleansing Water Infiltration			1 1 1	No No LS	150,00 150,00 300,00	150,00 150,00 300,00
	Subtotal Other Hardware						2.770,00
6.	Labour Skilled Unskilled			6 12	days days	300,00 150,00	1.800,00 1.800,00
	Subtotal Labour					, I	3.600,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wa	ork (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	:4:8) Cement Sand Apprente	0,17 161,95 0,470 0.95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530.00	148,00 85,00 85,00
	Subtota	l Foundation	. 845.5		100	1940		1.743,00
	D	1. 6						
Ζ.	Brick Wo	ork (Single Brick)	0.97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	382,33	kgrm3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate	0,440	m3/m3 m3/m3	0,1	m3 m3	1.060,00 530,00	106,00
	Brick Wo	rkemorcement	0.72	m2	8,1	кg	41,00	332,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Water	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00 0.00	32,00 21,00
	Plaster (1:3)	0,04	m3			0,00	0,00
	Montilatic	Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventriada	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	I Processing Compartment						4.356,00
3.	Superst	ructure						
	Brick Wa	ork (Half Brick)	11,00	m2	500			
		Mortar (1:4) Cement	0,023	m3/m2 kg/m3	97	ka	5,50	2.041,00
		Sand	1,070	m3/m3	0,27	m3	1.060,00	286,00
	Plaster (1:3) Cement Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 2 Bamboo Sticks (ca. 4 cm dia., 18 ft long)	50 cm)		5,0 3	m No	130,00 100,00	650,00 300,00
	Subtota	I Superstructure			1,4	ĸġ	41,00	4.968,00
4.	Staircas	500						
	Excavati	on Excavation	0,05	m3	0.05	m3	90.00	4.00
	Murum	Excaration	0.05	m3	0,00	ma	00,00	4,00
		Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	BUCK MO	Bricks (230 x 110 x 70 mm) Mortar (1:4)	455	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01	m3 ka(m3	5	ka	5 30	27.00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Subtota	li Staircase						449,00
5.	Other H	ardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00
		Unine Pipe Unine Collection Container (20 I) Cloansing Water Ring			1,5	No	40,00 250,00 40,00	500,00
		Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	n otner Hardware						z.520,00
6.	Labour	Skilled			6	days	300,00	1.800,00
	C	Unskilled			12	days	150,00	1.800,00
	Subtota	Η L αθούΓ						3,200,00
	Grand T	otal						17.636,00

figure 10: Cost estimate for "Design 7"





Image: Constrain Encode in Mark 10 month 10				Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1. Solution 1.28 n0 1,24	1.	Foundat	lion						
Maxma Data Maxma Mathem Max Mathem Max Mathm Max Mathm Max Mat		Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
Bit AVM. 6 Expet Ent(A) Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Aggrassite Carriert Sund Aggrassite Carriert Sund Aggrassite Carriert Sund Aggrassite Sund Carriert Sund Aggrassite Carriert Sund Aggrassite Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Carriert Sund Carriert Carriert Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund Carriert Sund		Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
Martar (140) array Martar		Brick Wo	rk (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
PCC. (1580) Aggregate. 0.17 (100) 1000 0.10 (100) 1000 0.10000 (100) 1000 0.10 (100) 1000			Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
Construct Construct Construct Construct Construct Subtrial Foundation 17434 Processing Compartment 0000 0.00		P.C.C. (1:	4:8) Cement Sand Accreaste	0,17 161,95 0,470	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530,00	148,00 85,00 85,00
Processing Compatibuant Processing Com		Subtota	I Foundation	0,00	indino	0,10		-	1.743,00
2 Processing Long Jamon H Prick Vork, State Stat									
Initial Sectors (20) in X (2) mmg Initial Sectors (1,1) (2) General (1,2) (2) Ge	Ζ.	Process	ing Compartment	0.07	m2				
Market Bard 100 100		DITUK WO	Bricks (230 x 110 x 70 mm)	455	No./m3	441	No	3,50	1.544,00
R.C.C. Siz (12:3) 0.23 m3 1 m3 1.060,00 100,00 Sand 0.44 m3/m3 0.1 m3 1.060,00 100,00 Brick Work (12:1) N.D. mm 53 19/m3 0.1 m3 1.060,00 100,00 Brick Work (12:1) N.D. mm 53 18/m3 0.22 m3 1.060,00 1.090,00 2.1 Plaster (12:1) Owner 53 18/m3 0.02 m3 1.080,00 2.1 Plaster (12:1) Owner 53 18/m3 0.04 m3 1.080,00 1.09 Comment 58/m3 0.00 m3 5.00 100 1.09 1.0			Cement Sand	382,33 1,070	kg/m3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
Cernent 398.33 107.03 0.1 160.00 110.00.00 100.00		R.C.C. SI	ab (1:2:4)	0,23	m3				
Aggragate User marks User mar			Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
Index Works full TrickS (20x 110 2.70m) 0.72 m3/m2 m3			Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
Martar (1.4) Construct Construct <thconstruct< th=""> <thconstruct< th=""> <</thconstruct<></thconstruct<>		Brick Wo	rk (Half Brick) Cover	0,72	m2 No.(m2	20	No	2.60	122.00
Sind 1,000 mämä 0,02 mämä 1,000,00 2,1 Plaster (1;3) 0,01 mämä 20 kg 5,300 0,02 Sand 1,000,00 2,00 kg 3,500 0,00 6,00 6,00 Ventilation System 2 No 300,00 0,00 0,00 6,00 </td <td></td> <td></td> <td>Mortar (1:4) Cement</td> <td>0,023</td> <td>m3/m2 kg/m3</td> <td>6</td> <td>ka</td> <td>5,50</td> <td>32.00</td>			Mortar (1:4) Cement	0,023	m3/m2 kg/m3	6	ka	5,50	32.00
Plaster (1:3) Served 0.04 (1:00) (1:00) PVC Pipe (1:0) PVC Pipe (2:0) PVC Pipe (2:0) P			Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
Ventilation System PVC TF, Piec Cover (fr) Subtotal Processing Compartment 2 No. 200,00 00,00		Plaster (*	I:3) Cement Sand	0,04 493,03 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
Procense (r) 2 No. 40,00 90,00 Subtoal Processing Compartment 43560 Superstructure 43560 Adde Birk (Ws (K)) 2,46 m3 Adde Birk (Ws (K)) 2,46 m3 Adde Birk (Ws (K)) 0,56 m3 0,00 0,0 Mult Plaster (C1) 0,13 m3 0,00 0,0 Dura 0,13 m3 0,00 0,0 0,0 Line Plaster (C1) 0,01 m3 0,00 0,0 0,0 Dare 0,04 m3 0,00 0,0 0,00 0,0 Line Plaster (C1) 0,06 m3 0,00 0,0 0,00 0,00 Doar 0,000 0,33 m3 0,000 0,00 0,000		Ventilatio	n System						
Subtotal Processing Compartment 4336/J Superstructure Adobe Brick Work (0*) 2,44 n3 Adobe Brick Work (0*) 0,55 m3/m3 0,27 m3 0,00 0,0 Mud Plaster (2,*) 0,15 m3/m3 0,37 m3 0,00 0,0 Line Plaster (2,*) 0,15 m3/m3 0,01 m3 1,080,00 0,0 Line Plaster (2,*) 0,04 m3 0,00 0,0 0,00 0,0 Line Plaster (2,*) 0,04 m3 0,00			PVC *T*-Piece (4*) PVC Pipe Cover (4*)			2 2 2	No No	60,00 40,00	120,00 80,00
Superstructure Adobe Brick Work (of) 2,46 n3 Adobe Drick work (of) 0,50 m3/m3 1,23 m3 0,00 0,0 Diswork (et lusk) 0,15 m3/m3 0,25 m3 0,00 0,0 Mull Plasting (C1) 0,15 m3/m3 0,03 m3 100,00 0,0 Lime Plasting (C1) 0,04 m3 0,03 m3 0,000 0,0 Lime Plasting (C3) 0,03 m3/m3 0,01 m3 0,000 0,0 Door Wooden Batters (5.6 m (g.50 x 25 mm) 0,00 m2 21,200,00 1,48 No Caryong soft 0,03 m3/m3 0,01 m3 100,00 0,0 Corrugated AC. Sheets (6 mm 2, 26 mets (6 105 x 20 cm) 5,0 m 130,00 650, 30 300,0 4,00 300,0 300,0 300,0 300,0 300,0 4,4 M0 100,00 100,00 300,0 4,4 M0 100,00 10,00,00 10,00,00 10,00,00		Subtota	Processing Compartment					-	4.356,00
Adobe Brick Werk (67) 2.46 m3 Adobe Drick and motar 0.50 m3/m3 0.23 m3 0.00 0.0 Biswift (2) 0.15 m3/m3 0.26 m3 0.00 0.0 Mud Paster (2) 0.15 m3/m3 0.01 m3 1.00.00 1.00 Line Placet (2) 0.15 m3/m3 0.01 m3 0.000 0.0 Line Placet (2) 0.03 m3 0.00 0.0 0.0 0.00 0.0 Door Wooden Batten (6.6 m (6.5 m (6.7 m)) 0.04 m3 0.00 m2 150.00 m3 100.00 100.00 100.00 100.00 0.	3.	Superst	ructure						
Abdo Chang Sull 0.00 0.00 0.00 0.00 Brawfine Husk 0.05 m3/m3 0.03 m3 0.00 0.00 Mud Plaster (2:1) 0.15 m3/m3 0.00 m3 1.080,00 106 Line Plaster (2:1) 0.01 m3/m3 0.00 m3 1.080,00 106 Line Plaster (2:1) 0.04 m3 0.03 m3 0.00 0.0 Line Plaster (2:1) 0.04 m3 0.00 0.00 0.00 0.00 Door Une (2) wy Sol 0.03 m3/m3 0.01 m3 0.00 0.00 Door Wooden Batten (5:5 m (9) 52 mm) 0.007 m3 0.11 m3 0.00 0.00 Subte Blar Hinges (6 mm da.) 1.00 m3/m3 0.01 m3 1.000 900 Subte Blar Hinges (6 mm da.) 1.00 m3/m3 0.05 m3 80,00 4 K Star case Excavation 1.000 m3/m3 0.05 m3		Adobe B	rick Work (6")	2,46	m3				
Dung 0.15 m3/m3 0.37 m3 0.00 n3 Mud Plaster (2.1) 0.73 m3/m3 0.00 m3 1.060,00 106, Line Plaster (2.1) 0.75 kg/m3 0.01 m3 1.060,00 106, Line Plaster (2.1) 0.04 m3 0.00 m3 0.00 0, Door Wooden Battens (5.8 m g) 50 x 25 mm3 0.01 m3 2.1200,00 148, Door Wooden Battens (5.8 m g) 50 x 25 mm3 0.01 m3 2.100,00 405, Statinzed Plain Steel Sheet (2 sheets 62,105 x 250 cm) 5.0 m m3 00,00 6.0 Barbo 50ko (ca, ca dm da, 18 th 0m3 1.4 kg 41,00 57, Subtotal Superstructure 1.057 m3/m3 0.05 m3 200,00 4.0 Murum 0.05 m3/m3 0.05 m3 200,00 4.0 Murum 0.05 m3/m3 0.05 m3 200,00 4.0 Murum 0.05 m			Clayey Soil Straw/Rice Husk	0,50	m3/m3 m3/m3	1,23	m3	0,00	0,00
Mud Plaster (2,1) Clayery Sol 0,13 0,25 0,25 0,25 0,25 0,25 0,25 0,25 0,25			Dung	0,15	m3/m3	0,37	m3	0,00	0,00
Lime Plaster (2-1) Lime		Mud Plas	ster (3:1) Sand Clayey Soil	0.13 0.75 0,25	m3 kg/m3 m3/m3	0,10 0,03	m3 m3	1.060,00 0,00	106,00 0,00
Chieve Soil 0001 0001 0001 0001 00000 0000 0000		Lime Pla	ster (21)	0,04	m3	0	Les.	0.00	0.00
Julu Wooden Bateris 65 m (2) siz 25 mm) Oatenized Plain Steel Sheet (2) sheets (2) 75 x 180 cm) 0.007 2,70 4,270 4,270 5,90 4,270 4,9 m3 4,100,0 148, 410,00 Roof Corrugated A.C. Sheets (6 mm, 2) sheets (2) 15 x 250 cm) Barhoo Sticks (c, 4 cm dia, 181 tong Barhoo Sticks (c, 4 cm dia, 181 tong Barhoo Sticks (c, 4 cm dia, 181 tong Barhoo Sticks (c, 4 cm dia, 191 tong Barhoo Sticks (c, 4 cm dia, 191 tong Barhoo Sticks (2,		0	Clayey Soil	0,33	m3/m3	0,01	m3	0,00	0,00
Roof Corrugated A.C. Sheets (6 mm, 2 sheets (20 to x 250 cm) Bamboo Sitks (ca. 4 cm dia, 18 ft ting) 5,0 3 m 190,00 300,0 660, 30,05 Subtotal Superstructure 16741 4. Staircas e 16741 Excavation 0,05 1,00 m3 0,05 m3/m3 0,05 m3/m3 0,05 m3/m3 0,00 4, Murum Murum 0,05 m3/m3 m3/m3 0,05 m3/m3 m3 200,00 10, Bricks (20) t10 x 70 mm) 455 No/ma/m3/m3 No/ma/m3 0,05 m3/m3 m3 200,00 10, Bricks (20) t10 x 70 mm) 455 No/ma/m3 No/ma/m3 77 No 3,50 220, 270, Morar (14) 0,246 m3/m3 1,070 m3/m3 16 kg kg 5,30 2,50 2,50 2,50 2,50 270, Vinter Coversion Squatting Pan & Cleansing Bowl 1,070 m3/m3 1,000 1,00 1,000 1,		Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)				0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48, 00 40 5, 00 8, 00
Subtotal Superstructure 1574.1 4. Staircase Excavation 0.05 m3 0.05 m3 0.00 4, Murum 0.05 m3m3 0.05 m3 200.00 10, 10, Brick Kolapie Bricki 0.05 m3m3 0.05 m3 200.00 10, 10, Brick Kolapie Bricki 0.05 m3m3 0.05 m3 200.00 10, 10, Brick Kolapie Bricki 0.14 m3m3 77 No 3.50 270, 10, Motrar (1-4) 0.246 m3m3 77 No 3.50 270, 10,00,00 4, 42, Plaster (1:3) Carrient 382,33 kg/m3 16 kg 5,30 27, 10,00,00 4, 42, Plaster (1:3) Carrient 443,03 kg/m3 5 kg 5,30 27, 10,00,00 11, 10,00,00 11, Subtotal Staircase 449,00 1,070 m3/m3 0,01 m3 1,080,00 14, 10,00,01 10, Carrient 49,03 kg/m3 5 kg 5,30 27, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10, 10,00,01 10		Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 2 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	50 cm)		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
A. Staircase Excavation Excavation 0.05 (1.00		Subtota	I Superstructure						1.674,00
Excavation Excavation 0.05 1.00 m3 m/m 0.05 m3 m3 80,00 4, 4 Murum Murum Murum 1.05 0.05 m3/m3 m3 0.05 m3 m3 200,00 10,00 Bitck Work (Single Bitck) Cement Sand 0.17 m3 to 10,00 0.17 m3 to 200,00 10,00 Pieter (13) Sand Cement Sand 0.01 m3 to 200,00 0.4 m3 to 200,00 10,00 Cement Sand Cannet 1.070 m3/m3 m3/m3 0.04 m3 to 200,00 10,00,00 12,000 24,200,00 Subtotal Staircase Market 1.070 m3/m3 0.01 m3 to 200,00 10,00,00 10,00,01 10,00,00 10,00,01 <th< td=""><td>4.</td><td>Staircas</td><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	4.	Staircas	6						
Marum Nurum 0.05 (1,05) m3 (1,05) 0.05 (1,05) m3 (1,05) 200,00 10,00 Brick Work Single Brick) Morar (1,4) Cernent 10,070 m3 (1,070) 77 No 3,50 270, 0,04 Marum Morar (1,4) Cernent 382,33 kg/m3 16 kg 5,30 85, 31,070 84,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 44,00 11,00 1,000,00 <td></td> <td>Excavati</td> <td>on Excavation</td> <td>0,05 1,00</td> <td>m3 m3/m3</td> <td>0,05</td> <td>m3</td> <td>80,00</td> <td>4,00</td>		Excavati	on Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
Brick Work (Single Brick) 0,17 m3 77 No 3.5.0 270, Brick (20) K10 X 70 mm) 455 No/m3 77 No 3.5.0 270, Sand 1,024 m3m3 16 kg 5.30 827, Cement 320,23 kg/m3 0.6 m3 1.080,00 42, Cement 403,01 kg/m3 0.01 m3 1.080,00 11, Sand 1,070 m3/m3 0,01 m3 1.080,00 11, Subtotal Staircase 449,1 kg/m3 5 kg 5.30 27, 5. Other Hardware 1 No 1.000,00 1.00, 100, Ume-Diversion Squatting Pan & Cleansing Bowl 1 No 160,00 100, Ume Oregower Pipe 2.5 m 40,00 100, Ume Oregower Pipe 2.5 m 40,00 100, Ume Oregower Pipe 2.5 m 40,00 100,		Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
Distance (a) (DX (0 min) D me D me <thd< td=""><td></td><td>Brick Wo</td><td>rk (Single Brick)</td><td>0,17</td><td>m3 No (m2</td><td>77</td><td>No</td><td>2.60</td><td>270.00</td></thd<>		Brick Wo	rk (Single Brick)	0,17	m3 No (m2	77	No	2.60	270.00
Sand 1,070 m3rm3 0,04 m3 1,060,00 42, Plaster (1:3) Cement Sand 0,01 m3 43,03 0,01 m3 5 kg 5,30 27, Subtotal Staircase 449,01 kgrm3 0,01 m3 1,000,00 100,00 11, Subtotal Staircase 449,01 kgrm3 0,01 m3 1,000,00 100,00			Mortar (1:4) Coment	0,246	m3/m3	16	ka	5,50	270,00
Plastar (1:3) 0,01 m3 43,03 kgrma 5, kg 5,30 27, 1,070 Subtotal Staircase 449,03 kgrma 5, kg 5,30 27, 1,070 1,000,00 <td></td> <td></td> <td>Sand</td> <td>1,070</td> <td>m3/m3</td> <td>0,04</td> <td>m3</td> <td>1.060,00</td> <td>42,00</td>			Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
Subtotal Staircase 449/ 5. Other Hardware 1 No 1.000,00 3.000,00<		Plaster (*	I:3) Cement Sand	0,01 493,03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
5. Other Hardware 1 No 1.000,00		Subtota	l Staircase					-	449,00
Ume-Diversion Squatting Pan & Cleansing Bowl 1 No 10000.00 1000.00 Virine Ziversion Squatting Pan & Cleansing Bowl 1 No 1600.00 1000.00 Oregwater Pipe 2.5 m 40.00 1000.00 1000.00 Urine Dire Pipe 1.5 m 40.00 1000.00 600.00 Urine Collection Container (20 I) 2 No 250.00 500.00 1000.00 1500.00 1200.00	5.	Other H	ardware						
Oregrvater Pipe 2.5 m 40,00 100,0 Urine Pipe 1.5 m 40,00 100,0 Urine Collection Container (20 h) 2 No 250,00 500,0 Cleanaing Water Infitration 1 No 150,00 150,00 150,00 Bucket (Oxer Material) 1 No 150,00 124,00,00 124,00,00 124,00,00 124,00,00 124,00,00 124,00,00 124,00,00 124,00,00 124,00,00		othern	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00 160.00	1.000,00
Urine Collection Container (20 l) 2 No 250,00 500,00 100, Cleanaing Vater Infitration 1 No 150,00 150, 150,00 150, Bucket (Over Material) 1 No 150,00 150, 150,00 150, Bucket (Over Material) 1 No 150,00 150, 150,00 150, Bucket (Over Material) 1 LS 300,00 150,00 150, Subtotal Other Hardware 2 2 2 2 2 2 2 300,00 1,800, 1,800,00 1,800,00 1,800,00 2,400,0 2,400,0 2,400,0 2,400,0 2,400,0 2,400,0 2,400,0 2,400,0 2,400,0 14,942,0 42,00,0 14,942,0 42,00,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942,0 14,942			Greywater Pipe Unine Pipe			2,5 1,5	m m	40,00 40,00	100,00 60,00
Bucket (Over Material) 1 No 150,00 300,00 300,00 300,00 150,00 250,00 150,00 2400,0 150,00 2400,0 2400,0 2400,0 2400,0 4200,0 4200,0 14,942,0 4200,0 14,942,0 14,942,0 4200,0 14,942,0			Urine Collection Container (20 I) Cleansing Water Pipe			2 2,5	No m	250,00 40,00	500,00 100,00
Cleansing Water Infitration 1 LS 300,00 300, Subtotal Other Hardware 2520,1 Subtotal Cher Hardware 6 days 300,00 1.800, Unikilied 16 days 150,00 2.400, Subtotal Labour 4200, Grand Total 14.942,1			Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
Subtotal Other Hardware 2,520,0 5. Labour Skilled Unskilled Subtotal Labour Grand Total Subtotal Cabour 14,942,0 Subtotal Labour 14,942,0 Subtotal Labour 14,942,0 Subtotal Labour Subtotal Labour 14,942,0 Subtotal Labour 14,942,0 Subtotal Labour 14,942,0 Subtotal Labour 14,942,0 Subtotal Labour 14,942,0 Subtotal Labour Subtotal Labour Subtotal Labour		_	Cleansing Water Infiltration			1	LS	300,00	300,00
Labour 6 days 300,00 1,800, 2,400, 2,400, 2,400, 4,200, 4,200, 4,200, 4,200, 4,200, 4,200, 4,200, 4,200, 14,942,		Subtota	I Other Hardware						2.520,00
Online O dars 30,000 1,80,00 2,400, Subtotal Labour 16 days 150,00 2,400, Grand Total 14,942,0	6.	Labour	Skilled			0	douo	200.02	1 000 00
Subtotal Labour 4 200,1 Grand Total 14 942,3			Unskilled			16	days	300,00 150,00	2.400,00
Grand Total 14.942.		Subtota	l Labour						4 200,00
		Grand T	otal						14,942,00

figure 11: Cost estimate for "Design 8"





tation tion Excavation Murum taster (3: 1) sand Clayey Soil taster (3: 1) taster (3: 1) taster (3: 1) taster (3: 1) Compartment Brick Work (6') Adobe Bricks and Montar Clayey Soil taster (3: 1) Sand Clayey Soil taster (2: 1) Ume Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3: 1) Sand Clayey Soil taster (2: 1) Ume PVC Pipe Cover (4'') PVC Pipe Cover (4'') P	0,61 1,00 0,81 1,05 0,75 0,25 0,25 0,25 0,25 0,25 0,25 0,25 0,2	m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3	0,61 0,85 0,14 0,05 0,13 0,05 0,13 0,01 0,01 15 0,12 0,04 2 2 2 2 2	m3 m3 m3 m3 m3 m3 m3 m3 No No No	80,00 200,00 1.060,00 0,00 0,00 1.060,00 0,00 1.060,00 1.060,00 0,00 1.060,00 0,00	49,01 170,01 148,00 0,00 367,00 42,00 0,00 42,00 0,00 1,500,00 127,00 0,00 127,00 0,00 127,00 0,00 127,00 0,00 127,00 0,00 127,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00
Excavalion Excavalion Murum Asser (3: 1) Sand Clayey Soil tal Foundation Adobe Breks and Motar Clayey Soil Sand Clayey Soil taster (2: 1) Lime Clayey Soil Laster (2: 1) L	0,66 0,66 0,66 0,66 0,66 0,65 0,25	m3im3 m3im3 m3 m3 m3 kg/m3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3	0,61 0,85 0,14 0,05 0,13 0,00 0,13 0,01 15 0,12 0,04 2 2 2 2	m3 m3 m3 m3 m3 m3 m3 m3 m3 N0 N0 N0 N0 N0	80,00 200,00 1,060,00 0,00 0,00 1,060,00 0,00 1,060,00 0,00 100,00 1	49,01 170,00 148,00 0,00 367,00 0,00 0,00 42,00 0,00 1,500,00 1,500,00 1,500,00 1,500,00 1,20,00 0,00 2,469,00 2,469,00
Murum aster (3: 1) Sand Clayer Soll tal Foundation sessing Compartment Brick Work (6') Addue Brecks and Montar Clayer Soll Sand Clayer Soll Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3: 1) Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3: 1) Sand Clayer Soll tion System PVC TP. Flece (4') PVC TP. Flece (4'	0,411 1,05 0,25 0,25 0,25 0,25 0,25 0,25 0,25 0	m3 m3/m3 m3/m3 kg/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3	0,85 0,14 0,05 0,43 0,30 0,13 0,01 0,01 0,01 0,01 2 2,2 2	m3 m3 m3 m3 m3 m3 m3 m3 No No No No	200,00 1.060,00 0,00 0,00 0,00 1.060,00 0,00 1.060,00 0,00 1.060,00 0,00 1.060,00 0,00 1.060,00 0,00 1.060,00 0,00	170,00 148,00 367,00 0,00 0,00 0,00 42,00 0,00 0,00 1,500,000 1,500,000 1,500,000 1,500,000 1,500,000 1,500,000
saser (3: 1) Sand Clayer Soil tal Foundation ssing Compartment Brick Work (6') Adobe Bricks and Mortar Clayer Soil Staw/Rice Husk Dung aster (3: 1) Sand Clayer Soil taster (2: 1) Lime Clayer Soil Barboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3: 1) Sand Clayer Soil tot System PVC Pipe Care (4'') PVC Pipe Care (4'') PVC Pipe Care (4'') PVC Pipe Corer (4'') For Chares Straw/Rice Husk Dung Sand Clayer Soil Staw/Rice Husk Dung Sand Sand Sand Clayer Soil Staw/Rice Husk Dung Sand Sand Sand Sand Sand Clayer Soil Staw/Rice Husk Dung Sand Sand Sand Clayer Soil Sand Sa	0,16 0,75 0,25 0,25 0,25 0,25 0,25 0,25 0,25 0,2	m3 kg/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3	0,14 0,05 0,43 0,30 0,13 0,04 0,01 15 0,04 0,01 2 2 2 2	m3 m3 m3 m3 m3 m3 m3 No No No No	1.060,00 0,00 0,00 1.060,00 0,00 1.060,00 0,00 100,00 1.060,00 0,00 1.060,00 0,00	148,00 ,0,00 367,00 0,00 0,00 42,00 0,00 1,500,00 1,500,00 1,27,00 0,00 1,27,00 0,00 1,27,00 0,00 1,27,00 1,20,00 1,20,00 2,2469,00
tal Foundation sissing Compartment Brick Work (6") Adobe Bricks and Mortar Clayey Soil Sand Clayey Soil Lissier (2:1) Barboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3:1) Sand Clayey Soil tion System PVC Pipe (4", 20 ft long) PVC Pipe Cover (4") tal Processing Compartment structure Brick Work (6") Adobe Bricks and Mortar Clayey Soil Structure Brick Work (6") Adobe Bricks and Mortar Clayey Soil Structure Brick Work (6") Adobe Bricks and Mortar Clayey Soil Structure Brick Work (6") Adobe Bricks and Mortar Structure Brick Work (6") Adobe Bricks and Mortar Structure Brick Work (6") Adobe Bricks and Mortar Structure Structure Brick Work (6") Adobe Bricks and Mortar Structure Brick Work (6") Adobe Brick Work (6") Adobe Bricks and Mortar Structure Brick Work (6") Adobe Brick Work (6	0,66 0,50 0,25 0,75 0,25 0,27 0,27 0,27 0,27 0,27 0,27 0,27 0,27	m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3	0,43 0,30 0,13 0,04 0,01 15 0,12 0,04 2 2 2 2	m3 m3 m3 m3 m3 M3 No No No No	0,00 0,00 1.060,00 0,00 1.060,00 1.060,00 0,00 300,00 60,00 40,00	0,00 0,01 0,01 0,01 0,01 0,01 1,500,000,000,000,000,000,000,000,000,00
ssing Compartment Brick Work (6') Adobe Bricks and Mortar Clayey Soli Straw/Rice Husk Dung aster (3: 1) Sand Clayey Soli taster (2: 1) Lime Clayey Soli Bambuo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3: 1) Sand Clayey Soli Uton System PVC Pipe Cover (4'') PVC Pipe Cover (4'') Adobe Bricks and Mortar Clayey Soli Straw/Rice Husk Dung aster (3: 1) Sand	0,86 0,50 0,25 0,75 0,75 0,77 0,87 0,87 0,75 0,25 0,25 0,25 0,25 0,25 0,25 0,25 0,2	m3 m3/m3 m3/m3 m3/m3 kg/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3	0,43 0,30 0,13 0,04 0,04 0,04 0,04 15 0,04 0,12 0,04 2 2 2 2 2	m3 m3 m3 m3 m3 M3 M3 No No No No	0,00 0,00 1.060,00 0,00 0,00 100,00 1.060,00 0,00 300,00 40,00	0,00 0,00 0,00 42,00 0,00 1.500,00 127,00 0,00 127,00 0,00 600,00 120,00 800,00 2.469,00
Brick Wark (6') Adobe Breks and Motar Clayey Soll Stand Rick Husk Dung Sard (3:1) Sand Clayey Soll Haster (2:1) Lime Clayey Soll Bamboo Sticks (ca. 4 cm dia., 18 ft long) Muß Plaster (3:1) Sand Clayey Soll tion System PVC Pipe Core (4'') PVC Pipe Core (4'') tal Processing Compartment Structure Brick Work (6'') Adobe Breks and Motar Clayey Soll Stand Micke Husk Dung Sand	0,86 0,50 0,15 0,05 0,25 0,25 0,25 0,25 0,25 0,25 0,2	m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3 m3/m3	0,43 0,30 0,13 0,04 0,01 0 0,01 15 0,12 0,04 2 2 2 2	m3 m3 m3 m3 m3 No m3 m3 No No	0,00 0,00 1,060,00 0,00 1,060,00 1,060,00 0,00	0,0 0,0 0,0 42,0 0,0 0,0 1.500,0 127,0 0,0 127,0 0,0 120,0 800,0 120,0 80,0 2.469,00
Clayey Soli Straw/Rice Husk Jung Sand Clayey Soli Laster (2:1) Laster (2:1) Barboo Sticks (ca. 4 cm dia., 18 (t long) Mud Plaster (3:1) Sand Clayey Soli Lton System PVC Pipe (4", 20 (t long) PVC Pipe (4", 20 (t long) PVC Pipe (4") PVC Pipe ce (4") PVC Pipe Cover (4") tal Processing Compartment Structure Brick Work (6") Adobe Bricke and Mottar Clayey Soli Straw/Rice Husk Dung	0,50 0,35 0,15 0,25 0,25 0,26 0,07 0,07 0,33 0,16 0,75 0,25 0,25 0,25 0,25	m3im3 m3im3 m3im3 m3 kg/m3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3 m3im3	0,43 0,30 0,13 0,04 0,01 0 0,01 15 0,12 0,04 2 2 2 2	m3 m3 m3 m3 m3 No m3 No No	0,00 0,00 1,060,00 0,00 1,060,00 1,060,00 0,00	0.01 0.01 0.01 0.01 42,01 0.01 0.01 1.500,01 127,01 0.01 127,01 0.01 120,01 500,01 120,01 2.469,00
aster (3: 1) Sand Clayey Soll taster (2: 1) Lime Clayey Soll Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3:1) Sand Clayey Soll tion System PVC Pipe (4", 20 ft long) PVC T"-Piece (4") PVC Pipe Cover (4") PVC Pipe Cover (4") tal Processing Compartment Structure Brick Wark (6") Adobe Bricks and Motar Clayey Soll Straw/Rice Husk Dung Sand	0,05 0,75 0,26 0,67 0,33 0,46 0,75 0,25 0,25 2,46 0,50 0,35 0,15	m3 kg/m3 m3/m3 kg/m3 m3/m3 m3/m3 m3/m3	0,04 0,01 0,01 15 0,12 0,04 2 2 2 2	m3 m3 No m3 m3 No No No	1.060,00 0,00 100,00 1.060,00 0,00 300,00 40,00	42,0(0,0(1.500,0(127,0(0,0(120,0(80,0(2,469,0(
Layey Soll taster (2:1) Lime Clayey Soll Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3:1) Sand Clayey Soll Clayey Soll PVC Pipe (4", 20 ft long) PVC Pipe (4", 20 ft long) PVC Pipe Cyter (4") PVC Pipe Cyter (4") Table Processing Compartment structure Brick Work (6") Adobe Bricks and Motar Clayey Soll Strawfice Husk Dung Sand	0,25 0,07 0,33 0,16 0,75 0,25 2,46 0,55 0,35 0,35 0,15	m3m3 m3 kg/m3 m3/m3 m3/m3 m3/m3 m3/m3	0 0,01 15 0,12 0,04 2 2 2 2 2	kg m3 No m3 m3 No No	0,00 0,00 1.060,00 0,00 300,00 40,00	0,0 0,0 1.500,0 127,0 0,0 800,0 120,0 80,0 2.469,00
Line Clavey Soil Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3-1) Sand Clavey Soil tion System PVC Pri-Piece (4-1) PVC Pri-Piece (4-1) PVC Pipe Cover (4+1) tal Processing Compartment Structure Brick Work (6 ⁻¹) Addbe Bricke and Mortar Clavey Soil StrawRice Husk Dung aster (3:1) Sand	0,67 0,33 0,16 0,75 0,25 2,46 0,55 0,35 0,15	kg/m3 m3/m3 kg/m3 m3/m3	0 0,01 15 0,12 0,04 2 2 2 2	kg m3 m3 m3 No No	0,00 0,00 100,00 1,060,00 0,00 300,00 40,00 40,00	0,0 0,0 1.500,0 127,0 0,0 600,0 120,0 80,0 2.469,0
Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (31) Sand Clavey Soil tion System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4") tal Processing Compartment structure Brick Work (6") Adobe Bricks and Montar Clavey Soil Strawfice Husk Dung Sand	0,16 0,75 0,25 2,46 0,56 0,35 0,35	m3 kg/m3 m3/m3	15 0,12 0,04 2 2 2 2	No m3 m3 No No	100,00 1.060,00 0,00 300,00 60,00 40,00	1.500,00 127,00 0,00 600,00 120,00 80,00 2.469,00
Multiplaster (31) Sand Clayey Soli tion System PVC Pipe (4", 20 ft long) PVC 7T: -Piece (4") PVC Pipe Cover (4") tal Processing Compartment structure Brick Work (6") Adobe Bricks and Mortar Clayey Soli Strawfice Husk Dung Saster (3:1) Sand	0,16 0,75 0,25 2,46 0,50 0,35 0,35 0,15	m3 kg/m3 m3/m3	0,12 0,04 2 2 2	m3 m3 No No	1.060,00 0,00 300,00 40,00 	127,00 0,00 600,00 120,00 80,00 2.469,00
tion System PVC Pipe (4", 20 ft long) PVC Pipe Caver (4") PVC Pipe Cover (4") tal Processing Compartment structure Brick Work (6") Adobe Bricks and Montar Clayey Soil Strawfice Husk Dung Sand	2,46 0,50 0,36 0,15	m3	2 2 2	No No	300,00 60,00 40,00	600,00 120,00 80,00 2.469,00
PVC Pipe (4", 20 ft long) PVC Pipe Cover (4") tal Processing Compartment structure Brick Work (6") Adobe Bricks and Mortar Clayey Soll Strawfice Husk Dung Saster (3: 1) Sand	2,46 0,50 0,35 0,15	m3	2 2 2	No No No	300,00 60,00 40,00 —	600,01 120,01 80,01 2.469,00
tal Processing Compartment structure Adobe Broks and Mortar Clayey Soll Straw/Rice Husk Dung aster (3:1) Sand	2,46 0,50 0,35 0,15	m3			-	2.469,00
structure Brick Work (6") Adobe Bricks and Mortar Clayey Soll Strawfice Husk Dung aster (3: 1) Sand	2,46 0,50 0,35 0,15	m3				
Brick Wark (0*) Adobe Bricks and Mortar Clayey Soll Straw/Rice Husk Dung aster (3:1) Sand	2,46 0,50 0,35 0,15	m3				
Clayey Soli StrawFrice Husk Dung aster (3:1) Sand	0,50 0,35 0,15					
laster (3:1) Sand		m3/m3 m3/m3 m3/m3	1,23 0,86 0,37	m3 m3 m3	0,00 0,00 0,00	0,00 0,00 0,00
Clourse Roil	0,14 0,75	m3 kg/m3	0,11	m3	1.060,00	117,00
laster (2:1)	0,05	m3	0,04	ins.	0,00	0,00
Lime Clay <i>e</i> y Soli	0,67 0,33	kg/m3 m3/m3	0 0,02	kg m3	0,00 0,00	0,00
Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	V		5,0 3 1,4	m No kg	1 30,00 1 00,00 41,00	650,00 300,00 57,00
tal Superstructure						1.685,00
ise						
tion Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
i Murum	0,05	m3 m3/m3	0.05	m3	200.00	10.01
Brick Work (6")	0,17	m3	184590			19451
Adobe bricks and mortar Clayey Soli Straw/Rice Husk	0,50	m3/m3 m3/m3	0,09 0,06	m3 m3	0,00 0,00	0,00
laster (3:1)	0,15	maima m3	0,03	m3	0,00	0,0
Sanu Clayey Soll	0,75	m3/m3	0,08	m3	0,00	0,00
laster (2:1) Lime Clayey Soil	0,01 0,67 0,33	m3 kg/m3 m3/m3	0 0,00	kg m3	0,00 0,00	0,00 0,01
tal Staircase					-	78,00
Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1 000 00	1.000.01
Washbasin Greywater Pipe			1 2,5	No	160,00 40,00	160,00
Urine Pipe Urine Collection Container (20)			1,5 2	m No	40,00 250,00	60,01 500,01
Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,0 150,0
Bucket (Water)			1	No LS	150,00 300,00	150,0 300,0
Cleansing Water Infiltration					-	2.520,00
Cleansing Water Infiltration tal Other Hardware			6 16	days davs	300,00 150.00	1.800,00 2.400.01
Cleansing Water Infitration stal Other Hardware Skiled Unskiled				.,-	-	4.200,00
Cleansing Water Infiltration tal Other Hardware Skilled Unskilled tal Labour						
1	Satu Clayey Soil Clayey Soil Clayey Soil Clayey Soil Clayer Soil Clayer Soil Clayer Soil Clayer Soil Crewater Pipe Unine Collection Container (20.) Cleansing Water Pipe Bucket (Over Material) Bucket (Water) Cleansing Water Influtation Cleansing Water Influtation Cleansing Water Influtation Cleansing Water Influtation	Sation Clayey Soil 0,15 Clayey Soil 0,15 Clayey Soil 0,15 Clayey Soil 0,17 Clayey Soil 0,17 Clayey Soil 0,17 Clayer Soil 0,17 Claye	Safe (21) Crayey Soll Crayey S	Salid Clayey Soll Clayey Soll	Safe (21) Crayey Soil Crayey S	Sational Cargery Soli 0.73 kg/mm3 0.08 m3 1.000,000 aster (21) 0.01 m3 0.000 m3 0.000 Lime 0.67 kg/m3 0.00 m3 0.000 Cisyery Soli 0.67 kg/m3 0.00 m3 0.000 cisyery Soli 0.67 kg/m3 0.00 m3 0.00 cisyery Soli 0.33 m3/m3 0.00 m3 0.00 cisyery Soli 0.33 m3/m3 0.00 m3 0.00 cisyery Soli 0.33 m3/m3 0.00 m3 0.00 cisyery Soli 1 No 1.000,00 m3 0.00 cisyery Soli 2 No 1.000,00 m3 0.00 cisyery Soli 1 No 1.000,00 m3 0.00 cisyery Soli 2 No 2.5 m<40,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 DO
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement	16,67 0,0089 382,33	No/m2 m3/m2 kg/m3	53	No kg	22,00 5,30	1.166 JU 58 DO
		Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. S	Jab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
		Sanu Aggregate Bajifercoment	0,440	m3/m3	0,13	m3 ka	530,00 41,00	74 DU 69 DO 246 DD
	4" (290 x	190×100) Hollow Block Masonry Cover	0.72	m2	0,0	мy	41.00	240,00
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264 00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	on System EV/C Bins (4" 20 ft long)			2	No	300.00	600.00
		PVC "TPiece (4") PVC "TPiece (4")			2 2	No	60,00 40,00	120,00
	Subtot	al Processing Compartment						2.975.00
3.	Supers	structure						
	4" (290 x	190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100)	8,70 16,67	m2 No/m2	145	No	22,00	3.190,00
		Mortar (1:4) Cement	0 , 008 9 382 ,33	m3/m2 kg/m3	30	kg	5,30	159,00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85 µU
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia)			0,007 2,70 0,2	m3 m2 kg	21 200 00 150 00 41 00	148 00 405 00 8 00
	Jalies	Jalies (300 × 450 mm)			2	No	110,00	220,00
	Roof							
		Corrugated A.C. Sheets (5 mm; 2 sheets (2 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 16 ft long) Steel Bar Hinges (6 mm dia.)	0		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	wurum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other H	Hardware				NL:	1 000 00	1 000 00
		Washbash Pina			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250,00	60 D0 500 D0
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150 00 300 00
	Subtot	al Other Hardware						2.520,00
6	Labor							
0.	Labou	Skilled Undeilled			4	days	300,00	1.200.00
	Quinter	on on the second s			đ	uays	100,001	2 400 00
	SUDIOL	ai Labuul						2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1. Foundation						
Excavation Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80 D0	32,00
Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
P.C.C. (1:48) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
Subtotal Foundation						546,00
2. Processing Compartment						
4" (290x190x100) Hollow Block Masonry	3,15	m2	50			
Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement Sand	0,0089 382,33 1.070	m3/m2 kg/m3 m3/m3	53 11 0.03	kg m3	22,00 5,30 1,060,00	58,00 32,00
R.C.C. slab (1:2:4)	0,15	m3	0,00		1,000,000	02,00
Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 00 74 00
Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530 DO 41 DO	69,00 246,00
4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72	m2 No/m2	12	No	22.00	264.00
Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	2	kg	5,30	11,00
Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
Ventilation System PVC Pipe (4", 20 ft long) PVC "T" Piece (4")			2	No	300,00	600,00
PVC Pipe Cover (4")			2	No	40,00	80,00
Subtotal Processing Compartment					-	2.975,00
3. Superstructure						
4" (290×190×100) Hollow Block Masonry Hellow Block (200 × 100 × 100 mm)	3,60	m2 No(m2	60	No	22.00	1 200 00
Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	12	kq	5,30	64.00
Sand Water	1, <mark>070</mark> 191	m3/m3 I/m3	0,03 6	m3 I	1.060,00 0,00	32,00 0,00
Ferro Cement (1:3)	0,16	m3 ka/m3	79	ka	5 30	419.00
Sand	1,070	m3/m3	0,17	m3	1.060,00	180,00
Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148,00 405,00 8,00
Jalies			1	No	110.00	110.00
Subtotal Superstructure					-	2.686.00
					-	
4. Staircase	-	1				
Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	00,08	5,00
Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
Subtotal Staircase						800,00
5. Other Hardware			1	No	1 000 00	1 000 00
Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00 100,00
Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
Cleansing Water Pipe Bucket (Cover Material)			2,5 1	m No	40,00 150,00	100,00 150,00
Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
Subtotal Other Hardware						2.520,00
6. Labour			1			100000
Skilled Unskilled			4 10	days days	300,00 150,00	1.200,00 1.500,00
Subtotal Labour						2.700,00
Grand Total						12.227,00

figure 5: Cost estimate for "Design 2"





		Quantity Unit/Unit Quanti					
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8)	0,23	m3			2.22	Transford
	Cement Sand	0,470	kg/m3 m3/m3	0,11	kg m3	5,30	196,00
	Aggregate	0,95	m3/m3	0,22	m3	530,00	546.00
						-	010,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,15	m2 No/m2	53	No	22.00	1 166 00
	Mortar (1:4) Cement	0,0089	m3/m2 ka/m3	11	ka	5.30	58.00
	Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 ka/m3	46	ka	5.30	244.00
	Sand Aggregate	0,440	m3/m3 m3/m3	0,07 0,13	m3 m3	1.060,00 530.00	74,00 69.00
	Reinforcement	40	kg/m3	6,0	kg	41,00	246,00
	4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72 16,67	m2 No/m2	12	No	22,00	264,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilation System						
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						2.975,00
3.	Superstructure						
	Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400,00 1.300,00
	Subtotal Superstructure					-	2.700,00
4.	Staircase						
	Excavation	0,06	m3 m3/m3	0.06	m3	80.00	5.00
	Murum	0,06	m3	0,00	mo	00,00	5,00
	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtotal Staircase						800,00
5	Other Hardware						
	Urine-Diversion Squatting Pan & Cleansing Bow Washbasin	I		1	No No	1.000,00 160,00	1.000,00 160,00
	Greywater Pipe Urine Pipe			2,5 1,5	m m	40,00 40.00	100,00 60.00
	Urine Collection Container (20 I) Cleansing Water Pine			2	No	250,00	500,00
	Bucket (Cover Material)			1	No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Other Hardware					1	2.520,00
6.	Labour						
	Skilled Unskilled			4 8	days days	300,00 150,00	1.200.00 1.200.00
	Subtotal Labour					5	2.400,00
	Grand Total						11.941,00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Sand	1,070	m3/m3	0,28	m3	1.060,00	297,00
	P.C.C. (1:4:8) Cement Sand	0,15 161,95 0,470	m3 kg/m3 m3/m3	24 0,07	kg m3	5,30 1.060,00	127,00 74,00
	Aggregate	0,95	m3/m3	0,14	m3	530,00	74,00
	Subtotal Foundation					6	1.561,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	4,20 16,67	m2 No/m2	70	No	22,00	1.540,00
	Mortar (1:4) Cement Sand	382,33	m3/m2 kg/m3 m3/m3	14 0.04	kg m3	5,30 1,060,00	74,00 42,00
	R.C.C. Slab (1:2:4)	0,15	m3	0,04	115	1.000,00	42,00
	Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244,00 74,00
	Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,84 16.67	m2 No/m2	14	No	22.00	308.00
	Mortar (1:4) Cement	0,0089 382,33	m3/m2 kg/m3	з	kg	5,30	16,00
	Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilation System PVC Pipe (4", 20 ft long) PVC ""-Piece (4")			2	No No	300,00	600,00 120,00
	PVC Pipe Cover (4")			2	No	40,00	80,00
	Subtotal Processing Compartment					2	3.424,00
3.	Superstructure						
	4" (290×190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100 mm)	8,70 16,67	m2 No/m2	145	No	22.00	3,190,00
	Mortar (1:4) Cement	0,0089 382,33	m3/m2 kg/m3	30	kg	5,30	159,00
	Sand Water	1,070 191	m3/m3 I/m3	0,08 15	m3 I	1.060,00 0,00	85,00 0,00
	Door Wonden Battens (5.6 m の 50 x 25 mm)			0.007	m3	21 200 00	148.00
	Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cr Steel Bar Hinges (6 mm dia.)	n)		2,70 0,2	m2 kg	150,00 41,00	405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150	cm)		3,0	m	130,00	390,00
	Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)			2 1,0	No kg	100,00 41,00	200,00 41,00
	Subtotal Superstructure						4.846,00
4.	Staircase						
	Excavation Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	0,05	m3	0.05		200.00	10.00
	4" (290×190×100) Solid Block Masonry	1,00	ma/ma	0,05	mo	200,00	10,00
	Solid Blocks (290 x 190 x 100 mm) Mortar (1:4)	24 0,02	No m3	24	No	30,00	720,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	8 0,02	kg m3	5,30 1.060,00	42,00 21,00
	Subtotal Staircase					2	797,00
5.	Other hardware						
	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00	1.000,00
	Greywater Pipe Urine Pipe Urine Callection Container (20.0			2,5	m m No	40,00	60,00
	Cleansing Water Pipe Bucket (Cover Material)			2,5	m	40,00	100,00
	Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtotal Staircase						2.520,00
6.	Labour						
1778	skilled unskilled			4 8	days days	300,00 150,00	1.200,00 1.200,00
	Subtotal Labour						2.400,00
	Grand Total					2	15 540 00
						5	10.040,00

figure 7: Cost estimate for "Design 4"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,57 1,00	m3 m3/m3	0,57	m3	80,08	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtotal Foundation					-	798,00
2	Processing Compartment						
2.	Brick Work (Single Brick)	0,83	mЗ				
	Bricks (230 × 110 × 70 mm) Mortar (1:4) Cement Sand	455 0,246 382,33 1,070	No./m3 m3/m3 kq/m3 m3/m3	378 78 0,22	No kg m3	3,50 5,30 1.060,00	1.323,00 413,00 233,00
	R.C.C. Slab (1:2:4) Cament	0,23	m3 kg/m3	71	ka	5.30	376.00
	Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2 No./m2	38	No	3.50	133.00
	Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement Sand	0,04 493.03 1.070	m3 kg/m3 m3/m3	20 0.04	kg m3	5,30 1.060,00	106,00
	Ventilation System	. 101.0	morris	2	Ma	200.00	500.00
	PVC Pipe (4 , 20 miong) PVC "T"-Piece (4") PVC Pipe Cover (4")			222	No No	60,00 40,00	120,00 80,00
	Subtotal Processing Compartment					-	4.023,00
З.	Superstructure						
	Brick Work (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
	Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (1:3) Cernent Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia)	cm)		0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	1 48,00 4 05,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm, 2 sheets @ 105 x 2 Bamboo Sticks (ca. 4 cm dia. 18 ft Iong)	'50 cm)		5,0 3	m No	130,00 100.00	650,00 300,00
	Steel Bar Hinge's (6 mm dia.)			1,4	kg	41,00 -	57,00 4.968,00
	Steinees						
	Excavation	0,06	m3				
	Excavation	1,00	m3/m3	0,06	m3	00,08	5,00
	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm) Monter (1.4)	0,17 455 0.246	m3 No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493.03 1.070	m3 kg/m3 m3/m3	5 0.01	kg m3	5,30 1.060.00	27,00 11.00
	Subtotal Staircase			6		-	452,00
5.	Other Hardware						
	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin Grewwater Pine			1 25	No No	1.000,00 160,00 40.00	1.000,00 160,00 1.00,00
	Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250,00	60,00 500,00
	Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
	Bucket (Water) Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Other Hardware					-	2.520,00
6.	Labour Skilled			6	days	300,00	1.800,00
	Unskilled			12	days	150,00	1.800,00
	Suptotal Labour						3.600,00
	Grand Total					1	16.361,00

figure 8: Cost estimate for "Design 5"




		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	m3	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement	0,34 161,95	m3 kg/m3	55	kg	5,30	292,00
	Sand Aggregate	0,470 0,95	m3/m3 m3/m3	0,16 0,32	m3 m3	1.060,00 530,00	170,00 170,00
	Subtotal Foundation						798,00
2.	Processing Compartment						
	Brick Work (Single Brick)	0,83	m3	270	N	2.59	4 222 02
	Bricks (230 x 110 x 70 mm) Mortar (1:4) Cement	455 0,246 382 33	m3/m3	3/8	N0	3,50 5,30	413.00
	Sand	1,070	m3/m3	0,22	m3	1.060,00	233,00
	Cement Sand	308 53	kg/m3	71	kg m3	5,30 1,060,00	376,00
	Aggregate Reinforcement	0,88 35	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2	20	Ma	2.59	122.00
	Mortar (1:4) Cement	0,023	m3/m2 kg/m3	6	ka	5,30	32.00
	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Plaster (1:3) Cement Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System			2	No	200.00	600.00
	PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtotal Processing Compartment						4.023,00
3.	Superstructure						
	Brick Work (Half Brick)	12,50	m2				
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	663	No	3,50	2.321,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	0,31	kg m3	5,30 1.060,00	329,00
	Plaster (1:3) Cement Sand	0,08 493 D3 1,070	m3 kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door			0.007		24,200,00	1.49.00
	Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		2,70	m2 kg	150,00 41,00	405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure						4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum	0,06	m3	0.00		200.00	12.00
	Murum Brick Work (Single Brick)	0.17	ma/ma m3	0,0	mo	200,00	12,00
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493 D3 1 070	m3 kg/m3 m3/m3	5	kg m3	5,30 1.060.00	27,00 11.00
	Subtotal Staircase						452,00
Ξ.							
5.	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	Greywater Pipe Urine Pine			2,5	m	40,00	100,00
	Urine Collection Container (20 l) Cleansing Water Pipe			3 2,5	No m	250,00 40,00	750,00 100,00
	Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
6.	Labour Skilled Unskilled			6	days	300,00	1.800,00
	Subtotal Labour			12	udys	150,00	3.600,00
							45.052.24
	Grand Total					i	15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wa	r ik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	448) Cement Sand Accreate	0,17 161,95 0,470 0.95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530.00	148,00 85,00 85,00
	Subtota	lFoundation			100	1940		1.743,00
	D							
Ζ.	Brick Wo	nng Comparament	0.97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	382,33	kgrm3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate	0,440	m3/m3 m3/m3	0,1	m3 m3	1.060,00 530,00	106,00
	Brick Wo	rk (Half Brick) Cover	0.72	m2	8,1	кg	41,00	332,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Woter	382,33 1,070 101	kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00 0.00	32,00 21,00
	Plaster (1:3)	0,04	m3			0,00	0,00
	Montilatic	Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventriada	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	I Processing Compartment						4.356,00
3.	Superst	ructure						
	Brick Wa	rk (Half Brick)	11,00	m2	500			
		Mortar (1:4) Cement	0,023	m3/m2 kg/m3	97	ka	5,50	2.041,00
		Sand	1,070	m3/m3	0,27	m3	1.060,00	286,00
	Plaster (1:3) Cement Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 25 Bamboo Sticks (ca. 4 cm dia., 18 ft long)	0 cm)		5,0 3	m No	130,00 100,00	650,00 300,00
	Subtota	I Superstructure			1,4	ĸġ	41,00	4.968,00
4.	Staircas	8						
	Excavati	on Excavation	0,05	m3	0.05	m3	90.00	4.00
	Murum	Excaration	0,05	m3	0,00	ma	00,00	4,00
		Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	BUCK MO	nk (Single Brick) Bricks (230 x 110 x 70 mm) Mortar (1 4)	455	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01	m3 ka(m3	5	ka	5 30	27.00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Subtota	i Staircase						449,00
5.	Other H	ardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00
		Unine Collection Container (20 I) Closed Water Ring			1,5	No	40,00 250,00 40,00	500,00
		Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	i Uther Hardware						z.520,00
6.	Labour	Skilled			6	days	300,00	1.800,00
	C	Unskilled			12	days	150,00	1.800,00
	Subtota	I Lapouf						3,200,00
	Grand T	otal						17.636,00

figure 10: Cost estimate for "Design 7"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	4 :8) Cement Sand Accreaste	0,17 161,95 0,470	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530,00	148,00 85,00 85,00
	Subtota	I Foundation	0,00	ind no	0,10		-	1.743,00
Ζ.	Process	ing Compartment	0.07	m2				
	DITUK WA	Bricks (230 x 110 x 70 mm)	455	No./m3	441	No	3,50	1.544,00
		Cement Sand	382,33	kg/m3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4)	0,23	m3				
		Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Sand	382,33	kgrm3 m3/m3	0,02	кg m3	5,30 1.060,00	32,00
	Plaster (1:3) Cement	0,04 493,03	m3 kg/m3	20	kg	5,30	106,00
	Montilatic	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	venulau	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC "T"-Piece (4")			2 2 2	No No	300,00 60,00	600,00 120,00
	Subtota	Processing Compartment			2	NO	40,00	4.356,00
2	Suparat	ructure						
J.	Adohe B	rick Wark (6")	2 46	m3				
	1140000	Adobe bricks and mortar Clavey Soil	0.50	m3/m3	1.23	m3	0.00	0.00
		Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00	0,00 0,00
	Mud Plas	ster (3:1) Sand Clavary Soil	0.13	m3 kg/m3 m3(m3	0,10	m3	1.060,00	106,00
	Lime Pla	ster (21)	0.04	m3	0,00	115	0,00	0,00
		Lime Clayey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @), 105 x 29 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinnes (6 mm dia.)	50 cm)		5,0 3	m No ka	130,00 100,00 41.00	650,00 300,00 57.00
	Subtota	I Superstructure			4.		-	1.674,00
4.	Staircas	e						
	Excavati	on Excavation	<mark>0,05</mark> 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05	m3	0.05	m3	200.00	10.00
	Brick Wo	rk (Single Brick)	0,17	m3	0,05	115	200,00	10,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01 493,03	m3 kg/m3	5	kg	5,30	27,00
	Subtota	Sand I Staircase	1,070	marma	0,01	ms	1.060,00	449,00
5.	Other H	ardware Unne-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbash Greywater Pipe			2,5	m	40,00	100,00
		Urine Fige Urine Collection Container (20 I)			1,5	No	250,00	500,00
		Bucket (Cover Material) Bucket (Cover Material)			45	No	150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	I Other Hardware					-	2.520,00
6.	Labour							
		Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtota	lLabour						4 200,00
	Grand T	otal						14.942,00

figure 11: Cost estimate for "Design 8"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,61 1,00	m3 m3/m3	0,61	m3	80,00	49,00
	Murum	Murum	0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,00
	Mud Plas	ster (3:1) Sand Clavey Soil	0,18 0,75 0,25	m3 kg/m3 m3/m3	0,14 0,05	m3 m3	1.060,00 0,00	148,00 0,00
	Subtota	I Foundation						367,00
2.	Process	sing Compartment						
	Adobe B	rick Work (6") Adobe Bricks and Mortar	0,86	m3				
		Clayey Soil Straw/Rice Husk Dung	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	0,43 0,30 0,13	m3 m3 m3	0,00 0,00 0,00	0,00 0,00 0,00
	Mud Plas	ter (3:1) Sand Claver Seil	0,05 0,75	m3 kg/m3 m3/m3	0,04	m3	1.060,00	42,00
	Lime Pla	ster (2:1)	0,23	m3	0,01	ing.	0,00	0,00
		Lime Clayey Soil	0,67	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
	Slab	Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3:1)	0.16	m3	15	No	100,00	1.500,00
		Sand Clayey Soil	0,75 0,25	kg/m3 m3/m3	0,12 0,04	m3 m3	1.060,00 0,00	127,00 0,00
	Ventilatio	PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 90,00
	Subtota	I Processing Compartment					1	2.469,00
3.	Superst	tructure						
	Adobe B	rick Work (6") Adobe Bricks and Mortar Clavey Soli	2,46	m3	1 23	m3	0.00	0.00
		StrawRice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00 0,00	0,00 0,00
	Mud Plas	ster (3:1) Sand Clayey Soil	0,14 0,75 0,25	m3 kg/m3 m3/m3	0,11 0,04	m3 m3	1.060,00 0,00	117,00 0,00
	Lime Pla	ster (2:1) Lime	0,05 0,67	m3 kg/m3	0	kg	0,00	0,00
	Door	Clayey Soil	0,33	m3/m3	0,02	m3	0,00	0,00
	200	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Roof	Corrugated A.C. Sheets (6 mm, 2 sheets @ 105 x 250 c Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	m)		5,0 3 1,4	m No kg	1 30,00 1 00,00 41,00	650,00 300,00 57,00
	Subtota	Il Superstructure					1. .	1.685,00
4.	Staicas	e						
	Excavati	on Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05	m3 m3/m3	0.05	m3	200.00	10.00
	Adobe B	rick Work (6")	0,17	m3	9,00		200,00	10,00
		Adobe bricks and mortar Clayey Soil Straw/Rice Husk	0,50	m3/m3 m3/m3	0,09 0,06	m3 m3	0,00 0,00	0,00
	Mud Plas	Dung	0,15	m3/m3	0,03	m3	0,00	0,00
		Sand Clayey Soil	0,75	kg/m3 m3/m3	0,06 0,02	m3 m3	1.060,00 0,00	64,00 0,00
	Lime Pla	ster (2:1) Lime	0,01 0,67	m3 kg/m3	0	kg	0,00	0,00
	Subtota	clayey soll	0,33	m3/m3	0,00	ma	- 10,00	78,00
5.	Other H	ardware						
		Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin Grewwater Pine			1 25	No No	1.000,00 160,00 40.00	1.000,00 160,00 100.00
		Urine Pipe Urine Collection Container (20.)			1,5	m	40,00 40,00 250.00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m	40,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtota	I Other Hardware					8	2.520,00
6.	Labour	Skilled			6	days	300,00	1.800,00
	Subtota	Unskilled			16	days	150,00 -	2.400,00
							-	
	Grand 1	īotal					83-	11.319,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					3	546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2	52	Ne	22.00	1 100 00
		Mortar (1:4) Cement Sand	0,0069 .382,33 1.070	m3/m2 kg/m3 m3/m3	11 0.03	kg m3	5,30 1,060,00	58 DO 32 DD
	R.C.C. S	Silab (1:2:4)	0,15	m3	0,00	115	1.000,00	52,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 DO 74 DO
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290 x	(190×100) Hollow Block Masonry Cover	0,72	m2				100000000
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	.382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	PVC Pipe (4", 20 ft long)			2	No	300,00	600 DO
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
З.	Supers	structure						
	4" (290 x	(190×100) Hollow Block Masonry	8,70	m2 No (m2)	1.45	Na	22.00	2 100 00
		Montar (1:4)	0,0089	m3/m2	145	ka	22.00 6.20	150.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85,00
	Door	Wooden Battens (56 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel BarHinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148.00 405.00 8.00
	Jalies	Jolian (200 v 460 mm)			2	No	110.00	220.00
	Roof				-	110	110,00	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	(190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other I	Hardware				No	1 000 00	1 000 00
		Washbasin Grevwater Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250.00	60,00 500,00
		Clean sing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6	l abou	r						
υ.	Labou	Skilled Unskilled			4	da ys da ys	300,00	1.200,00
	Subtet	al Labour			U	2019	100,00	2 400 00
	Subiol							2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	mЗ	80,08	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	mЗ	200,00	84,00
	P.C.C. (1	:448) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					-	546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry	3,15	m2	50			
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement	16,67 0,0089 382,33	No/m2 m3/m2 kg/m3	53 11 0.02	No kg	22 JU 5 30	1.166,00 58,00 22,00
	R.C.C.s	lab (1:2:4)	0.15	m3	000	115	1.000,00	32,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 00 74 00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69,00 246,00
	4" (290x	190 x100) Hollow Block Masonry Cover Hallow Black (200 x 190 x 100 mm)	0,72	m2 No/m2	10	No	22.00	264.00
		Mortar (1:4) Cement	0,0089	m3/m2 ka/m3	2	ka	5.30	204,00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilati	on System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC Pipe Cover (4") PVC Pipe Cover (4")			2	No	40 DO	120,00
	Subtot	al Processing Compartment					-	2.975,00
3.	Supers	structure						
	4" (290x	190 x100) Hollow Block Masonry	3,60	m2	60	N.	22.00	1 220 00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	12	ka	5 30	64.00
		Sand Water	1, <mark>070</mark> 191	m3/m3 I/m3	0 D 3 6	m3 I	1.060,00 0,00	32,00 0,00
	Ferro Ce	ement (1:3)	0,16	m3 ka/m2	70	ka	5 20	419.00
		Sand	1,070	m3/m3	0,17	m3	1.060,00	180,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinnes (6 mm dia)	m)		0,007 2,70 0.2	m3 m2 ka	21 200 00 150 00 41 00	148,00 405,00 8,00
	Jalies							
	Outstat	Jalies			1	No	110,00	110,00
	Subtot	al Superstructure					-	2.080,00
4.	Stairca	se						
	Excavat	ion Excavation	0,06 1,00	m3 m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x	190×100) Solid Block Masonry						
		Solid Blocks (290 x 190 x 100 mm) Mortar (1:4)	24 0,02	No m3 ka/m3	24	No	30,00	720,00 42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	42,00 21,00
	Subtot	al Staircase					-	800,00
5.	Other I	Hardware				21-	4 000 00	4 000 00
		Washbasin Greweter Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40 D0 250 D0	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware					-	2.520,00
6.	Labour	Skilled			4	davs	300.00	1.200 00
		Unskilled			10	days	150,00	1.500,00
	Subtot	al Labour					-	2.700,00
	Grand	Total						12.227,00

figure 5: Cost estimate for "Design 2"





	,	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtotal Foundation						546,00
2.	Processing Compartment						
	4" (290x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm) Morter (1.4)	3,15 16,67	m2 No/m2 m3/m2	53	No	22,00	1.166,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58,00 32,00
	R.C.C. Slab (1:2:4) Cement Sand Aggregate Reinforcement	0,15 308,53 0,440 0,88 40	m3 kg/m3 m3/m3 m3/m3 kg/m3	46 0,07 0,13 6,0	kg m3 m3 kg	5,30 1.060,00 530,00 41,00	244,00 74,00 69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (200 x 190 x 100 mm)	0,72	m2 No/m2	12	No	22.00	264.00
	Mortar (1:4) Cement	0,0089 382,33	m3/m2 kg/m3	2	kg	5,30	11,00
	Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						2.975,00
3.	Superstructure						
0.	Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400,00 1.300,00
	Subtotal Superstructure						2.700,00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Subtotal Staircase	1,070	m3/m3	0,02	m3	1.060,00	800.00
5	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bow Washbasin Greywater Pipe Urine Collection Container (20 I) Cleansing Water Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration	1		1 2,5 1,5 2 2,5 1 1 1	No M m No No LS	1.000,00 160,00 40,00 250,00 40,00 150,00 150,00 300,00	1.000,00 160,00 60,00 500,00 100,00 150,00 150,00 300,00
	SUDIOIAI ULITET HATAWAFE					1	2.920,00
6.	Labour Skilled Unskilled			4 8	days days	300,00 150,00	1.200,00 1.200,00
	Subtotal Labour						2.400,00
	Grand Total					-	11.941,00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg	5,30	127,00
	Sano Aggregate	0,95	m3/m3	0,14	m3 m3	530,00	74,00
	Subtotal Foundation					5	1.561,00
2.	Processing Compartment						
	4" (290×190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100 mm)	4,20	m2 No/m2	70	No	22.00	1 540 00
	Mortar (1:4) Cement	0,0069	m3/m2 kg/m3	14	kg	5,30	74,00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Aggregate Reinforcement	0,88	m3/m3 ka/m3	0,13	m3 ka	530,00	69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0,84	m2				
	Hollow Blocks (290 × 190 × 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System PVC Pine (4* 20 ft long)			2	No	300.00	600.00
	PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtotal Processing Compartment						3.424,00
3.	Superstructure						
630	4" (290x190x100) Hollow Block Masonry	8,70	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	145	No	22,00	3.190,00
	Cernent Sand Water	382,33 1,070 191	kg/m3 m3/m3	30 0,08 15	kg m3	5,30 1.060,00 0.00	159,00 85,00
	Door	191	Ung	15		0,00	0,00
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.)	0		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure						4.846,00
4.	Staircase						
-	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum Murum	1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand Subtotal Staircase	1,070	m3/m3	0,02	ma	1.060,00	797,00
5.	Other hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	washbasin Greywater Pipe Urine Pine			2,5	m	40,00	100,00
	Unine Collection Container (201) Cleansing Water Pipe			2	No	250,00 40,00	500,00 100.00
	Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Suntolal StairCase					3	2.520,00
6.	Labour skilled			4	days	300,00	1.200,00
	unskilled			8	days	150,00	1.200,00
	Subtotal Labour						2.400,00
	Grand Total						15.548,00

figure 7: Cost estimate for "Design 4"





		G	uantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,57 1,00	m3 m3/m3	0,57	m3	00,08	46,00
	Murum	Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:	4.8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtota	l Foundation						798,00
2.	Process	sing Compartment						
	Brick Wa	rk (Single Brick)	0,83	m3 Na ka2	270	NE	2.50	1 202 00
		Motrar (1-4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	578 78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Wa	r k (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72 53	m2 No./m2	38	No	3,50	133,00
		Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00	32,00 21,00
	Plaster (*	1:3) Cement Sand	0,04 493,03 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4*, 20 ft long) PVC T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	l Processing Compartment						4.023,00
3.	Superst	ructure						
	Brick Wa	rk (Half Brick)	11,00	m2	500	Na	2.50	2.041.00
		Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (*	I:3) Cerment Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0.10	kg m3	5,30 1.060.00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)		10150005	0,007	m3	21,200,00	148,00
	lalice	Steel Bar Hinges (6 mm dia.)			0,2	kg	41,00	405,00 8,00
	o uno	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	Ù		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Stairca	5e						
	Excavati	on Execution	0,06	m3	0.06		90.00	£ 00
	Murum	Excertation	0,06	m3	0,00	mo	00,00	5,00
	Brick Ma	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (*	I:3) Cement Sand	0,01 493,03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	Il Staircas e						452,00
5.	Other H	ardware						
		Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00 160,00	1.000,00
		Urine Pipe Urine Collection Container (20 h			2,5 1,5 2	m No	40,00 40,00 250.00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtota	l Other Hardware						2.520,00
6.	Labour	etal a				142000		1 000 00
		Unskilled			12	ua ys da ys	300,00 150,00	1,800,00
	Subtota	l Labour						3.600,00
	Grand 1	Fotal						16.361,00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	mЗ	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	5,30 1.060,00	292,00 170,00
	Subtotal Foundation	0,95	marma	0,32	ma	550,00	798.00
							100,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4)	0,23	m3				
	Lement Sand Aggregate Reinforcement	0,440 0,88 35	kg/m3 m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	ка m3 m3 ka	5,30 1.060,00 530,00 41,00	376,00 106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2				
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	6,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System			2	Ne	200.00	000.00
	PVC Pipe (4", 20 ff tong) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	120,00 80,00
	Subtotal Processing Compartment					18	4.023,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 × 110 × 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	110	kg	5,30	583,00
	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Plaster (1:3) Cement Sand	493 D3 1,070	ma kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cr Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure					1	4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum	0,06	m3	0.05		200.00	12.00
	Brick Work (Single Brick)	0.17	m3	0,00	115	200,00	12,00
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	30, 5 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493 D3 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase						452,00
2.							
5.	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	Washbash Greywater Pipe Uting Ping			2,5	m	40,00	100,00
	Urine Collection Container (20 I) Cleansing Water Pine			3	No	250,00 40,00	750,00
	Bucket (Cover Material) Bucket (Water)			1	No No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
						19	
6.	Labour Skilled Unskilled			6 12	days davs	300,00 150,00	1.800,00 1.800.00
	Subtotal Labour						3.600,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion			nkUnit Quantity Unit Unit Costs [IRR/Unit] Cr m3 1,28 m3 80,00 1 m3 0,69 m3 200,00 1 m3 0,69 m3 200,00 1 m3 0,73 m3 1,080,00 1 m3 0,73 m3 1,080,00 1 m3 0,76 m3 1,080,00 1 m3 0,76 m3 1,080,00 1 m3 0,76 m3 1,080,00 1 m3 0,26 m3 1,080,00 1 m3 0,26 m3 1,080,00 1 m3 0,22 m3 1,080,00 1 m3 0,22 m3 1,080,00 1 m3 0,02 m3 1,080,00 4 m3 0,02 m3 1,080,00 4 m3 0,02 m3 1,080,00 4			
	Excavati	on	1,28	m3	1.00			400.00
	Murum	Excavation	1,00	m3/m3	1,28	m3	80,00	102,00
	Inter ann	Murum	1,05	m3/m3	0,69	m3	200,00	138,00
	Brick Wa	ork (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement	0,246	m3/m3 kg/m3	47	kg	Unit Unit Costs [INR/Unit] m3 80,00 m3 200,00 No 3,50 kg 5,30 m3 1,060,00 m4 1,000,00 m3 1,060,00 m4 1,000,00 m3 200,00 m3 200,00 m3 200,00 m3 200,00 m3 1,000,00 m3 200,00 m3 1,000,00 m4	249,00
	BCC (1	sano	1,0/0	maima m3	0,13	ma	1.060,00	138,00
	1.0.0. (1	Cement Sand	161,95	kg/m3 m3/m3	28 0.08	kg m3	5,30 1.060.00	148,00 85,00
		Aggregate	0,95	m3/m3	0,16	m3	530,00	85,00
	Subtota	I Foundation						1.743,00
2.	Process	ing Compartment						
	Brick Wa	Pricks (Single Brick) Bricks (330 x 110 x 70 mm)	0,97	m3 No (m3	441	No	3.50	1.544.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	91	kg	5,30	482,00
		Sand	1,070	m3/m3	0,26	m3	1.060,00	276,00
	R.C.C. S	ab (1:2:4) Cement	0,23	m3 kg/m3	71	kg	5,30	376,00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,2	m3 kg	530,00	106,00
	Brick Wa	nrk (Half Brick) Cover	0,72	m2	10			
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Wotor	382,33	kg/m3 m3/m3	0,02	m3	5,30	32,00
	Plaster ((Vale) 1:3)	0.04	m3	3	4	0,00	0,00
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	on System						
		PVC Pipe (4", 20 π iong) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No	300,00 60,00 40,00	120,00
	Subtota	I Processing Compartment				110	-	4.356,00
3.	Superst	ructure		(mail				
	Brick We	homk (Haff Brick) Bricks (230 x 110 x 70 mm) Montos (1.4)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
		Cement Sand	382,33	kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (1:3)	0,09	m3	1000		2306.340.0	5.504.95
		Cement Sand	493,03 1,070	kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 v 25 mm)			0.007	m3	21 200 00	148.00
		Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cn Steel Bar Hinges (6 mm dia.)	n)		2,70	m2 kg	150,00 41,00	405,00 8,00
	Jalies							
	Roof	Jalles			2	No	110,00	220,00
	RUUI	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 Bamboo Sticks (ca. 4 cm dia. 18 ft long)	cm)		5,0	m	130,00 100,00	650,00 300.00
		Steel Bar Hinges (6 mm dia.)			1,4	kg	41,00	57,00
	Subtota	I Superstructure						4.968,00
4.	Staircas	e -						
	Excavati	on Everyation	0,05	m3 m3(m3	0.05	m2	90.00	4.00
	Murum		0.05	m3	0,00		00,00	1,00
		Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	Brick Wa	ork (Single Brick) Bricks (230 x 110 x 70 mm)	0,17 455	m3 No./m3	77	No	3,50	270,00
		Cement Sand	382,33	kg/m3 m3/m3	16 0.04	kg m3	5,30 1.060.00	85,00 42,00
	Plaster (1:3)	0,01	m3			SantaMan.	
		Cement Sand	493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	I Staircase					-	449,00
5	Othor H	arduaro						
Ј.	Other II	University of the second secon			1	No No	1.000,00	1.000,00
		Greywater Pipe Urine Pipe			2,5 1,5	m m	40,00 40,00	100,00 60,00
		Urine Collection Container (20 I) Cleansing Water Pipe			2 2,5	No m	250,00 40,00	500,00 100,00
		Bucket (Cover Material) Bucket (Water)			1	No	150,00 150,00	150,00
	Subtota	Cleansing water innuration			1	LS	300,00	2 5 20 00
	Jantola							
6.	Labour	Skilled			6	days	300,00	1.800,00
		Unskilled			12	days	150,00	1.800,00
	Subtota	il Labour						3.600,00
	Grand 1	otal					25	17.636,00

figure 10: Cost estimate for "Design 7"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	4 :8) Cement Sand Accreaste	0,17 161,95 0,470 0.95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530,00	148,00 85,00 85,00
	Subtota	I Foundation	0,00	ind no	0,10		-	1.743,00
Ζ.	Process	ing Compartment	0.07	m2				
	DIICK W	Bricks (230 x 110 x 70 mm)	455	No./m3	441	No	3,50	1.544,00
		Cement Sand	382,33	kg/m3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4)	0,23	m3				
		Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Sand	382,33	kgrm3 m3/m3	0,02	кg m3	5,30 1.060,00	32,00
	Plaster (1:3) Cement	0,04 493,03	m3 kg/m3	20	kg	5,30	106,00
	Montilatic	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	venulau	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC "T"-Piece (4")			2 2 2	No No	300,00 60,00	600,00 120,00
	Subtota	Processing Compartment			2	NO	40,00	4.356,00
2	Suparat	ructure						
J.	Adohe B	rick Wark (6")	2 46	m3				
	1140000	Adobe bricks and mortar Clavey Soil	0.50	m3/m3	1.23	m3	0.00	0.00
		Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00	0,00 0,00
	Mud Plas	ster (3:1) Sand Clavar Soll	0.13	m3 kg/m3 m3(m3	0,10	m3	1.060,00	106,00
	Lime Pla	ster (21)	0.04	m3	0,00	115	0,00	0,00
		Lime Clayey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @), 105 x 29 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinnes (6 mm dia.)	50 cm)		5,0 3	m No ka	130,00 100,00 41.00	650,00 300,00 57.00
	Subtota	I Superstructure			4.		-	1.674,00
4.	Staircas	e						
	Excavati	on Excavation	<mark>0,05</mark> 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05	m3	0.05	m3	200.00	10.00
	Brick Wo	rk (Single Brick)	0,17	m3	0,05	115	200,00	10,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01 493,03	m3 kg/m3	5	kg	5,30	27,00
	Subtota	Sand I Staircase	1,070	marma	0,01	ms	1.060,00	449,00
5.	Other H	ardware Unne-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbash Greywater Pipe			2,5	m	40,00	100,00
		Urine Fige Urine Collection Container (20 I)			1,5	No	250,00	500,00
		Bucket (Cover Material) Bucket (Cover Material)			45	No	150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	I Other Hardware					-	2.520,00
6.	Labour							
		Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtota	lLabour						4 200,00
	Grand T	otal						14.942,00

figure 11: Cost estimate for "Design 8"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1. 1	Foundati	ion						
	Excavatio	n Excavation	0,61 1,00	m3 m3/m3	0,61	m3	80,00	49,00
	Murum	Murum	0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,00
9	Mud Plast	er (3:1) Sand Clayey Soil	0,18 0,75 0,25	m3 kg/m3 m3/m3	0,14 0,05	m3 m3	1.060,00 0,00	148,00 0,00
5	Subtotal	Foundation					-	367,00
2. I	Processi	ing Compartment						
1	Adobe Bri	ck Work (6") Adobe Bricks and Mortar	0,86	m3	0.42	m2	0.00	0.00
		Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,43 0,30 0,13	m3 m3	0,00 0,00 0,00	0,00 0,00
,	Mud Plast	er (3:1) Sand Clavev Soil	0,05 0,75 0.25	m3 kg/m3 m3/m3	0, 04 0. 01	m3 m3	1.060,00	42,00 0.00
ı	Lime Plast	ter (2:1) Lime	0,02 0.67	m3 ka/m3	0	ka	0.00	0.00
10	Slah	Clayey Soil	0,33	m3/m3	0, 01	m3	0,00	0,00
	51015	Bamboo Sticks (ca. 4 cm dia., 18 ft long) Mud Plaster (3:1)	0,16	m3	15	No	100,00	1.500,00
		Sand Clayey Soil	0,75	kg/m3 m3/m3	0,12 0,04	m3 m3	1.060,00 0,00	127,00 0,00
١	Ventilation	a System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4")			2	No No	300,00 60.00	600,00 120.00
i	Subtotal	PVC Pipe Cover (4")			2	No	40,00	90,00
								2.135,00
3. 1 1	Superstr Adobe Bri	ucture ck Work (6")	2,46	m3				
		Adobe Bricks and Mortar Clayey Soll Straw/Rice Husk	0,50 0,35	m3/m3 m3/m3	1,23 0,86	m3 m3	0,00 0,00	0,00 0,00
r	Mud Plast	Dung er (3:1)	0,15	m3/m3 m3	0, 37	m3	0,00	0,00
		Sand Clayey Soil	0,75 0,25	kg/m3 m3/m3	0,11 0,04	m3 m3	1.060,00 0,00	117,00 0,00
1	Lime Plast	ter (2:1) Lime Clayey Soil	0,05 0,67 0,33	m3 kg/m3 m3/m3	0 0,02	kg m3	0,00 0,00	0,00 0,00
I	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bost Hungo (6 cm dia)			0,007 2,70	m3 m2	21.200,00 150,00 41.00	148,00 405,00
F	Roof	Corrupted A.C. Sheets (6 mm 2 sheets @ 105 x 250 c	m)		5.0	m	130.00	650.00
		Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)			3 1,4	No kg	100,00 41,00	300,00 57,00
5	Subtotal	Superstructure						1.685,00
4. 9	Staicase		0.05	-				
	CXLavalio	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
1	Adobe Bri	ck Work (6") Adobe bricks and mortar	0,17	m3	0.00		0.00	0.00
		Straw/Rice Husk Dung	0,35	m3/m3 m3/m3	0,09 0,06 0,03	m3 m3	0,00 0,00 0,00	0,00 0,00
9	Mud Plast	er (3:1) Sand Charas Seil	0,08 0,75	m3 kg/m3 m3/m3	0,06	m3	1.060,00	64,00
ı	Lime Plast	ter (2:1) Lime	0,23 0,01 0.67	m3 ka/m3	0,02	ka	0.00	0.00
i	Subtotal	Clayey Soil Staircase	0,33	m3/m3	0,00	m3	0,00	0,00 78,00
5 1	Other Ha	irdware						
		Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00	1.000,00
		Urine Pipe Urine Collection Container (20.0			2,5 1,5 2	m	40,00 40,00 250,00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m	40,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
5	Subtotal	Other Hardware					-	2.520,00
6. I	Labour	Skilled			6	days	300,00	1.800,00
i	Subtotal	Labour			16	days	15U,UO -	4.200,00
	Crowd T-							11 240 00
,	Grand To	Ital						11.319,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					3	546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2	52	Ne	22.00	1 100 00
		Mortar (1:4) Cement Sand	0,0069 .382,33 1.070	m3/m2 kg/m3 m3/m3	11 0.03	kg m3	5,30 1,060,00	58 DO 32 DD
	R.C.C. S	Slab (1:2:4)	0,15	m3	0,00	115	1.000,00	52,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 DO 74 DO
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290 x	(190×100) Hollow Block Masonry Cover	0,72	m2				100000000
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	.382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	PVC Pipe (4", 20 ft long)			2	No	300,00	600 DO
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
З.	Supers	structure						
	4" (290 x	190×100) Hollow Block Masonry Hollow Block (200 × 100 × 100)	8,70	m2 No (m2)	1.45	Na	22.00	2 100 00
		Montar (1:4)	0,0089	m3/m2	145	ka	22.00 6.20	150.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85,00
	Door	Wooden Battens (56 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel BarHinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148 00 405 00 8 00
	Jalies	Jolian (200 v 460 mm)			2	No	110.00	220.00
	Roof				-	110	1000	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	(190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other I	Hardware				No	1 000 00	1 000 00
		Washbasin Grevwater Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250.00	60,00 500,00
		Clean sing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6	l abou	r						
υ.	Labou	Skilled Unskilled			4	da ys da ys	300,00	1.200,00
	Subtet	al Labour			U	2019	100,00	2 400 00
	Subiol							2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80 D0	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	mЗ	200,00	84,00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry	3,15	m2	50			
		Holiow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement Sand	0,0089 382,33 1.070	m3/m2 kg/m3 m3/m3	53 11 0.03	kg m3	22,00 5,30 1,060,00	58,00 32,00
	R.C.C. s	lab (1:2:4)	0,15	m3	0,00		1,000,000	02,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244,00 74,00
		Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530 DO 41 DO	69,00 246,00
	4" (290x	190 x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72	m2 No/m2	12	No	22.00	264.00
		Mortar (1:4) Cement	0,0089 362,33	m3/m2 kg/m3	2	kg	5,30	11,00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilati	on System PVC Pipe (4", 20 ft long) PVC "T" Piece (4")			2	No	300,00	600,00
		PVC Pipe Cover (4")			2	No	40,00	80,00
	Subtot	al Processing Compartment					-	2.975,00
3.	Supers	structure						
	4" (290x	190 x100) Hollow Block Masonry	3,60	m2 No(m2	60	NIa	22.00	1 200 00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	12	kq	5,30	64.00
		Sand Water	1, <mark>070</mark> 191	m3/m3 I/m3	0,03 6	m3 I	1.060,00 0,00	32,00 0,00
	Ferro Ce	ement (1:3)	0,16	m3 ka/m3	79	ka	5 30	419.00
		Sand	1,070	m3/m3	0,17	m3	1.060,00	180,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	1 48 00 405 00 8 00
	Jalies	Islies			1	No	110.00	110.00
	Subtot	al Superstructure					-	2.686.00
							-	
4.	Stairca	se		i seri				
	Excavat	ion Excavation	0,06 1,00	m3 m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Suptot	al Staircase						800,00
5.	Other I	Hardware			1	No	1 000 00	1 000 00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00 100,00
		Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	LS	150 DO 300 DO	300,00
	Subtot	al Other Hardware						2.520,00
6.	Labour	Skilled				dave	300.00	1 200 0.0
		Unskilled			10	days	150,00	1.500,00
	Subtot	al Labour						2.700,00
	Grand	Total						12.227,00

figure 5: Cost estimate for "Design 2"





	2	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtotal Foundation					-	546,00
2.	Processing Compartment						
	4" (290x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm) Morter (1.4)	3,15 16,67	m2 No/m2 m3/m2	53	No	22,00	1.166,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58,00 32,00
	R.C.C. Slab (1:2:4) Cement Sand Aggregate Reinforcement	0,15 308,53 0,440 0,88 40	m3 kg/m3 m3/m3 m3/m3 ka/m3	46 0,07 0,13 6,0	kg m3 m3 ka	5,30 1.060,00 530,00 41,00	244,00 74,00 69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0,72	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement	16,67 0,0089 382,33	No/m2 m3/m2 ka/m3	12	No ka	22,00 5,30	264,00
	Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilation System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment					-	2.975,00
3.	Superstructure						
	Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400.00 1.300.00
	Subtotal Superstructure					-	2.700,00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30 00	720.00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Subtotal Staircase	1,070	1115/1115	0,02	1115	1.060,00	800.00
5	Cother Hardware Urine-Diversion Squatting Pan & Cleansing Bow Washbasin Greywater Pipe Urine Pipe Urine Collection Container (20 I) Cleansing Water Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration	1		1 2,5 1,5 2,5 1 1 1	No M m No No No LS	1.000,00 160,00 40,00 250,00 40,00 150,00 150,00 300,00	$\begin{array}{c} 1.000,00\\ 160,00\\ 100,00\\ 500,00\\ 100,00\\ 150,00\\ 150,00\\ 300,00\end{array}$
	Subtotal Other Hardware					1	2.520,00
6.	Labour				dave	300.00	1 200 00
	Unskilled			4 8	days	150,00	1.200,00
	Subtotal Labour					-	2.400,00
	Grand Total					-	11.941,00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg	5,30	127,00
	Aggregate	0,95	m3/m3	0,14	m3	530,00	74,00
	Subtotal Foundation						1.561,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (200 x 190 x 100 mm)	4,20	m2 No/m2	70	No	22.00	1.540.00
	Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	14	ka	5 30	74.00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Sand Aggregate Reinforcement	0,88	m3/m3 m3/m3 ka/m3	0,07	m3 m3 ka	530,00	74,00 69,00 246,00
	4" (290×190×100) Hollow Block Masonry Cover	0.84	m2	0,0	49	41,00	240,00
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System			2	No	300.00	600.00
	PVC T ^{**} -Piece (4*) PVC Pipe Cover (4*)			2	No No	60,00 40,00	120,00
	Subtotal Processing Compartment						3.424,00
2	Superstructure						
J .	4" (290×190×100) Hollow Block Masonry	8,70	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	145	No	22,00	3.190,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	30 0,08	kg m3	5,30 1.060,00	159,00 85,00
	vvater	191	Um3	15	8	UU U	040
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.))		0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure					100000	4.846,00
4	Staircase						
4.	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand Subtotal Staircase	1,070	mid/mid	0,02	md	1.060,00	797,00
5.	Other hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	wasnbasin Greywater Pipe Unice Bine			2,5	m	40,00	100,00
	Unine Collection Container (201) Cleansing Water Pipe			2	No	250,00	500,00
	Bucket (Cover Material) Bucket (Vkater)			1	No No	150,00 150,00	150,00 150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Staircase					8	2.520,00
6.	Labour skilled			4	davs	300.00	1 200 00
	unskilled			8	days	150,00	1.200,00
	Subtotal Labour						2.400,00
	Grand Total					2	15.548,00

figure 7: Cost estimate for "Design 4"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,57 1,00	m3 m3/m3	0,57	m3	80,08	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0.16	kg	5,30 1.060.00	292,00
	Aggregate	0,95	m3/m3	0,32	m3	530,00	170,00
	Subtotal Foundation						798,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83	m3 No./m3	378	No	3.50	1 323 00
	Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	78	kg	5,30	413,00
	Sand	1,070	m3/m3	0,22	m3	1.060,00	233,00
	Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0.1	kg m3	5,30 1.060.00	376,00 106,00
	Aggregate Reinforcement	0,88 35	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Work (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72	m2 No./m2	38	No	360	133.00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	6	kq	5,30	32,00
	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Plaster (1:3) Cement Sand	U,U4 493,D3 1,070	m3 kg/m3 m3/m3	20	kg m3	5,30 1,060,00	106,00
	Ventilation System	1,010	morris	0,04	110	1.000,00	42,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4")			2	No No	300,00 60,00	600,00 120,00
	PVC Pipe Cover (4*)			2	NO	40,00 -	4 023 00
	Subtotal Processing Comparament						4.020,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
	Mortar (1:4) Cement Sand	0,023 382,33 1.070	m3/m2 kg/m3 m3/m3	97 0.27	kg m3	5,30 1,060,00	514,00 286,00
	Plaster (1:3)	0,09	m3	U.L.	ino	1.000,00	200,00
	Cement Sand	493,03 1,070	kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets Carl Park Miners (6 mm dia)	@ 75 x 180 cm)		0,007 2,70	m3 m2	21.200,00 150,00	148,00 405,00
	Jalies			0,2	NG NL-	41,00	220.00
	Jailes			2	NO	00,011	220,00
	Corrugated A.C. Sheets (6 mm, 2 sheet Bamboo Sticks (ca. 4 cm dia., 18 ft long Steel Bar Hinges (6 mm dia.)	s @ 105 x 250 cm))		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtotal Superstructure					-	4.968,00
4.	Staircase						
	Excavation	0,06	m3 m3/m3	0.06	m3	90.00	5.00
	Murum	0,06	m3	040	110	00,00	0,00
	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0.246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3)	0,01	m3	-		5.00	27.00
	Sand	495,05 1,070	m3/m3	0,D1	кg mЗ	1.060,00	11,00
	Subtotal Staircase						452,00
5.	Other Hardware					1 000 00	4 000 00
	Washbasin Grewester Pine	ang Dowi		1 25	No	160,00	160,00
	Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250,00	60,00 500,00
	Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
	Bucket (Water) Cleansing Water Infiltration			1	LS	150,00 300,00	150,00 300,00
	Subtotal Other Hardware					-	2.520,00
6.	Labour						
	Skilled Unskilled			6 12	days days	300,00 150,00	1.800,00 1.800,00
	Subtotal Labour					-	3.600,00
	Grand Total					-	16.361.00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	mЗ	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	5,30 1.060,00	292,00 170,00
	Subtotal Foundation	0,95	marma	0,32	ma	550,00	798.00
							100,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4)	0,23	m3				
	Lement Sand Aggregate Reinforcement	0,440 0,88 35	kg/m3 m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	ка m3 m3 ka	5,30 1.060,00 530,00 41,00	376,00 106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2				
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	6,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System			2	Ne	200.00	000.00
	PVC Pipe (4", 20 ff tong) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	120,00 80,00
	Subtotal Processing Compartment					18	4.023,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 × 110 × 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	110	kg	5,30	583,00
	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Plaster (1:3) Cement Sand	493 D3 1,070	ma kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cr Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure					1	4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum	0,06	m3	0.05		200.00	12.00
	Brick Work (Single Brick)	0.17	m3	0,00	115	200,00	12,00
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	30, 5 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493 D3 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase						452,00
2.							
5.	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	Washbash Greywater Pipe Uting Ping			2,5	m	40,00	100,00
	Urine Collection Container (20 I) Cleansing Water Pine			3	No	250,00	750,00
	Bucket (Cover Material) Bucket (Water)			1	No No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
						19	
6.	Labour Skilled Unskilled			6 12	days davs	300,00 150,00	1.800,00 1.800.00
	Subtotal Labour						3.600,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wa	r k (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	4:8) Cement Sand	0,17 161,95 0,470	m3 kg/m3 m3/m3	28 0,08	kg m3	5,30 1.060,00	148,00 85,00
	Subtota	Aggregate	0,85	marma	0,10	HID	- 550,00	1.743.00
2.	Process	ing Compartment	0.07					
	DITCK VVL	Bricks (230 x 110 x 70 mm) Morter (1:4)	455	No./m3	441	No	3,50	1.544,00
		Cement Sand	382,33	kg/m3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. S	ab (1:2:4)	0,23	m3				
		Cement Sand	308,53	kg/m3 m3/m3	71	kg m3	5,30 1.060,00	376,00
		Reinforcement	35	kg/m3	0,2 8,1	kg	41,00	332,00
	Brick Wa	rk (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72 53	m2 No./m2	38	No	3,50	133,00
		Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	6	kg	5,30	32,00
		Sand Water	1,070 191	m3/m3 I/m3	0,02 3	m3 1	1.060,00 0,00	21,00 0,00
	Plaster (1:3) Coment	0,04	m3 ka(m2	20	ka	5.20	106.00
		Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Ventilati	m System PVC Pipe (4*, 20 ft long) PVC *T*-Piece (4*) PVC Pine Cover (4*)			2 2 2	No No	300,00 60,00 40,00	600,00 120,00 80.00
	Subtota	I Processing Compartment				145	-	4.356,00
2	Suparat	rustura						
3.	Superst Brick Mk	ructure	11.00	m2				
	DITCK TH	Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0.023	No./m2 m3/m2	583	No	3,50	2.041,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (1:3)	0,09	m3		100	5.00	
		Sand	493,03	kgima m3/m3	44 0,10	m3	5,30 1.060,00	233,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 o Steel Bart Hinges (6 mm dia)	:m)		0,007 2,70 0.2	m3 m2 ka	21.200,00 150,00 41.00	148,00 405,00 8.00
	Jalies							
	Roof	Jalles			2	NO	110,00	220,00
		Corrugated A.C. Sheets (6 mm, 2 sheets @ 105 x 25 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	0 cm)		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure					-	4.968,00
4.	Staircas	e						
	Excavati	on Excavation	0,05 1.00	m3 m3/m3	0.05	m3	80.00	4.00
	Murum		0,05	m3			0.00000	
		Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	Brick We	nk (Single Brick) Bricks (230 x 110 x 70 mm) Monter (1-4)	U,17 455 0.246	m3 No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3)	0,01	m3				
		Cement Sand	493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	I Staircase					-	449,00
5.	Other H	ardware						
		Unine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00 160,00	1.000,00 160,00
		Greywater Pipe Unine Pipe			2,5 1,5	m	40,00 40,00	100,00 60,00
		Urine Collection Container (20 I) Cleansing Water Pipe			2,5	No m	250,00 40,00	500,00 100,00
		Bucket (Cover Material) Bucket (Water)			1	No	150,00 150,00	150,00 150,00
	Subtata	Cleansing Water Infiltration			1	LS	300,00	300,00
	Santo(a	r stande frankware .						00,02 م
6.	Labour	Skilled			6	days	300,00	1.800,00
	The same the	Unskilled			12	days	150,00	1.800,00
	Subtota	l Labour						3.600,00
	Grand 1	otal					-	17.636,00

figure 10: Cost estimate for "Design 7"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rk (Single Brick)	0,50	m3	220		2.50	700.00
		Mortar (1:4)	455 0,246 387 33	m3/m3 kalm3	228	NO	3,50	798,00
		Sand	1,070	m3/m3	0,13	m3	1.060,00	138,00
	P.C.C. (1	44:8) Cement Sand Aggregate	0,17 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0,16	kg m3 m3	5,30 1.060,00 530,00	1 48, 00 85, 00 85, 00
	Subtota	I Foundation					-	1.743,00
2.	Process	ing Compartment						
	Brick Wa	rk (Single Brick)	0,97	m3				1.544.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	441 .91	ka	3,50	482.00
		Sand	1,070	m3/m3	0,26	m3	1.060,00	276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88	m3/m3 m3/m3	0,1 0,2	m3 m3	1.060,00 530,00 41.00	106,00
	Brick Wa	rk (Half Brick) Cover	0,72	m2	0,1	<i>~</i> 9	41,00	552,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand	382,33	kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement	0,04 493.03	m3 kaim3	20	ka	5 30	106.00
		Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Ventilatio	PVC Pipe (4", 20 ft long) PVC "T" Pime (4")			2	No	300,00	600,00
		PVC Pipe Cover (4")			2	No	40,00	80,00
	Subtota	I Processing Compartment						4.356,00
3.	Superst	ructure						
	Adobe B	rick Work (6") Adobe bricks and mortar	2,46	m3				
		Clayey Soil Straw/Rice Husk	0,50 0,35	m3/m3 m3/m3	1,23 0,86	m3 m3	0,00 0,00	0,00 0,00
		Dung	0,15	m3/m3	0,37	m3	0,00	0,00
	Mud Plas	Sand Clavey Soli	0,13	m3 kg/m3 m3(m3	0,10	m3	1.060,00	106,00
	Lime Pla	ster (21)	0,04	m3	0,00		0,00	0,00
		Lime Clayey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)			0,007	m3	21.200,00	148,00
		Steel Bar Hinges (6 mm dia.)	n)		0,2	m2 kg	41,00	405,00 8,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250	cm)		5,0	m	130,00	650,00
		Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)			3 1,4	No kg	100,00 41,00	300,00 57,00
	Subtota	I Superstructure					-	1.674,00
4.	Staircas	e						
	Excavati	on Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Munim	0,05	m3	0.05	m3	200.00	10.00
	Brick Wa	rk (Single Brick)	0,17	m3	0,05	115	200,00	10,00
		Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01 493,03	m3 kg/m3	5	kg	5,30	27,00
	6.14.4	Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Sublota	i Stancase						445,00
5.	Other H	ardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000.00	1.000.00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00 100,00
		Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	LS	150,00 300,00	150,00 300,00
	Subtota	I Other Hardware					-	2.520,00
6.	Labour	-					United and	1999
		Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtota	lLabour					-	4 200,00
	Grand T	otal						14.942,00

figure 11: Cost estimate for "Design 8"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1. 1	Foundat	ion	0.64	m)				
	Acavado	Excavation	1,00	m3/m3	0,61	m3	80,00	49,00
1	Murum	Murum	0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,00
9	Mud Plast	er (3:1) Sand Clayey Soil	0,18 0,75 0,25	m3 kg/m3 m3/m3	0,14 0,05	m3 m3	1.060,00 0,00	148,00 0,00
9	Subtotal	Foundation						367,00
2. I	Process	ing Compartment						
1	Adobe Bri	ick Work (6") Adobe Bricks and Mortar	0,86	m3		1002.0	(0.00)	12103
		Clayey Soil Straw/Rice Husk Dung	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	0,43 0,30 0,13	m3 m3 m3	0,00 0,00	0,00 0,00 0,00
,	Mud Plast	er (3:1) Sand Claver Seil	0,05 0,75 0.25	m3 kg/m3 m3/m3	0,04	m3	1.060,00	42,00
ı	.ime Plas	ter (2:1)	0,02	m3	0,01		0,00	0,00
27-		Lime Clay <i>e</i> y Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
5	Slab	Bamboo Sticks (ca. 4 cm dia., 18 ft long) Muid Plaster (3:1)	0.16	m3	15	No	100,00	1.500,00
		Sand Clayey Soil	0,75 0,25	kg/m3 m3/m3	0,12 0,04	m3 m3	1.060,00 0,00	127,00 0,00
١	/entilation	n System PVC Pipe (4", 20 ft Iona)			2	No	300.00	600.00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 90,00
9	Subtotal	Processing Compartment					8. -	2.469,00
3. 9	Supersti	ucture						
	Adobe Bri	Adobe Bricks and Mortar Clavev Soll	2,46	m3 m3/m3	1.23	m3	0.00	0.00
		Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00 0,00	0,00 0,00
	Mud Plast	er (3:1) Sand Clayey Soil	0,14 0,75 0,25	m3 kg/m3 m3/m3	0,11 0,04	m3 m3	1.060,00 0,00	117,00 0,00
I	.ime Plas	ter (2:1) Lime	0,05	m3 ka/m3	0	ka	0.00	0.00
27		Clayey Soil	0,33	m3/m3	0,02	m3	0,00	0,00
	Joor	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
J	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets (2) 105 x 250 ci Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	m)		5,0 3 1,4	m No kg	1 30,00 1 00,00 41,00	650,00 300,00 57,00
5	Subtotal	Superstructure					13. -	1.685,00
4. 9	Staicase							
E	xcavatio	n Excavation	<mark>0,05</mark> 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
1	Adobe Bri	ick Work (6")	0,17	m3				
		Clayey Soil StrawfRice Husk	0,50 0,35	m3/m3 m3/m3	0,09 0,06	m3 m3	0,00 0,00	0,00 0,00
	Mud Plast	Dung er (3:1)	0,15	m3/m3	0,03	m3	0,00	0,00
		Sand Clayey Soil	0,75 0,25	kg/m3 m3/m3	0,06 0,02	m3 m3	1.060,00 0,00	64,00 0,00
ı	.ime Plas	ter (2:1) Lime	0,01 0,67	m3 kg/m3	0	kg	0,00	0,00
9	Subtotal	Staircase	0,00	- mozno	0,00	ing.	- 0,00	78,00
5. (Other Ha	ardware						
		Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin Greenwater Pine			1 1 25	No No	1.000,00 160,00 40.00	1.000,00 160,00 100.00
		Urine Pipe Urine Collection Container (20.)			1,5	m	40,00 40,00 250.00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
5	Subtotal	Other Hardware					-	2.520,00
6. I	abour	Skilled			6	days	300,00	1.800,00
9	Subtotal	Labour			16	uays	150,00	4.200,00
	0 mm - 1 =						-	11 040 45
(Grand To	סדמו						11.319,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					3	546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2	52	Ne	22.00	1 100 00
		Mortar (1:4) Cement Sand	0,0069 .382,33 1.070	m3/m2 kg/m3 m3/m3	11 0.03	kg m3	5,30 1,060,00	58 DO 32 DD
	R.C.C. S	Slab (1:2:4)	0,15	m3	0,00	115	1.000,00	52,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 DO 74 DO
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290 x	(190×100) Hollow Block Masonry Cover	0,72	m2				100000000
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	.382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
З.	Supers	structure						
	4" (290 x	190×100) Hollow Block Masonry Hollow Block (200 × 100 × 100)	8,70	m2 No (m2)	1.45	Na	22.00	2 100 00
		Montar (1:4)	0,0089	m3/m2	145	ka	22.00 6.20	150.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85,00
	Door	Wooden Battens (56 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel BarHinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148.00 405.00 8.00
	Jalies	Jolian (200 v 460 mm)			2	No	110.00	220.00
	Roof				-	110	110,00	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	(190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other I	Hardware				No	1 000 00	1 000 00
		Washbasin Grevwater Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250.00	60,00 500,00
		Clean sing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6	l abou	r						
υ.	Labou	Skilled Unskilled			4	da ys da ys	300,00	1.200,00
	Subtet	al Labour			U	2019	100,00	2 400 00
	Subiol							2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavati	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,08	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement	0,23	m3 ka/m3	37	ka	5.30	196.00
		Sand Aggregate	0,470	m3/m3	0,11	m3 m3	1.060,00	117,00
	Subtot	al Foundation	0,00		042		-	546,00
~	D							
2.	Proces		2.45	2				
	4 (Z9UX	Hollow Blocks (290 x 190 x 100 mm)	3,13 16,67	m2 No/m2	53	No	22,00	1.166,00
		Cement Sand	382,33 1,070	m3/m2 kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58,00 32,00
	R.C.C. s	lab (1:2:4)	0,15	m3				
		Cement Sand	308,53	kg/m3 m3/m3	46 0.07	kg m3	5,30 1,060,00	244 UU 74 DO
		Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530 DU 41 DO	246 DO
	4" (290x	190 x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72	m2 No/m2	12	No	22.00	264.00
		Mortar (1:4)	0,0089	m3/m2	12	ka	£ 20	11.00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilati	on System PVC Pipe (4*, 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60 D0 40 D0	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
3.	Supers	tructure						
	4" (290x	190 x100) Hollow Block Masonry	3.60	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67	No/m2 m3/m2	60	No	22,00	1.320,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	12 0,03	kg m3	5,30 1.060,00	64,00 32,00
	F	vvaluer	191	cmv	0	1	UQ U	000
	Ferro Ce	ment (1:3) Cement Sand	493.03 1,070	kg/m3 m3/m3	79 0,17	kg m3	5,30 1.060,00	419,00 180,00
	Door							
		Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cn Steel Bar Hinges (6 mm dia.)	n)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			1	No	110,00	110,00
	Subtot	al Superstructure						2.686,00
4	Stairca	se						
	Excavati	on .	0.06	m3				
		Excavation	1,00	m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	74	No	24	No	30.00	720.00
		Mortar (1:4) Cement	0,02 382 33	m3 ka/m3	8	ka	5 30	42.00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21 00
	Subtot	al Staircase						800,00
5.	Other H	Hardware			4	No	1 000 00	1,000,00
		Washbasho Divo			1	No	160,00	160,00
		Urine Pipe			1,5	m	40,00	60,00
		Urine Collection Container (201) Cleansing Water Pipe			2,5	m	250 DU 40 DO	500,00 100,00
		Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
	Subtot	al Other Hardware				20	-	2.520,00
6.	Labour	Skilled			4	days	300,00	1.200,00
	Subtat	allabour			10	uays	-	2 700 00
	Jastol	nndV41						2.700,00
	Grand	Total						12.227,00

figure 5: Cost estimate for "Design 2"





	9	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8)	0,23	m3 kalm2	27	ka	E 20	106.00
	Sand Aggregate	0,470	m3/m3 m3/m3	0,11 0,22	m3 m3	1.060,00 530,00	196,00 117,00 117,00
	Subtotal Foundation					-	546,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement	3,15 16,67 0,0089 382,33	m2 No/m2 m3/m2 ka/m3	53 11	No ka	22,00 5.30	1.166,00
	Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. Slab (12:4) Cement Sand Aggregate Perforcement	0,15 308,53 0,440 0,88	m3 kg/m3 m3/m3 m3/m3 kg/m3	46 0,07 0,13	kg m3 m3	5,30 1.060,00 530,00 41.00	244,00 74,00 69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0.72	m2	0,0	ng	41,00	240,00
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilation System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						2.975,00
3.	Superstructure						
	Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400,00 1.300,00
	Subtotal Superstructure					-	2.700,00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement Sand	0,02 382,33 1,070	m3 kg/m3 m3/m3	8	kg m3	5,30 1.060.00	42,00 21.00
	Subtotal Staircase	1,010	monto	0,02	ine		800,00
	2 (1)						
э	Unier Hardware Urine-Diversion Squatting Pan & Cleansing Bow Washbasin Greywater Pipe Urine Pipe Urine Collection Container (20 I) Cleansing Water Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration	И		1 1 2,5 1,5 2 2,5 1 1 1	No M M M No LS	1.000,00 160,00 40,00 250,00 40,00 150,00 150,00 300,00	$\begin{array}{c} 1.000,00\\ 160,00\\ 100,00\\ 60,00\\ 500,00\\ 100,00\\ 150,00\\ 150,00\\ 300,00\\ \end{array}$
	Subtotal Other Hardware					2	2.520,00
6.	Labour Skilled			4	days	300,00	1.200,00
	Unskilled Subtotal Labour			8	days	150,00	1.200,00 2.400,00
	Grand Total					1 1 1	11.941.00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg	5,30	127,00
	Sano Aggregate	0,95	m3/m3	0,14	m3 m3	530,00	74,00
	Subtotal Foundation					5	1.561,00
2.	Processing Compartment						
	4" (290×190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100 mm)	4,20	m2 No/m2	70	No	22.00	1 540 00
	Mortar (1:4) Cement	0,0069	m3/m2 kg/m3	14	kg	5,30	74,00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Aggregate Reinforcement	0,88	m3/m3 ka/m3	0,13	m3 ka	530,00	69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0,84	m2				
	Hollow Blocks (290 × 190 × 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System PVC Pine (4* 20 ft long)			2	No	300.00	600.00
	PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtotal Processing Compartment						3.424,00
3.	Superstructure						
630	4" (290x190x100) Hollow Block Masonry	8,70	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	145	No	22,00	3.190,00
	Cernent Sand Water	382,33 1,070 191	kg/m3 m3/m3	30 0,08 15	kg m3	5,30 1.060,00 0.00	159,00 85,00
	Door	191	Ung	15		0,00	0,00
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.)	0		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure						4.846,00
4.	Staircase						
-	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum Murum	1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand Subtotal Staircase	1,070	m3/m3	0,02	ma	1.060,00	797,00
5.	Other hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	washbasin Greywater Pipe Urine Pine			2,5	m	40,00	100,00
	Unine Collection Container (201) Cleansing Water Pipe			2	No	250,00 40,00	500,00 100.00
	Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Suntolal StairCase					3	2.520,00
6.	Labour skilled			4	days	300,00	1.200,00
	unskilled			8	days	150,00	1.200,00
	Subtotal Labour						2.400,00
	Grand Total						15.548,00

figure 7: Cost estimate for "Design 4"





		G	luantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,57 1,00	m3 m3/m3	0,57	m3	80,08	46,00
	Murum	Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:	4:8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtota	l Foundation						798,00
2.	Process	sing Compartment						
	Brick Wa	rk (Single Brick)	0,83	m3			1.212.	
		Bricks (230 x 110 x 70 mm) Mortar (1:4) Cement Sand	455 0,246 382,33 1,070	No./m3 m3/m3 kg/m3 m3/m3	378 78 0,22	No kg m3	3,50 5,30 1.060,00	413,00 233,00
	R.C.C. SI	ab (1:2:4)	0,23	m3 ka/m3	71	ka	5 30	376.00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 ka/m3	0,1 0,2 8,1	ng m3 m3 ka	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Wa	rk (Half Brick) Cover	0,72	m2		, in the second s		
		Bricks (230 x 110 x 70 mm) Mortar (1:4) Cement Sand	63 0,023 382,33 1,070	No./m2 m3/m2 kg/m3 m3/m3	38 6 0.02	No kg m3	3,50 5,30 1,060,00	133,00 32,00 21,00
	Plaster (*	1:3)	0,04	m3			in the second second	100000
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	venurau	n System FVC Pipe (4", 20 ft long) FVC "1"-Piece (4") FVC Pice Cover (4")			2 2 2	No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	l Processing Compartment					-	4.023,00
2	.							
3.	Supersi Brick Wo	ructure	11.00	m2				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	583	No	3,50	2.041,00
	Diantas (Cement Sand	382,33	kg/m3 m3/m3	97 0,27	kg m3	5,30 1,060,00	514,00 286,00
	Plaster (Cement Sand	493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 cr Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	n)		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Stairca	5e						
	Excavati	on Formation	0,06	m3	0.00	2	90.00	5.00
	Murum	Excavation	0,06	m3	0,00	cin	00,00	5,00
	Brick Wa	Murum rk (Single Brick)	1,05 0,17	m3/m3 m3	0,06	m3	200,00	12,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (*	1:3) Cement Sand	0,01 493,03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	l Staircase					÷	452,00
5.	Other H	ardware						
		Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00	1.000,00 160,00
		Greywater Pipe Urine Pipe			2,5	m	40,00	100,00 60,00
		Cleansing Water Pipe			2,5	m	40,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No	150,00 300,00	150,00
	Subtota	I Other Hardware						2.520,00
6.	Labour							
		Skilled Unskilled			6 12	da ys da ys	300,00 150,00	1.800,00 1.800,00
	Subtota	l Labour						3.600,00
	Grand 1	Total					-	16.361,00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	m3	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0.470	m3 kg/m3 m3/m3	55 0.16	kg m3	5,30 1,060,00	292,00 170.00
	Aggregate	0,95	m3/m3	0,32	m3	530,00	170,00
	Subtotal Foundation						790,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	78 0,22	kg m3	30, 30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4)	0,23	m3	71	lea.	5 20	276.00
	Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8.1	m3 m3 ka	1.060,00 530,00 41.00	106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2				
	Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
	Cement Sand	382,33	kg/m3 m3/m3	0,02	kg m3	5,30 1.060,00	32,00
	Plaster (1:3) Cement Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System						
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment					18	4.023,00
3.	Superstructure						
	Brick Work (Half Brick)	12,50	m2			0.50	0 004 00
	Bricks (230 x 110 x 70 mm) Mortar (1:4) Coment	0,023	m3/m2 kg/m3	663 110	No	3,50	2.321,00
	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Plaster (1:3) Cement Sand	0,08 493 D3 1,070	m3 kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 o Steel Bar Hinges (5 mm dia.)	:m)		0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148,00 405,00 8,00
	Jalies Jalies			2	No	110.00	220.00
	Subtotal Superstructure						4.316,00
4.	Staircase						
	Excavation Excavation	0,06	m3 m3/m3	0.06	m3	80.00	5.00
	Murum	0,06	m3				
	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	Bricks (230 × 110 × 70 mm) Montar (1:4)	455	No./m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493 D3 1 070	m3 kg/m3 m3/m3	5 0.01	kg m3	5,30 1.060.00	27,00 11.00
	Subtotal Staircase						452,00
5.	Other Hardware Unine-Diversion Squatting Pan & Cleansing Bowl Washbasin Greywater Pipe Unine Pipe			1 1 2,5 1,5	No No m	1.000,00 160,00 40,00 40,00	1.000,00 160,00 100,00 60,00
	Urine Collection Container (201) Cleaning Witater Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration			3 2,5 1 1	No Mo No LS	250,00 40,00 150,00 150,00 300,00	750,00 100,00 150,00 150,00 300,00
	Subtotal Other Hardware						2.770,00
6.	Labour Skilled			6	daγs	300,00	1.800,00
	Unskilled Subtotal Labour			12	days	150,00	1.800,00 3.600,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundat	lion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rk (Single Brick) Bricks (230 x 110 x 70 mm)	0,50	m3 No./m3	228	No	3.50	798.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	47	kg	5,30	249,00
	P.C.C. (1:	sand 4:8)	0,17	m3/m3	0,13	ma	1.060,00	138,00
		Cement Sand	161,95	kg/m3 m3/m3 m3/m3	28 0,08	kg m3	5,30 1.060,00 630.00	148,00 85,00
	Subtota	l Foundation	0,00	marino	0,10	115	-	1.743,00
2	Process	ing Compartment						
	Brick Wo	rk (Single Brick)	0,97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	1,070	m3/m3	0,26	m3	1.060,00	276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8.1	m3 m3 ka	1.060,00 530,00 41.00	106,00 106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2	4.			
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Water	382,33 1,070 191	Kgrm3 m3/m3 l/m3	0,02 3	kg m3	5,30 1.060,00 0.00	32,00 21,00 0.00
	Plaster (*	1:3)	0,04	m3			0,00	0,00
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtota	Processing Compartment					-	4.356,00
3.	Superst	ructure						
	Brick Wo	rk (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
		Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	97	kg	5,30	514,00
	Plaster (*	5anu 1:3)	0.09	m3	0,27	1115	1.000,00	200,00
	1	Ćement Sand	493,03 1,070	kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)			0,007	m3	21.200,00	148,00
		Galvanized Plain Steel Sheet (2 sheets (2) / 5 x 180 Steel Bar Hinges (6 mm dia.)	cm)		2,70	m2 kg	150,00 41,00	405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 2	150 cm)		5,0	m	130,00	650,00
		Bamboo Sticks (ca. 4 cm dia., 16 ft long) Steel Bar Hinges (6 mm dia.)			1,4	kg	41,00	300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Staircas	e						
	Excavati	on Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	Brick Wo	rk (Single Brick) Bricks (230 x 110 x 70 rom)	0,17 455	m3 No./m3	77	No	3.50	270.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	16	kg	5,30	85,00
	Diaster (Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	T IUSIGI (Cement Sand	493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	l Staircase						449,00
5.	Other H	ardware						
		Washbasin Grevwater Pine			1 25	No	160,00	1.000,00
		Unine Pipe Unine Collection Container (201)			1,5	m	40,00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtota	l Other Hardware						2.520,00
6.	Labour							
		Skilled Unskilled			6 12	days days	300,00 150,00	1.800,00 1.800,00
	Subtota	I Labour					-	00,003.8
	Grand T	otal						17.636,00

figure 10: Cost estimate for "Design 7"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	4 :8) Cement Sand Accreaste	0,17 161,95 0,470	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530,00	148,00 85,00 85,00
	Subtota	I Foundation	0,00	ind no	0,10		-	1.743,00
Ζ.	Process	ing Compartment	0.07	m2				
	DIICK W	Bricks (230 x 110 x 70 mm)	455	No./m3	441	No	3,50	1.544,00
		Cement Sand	382,33	kg/m3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4)	0,23	m3				
		Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Sand	382,33	kgrm3 m3/m3	0,02	кg m3	5,30 1.060,00	32,00
	Plaster (1:3) Cement	0,04 493,03	m3 kg/m3	20	kg	5,30	106,00
	Montilatic	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	venulau	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC "T"-Piece (4")			2 2 2	No No	300,00 60,00	600,00 120,00
	Subtota	Processing Compartment			2	NO	40,00	4.356,00
2	Suparat	ructure						
J.	Adohe B	rick Wark (6")	2 46	m3				
	1140000	Adobe bricks and mortar Clavey Soil	0.50	m3/m3	1.23	m3	0.00	0.00
		Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00	0,00 0,00
	Mud Plas	ster (3:1) Sand Clavar Soll	0.13	m3 kg/m3 m3(m3	0,10	m3	1.060,00	106,00
	Lime Pla	ster (21)	0,20	m3	0,00	115	0,00	0,00
		Lime Clayey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @), 105 x 29 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinnes (6 mm dia.)	50 cm)		5,0 3	m No ka	130,00 100,00 41.00	650,00 300,00 57.00
	Subtota	I Superstructure			4.		-	1.674,00
4.	Staircas	e						
	Excavati	on Excavation	<mark>0,05</mark> 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05	m3	0.05	m3	200.00	10.00
	Brick Wo	rk (Single Brick)	0,17	m3	0,05	115	200,00	10,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01 493,03	m3 kg/m3	5	kg	5,30	27,00
	Subtota	Sand I Staircase	1,070	marma	0,01	ms	1.060,00	449,00
5.	Other H	ardware Unne-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbash Greywater Pipe			2,5	m	40,00	100,00
		Urine Fige Urine Collection Container (20 I)			1,5	No	250,00	500,00
		Bucket (Cover Material) Bucket (Cover Material)			45	No	150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	I Other Hardware					-	2.520,00
6.	Labour							
		Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtota	lLabour						4 200,00
	Grand T	otal						14.942,00

figure 11: Cost estimate for "Design 8"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation							
	Excavation Excavation	n	0,61 1,00	m3 m3/m3	0,61	m3	80,00	49,00
	Murum Murum		0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,00
	Mud Plaster (3:1) Sand Clayey So	a	0,18 0,75 0,25	m3 kg/m3 m3/m3	0,14 0,05	m3 m3	1.060,00 0,00	148,00 0,00
	Subtotal Foundat	ion					.	367,00
2.	Processing Comp	partment						
	Adobe Brick Work (6 Adobe Bri	5") cks and Mortar	0,86	m3	10000	1002.0	(0.00)	222
	Clay Strav Duni	ey Soll w/Rice Husk J	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	0,43 0,30 0,13	m3 m3 m3	0,00 0,00	0,00 0,00 0,00
	Mud Plaster (3:1) Sand Clavev So	1	0,05 0,75 0.25	m3 kg/m3 m3/m3	0,04 0.01	m3 m3	1.060,00	42,00 0.00
	Lime Plaster (2:1)		0,02	m3 kaim3	0	ka	0.00	0.00
	Clayey So	1	0,33	m3/m3	0,01	m3	0,00	0,00
	Bamboo S Mud Plast	iticks (ca. 4 cm dia., 18 ft long) er (3:1)	0,16	m3	15	No	100,00	1.500,00
	Sano Clay	d ey Soil	0,75 0,25	kg/m3 m3/m3	0,12 0,04	m3 m3	1.060,00 0,00	127,00 0,00
	Ventilation System PVC Pipe	(4", 20 ft long)			2	No	300,00	600,00
	PVC "T"-P PVC Pipe	lece (4") Cover (4")			2 2	No No	60,00 40,00	120,00 90,00
	Subtotal Process	ing Compartment					10 .	2.469,00
З.	Superstructure							
	Adobe Brick Work (6 Adobe Brid	5") cks and Mortar cv. Soli	2,46	m3	1.00	m2	0.00	0.00
	Strav Dung	ay Son MRice Husk D	0,35	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00 0,00	0,00 0,00
	Mud Plaster (3:1) Sand Clavey So	a	0,14 0,75 0,25	m3 kg/m3 m3/m3	0,11 0.04	m3 m3	1.060,00	117,00 0.00
	Lime Plaster (2:1)		0,05	m3 kaim2	0	ka	0.00	0.00
	Clayey So	ŭ	0,87	m3/m3	0,02	m3	0,00	0,00
	Door Wooden B Galvanize Steel Bar I	lattens (5.6 m @ 50 x 25 mm) d Plain Steel Sheet (2 sheets @ 75 x 180 cm) Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Roof Corrugate Bamboo S Steel Bar I	d A. C. Sheets (6 mm; 2 sheets @ 105 x 250 c titicks (ca. 4 cm dia., 18 ft long) Hinges (6 mm dia.)	m)		5,0 3 1,4	m No kg	1 30,00 1 00,00 41,00	650,00 300,00 57,00
	Subtotal Supersti	ructure					8	1.685,00
4.	Staicase							
	Excavation Excavation	n	<mark>0,05</mark> 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum		0,05	m3	0.05	m3	200.00	10.00
	Adobe Brick Work (6	57)	0,17	m3	0,05	ma	200,00	10,00
	Adobe brid Clay Strav	cks and mortar ey Soll MRice Husk	0,50 0,35	m3/m3 m3/m3	0, 09 0, 06	m3 m3	0,00 0,00	0,00 0,00
	Dung Mud Plaster (3:1)	9	0,15 0,08	m3/m3 m3	0,03	m3	0,00	0,00
	Sand Clayey So	a	0,75 0,25	kg/m3 m3/m3	0,06 0,02	m3 m3	1.060,00 0,00	64,00 0,00
	Lime Plaster (2:1) Lime Claver Sn	π.	0,01 0,67 0.33	m3 kg/m3 m3/m3	0	kg m3	0,00	0,00
	Subtotal Staircas	e					-	78,00
5.	Other Hardware						1 000 00	4 000 00
	Washbasir Greywater	n Pipe			1 2.5	No	160,00	160,00
	Urine Pipe Urine Colle	ection Container (20 l)			1,5	m	40,00	60,00 500.00
	Cleansing Bucket (Cr	Water Pipe over Material)			2,5	m No	40,00 150,00	100,00
	Bucket (W Cleansing	later) Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtotal Other Ha	ardware					-	2.520,00
6.	Labour Skilled				6	days	300,00	1.800,00
	Unskilled Subtotal Labour				16	days	150,00 -	2.400,00 4.200.00
							-	
	Grand Total							11.319,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	mЗ	200,00	84,00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290 x	190x100) Hollow Block Masonry	3,15	m2	50		00.00	1 100 00
		Mortar (1:4) Cement	0,0069	m3/m2 kg/m3	53 11	kg	22 JU 5 30	1.166 µU 58 µO
	DCCS	5ano	0.45	m3	0.03	mo	1.060,00	32 µU
	R.C.C. 3	Cement Sand	308,53	kg/m3	46	kg m3	5,30	244,00
		Aggregate Reinforcement	0,88	m3/m3 ka/m3	0,13	m3 ka	530,00 41,00	69,00 246,00
	4" (290 x	190x100) Hollow Block Masonry Cover	0,72	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	on System PVC Pipe (4", 20 ft long)			2	No	300,00	600 DO
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120 DO 80 DO
	Subtot	al Processing Compartment						2.975,00
3.	Supers	structure						
	4" (290 x	190×100) Hollow Block Masonry Bollow Block (290 × 190 × 100)	8,70	m2 No/m2	145	No	22.00	3 100 00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	30	ka	5 30	159.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85 00
	Door	Wooden Battens (5 6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21 200 00 150 00 41 00	148 DO 405 DO 8 DO
	Jalies	Inline (200 x 460 mm)			2	No	110.00	220.00
	Roof				-	110	110,00	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 16 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion Execution	0,06	m3	0.06	m3	80.00	5.00
	Murum	Excavalion	0,06	m3	000	1115	00,00	5,00
	48.000	Murum	1,05	m3/m3	UДБ	m3	200,00	12,00
	4 (290%	Solid Blocks (290 x 190 x 100 mm) Mortar (1-1)	24	No m3	24	No	30,00	720,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	8 0,02	kg m3	5,30 1.060,00	42,00 21,00
	Subtot	al Staircase					1	800,00
5	Other	Jardwara						
v	outeri	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			:	No No	1.000,00	1.000,00 160,00
		Greywater Pipe Urine Pipe			2,5	m	40,00 40,00	100,00
		Urine Collection Container (20 l) Cleansing Water Pine			2	No	250 00 40 00	500,00 100,00
		Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150 D0 150 D0
	Cubbat	Cleansing Water Infiltration			1	LS	300,000	300,00
	SUDIO	ai other Hardware						2.820,00
6.	Labou	r Skilled			4	days	300,00	1.200,00
		Unskilled			8	da ys	150,00	1.200,00
	Subtot	al Labour						2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	[INR/Unit]	[INR]
1.	Found	ation						
	Excavati	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,08	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	mЗ	200 00	84 00
	P.C.C. (1	: 4:8) Cement Sand	0,23 161,95 0,470	m3 kg/m3 m3/m3	37 0,11	kg m3	5,30 1.060,00	196,00 117,00
	0.14.4	Aggregate	0,95	m3/m3	0,22	m3	530,00 -	117,00
	Subtot	al Foundation					÷	546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,15 16,67	m2 No/m2	53	No	22,00	1.166,00
		Mortar (1:4) Cement	0 ,0089 382 ,33	m3/m2 kg/m3	11	kg	5,30	58,00
	BCC.	Sand	1,070	m3/m3	603	m3	1.060,00	32,00
	R.C.C. S	Cement Sand	308,53	kg/m3	46	kg m3	5,30 1,060,00	244,00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13	m3 kg	530 D0 41 D0	69 D0 246 D0
	4" (290x	190 x100) Hollow Block Masonry Cover	0,72	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Ventilati	on System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment					-	2.975,00
3.	Supers	structure						
	4" (290x	190 x100) Hollow Block Masonry	3,60	m2	50	N	22.00	1 220 00
		Mortar (1:4)	0,0089	m3/m2	12	ka	22 JU 5 30	64.00
		Sand Water	1,070	m3/m3	0 D 3 6	m3 I	1.060,00 0,00	32,00 0,00
	Ferro Ce	ement (1:3)	0,16	mЗ			- Augustine	
		Cement Sand	493,03	kg/m3 m3/m3	79 0,17	kg m3	5,30 1.060,00	419,00 180,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)	a)		0,007	m3	21 200 00	148,00
		Steel Bar Hinges (6 mm dia.)	10		0,2	kg	41 00	8,00
	Jalies	Jalies			1	No	110,00	110,00
	Subtot	al Superstructure					-	2.686,00
4.	Stairca	se						
	Excavati	ion Exception	0,06	m3	0.06	m3	80.00	5.00
	Murum	Excavation	0,06	m3	0,00	ing.	00,00	5,60
		Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Cement Sand	382,33	kg/m3	8 0.02	kg m3	5,30	42,00
	Subtot	al Staircase	1,010	marina	0.02	110		800,00
	12000							
5.	Other I	Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Greywater Pipe			2,5	m	40,00	100,00
		Urine Collection Container (20 I) Cleansing Water Pine			2	No	250 D0 40 00	500,00
		Bucket (Cover Material) Bucket (Water)			1	No No	150 D0 150 D0	150,00
	Subtot	Cleansing Water Infiltration			1	LS	300,00 -	300,00
	GUNIOL						-	2.020,00
6.	Labour	Skilled			4	days	300,00	1.200,00
		Unskilled			10	days	150,00 -	1.500,00
	Subtot	al Labour						2.700,00
	Grand	Total					-	12.227,00

figure 5: Cost estimate for "Design 2"





	9	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8)	0,23	m3 kalm2	27	ka	E 20	106.00
	Sand Aggregate	0,470	m3/m3 m3/m3	0,11 0,22	m3 m3	1.060,00 530,00	196,00 117,00 117,00
	Subtotal Foundation					-	546,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement	3,15 16,67 0,0089 382,33	m2 No/m2 m3/m2 ka/m3	53 11	No ka	22,00 5.30	1.166,00
	Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. Slab (12:4) Cement Sand Aggregate Perforcement	0,15 308,53 0,440 0,88	m3 kg/m3 m3/m3 m3/m3 kg/m3	46 0,07 0,13	kg m3 m3	5,30 1.060,00 530,00 41.00	244,00 74,00 69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0.72	m2	0,0	ng	41,00	240,00
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilation System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						2.975,00
3.	Superstructure						
	Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400,00 1.300,00
	Subtotal Superstructure					-	2.700,00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement Sand	0,02 382,33 1,070	m3 kg/m3 m3/m3	8	kg m3	5,30 1.060.00	42,00 21.00
	Subtotal Staircase	1,010	monto	0,02	ine		800,00
	2 (1)						
э	Unier Hardware Urine-Diversion Squatting Pan & Cleansing Bow Washbasin Greywater Pipe Urine Pipe Urine Collection Container (20 I) Cleansing Water Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration	И		1 1 2,5 1,5 2 2,5 1 1 1	No M M M No LS	1.000,00 160,00 40,00 250,00 40,00 150,00 150,00 300,00	$\begin{array}{c} 1.000,00\\ 160,00\\ 100,00\\ 60,00\\ 500,00\\ 100,00\\ 150,00\\ 150,00\\ 300,00\\ \end{array}$
	Subtotal Other Hardware					2	2.520,00
6.	Labour Skilled			4	days	300,00	1.200,00
	Unskilled Subtotal Labour			8	days	150,00	1.200,00 2.400,00
	Grand Total					1 1 1	11.941.00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg	5,30	127,00
	Sano Aggregate	0,95	m3/m3	0,14	m3 m3	530,00	74,00
	Subtotal Foundation					5	1.561,00
2.	Processing Compartment						
	4" (290×190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100 mm)	4,20	m2 No/m2	70	No	22.00	1 540 00
	Mortar (1:4) Cement	0,0069	m3/m2 kg/m3	14	kg	5,30	74,00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Aggregate Reinforcement	0,88	m3/m3 ka/m3	0,13	m3 ka	530,00	69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0,84	m2				
	Hollow Blocks (290 × 190 × 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System PVC Pine (4* 20 ft long)			2	No	300.00	600.00
	PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtotal Processing Compartment						3.424,00
3.	Superstructure						
630	4" (290x190x100) Hollow Block Masonry	8,70	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	145	No	22,00	3.190,00
	Cernent Sand Water	382,33 1,070 191	kg/m3 m3/m3	30 0,08 15	kg m3	5,30 1.060,00 0.00	159,00 85,00
	Door	191	Ung	15		0,00	0,00
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.)	0		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure						4.846,00
4.	Staircase						
-	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum Murum	1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand Subtotal Staircase	1,070	m3/m3	0,02	ma	1.060,00	797,00
5.	Other hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	washbasin Greywater Pipe Urine Pine			2,5	m	40,00	100,00
	Unine Collection Container (201) Cleansing Water Pipe			2	No	250,00 40,00	500,00 100.00
	Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Suntolal StairCase					3	2.520,00
6.	Labour skilled			4	days	300,00	1.200,00
	unskilled			8	days	150,00	1.200,00
	Subtotal Labour						2.400,00
	Grand Total						15.548,00







			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,57 1,00	m3 m3/m3	0,57	m3	80,08	46,00
	Murum	Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:	4:8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtota	l Foundation					-	798,00
2	Process	sing Compartment						
-	Brick Wo	rk (Single Brick)	0,83	m3	and the second se		1.2.102.00	
		Bricks (230 × 110 × 70 mm) Mortar (1:4) Cement Sand	455 0,246 382,33 1,070	No./m3 m3/m3 kg/m3 m3/m3	378 78 0,22	No kg m3	3,50 5,30 1,060,00	1.323,00 413,00 233,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2 Nio (m2	20	No	2.50	122.00
		Mortar (1:4) Cement	0,023	m3/m2 kg/m3		kg	5,30	32,00
	Plaster (1	5and 1:3)	0,04	m3/m3	υµz	ma	1.060,00	21,00
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4")			2	No No	300,00 60.00	600,00 120,00
		PVC Pipe Cover (4")			2	No	40,00	80,00
	Subtota	l Processing Compartment						4.023,00
3.	Superst	ructure						
	Brick Wo	rk (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
		Cement Sand	382,33 1,070	m3/m2 kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (1	l:3) Cement	0,09 493,03	m3 kg/m3	44	kg	5,30	233,00
	Door	Sand	1,070	m3/m3	0,10	md	1.060,00	106,00
	2200.00	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	1 48,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 c Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	m)		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Staircas	5e						
	Excavatio	on Excavation	0,06 1.00	m3 m3/m3	0.06	m3	80.00	5.00
	Murum	Murum	0,06	m3 m3/m3	20.0		200.000	12.00
	Brick Wo	rk (Single Brick)	0,17	m3	0,00	nio:	200,00	270.00
		Mortar (1:4) Cement	0,246	m3/m3 kg/m3	16	ka	5,30	270,00
	DI	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Plaster (1	::) Cement Sand	493.03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	ll Staircase						452,00
5.	Other H	ardware					1 000 00	4 000 00
		Washbasin Greywater Pipe			1 2,5	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	l Other Hardware						2.520,00
6.	Labour	Skilled			6	davs	300.00	1,800.00
		Unskilled			12	days	150,00	1.800,00
	Subtota	l Labour						3.600,00
	Grand 1	Fotal						16.361,00

figure 8: Cost estimate for "Design 5"




			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation	1						
	Excavation Exc	cavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	m3	80,00	46,00
	Murum Mu	rum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cei Sai) ment nd	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	30, 30 1.060,00	292,00 170,00
	Agi Subtotal F	gregate oundation	0,95	m3/m3	0,32	m3	530,00	170,00 798,00
	_							
2.	Processing Brick Work (j Compartment Single Brick)	0.83	m3				
	Brid	cks (230 x 110 x 70 mm) ntar (1:4)	455 0,246	No./m3 m3/m3	378	No	3,50	1.323,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. Slab (Cel	(1:2:4) ment	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
	Sar Agi Rei	nd gregate inforcement	0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Work (Half Brick) Cover sks (230 × 110 × 70 mm)	0,72 53	m2 No./m2	38	No	3.50	133.00
	Mo	rtar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	6	kg	5,30	32,00
	Di	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Plaster (1:3) Ce Sai	ment nd	493 D3 1,070	ma kg/m3 m3/m3	20 0,04	kg m3	30, 30 1.060,00	106,00 42,00
	Ventilation S	ystem CPipe (4", 20 ft long)			2	No	300,00	600,00
	PV	C Thece (41) C Pipe Cover (41)			2	No No	60,00 40,00	120,00
	Subtotal P	rocessing Compartment					112	4.023,00
3.	Superstruc	ture						
	Brick Work (Brid	Half Brick) cks (230 x 110 x 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mo	rtar (1:4) Cement	0,023	m3/m2 kg/m3	110	kg	5,30	583,00
	Disetor (1-3)	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Ce Sa	ment Id	493 D3 1,070	kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wo Ga Ste	oden Battens (5.6 m @ 50 x 25 mm) Wanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) el Bar Hinges (5 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48,00 405,00 8,00
	Jalies Jali	ies			2	No	110,00	220,00
	Subtotal S	uperstructure						4.316,00
4.	Staircase							
	Excavation Exi	cavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Mu	rum	0,06 1.05	m3 m3/m3	0.06	m3	200.00	12.00
	Brick Work (Single Brick)	0,17	m3				
	Bri Mo	cks (230 × 110 × 70 mm) rtar (1:4)	0,246	No./m3 m3/m3	17	No	3,50	270,00
		Sand	1,070	m3/m3	0,04	m3	0,50 1.060,00	42,00
	Plaster (1:3) Ce Sar	ment nd	0,01 493 D3 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	30, 30 1.060,00	27,00 11,00
	Subtotal S	taircase						452,00
5.	Other Hard	ware						
	Uri VVa	ne-Diversion Squatting Pan & Cleansing Bowl shbasin			1	No No	1.000,00 160,00	1.000,00 160,00
	Gre Uri	aywater Pipe ne Pipe			2,5 1,5	m	40,00 40,00	100,00 60,00
	Uri	ne Collection Container (20 I) ansing Water Pipe			3 2,5	No m	250,00 40,00	750,00 100,00
	Bui	cket (Cover Matenal) cket (Water) cansing Water Infiltration			1	No No	150,00 150,00 300.00	150,00 150,00 300,00
	Subtotal O	ther Hardware					-	2.770,00
6.	Labour						oligina ta kata	
	Ski Un	lled skilled			6 12	days days	300,00 150,00	1.800,00 1.800,00
	Subtatall	abour						0.000.00
	Subtotal						1.0	3.600,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wa	r ik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	448) Cement Sand Accreate	0,17 161,95 0,470 0.95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530.00	148,00 85,00 85,00
	Subtota	lFoundation			100	1940		1.743,00
	D							
Ζ.	Brick Wo	nng Comparament	0.97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	382,33	kgrm3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate	0,440	m3/m3 m3/m3	0,1	m3 m3	1.060,00 530,00	106,00
	Brick Wo	rk (Half Brick) Cover	0.72	m2	8,1	кg	41,00	332,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Woter	382,33 1,070 101	kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00 0.00	32,00 21,00
	Plaster (1:3)	0,04	m3			0,00	0,00
	Montilatio	Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	ventriado	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	I Processing Compartment						4.356,00
3.	Superst	ructure						
	Brick Wa	rk (Half Brick)	11,00	m2	500			
		Mortar (1:4) Cement	0,023	m3/m2 kg/m3	97	ka	5,50	2.041,00
		Sand	1,070	m3/m3	0,27	m3	1.060,00	286,00
	Plaster (1:3) Cement Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 25 Bamboo Sticks (ca. 4 cm dia., 18 ft long)	0 cm)		5,0 3	m No	130,00 100,00	650,00 300,00
	Subtota	I Superstructure			1,4	ĸġ	41,00	4.968,00
4.	Staircas	8						
	Excavati	on Excavation	0,05	m3	0.05	m3	90.00	4.00
	Murum	Excaration	0,05	m3	0,00	ma	00,00	4,00
		Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	BUCK MO	nk (Single Brick) Bricks (230 x 110 x 70 mm) Mortar (1 4)	455	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01	m3 ka(m3	5	ka	5 30	27.00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Subtota	i Staircase						449,00
5.	Other H	ardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00
		Unine Collection Container (20 I) Closed Water Ring			1,5	No	40,00 250,00 40,00	500,00
		Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	i Uther Hardware						z.520,00
6.	Labour	Skilled			6	days	300,00	1.800,00
	C	Unskilled			12	days	150,00	1.800,00
	Subtota	I Lapouf						3,200,00
	Grand T	otal						17.636,00

figure 10: Cost estimate for "Design 7"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	4 :8) Cement Sand Accreaste	0,17 161,95 0,470 0.95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530,00	148,00 85,00 85,00
	Subtota	I Foundation	0,00	ind no	0,10		-	1.743,00
Ζ.	Process	ing Compartment	0.07	m2				
	DIICK W	Bricks (230 x 110 x 70 mm)	455	No./m3	441	No	3,50	1.544,00
		Cement Sand	382,33	kg/m3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4)	0,23	m3				
		Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Sand	382,33	kgrm3 m3/m3	0,02	кg m3	5,30 1.060,00	32,00
	Plaster (1:3) Cement	0,04 493,03	m3 kg/m3	20	kg	5,30	106,00
	Montilatic	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	venulau	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC "T"-Piece (4")			2 2 2	No No	300,00 60,00	600,00 120,00
	Subtota	Processing Compartment			2	NO	40,00	4.356,00
2	Suparat	ructure						
J.	Adohe B	rick Wark (6")	2 46	m3				
	1140000	Adobe bricks and mortar Clavey Soil	0.50	m3/m3	1.23	m3	0.00	0.00
		Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00	0,00 0,00
	Mud Plas	ster (3:1) Sand Clavar Soll	0.13	m3 kg/m3 m3(m3	0,10	m3	1.060,00	106,00
	Lime Pla	ster (21)	0,20	m3	0,00	115	0,00	0,00
		Lime Clayey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @), 105 x 29 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinnes (6 mm dia.)	50 cm)		5,0 3	m No ka	130,00 100,00 41.00	650,00 300,00 57.00
	Subtota	I Superstructure			4.		-	1.674,00
4.	Staircas	e						
	Excavati	on Excavation	<mark>0,05</mark> 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05	m3	0.05	m3	200.00	10.00
	Brick Wo	rk (Single Brick)	0,17	m3	0,05	115	200,00	10,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01 493,03	m3 kg/m3	5	kg	5,30	27,00
	Subtota	Sand I Staircase	1,070	marma	0,01	ms	1.060,00	449,00
_								
5.	Other H	ardware Unne-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbash Greywater Pipe			2,5	m	40,00	100,00
		Urine Fige Urine Collection Container (20 I)			1,5	No	250,00	500,00
		Bucket (Cover Material) Bucket (Cover Material)			45	No	150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	I Other Hardware					-	2.520,00
6.	Labour							
		Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtota	lLabour						4 200,00
	Grand T	otal						14.942,00

figure 11: Cost estimate for "Design 8"





	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
n	0.04					
xcavation	1,00	m3 m3/m3	0,61	m3	80,00	49,00
lurum	0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,01
(3:1) and layev Soil	0,18 0,75 0.25	m3 kg/m3 m3/m3	0,14 0.05	m3 m3	1.060,00	148,0
oundation	0.452				-	367,00
g Compartment						
(Work (6'') dobe Bricks and Mortar	0,86	m3	stables	2017.5.4	550 (v. 9)	12.24
Clayey Soil Straw/Rice Husk Dung	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	0,43 0,30 0,13	m3 m3 m3	0,00 0,00 0,00	0,01 0,01 0,01
(3:1) and	0,05 0,75	m3 kg/m3	0,04	m3	1.060,00	42,0
r (2:1)	0,25	m3	0,01	1115	0,00	0,0
ime tayey Soil	0,67	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,0 0,0
lamboo Sticks (ca. 4 cm dia., 18 ft long) Jud Plactor (2:1)	0.46	m2	15	No	100,00	1.500,00
Sand Clayey Soil	0,75	kg/m3 m3/m3	0,12 0,04	m3 m3	1.060,00 0,00	1 27,00 0,01
System			2	No	200.00	600.0
VC "T"-Piece (4") VC Pipe Cover (4")			2 2	No No	60,00 40,00	120,0
rocessing Compartment					10 .	2.469,00
cture						
(Work (6") dobe Bricks and Mortar Claver Spil	2,46	m3	1 23	m3	0.00	0.01
Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00 0,00	0,00
(3:1) and Javey Soil	0,14 0,75 0,25	m3 kg/m3 m3/m3	0,11 0.04	m3 m3	1.060,00	117,00
r (2:1)	0,05	m3		lar		0.01
rne Jayey Soll	0,87	m3/m3	0,02	m3	0,00	0,0
√ooden Battens (5.6 m @ 50 x 25 mm) ∖alvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) teel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48,00 405,00 8,00
corrugated A.C. Sheets (6 mm; 2 sheets @, 105 x 250 cn lamb oo Sticks (ca. 4 cm dia., 18 ft long) teel Bar Hinqes (6 mm dia.)	Ŋ		5,0 3 1,4	m No ka	1 30,00 1 00,00 41,00	650,00 300,00 57,00
uperstructure					100000	1.685,00
xcavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,01
1.mm	0,05	m3	0.05	m3	200.00	10.0
«Work (6")	0,17	m3	0,05	III3	200,00	10,0
dobe bricks and mortar Clayey Soil Straw/Rice Husk	0,50	m3/m3 m3/m3	0,09 0.06	m3 m3	0,00	0,0
Dung	0,15	m3/m3	0,03	m3	0,00	0,0
land layey Soll	0,75	kg/m3 m3/m3	0,06 0,02	m3 m3	1.060,00 0,00	64,0 0,0
r (2:1) ime Isaar Sail	0,01 0,67	m3 kg/m3 m3/m2	0	kg	0,00	0,00
itaircase	0,00	morino	0,00	1113	-	78,00
dware						
rrine-Diversion Squatting Pan & Cleansing Bowl Vashbasin Frevwater Pipe			1 2.5	No	1.000,00 160,00 40.00	1.000,00 160,00 100,00
Irine Pipe Irine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,01 500,01
leansing Water Pipe lucket (Cover Material)			2,5	m No	40,00 150,00	100,0 150,0
ucket (Water) leansing Water Infiltration			1	No LS	150,00 300,00	150,0 300,0
Other Hardware					-	2.520,00
killed			6	days	300,00	1.800,00
abour			16	days	15U,UO -	4.200,00
					<u>1</u>	
inskille abou al	ad 1 r	ad Ir	ad Ir	ad 16 Ir	ad 16 days ur	ad 16 days 150,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					3	546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2	52	Ne	22.00	1 100 00
		Mortar (1:4) Cement Sand	0,0069 .382,33 1.070	m3/m2 kg/m3 m3/m3	11 0.03	kg m3	5,30 1,060,00	58 DO 32 DD
	R.C.C. S	Slab (1:2:4)	0,15	m3	0,00	115	1.000,00	52,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 DO 74 DO
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290 x	(190×100) Hollow Block Masonry Cover	0,72	m2				100000000
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	.382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
З.	Supers	structure						
	4" (290 x	(190×100) Hollow Block Masonry	8,70	m2 No (m2)	1.45	Na	22.00	2 100 00
		Montar (1:4)	0,0089	m3/m2	145	ka	22.00 6.20	150.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85,00
	Door	Wooden Battens (56 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel BarHinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148.00 405.00 8.00
	Jalies	Jolian (200 v 460 mm)			2	No	110.00	220.00
	Roof				-	110	110,00	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	(190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other I	Hardware				No	1 000 00	1 000 00
		Washbasin Grevwater Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250.00	60,00 500,00
		Clean sing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6	l abou	r						
υ.	Labou	Skilled Unskilled			4	da ys da ys	300,00	1.200,00
	Subtet	al Labour			U	2019	100,00	2 400 00
	Subiol							2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavati	on Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,08	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement	0,23	m3 ka/m3	37	ka	5.30	196.00
		Sand Aggregate	0,470 0,95	m3/m3 m3/m3	0,11 0,22	m3 m3	1.060,00 530,00	117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry	3.15	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	53	No	22,00	1.166,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58,00 32,00
	R.C.C. s	ab (1:2:4)	0,15	m3				
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 00 74 00
		Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290x	190 x100) Hollow Block Masonry Cover	0,72	m2	10	N	22.00	201.00
		Mortar (1:4)	0,0089	m3/m2	12	NO	22,00	264 JU
		Sand	1,070	m3/m3	0,01	кg m3	1.060,00	11,00
	Ventilati	on System EVC Pine (4* 20 ft land)			2	No	300.00	600.00
		PVC "T"-Piece (4") PVC Pine Cover (4")			2	No	60 D0 40 D0	120,00
	Subtot	al Processing Compartment					-	2 975 00
З.	Supers	tructure						
	4" (290x	190 x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,60	m2 No/m2	60	No	22.00	1 320 00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	12	ka	5 30	64.00
		Sand Water	1,070	m3/m3 I/m3	0 D 3 6	m3 	1.060,00 0,00	32,00 0,00
	Ferro Ce	ment (1:3)	0,16	m3				
		Cement Sand	493.03 1,070	kg/m3 m3/m3	79 0,17	kg m3	5,30 1.060,00	419,00 180,00
	Door							
		Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cn Steel Bar Hinges (6 mm dia.)	n)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			1	No	110,00	110,00
	Subtot	al Superstructure						2.686,00
4.	Stairca	se						
	Excavati	on	0,06	m3				
		Excavation	1,00	m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0 D 6	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
		Mortar (1:4) Cement	0,02 382,33	m3 ka/m3	8	ka	5.30	42.00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5.	Other H	Hardware			4	No	1 000 00	1 000 00
		Washbasin Grevwater Pipe			1	No	160 D0 40 D0	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40 DO 250 DO	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6.	Labour							
5.		Skilled Unskilled			4 10	days days	300,00 150,00	1.200,00 1.500,00
	Subtot	al Labour				199 6 9999	a seroit da	2.700.00
	Grand	Iotal						12.227,00

figure 5: Cost estimate for "Design 2"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8)	0,23	m3			2.52	Transford
	Cement Sand	161,95	kg/m3 m3/m3	37 0,11	kg m3	5,30 1.060,00	196,00 117,00
	Aggregate	0,95	m3/m3	0,22	m3	530,00	546.00
	eastean oundation						
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,15	m2 No/m2	53	No	22.00	1 166 00
	Mortar (1:4) Cement	0,0089	m3/m2 ka/m3	11	ka	5.30	58.00
	Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. Slab (1:2:4) Cement	0,15 308.53	m3 ka/m3	46	ka	5.30	244.00
	Sand Aggregate	0,440	m3/m3 m3/m3	0,07 0.13	m3 m3	1.060,00	74,00 69,00
	Reinforcement	40	kg/m3	6,0	kg	41,00	246,00
	4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72 16,67	m2 No/m2	12	No	22,00	264,00
	Cement Sand	382,33	kg/m3 m3/m3	2	kg m3	5,30 1.060.00	11,00
	Ventilation System	1,010	momo	0,01	1115	1.000,00	11,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No	300,00 60,00 40,00	600,00 120,00
	Subtotal Processing Compartment			2	NO		2.975,00
•	2						
Ј.	Bamboo Mats (130 x 180 cm)			7	No	200,00	1.400,00
	Subtotal Superstructure			13	NO	100,00	2 700 00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtotal Staircase						800,00
5	Other Hardware						
	Urine-Diversion Squatting Pan & Cleansing Bow Washbasin	l.		1	No No	1.000,00 160,00	1.000,00 160,00
	Greywater Pipe Urine Pipe			2,5 1,5	m m	40,00 40,00	100,00 60,00
	Urine Collection Container (20 l) Cleansing Water Pine			2	No	250,00	500,00
	Bucket (Cover Material)			1	No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Other Hardware						2.520,00
6.	Labour						
	Skilled Unskilled			4	days days	300,00 150,00	1.200.00 1.200.00
	Subtotal Labour						2.400,00
	Grand Total						11.941,00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg	5,30	127,00
	Aggregate	0,95	m3/m3	0,14	m3	530,00	74,00
	Subtotal Foundation						1.561,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (200 x 190 x 100 mm)	4,20	m2 No/m2	70	No	22.00	1.540.00
	Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	14	ka	5 30	74.00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Sand Aggregate Reinforcement	0,88	m3/m3 m3/m3 ka/m3	0,07	m3 m3 ka	530,00	74,00 69,00 246,00
	4" (290×190×100) Hollow Block Masonry Cover	0.84	m2	0,0	49	41,00	240,00
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System			2	No	300.00	600.00
	PVC T ^{**} -Piece (4*) PVC Pipe Cover (4*)			2	No No	60,00 40,00	120,00
	Subtotal Processing Compartment						3.424,00
2	Superstructure						
J .	4" (290×190×100) Hollow Block Masonry	8,70	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	145	No	22,00	3.190,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	30 0,08	kg m3	5,30 1.060,00	159,00 85,00
	vvater	191	Um3	15	8	UU U	040
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.))		0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure					100000	4.846,00
4	Staircase						
4.	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand Subtotal Staircase	1,070	mid/mid	0,02	md	1.060,00	797,00
5.	Other hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	wasnbasin Greywater Pipe Unice Bine			2,5	m	40,00	100,00
	Unine Collection Container (201) Cleansing Water Pipe			2	No	250,00	500,00
	Bucket (Cover Material) Bucket (Vkater)			1	No No	150,00 150,00	150,00 150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Staircase					8	2.520,00
6.	Labour skilled			4	davs	300.00	1 200 00
	unskilled			8	days	150,00	1.200,00
	Subtotal Labour						2.400,00
	Grand Total					2	15.548,00

figure 7: Cost estimate for "Design 4"





		G	uantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,57 1,00	m3 m3/m3	0,57	m3	00,08	46,00
	Murum	Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:	4.8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtota	l Foundation						798,00
2.	Process	sing Compartment						
	Brick Wa	rk (Single Brick)	0,83	m3 Na ka2	270	NE	2.50	1 202 00
		Motrar (1-4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	578 78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Wa	r k (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72 53	m2 No./m2	38	No	3,50	133,00
		Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00	32,00 21,00
	Plaster (*	1:3) Cement Sand	0,04 493,03 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4*, 20 ft long) PVC T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	l Processing Compartment						4.023,00
3.	Superst	ructure						
	Brick Wa	rk (Half Brick)	11,00	m2	500	Na	2.50	2.041.00
		Mortar (1:4) Cement Sand	0,023 382,33 1,070	m3/m2 kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (*	I:3) Cerment Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0.10	kg m3	5,30 1.060.00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)		10150005	0,007	m3	21,200,00	148,00
	lalice	Steel Bar Hinges (6 mm dia.)			0,2	kg	41,00	405,00 8,00
	o uno	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm, 2 sheets @ 105 x 250 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	Ù		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Stairca	5e						
	Excavati	on Execution	0,06	m3	0.06		90.00	£ 00
	Murum	Excertation	0,06	m3	0,00	mo	00,00	5,00
	Brick Ma	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (*	I:3) Cement Sand	0,01 493,03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	I Staircas e						452,00
5.	Other H	ardware						
		Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00 160,00	1.000,00
		Urine Pipe Urine Collection Container (20 h			2,5 1,5 2	m No	40,00 40,00 250.00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtota	l Other Hardware						2.520,00
6.	Labour	etal a				142000		1 000 00
		Unskilled			12	ua ys da ys	300,00 150,00	1,800,00
	Subtota	l Labour						3.600,00
	Grand 1	Fotal						16.361,00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	mЗ	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	5,30 1.060,00	292,00 170,00
	Aggregate	0,95	ma/ma	0,32	ma	530,00	798.00
							100,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4)	0,23	m3				
	Cement Sand Aggregate Reinforcement	0,440 0,88 35	kg/m3 m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	ка m3 m3 ka	5,30 1.060,00 530,00 41,00	376,00 106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2				
	Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	6,30 1.060,00	32,00 21,00
	Plaster (1:3) Cernent Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	6,30 1.060,00	106,00 42,00
	Ventilation System						
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						4.023,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 x 110 x 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	110	kg	5,30	583,00
	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Plaster (1:3) Cement Sand	493 D3 1,070	m3 kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (5 mm dia.)	cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure						4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1.05	m3 m3/m3	0.06	m3	200.00	12.00
	Brick Work (Single Brick)	0,17	m3	10100	1000		
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cernent Sand	0,01 493 D3 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase						452,00
2.							
0.	Other Hardware Unine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	vvasnoasin Greywater Pipe Ukino			2,5	m	40,00	100,00
	Urine Collection Container (20 I)			3	No	250,00	750,00
	Bucket (Cover Material) Bucket (Material)			2,3	No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Other Hardware						2.770,00
6.	Labour Skilled			6	days	300,00	1.800,00
	Unskilled			12	days	150,00	1.800,00
	Surtotal Labour						3.000,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wa	r ik (Single Brick) Bricks (230 x 110 x 70 mm)	0,50 455	m3 No./m3	228	No	3,50	798,00
		Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1	448) Cement Sand Accreate	0,17 161,95 0,470 0.95	m3 kg/m3 m3/m3 m3/m3	28 0,08 0.16	kg m3 m3	5,30 1.060,00 530.00	148,00 85,00 85,00
	Subtota	lFoundation			100	1940		1.743,00
	D							
Ζ.	Brick Wo	nng Comparament	0.97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	382,33	kgrm3 m3/m3	91 0,26	kg m3	5,30 1.060,00	482,00 276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate	0,440	m3/m3 m3/m3	0,1	m3 m3	1.060,00 530,00	106,00
	Brick Wo	rk (Half Brick) Cover	0.72	m2	8,1	кg	41,00	332,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Woter	382,33 1,070 101	kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00 0.00	32,00 21,00
	Plaster (1:3)	0,04	m3			0,00	0,00
	Montilatic	Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	ventriado	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtota	I Processing Compartment						4.356,00
3.	Superst	ructure						
	Brick Wa	rk (Half Brick)	11,00	m2	500			
		Mortar (1:4) Cement	0,023	m3/m2 kg/m3	97	ka	5,50	2.041,00
		Sand	1,070	m3/m3	0,27	m3	1.060,00	286,00
	Plaster (1:3) Cement Sand	0,09 493,03 1,070	m3 kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 25 Bamboo Sticks (ca. 4 cm dia., 18 ft long)	0 cm)		5,0 3	m No	130,00 100,00	650,00 300,00
	Subtota	I Superstructure			1,4	ĸġ	41,00	4.968,00
4.	Staircas	8						
	Excavati	on Excavation	0,05	m3	0.05	m3	90.00	4.00
	Murum	Excaration	0,05	m3	0,00	ma	00,00	4,00
		Murum	1,05	m3/m3	0,05	m3	200,00	10,00
	BUCK MO	nk (Single Brick) Bricks (230 x 110 x 70 mm) Mortar (1 4)	455	No./m3 m3/m3	77	No	3,50	270,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (1:3) Cement	0,01	m3 ka(m3	5	ka	5 30	27.00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Subtota	i Staircase						449,00
5.	Other H	ardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00
		Unine Collection Container (20 I) Closed Water Ring			1,5	No	40,00 250,00 40,00	500,00
		Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	i Uther Hardware						z.520,00
6.	Labour	Skilled			6	days	300,00	1.800,00
	C	Unskilled			12	days	150,00	1.800,00
	Subtota	I Lapouf						3,200,00
	Grand T	otal						17.636,00

figure 10: Cost estimate for "Design 7"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundat	tion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Museum	0,66	m3	0.60		200.00	100.00
	Brick Wo	rk (Single Brick)	0,50	m3	0,03	1110	200,00	130,00
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	228	No	3,50	798,00
		Sand	382,33	m3/m3	0,13	кg m3	1.060,00	138,00
	P.C.C. (1:	4:8) Cement	0,17 161,95	m3 kg/m3	28	kg	5,30	148,00
		Sand Aggregate	0,470	m3/m3 m3/m3	0,08	m3	530,00	85,00
	Subtota	l Foundation						1.743,00
2.	Process	ing Compartment						
	Brick Wo	r k (Single Brick) Bricks (230 x 110 x 70 mm)	0,97 455	m3 No./m3	441	No	3,50	1.544,00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	91	kg	5,30	482,00
	R.C.C. SI	sano ab (1:2:4)	0.23	ma ma	0,26	ma	1.060,00	276,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
		Reinforcement	0,88	kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Wo	rk (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72 53	m2 No./m2	38	No	3,50	133,00
		Mortar (1:4) Cement Sand	0,023 382,33 1.070	m3/m2 kg/m3 m3/m3	6 0.02	kg m3	5,30 1.060.00	32,00
	Plaster (*	1:3)	0,04	m3				
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "1"-Piece (4") PVC Pipe Cover (4")			2	No No	60,00 40,00	120,00 80,00
	Subtota	I Processing Compartment					-	4.356,00
3.	Superst	ructure						
	Adobe B	rick Work (6") Adobe bricks and mortar	2,46	m3				
		Clayey Soil Straw/Rice Husk Dung	0,50 0,35 0.15	m3/m3 m3/m3 m3/m3	1,23 0,86 0.37	m3 m3	0,00 0,00 0.00	0,00
	Mud Plas	ster (3:1)	0,13	m3	0,01	115	0,00	0,00
		Sand Clayey Soll	0,75 0,25	kg/m3 m3/m3	0,10 0,03	m3 m3	1.060,00 0,00	106,00 0,00
	Lime Pla	ster (2:1) Lime	0,04 0,67	m3 kg/m3	0	kg	0,00	0,00
	Door	Clayey Soil	0,33	m3/m3	0,01	m3	0,00	0,00
		Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets (⊉,75 x 180 cm)		0,007 2,70	m3 m2	21.200,00 150,00	148,00 405,00
	Roof	steel Bar Hinges (o mm dia.)			U ,2	кg	41,00	8,00
		Corrugated A.C. Sheets (6 mm; 2 sheets Bamboo Sticks (ca. 4 cm dia., 18 ft long)	@ 105 x 250 cm)		5,0	m No	130,00 100,00	650,00 300,00
	Subtota	I Superstructure			1,4	ny	41,00	1.674,00
	C 1.1							
4.	Excavati	on	0.05	m3				
		Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	Brick Wo	rk (Single Brick) Bricks (230 × 110 × 70 mm)	0,17 455	m3 No./m3	77	No	3,50	270,00
		Cement Sand	0,246 382,33 1,070	kg/m3 m3/m3	16 0.04	kg m3	5,30 1.060,00	85,00 42,00
	Plaster (*	1:3) Compat	0,01	m3		Log.	5 20	27.00
		Sand	1,070	m3/m3	0,01	m3	1.060,00	11,00
	Subtota	I Staircase						449,00
5.	Other H	ardware Urine-Diversion Squatting Pan & Cleansi	ng Bowl		1	No	1.000,00	1.000,00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00
		Urine Collection Container (20 I) Cleansing Water Pipe			1,5 2 2,5	No m	40,00 250,00 40.00	500,00 100.00
		Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150,00 150,00
	Subtota	Cleansing water inititration			1	LS	300,00	2.520.00
6.	Labour	Skilled Unskilled			6 16	days dav∘	300,00 150.00	1.800,00 2.400.00
	Subtota	I Labour					-	4 200,00
	Grand T	otal						14 942 00
	Granu I	σται						14.542,00

figure 11: Cost estimate for "Design 8"





	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
n	0.04					
xcavation	1,00	m3 m3/m3	0,61	m3	80,00	49,00
lurum	0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,01
(3:1) and layev Soil	0,18 0,75 0.25	m3 kg/m3 m3/m3	0,14 0.05	m3 m3	1.060,00	148,0
oundation	0.452					367,00
g Compartment						
(Work (6'') dobe Bricks and Mortar	0,86	m3	stables	2017.5.4	550 (v. 9)	12.24
Clayey Soil Straw/Rice Husk Dung	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	0,43 0,30 0,13	m3 m3 m3	0,00 0,00 0,00	0,01 0,01 0,01
(3:1) and	0,05 0,75	m3 kg/m3	0,04	m3	1.060,00	42,0
r (2:1)	0,25	m3	0,01	1113	0,00	0,0
ime tayey Soil	0,67	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,0 0,0
lamboo Sticks (ca. 4 cm dia., 18 ft long) Jud Plactor (2:1)	0.46	m2	15	No	100,00	1.500,00
Sand Clayey Soil	0,75	kg/m3 m3/m3	0,12 0,04	m3 m3	1.060,00 0,00	1 27,00 0,01
System			2	No	200.00	600.0
VC "T"-Piece (4") VC Pipe Cover (4")			2 2	No No	60,00 40,00	120,0
rocessing Compartment					10 .	2.469,00
cture						
(Work (6") dobe Bricks and Mortar Claver Spil	2,46	m3	1 23	m3	0.00	0.01
Straw/Rice Husk Dung	0,35 0,15	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00 0,00	0,00
(3:1) and Javey Soil	0,14 0,75 0,25	m3 kg/m3 m3/m3	0,11 0.04	m3 m3	1.060,00	117,00
r (2:1)	0,05	m3		lar		0.01
rne Jayey Soll	0,87	m3/m3	0,02	m3	0,00	0,0
√ooden Battens (5.6 m @ 50 x 25 mm) ∖alvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) teel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48,00 405,00 8,00
corrugated A.C. Sheets (6 mm; 2 sheets @, 105 x 250 cn lamb oo Sticks (ca. 4 cm dia., 18 ft long) teel Bar Hinqes (6 mm dia.)	Ŋ		5,0 3 1,4	m No ka	1 30,00 1 00,00 41,00	650,00 300,00 57,00
uperstructure					100000	1.685,00
xcavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,01
1.mm	0,05	m3	0.05	m3	200.00	10.0
«Work (6")	0,17	m3	0,05	III3	200,00	10,0
dobe bricks and mortar Clayey Soil Straw/Rice Husk	0,60	m3/m3 m3/m3	0,09 0.06	m3 m3	0,00	0,0
Dung	0,15	m3/m3	0,03	m3	0,00	0,0
land layey Soll	0,75	kg/m3 m3/m3	0,06 0,02	m3 m3	1.060,00 0,00	64,0 0,0
r (2:1) ime Isaar Sail	0,01 0,67	m3 kg/m3 m3/m2	0	kg	0,00	0,00
itaircase	0,00	morino	0,00	1113	- 0,00	78,00
dware						
rrine-Diversion Squatting Pan & Cleansing Bowl Vashbasin Frevwater Pipe			1 2.5	No	1.000,00 160,00 40.00	1.000,00 160,00 100,00
Irine Pipe Irine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,01 500,01
leansing Water Pipe lucket (Cover Material)			2,5	m No	40,00 150,00	100,0 150,0
lucket (Water) leansing Water Infiltration			1	No LS	150,00 300,00	150,0 300,0
Other Hardware					-	2.520,00
killed			6	days	300,00	1.800,00
abour			16	days	15U,UO -	4.200,00
					<u>1</u>	
inskille abou al	ad 1 r	ad Ir	ad Ir	ad 16 Ir	ad 16 days ur	ad 16 days 150,00

figure 12: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation					3	546,00
2.	Proces	ssing Compartment						
	4" (290 x	190×100) Hollow Block Masonry	3,15	m2	52	Ne	22.00	1 100 00
		Mortar (1:4) Cement Sand	0,0069 .382,33 1.070	m3/m2 kg/m3 m3/m3	11 0.03	kg m3	5,30 1,060,00	58 DO 32 DD
	R.C.C. S	Slab (1:2:4)	0,15	m3	0,00	115	1.000,00	52,00
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 DO 74 DO
		Aggregate Reinforcement	0,88	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290 x	(190×100) Hollow Block Masonry Cover	0,72	m2				100000000
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	.382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	PVC Pipe (4", 20 ft long)			2	No	300,00	600 DO
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
З.	Supers	structure						
	4" (290 x	(190×100) Hollow Block Masonry	8,70	m2 No (m2)	1.45	Na	22.00	2 100 00
		Montar (1:4)	0,0089	m3/m2	145	ka	22.00 6.20	150.00
		Sand	1,070	m3/m3	0,08	m3	1.060,00	85,00
	Door	Wooden Battens (56 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel BarHinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	148.00 405.00 8.00
	Jalies	Jolian (200 v 460 mm)			2	No	110.00	220.00
	Roof				-	110	110,00	220,00
		Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.))		3,0 2 1,0	m No kg	130,00 100,00 41,00	390 DO 200 DO 41 DO
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion	0,06	m3				
	Murum	Excavation	1,00	m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	1,05	m3/m3	0,06	m3	200,00	12,00
	4" (290 x	(190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5	Other I	Hardware				No	1 000 00	1 000 00
		Washbasin Grevwater Pine			1	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250.00	60,00 500,00
		Clean sing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6	l abou	r						
υ.	Labou	Skilled Unskilled			4	da ys da ys	300,00	1.200,00
	Subtet	al Labour			U	2019	100,00	2 400 00
	Subiol							2.400,00
	Grand	Total						14.087,00

figure 4: Cost estimate for "Design 1"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavati	on Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,08	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 00
	P.C.C. (1	:4:8) Cement	0,23	m3 ka/m3	37	ka	5.30	196.00
		Sand Aggregate	0,470 0,95	m3/m3 m3/m3	0,11 0,22	m3 m3	1.060,00 530,00	117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry	3.15	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	53	No	22,00	1.166,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58,00 32,00
	R.C.C. s	ab (1:2:4)	0,15	m3				
		Cement Sand	308,53 0,440	kg/m3 m3/m3	46 0,07	kg m3	5,30 1.060,00	244 00 74 00
		Aggregate Reinforcement	0,88 40	m3/m3 kg/m3	0,13 6,0	m3 kg	530,00 41,00	69 DO 246 DO
	4" (290x	190 x100) Hollow Block Masonry Cover	0,72	m2	10	N	22.00	201.00
		Mortar (1:4)	0,0089	m3/m2	12	NO	22,00	264 JU
		Sand	1,070	m3/m3	0,01	кg m3	1.060,00	11,00
	Ventilati	on System EVC Pine (4* 20 ft land)			2	No	300.00	600.00
		PVC "T"-Piece (4") PVC Pine Cover (4")			2	No	60 D0 40 D0	120,00
	Subtot	al Processing Compartment					-	2 975 00
							-	
З.	Supers	tructure						
	4" (290x	190 x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,60	m2 No/m2	60	No	22.00	1 320 00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	12	ka	5 30	64.00
		Sand Water	1,070	m3/m3 I/m3	0 D 3 6	m3 	1.060,00 0,00	32,00 0,00
	Ferro Ce	ment (1:3)	0,16	m3				
		Cement Sand	493.03 1,070	kg/m3 m3/m3	79 0,17	kg m3	5,30 1.060,00	419,00 180,00
	Door							
		Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cn Steel Bar Hinges (6 mm dia.)	n)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies	Jalies			1	No	110,00	110,00
	Subtot	al Superstructure						2.686,00
4.	Stairca	se						
	Excavati	on	0,06	m3				
		Excavation	1,00	m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0 D 6	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30.00	720.00
		Mortar (1:4) Cement	0,02 382,33	m3 ka/m3	8	ka	5.30	42.00
		Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtot	al Staircase						800,00
5.	Other H	Hardware			4	No	1 000 00	1 000 00
		Washbasin Grevwater Pipe			1	No	160 D0 40 D0	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40 DO 250 DO	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtot	al Other Hardware						2.520,00
6.	Labour							
5.		Skilled Unskilled			4 10	days days	300,00 150,00	1.200,00 1.500,00
	Subtot	al Labour				199 6 9999	a seroit da	2.700.00
	Grand	Iotal						12.227,00

figure 5: Cost estimate for "Design 2"





	9	Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8)	0,23	m3 kalm2	27	ka	E 20	106.00
	Sand Aggregate	0,470	m3/m3 m3/m3	0,11 0,22	m3 m3	1.060,00 530,00	196,00 117,00 117,00
	Subtotal Foundation					-	546,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4) Cement	3,15 16,67 0,0089 382,33	m2 No/m2 m3/m2 ka/m3	53 11	No ka	22,00 5.30	1.166,00
	Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. Slab (12:4) Cement Sand Aggregate Perforcement	0,15 308,53 0,440 0,88	m3 kg/m3 m3/m3 m3/m3 kg/m3	46 0,07 0,13	kg m3 m3	5,30 1.060,00 530,00 41.00	244,00 74,00 69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0.72	m2	0,0	ng	41,00	240,00
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	12	No	22,00	264,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilation System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 80,00
	Subtotal Processing Compartment						2.975,00
3.	Superstructure						
	Bamboo Mats (130 x 180 cm) Bamboo Sticks (ca. 4 cm dia., 18 ft long)			7 13	No No	200,00 100,00	1.400,00 1.300,00
	Subtotal Superstructure					-	2.700,00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement Sand	0,02 382,33 1,070	m3 kg/m3 m3/m3	8	kg m3	5,30 1.060.00	42,00 21.00
	Subtotal Staircase	1,010	monto	0,02	ine		800,00
	2 (1)						
э	Unier Hardware Urine-Diversion Squatting Pan & Cleansing Bow Washbasin Greywater Pipe Urine Pipe Urine Collection Container (20 I) Cleansing Water Pipe Bucket (Cover Material) Bucket (Water) Cleansing Water Infiltration	И		1 1 2,5 1,5 2 2,5 1 1 1	No M M M No LS	1.000,00 160,00 40,00 250,00 40,00 150,00 150,00 300,00	$\begin{array}{c} 1.000,00\\ 160,00\\ 100,00\\ 60,00\\ 500,00\\ 100,00\\ 150,00\\ 150,00\\ 300,00\\ \end{array}$
	Subtotal Other Hardware					2	2.520,00
6.	Labour Skilled			4	days	300,00	1.200,00
	Unskilled Subtotal Labour			8	days	150,00	1.200,00 2.400,00
	Grand Total					1 1 1	11.941.00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg	5,30	127,00
	Aggregate	0,95	m3/m3	0,14	m3	530,00	74,00
	Subtotal Foundation						1.561,00
2.	Processing Compartment						
	4" (290×190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100 mm)	4,20	m2 No/m2	70	No	22.00	1 540 00
	Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	14	kg	5,30	74,00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Aggregate Reinforcement	0,88	m3/m3 ka/m3	0,13	m3 ka	530,00	69,00 246,00
	4" (290x190x100) Hollow Block Masonry Cover	0,84	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
	PVC "T"-Piece (4") PVC Pipe Cover (4")			2	No No	60,00 40,00	120,00 80,00
	Subtotal Processing Compartment						3.424,00
3.	Superstructure						
	4" (290×190×100) Hollow Block Masonry	8,70	m2				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	145	No	22,00	3.190,00
	Sand Water	1,070 191	m3/m3	0,08	m3	5,50 1.060,00 0.00	85,00 0,00
	Door	3.5.5					
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.))		0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure					1000100	4.846,00
4.	Staircase						
••	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum	1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Subtotal Staircase	1,010	ma/ma	0,02	mo	1.060,000	797,00
-							
ο.	Uriner Dardware Urine-Diversion Squatting Pan & Cleansing Bowl Workhasin			1	No	1.000,00	1.000,00
	Greywater Pipe Urine Pipe			2,5 1,5	m	40,00	100,00 60,00
	Urine Collection Container (20 I) Cleansing Water Pipe			2 2,5	No m	250,00 40,00	500,00 100,00
	Bucket (Cover Material) Bucket (Water)			1	No	150,00 150,00	150,00 150,00
	Cleansing water inflitration				LS	300µ0.	2 520 00
						8	2.020,00
6.	Labour skilled			4	days	300,00	1.200,00
	unskilled			8	days	150,00	1.200,00
	SUDTOTAL LABOUR					9	2.400,00
	Grand Total					1	15.548,00

figure 7: Cost estimate for "Design 4"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Founda	tion						
	Excavati	on Excavation	0,57 1,00	m3 m3/m3	0,57	m3	80,08	46,00
	Murum	Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:	4:8) Cement Sand Aggregate	0,34 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	55 0,16 0,32	kg m3 m3	5,30 1.060,00 530,00	292,00 170,00 170,00
	Subtota	l Foundation					-	798,00
2	Process	sing Compartment						
-	Brick Wo	rk (Single Brick)	0,83	m3	and the second se		1.2.102.00	
		Bricks (230 × 110 × 70 mm) Mortar (1:4) Cement Sand	455 0,246 382,33 1,070	No./m3 m3/m3 kg/m3 m3/m3	378 78 0,22	No kg m3	3,50 5,30 1,060,00	1.323,00 413,00 233,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	m3 m3 kg	1.060,00 530,00 41,00	106,00 106,00 332,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2 Nio (m2	20	No	2.50	122.00
		Mortar (1:4) Cement	0,023	m3/m2 kg/m3		kg	5,30	32,00
	Plaster (1	5and 1:3)	0,04	m3/m3	υµz	ma	1.060,00	21,00
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4", 20 ft long) PVC "T"-Piece (4")			2	No No	300,00 60.00	600,00 120,00
		PVC Pipe Cover (4")			2	No	40,00	80,00
	Subtota	l Processing Compartment						4.023,00
3.	Superst	ructure						
	Brick Wo	rk (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
		Cement Sand	382,33 1,070	m3/m2 kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (1	l:3) Cement	0,09 493,03	m3 kg/m3	44	kg	5,30	233,00
	Door	Sand	1,070	m3/m3	0,10	md	1.060,00	106,00
	2200.00	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	1 48,00 405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 250 c Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	m)		5,0 3 1,4	m No kg	130,00 100,00 41,00	650,00 300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Staircas	5e						
	Excavatio	on Excavation	0,06 1.00	m3 m3/m3	0.06	m3	80.00	5.00
	Murum	Murum	0,06	m3 m3/m3	20.0	m3	200.000	12.00
	Brick Wo	rk (Single Brick)	0,17	m3	0,00	nio:	200,00	270.00
		Mortar (1:4) Cement	0,246	m3/m3 kg/m3	16	ka	5,30	270,00
	DI	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Plaster (1	::) Cement Sand	493.03 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	ll Staircase						452,00
5.	Other H	ardware					1 000 00	4 000 00
		Washbasin Greywater Pipe			1 2,5	No	160,00	160,00
		Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtota	l Other Hardware						2.520,00
6.	Labour	Skilled			6	davs	300.00	1,800.00
		Unskilled			12	days	150,00	1.800,00
	Subtota	l Labour						3.600,00
	Grand 1	Fotal						16.361,00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	mЗ	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	5,30 1.060,00	292,00 170,00
	Subtotal Foundation	0,95	marma	0,32	ma	550,00	798.00
							100,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4)	0,23	m3				
	Lement Sand Aggregate Reinforcement	0,440 0,88 35	kg/m3 m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	ка m3 m3 ka	5,30 1.060,00 530,00 41,00	376,00 106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2				
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	6,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System			2	Ne	200.00	000.00
	PVC Pipe (4", 20 ff tong) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	120,00 80,00
	Subtotal Processing Compartment					18	4.023,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 × 110 × 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	110	kg	5,30	583,00
	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Plaster (1:3) Cement Sand	493 D3 1,070	ma kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cr Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure					1	4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum	0,06	m3	0.05		200.00	12.00
	Brick Work (Single Brick)	0.17	m3	0,00	115	200,00	12,00
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	30, 5 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493 D3 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase						452,00
2.							
5.	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	Washbash Greywater Pipe Uting Ping			2,5	m	40,00	100,00
	Urine Collection Container (20 I) Cleansing Water Pine			3	No	250,00	750,00
	Bucket (Cover Material) Bucket (Water)			1	No No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
						19	
6.	Labour Skilled Unskilled			6 12	days davs	300,00 150,00	1.800,00 1.800.00
	Subtotal Labour						3.600,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundat	lion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rk (Single Brick) Bricks (230 x 110 x 70 mm)	0,50	m3 No./m3	228	No	3.50	798.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	47	kg	5,30	249,00
	P.C.C. (1:	sand 4:8)	0,17	m3/m3	0,13	ma	1.060,00	138,00
		Cement Sand	161,95	kg/m3 m3/m3 m3/m3	28 0,08	kg m3	5,30 1.060,00 630.00	148,00 85,00
	Subtota	l Foundation	0,00	marino	0,10	115	-	1.743,00
2	Process	ing Compartment						
	Brick Wo	rk (Single Brick)	0,97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	1,070	m3/m3	0,26	m3	1.060,00	276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8.1	m3 m3 ka	1.060,00 530,00 41.00	106,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2	4.			
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Water	382,33 1,070 191	Kgrm3 m3/m3 l/m3	0,02 3	kg m3	5,30 1.060,00 0.00	32,00 21,00 0.00
	Plaster (*	1:3)	0,04	m3			0,00	0,00
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	m System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	120,00 80,00
	Subtota	Processing Compartment					-	4.356,00
3.	Superst	ructure						
	Brick Wo	rk (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
		Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	97	kg	5,30	514,00
	Plaster (*	5anu 1:3)	0.09	m3	0,27	1115	1.000,00	200,00
	1	Ćement Sand	493,03 1,070	kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)			0,007	m3	21.200,00	148,00
		Galvanized Plain Steel Sheet (2 sheets (2) / 5 x 180 Steel Bar Hinges (6 mm dia.)	cm)		2,70	m2 kg	150,00 41,00	405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 2	150 cm)		5,0	m	130,00	650,00
		Bamboo Sticks (ca. 4 cm dia., 16 ft long) Steel Bar Hinges (6 mm dia.)			1,4	kg	41,00	300,00 57,00
	Subtota	I Superstructure						4.968,00
4.	Staircas	e						
	Excavati	on Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	Brick Wo	rk (Single Brick) Bricks (230 x 110 x 70 rom)	0,17 455	m3 No./m3	77	No	3.50	270.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	16	kg	5,30	85,00
	Diaster (Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	T IUSIGI (Cement Sand	493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtota	l Staircase					-	449,00
5.	Other H	ardware						
		Washbasin Grevwater Pine			1 25	No	160,00	1.000,00
		Unine Pipe Unine Collection Container (201)			1,5	m	40,00	60,00
		Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
		Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtota	l Other Hardware						2.520,00
6.	Labour							
		Skilled Unskilled			6 12	days days	300,00 150,00	1.800,00 1.800,00
	Subtota	I Labour					-	00,003.8
	Grand T	otal						17.636,00

figure 10: Cost estimate for "Design 7"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80.00	102.00
	Murum	0,66	m3	0.00			
	Murum Brick Mintk (Simple Brick)	1,05	m3/m3	0,69	m3	200,00	138,00
	Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	228	No	3,50	798,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	47 0,13	kg m3	5,30 1.060,00	249,00 138,00
	P.C.C. (1:4:8) Cement	0,17 161,95	m3 kg/m3	28	kg	5,30	148,00
	Sand Aggregate	0,470 0,95	m3/m3 m3/m3	0,08 0,16	m3 m3	1.060,00 530,00	85,00 85,00
	Subtotal Foundation						1.743,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,97 455	m3 No./m3	441	Nn	3.50	1.544.00
	Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	91	kg	5,30	482,00
	Sand RCC Slab (4:24)	1,070	m3/m3	0,26	m3	1.060,00	276,00
	Cement Sand	308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
	Aggregate Reinforcement	0,88 35	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Work (Half Brick) Cover Bricks (230 x 110 x 70 mm)	0,72 53	m2 No./m2	38	No	3,50	133,00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	6	kg	5,30	32,00
	Sand Plaster (1:3)	0,04	marma m3	0,02	ma	1.060,00	21,00
	Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
	PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60,00 40,00	1 2 0,00 80,00
	Subtotal Processing Compartment					-	4.356,00
3.	Superstructure						
	Adobe Brick Work (6")	2,46	m3				
	Clayey Soil Straw/Rice Husk	0,50	m3/m3 m3/m3	1,23 0,86	m3 m3	0,00 0,00	0,00 0,00
	Dung	0,15	m3/m3	0,37	m3	0,00	0,00
	Muci Plaster (3:1) Sand Clavev Soli	0,13 0,75 0,25	kg/m3 m3/m3	0,10	m3 m3	1.060,00	106,00
	Lime Plaster (21)	0,04	m3			0.00	0.00
	Clayey Soil	0,33	m3/m3	0,01	m3	0,00	0,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 15	l0 cm)		0,007	m3 m2	21.200,00	148,00
	Steel Bar Hinges (6 mm dia.)	0.0119		0,2	kg	41,00	8,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x Bamboo Sticks (ca. 4 cm dia. 18 ft long)	250 cm)		5,0	m	130,00	650,00
	Steel Bar Hinges (6 mm dia.)			1,4	kg	41,00	57,00
	Subtotal Superstructure						1.674,00
4.	Staircas e						
	Excavation Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	Brick Work (Single Brick)	0,17	m3				270.00
	Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	16	kq	5,30	270,00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Cement Sand	493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase					-	449,00
5	Other Hardware						
	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00 160,00	1.000,00 160,00
	Greywater Pipe Urine Pipe Urine Collection Container (20 I)			2,5	m m	40,00 40,00	100,00 60,00
	Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00
	Bucket (Water) Cleansing Water Infiltration			1	No LS	150,00 300,00	150,00 300,00
	Subtotal Other Hardware					-	2.520,00
6.	Labour						
	Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtotal Labour					-	4,200,00
	Grand Total					1.00	14.942,00

figure 11: Cost estimate for "Design 8"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84 DO
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196 DO 117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290 x	190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,15 16.67	m2 No/m2	53	No	22.00	1.166 DO
		Mortar (1:4) Cement Sand	0,0089 382,33 1,070	m3/m2 kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58 DO 32 DO
	R.C.C. S	ilab (1:2:4) Cement	0,15 308,53	m3 ka/m3	46	ka	5 30	244 00
		Sand Aggregate	0,440	m3/m3 m3/m3	0,07 0,13	m3 m3	1.060,00 530,00	74 DO 69 DO
	4" (290 v	Reinforcement	40	kg/m3	6,0	kg	41 JU	246 JU
	4 (250%	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0069	No/m2 m3/m2	12	No	22,00	264 DO
		Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	on System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2	No	60,00 40,00	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
3.	Supers	structure						
	4" (290 x	190×100) Hollow Block Masonry Hollow Blocks (290 × 190 × 100)	8,70 16,67	m2 No/m2	145	No	22.00	3,190,00
		Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	30	kg	5,30	159 DO
	Door	Sand	1,070	m3/m3	0.08	m3	1.060,00	92 NO
		Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm) Steel Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21 200 00 150 00 41 00	1 48 DO 405 DO 8 DO
	Jalies	Jalies (300 x 450 mm)			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 cm Bamboo Sticks (ca. 4 cm dia. 16 ft long))		3,0	m No	130,00 100,00	390.00 200.00
	0.14.4	Steel Bar Hinges (6 mm dia.)			1,0	kg	41,00	41 00
	Subtot	al Superstructure						4.846,00
4.	Stairca	ase						
	Excavat	ion Excavation	0,06 1,00	m3 m3/m3	0,06	m3	00,08	5,00
	Murum	Murum	<mark>0,06</mark> 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290 x	190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3 m3/m3	8	kg	5,30	42,00
	Subtot	al Staircase	1,070	Cincent	0,02	mo	1.000,00	800,00
5	Other I	⊣ardware Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No	1.000,00	1.000.00
		Greywater Pipe Vrine Pipe			2,5	m	40,00	100 D0 60 D0
		Urine Collection Container (20 l) Clean sing Water Pipe			2	No	250,00 40,00	500 DO 100 DO
		Bucket (Čover Material) Bucket (Water)			1	No No	150,00 150,00	150 DO 150 DO
	Subtot	Cleansing Water Infiltration			1	LS	300,00	300,00
	5 20101						0	2.520,50
6.	Labour	r Skilled			4	days	300,00	1.200.00
	Subtot	Unskilled			8	days	150,00	1.200,00
	- 40101							2.400,00
	Grand	Total						14.087,00

figure 42: Cost estimate for "Design 9"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Found	ation						
	Excavat	ion Excavation	<mark>0,40</mark> 1,00	m3 m3/m3	0,40	m3	80 DO	32,00
	Murum	Murum	0,40 1,05	m3 m3/m3	0,42	mЗ	200,00	84 00
	P.C.C. (1	:4:8) Cement Sand Aggregate	0,23 161,95 0,470 0,95	m3 kg/m3 m3/m3 m3/m3	37 0,11 0,22	kg m3 m3	5,30 1.060,00 530,00	196,00 117,00 117,00
	Subtot	al Foundation						546,00
2.	Proces	sing Compartment						
	4" (290x	190 x100) Hollow Block Masonry	3,15	m2	70	NI-	22.00	1 100 00
		Montav (1:4) Cement Sand	0,0089 382,33 1,070	m3/m2 kg/m3 m3/m3	11 0,03	kg m3	5,30 1.060,00	58 DO 32 DO
	R.C.C. s	lab (1:2:4)	0,15	m3				
		Cement Sand Aggregate	308,53 0,440 0,88	m3/m3 m3/m3 m3/m3	46 0,07 0,13	кg m3 m3	5,30 1.060,00 530,00	244 DU 74 DO 69 DO
	19 (20.0	Reinforcement	40	kg/m3	6,0	kg	41 00	246,00
	4 (290x	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67	No/m2 m3/m2	12	No	22,00	264,00
		Cement Sand	382,33 1,070	kg/m3 m3/m3	2 0,01	kg m3	5,30 1.060,00	11,00 11,00
	Ventilati	on System PVC Pipe (4", 20 ft long)			2	No	300.00	600.00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2	No No	60 DO 40 DO	120,00 80,00
	Subtot	al Processing Compartment						2.975,00
3.	Supers	structure						
	4" (290×	190 x100) Hollow Block Masonry	3,60	m2				
		Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67	No/m2 m3/m2	60	No	22,00	1.320,00
		Sand Water	1,070 191	m3/m3 I/m3	0,D3 6	m3 I	1.060,00 0,00	32,00 0,00
	Ferro Ce	ement (1:3)	0,16	m3 ka/m2	70	Les.	5 20	419.00
		Sand	1,070	m3/m3	0,17	m3	1.060,00	180,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 c Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200.00 150.00 41.00	1 48 DO 405 DO 8 DO
	Jalies					Ne	110.00	110.00
	Subtat	Jalles				NU		2 696 00
	Subtot							2.000,00
4.	Stairca	se						
	Excavat	ion Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum	Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x	190 x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
		Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Subtot	Sand al Staircase	1,070	m3/m3	0,02	m3	1.060,00	21 JU
	Subtot							
5.	Other I	Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
		Washbasin Greywater Pipe			1 2,5	No m	160,00 40,00	160,00 100,00
		Urine Pipe Urine Collection Container (20 I)			1,5	m No	40,00 250,00	60,00 500,00
		Cleansing Water Pipe Bucket (Cover Material) Bucket (Moter)			2,5	m No	40,00 150,00	100,00 150,00
		Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtot	al Other Hardware						2.520,00
6.	Labour	Skille d			4	days	300,00	1.200,00
	_	Unskilled			10	days	150,00	1.500,00
	Subtot	al Labour						2.700,00
	Grand	Total						12.227,00

figure 5: Cost estimate for "Design 2"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	0,40 1,00	m3 m3/m3	0,40	m3	80,00	32,00
	Murum Murum	0,40 1,05	m3 m3/m3	0,42	m3	200,00	84,00
	P.C.C. (1:4:8)	0,23	m3			2.22	Transford
	Cement Sand	161,95	kg/m3 m3/m3	37 0,11	kg m3	5,30 1.060,00	196,00 117,00
	Aggregate	0,95	m3/m3	0,22	m3	530,00	546.00
	eastean oundation					-	
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	3,15	m2 No/m2	53	No	22.00	1 166 00
	Mortar (1:4) Cement	0,0089	m3/m2 ka/m3	11	ka	5.30	58.00
	Sand	1,070	m3/m3	0,03	m3	1.060,00	32,00
	R.C.C. Slab (1:2:4) Cement	0,15 308.53	m3 ka/m3	46	ka	5.30	244.00
	Sand Aggregate	0,440	m3/m3 m3/m3	0,07 0.13	m3 m3	1.060,00	74,00 69,00
	Reinforcement	40	kg/m3	6,0	kg	41,00	246,00
	4" (290x190x100) Hollow Block Masonry Cover Hollow Blocks (290 x 190 x 100 mm)	0,72 16,67	m2 No/m2	12	No	22,00	264,00
	Cement Sand	382,33	kg/m3 m3/m3	2	kg m3	5,30 1.060.00	11,00
	Ventilation System	1,010	momo	0,01	1115	1.000,00	11,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No	300,00 60,00 40,00	600,00 120,00
	Subtotal Processing Compartment			-	NO		2.975,00
•	2						
Ј.	Bamboo Mats (130 x 180 cm)			7	No	200,00	1.400,00
	Subtotal Superstructure			13	NO	100,00	2 700 00
4.	Staircase						
	Excavation Excavation	0,06 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum Murum	0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	4" (290x190x100) Solid Block Masonry Solid Blocks (290 x 190 x 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtotal Staircase						800,00
5	Other Hardware						
	Urine-Diversion Squatting Pan & Cleansing Bow Washbasin	l.		1	No No	1.000,00 160,00	1.000,00 160,00
	Greywater Pipe Urine Pipe			2,5 1,5	m m	40,00 40,00	100,00 60,00
	Urine Collection Container (20 l) Cleansing Water Pine			2	No	250,00	500,00
	Bucket (Cover Material)			1	No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
	Subtotal Other Hardware						2.520,00
6.	Labour						
	Skilled Unskilled			4	days days	300,00 150,00	1.200.00 1.200.00
	Subtotal Labour						2.400,00
	Grand Total						11.941,00

figure 6: Cost estimate for "Design 3"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,96</mark> 1,00	m3 m3/m3	0,96	m3	80,00	77,00
	Murum Murum	0,09 1,05	m3 m3/m3	0,09	m3	200,00	18,00
	Random Rubble Masonry Rubble Masonry	0,87	m3				
	Stones Mortar (1:4)	1,05 0,3	m3/m3 m3/m3	0,91	m3	400,00	364,00
	Cement Sand	362,33 1,070	kg/m3 m3/m3	100 0,28	kg m3	5,30 1.060,00	530,00 297,00
	P.C.C. (1:4:8) Cement	0,15 161,95	m3 kg/m3	24	kg m3	5,30	127,00
	Aggregate	0,95	m3/m3	0,14	m3	530,00	74,00
	Subtotal Foundation						1.561,00
2.	Processing Compartment						
	4" (290x190x100) Hollow Block Masonry Hollow Blocks (290 x 190 x 100 mm)	4,20	m2 No/m2	70	No	22.00	1 540 00
	Mortar (1:4) Cement	0,0089	m3/m2 kg/m3	14	kg	5,30	74,00
	Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	R.C.C. Slab (1:2:4) Cement	0,15 308,53	m3 kg/m3	46	kg	5,30	244,00
	Sano Aggregate Pointercomment	0,88	m3/m3 m3/m3 ka/m3	0,07	m3 m3 ka	530,00	74,00 69,00 246,00
	4" (290×190×100) Hollow Block Masonry Cover	0.84	m2	0,0	49	41,00	240,00
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67 0,0089	No/m2 m3/m2	14	No	22,00	308,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	3 0,01	kg m3	5,30 1.060,00	16,00 11,00
	Ventilation System			2	No	300.00	600.00
	PVC T"-Piece (4") PVC Pipe Cover (4")			2	No No	60,00 40,00	120,00
	Subtotal Processing Compartment						3.424,00
-	2						
3.	Superstructure	8 70	m7				
	Hollow Blocks (290 x 190 x 100 mm) Mortar (1:4)	16,67	No/m2 m3/m2	145	No	22,00	3.190,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	30 0,08	kg m3	5,30 1.060,00	159,00 85,00
	Water	191	l/m3	15	1	00, 0	00,0
	Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cm Steel Bar Hinges (6 mm dia.)	1)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 150 Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)	cm)		3,0 2 1,0	m No kg	130,00 100,00 41,00	390,00 200,00 41,00
	Subtotal Superstructure					1044100	4.846,00
4	Staimase						
-	Excavation	0,05	m3				
	Excavation	1,00	m3/m3	0,05	m3	80,00	4,00
	Murum Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	4" (290×190×100) Solid Block Masonry Solid Blocks (290 × 190 × 100 mm)	24	No	24	No	30,00	720,00
	Mortar (1:4) Cement	0,02 382,33	m3 kg/m3	8	kg	5,30	42,00
	Sand	1,070	m3/m3	0,02	m3	1.060,00	21,00
	Subtotal StallCase					2	797,00
5.	Other hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1 000 00	1.000.00
	Washbasin Greywater Pipe			1 2,5	No m	160.00 40.00	160,00 100,00
	Urine Pipe Urine Collection Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
	Cleansing Water Pipe Bucket (Cover Material)			2,5	m No	40,00 150,00	100,00 150,00
	Bucket (Water) Cleansing Water Infiltration			1	LS	160,00 300,00	300,00
	Subtotal Staircase					- 	2.520,00
6.	Labour						
	skilled unskilled			4 8	days days	300,00 150,00	1.200,00 1.200,00
	Subtotal Labour						2.400,00
	Grand Total					÷	15 549 00
	WINING IVINI					6	10.040,00

figure 7: Cost estimate for "Design 4"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation							
	Excavation Excavation		0,57 1,00	m3 m3/m3	0,57	m3	00,08	46,00
	Murum Murum		0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand		0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	5,30 1.060,00	292,00 170,00
	Aggregate		0,95	m3/m3	0,32	m3	530,00	170,00
	Subtotal Foundation							798,00
2.	Processing Compartm	ent						
	Brick Work (Single Brick) Bricks (230 x 110	× 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement		0,246 382,33	m3/m3 kg/m3	78	kg	5,30	413,00
	Sand B.C.C. Slab (1:2:4)		0.23	m3/m3	0,22	ma	1.060,00	233,00
	Cement Sand		308,53 0,440	kg/m3 m3/m3	71 0,1	kg m3	5,30 1.060,00	376,00 106,00
	Aggregate Reinforcement		0,88 35	m3/m3 kg/m3	0,2 8,1	m3 kg	530,00 41,00	106,00 332,00
	Brick Work (Half Brick) Co Bricks (730 x 110	ver v 70 mm)	0,72	m2 No/m2	38	No	3.50	133.00
	Mortar (1:4) Cement	x 70 mm)	0,023	m3/m2 kg/m3	6	kq	5,30	32,00
	Sand		1,070	m3/m3	0,02	m3	1.060,00	21,00
	Plaster (1:3) Cement Sand		U,U4 493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System	81)			2	NG	200.00	000.00
	PVC Pipe (4, 20 PVC "T"-Piece (4 PVC Pipe Cover	π long) ") (4")			2	No	60,00 40,00	120,00
	Subtotal Processing C	ompartment					-	4.023,00
line.								
3.	Superstructure			-				
	Brick Work (Half Brick) Bricks (230 x 110	x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
	Cement Sand		382,33 1,070	kg/m3 m3/m3	97 0,27	kg m3	5,30 1.060,00	514,00 286,00
	Plaster (1:3) Cement		0,09 493,03	m3 kg/m3	44	kg	5,30	233,00
	Door		1,070	cinvent	0,10	cin	1.000,000	100,00
	Wooden Battens Galvanized Plain Steel Bar Hinges	(5.6 m @ 50 x 25 mm) Steel Sheet (2 sheets @ 75 x 180 cm) (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21,200,00 150,00 41,00	1 48 00 405 00 8,00
	Jalies Jalies				2	No	110,00	220,00
	Roof Corrugated A.C.	Sheets (6 mm, 2 sheets @ 105 x 250 c	m)		5,0	m	130,00	650,00
	Steel Bar Hinges	(6 mm dia.)			1,4	kg	41,00	57,00
	Subtotal Superstructu	re						4.968,00
4.	Staircase		12.22					
	Excavation Excavation		0,06 1,00	m3 m3/m3	0,06	m3	00, 08	5,00
	Murum Murum		0,06 1,05	m3 m3/m3	0,06	m3	200,00	12,00
	Brick Work (Single Brick) Bricks (230 x 110	× 70 mm)	0,17 455	m3 No./m3	77	No	3,50	270,00
	Mortar (1:4) Cement Sand		0,246 382,33	m3/m3 kg/m3 m3/m3	16 0.04	kg m3	5,30	85,00
	Plaster (1:3)		0,01	m3	0,04	ma	1.000 00	42,00
	Cement Sand		493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase						-	452,00
5.	Other Hardware	Austting Pan & Cleancing Baud			4	No	1 000 00	1.000.00
	Washbasin Grewater Pipe	qualiting r an & cleansing bow			1 2.5	No	160,00	160,00
	Urine Pipe Urine Collection (Container (20 I)			1,5 2	m No	40,00 250,00	60,00 500,00
	Clean sing Water Bucket (Cover M	Pipe aterial)			2,5	m No	40,00 150,00	100,00 150,00
	Cleansing Water	Infiltration			1	LS	300,00	300,00
	Subtotal Other Hardwa	ire					-	2.520,00
6.	Labour				e	dave	200.00	1 900 00
	Unskilled				12	days	150,00	1.800,00
	Subtotal Labour						-	3.600,00
	Grand Total						÷	16.361,00

figure 8: Cost estimate for "Design 5"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>0,57</mark> 1,00	m3 m3/m3	0,57	mЗ	80,00	46,00
	Murum Murum	0,57 1,05	m3 m3/m3	0,6	m3	200,00	120,00
	P.C.C. (1:4:8) Cement Sand	0,34 161,95 0,470	m3 kg/m3 m3/m3	55 0,16	kg m3	5,30 1.060,00	292,00 170,00
	Subtotal Foundation	0,95	marma	0,32	ma	550,00	798.00
							100,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,83 455	m3 No./m3	378	No	3,50	1.323,00
	Mortar (1:4) Cement Sand	0,246 382,33 1,070	m3/m3 kg/m3 m3/m3	78 0,22	kg m3	5,30 1.060,00	413,00 233,00
	R.C.C. Slab (1:2:4)	0,23	m3				
	Lement Sand Aggregate Reinforcement	0,440 0,88 35	kg/m3 m3/m3 m3/m3 kg/m3	0,1 0,2 8,1	ка m3 m3 ka	5,30 1.060,00 530,00 41,00	376,00 106,00 106,00 332,00
	Brick Work (Half Brick) Cover	0,72	m2				
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	6,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement Sand	0,04 493 D3 1,070	m3 kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilation System			2	Ne	200.00	000.00
	PVC Pipe (4", 20 ff tong) PVC "T"-Piece (4") PVC Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	120,00 80,00
	Subtotal Processing Compartment					18	4.023,00
3.	Superstructure						
	Brick Work (Half Brick) Bricks (230 × 110 × 70 mm)	12,50 53	m2 No./m2	663	No	3,50	2.321,00
	Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	110	kg	5,30	583,00
	Sand	1,070	m3/m3	0,31	m3	1.060,00	329,00
	Plaster (1:3) Cement Sand	493 D3 1,070	ma kg/m3 m3/m3	39 0,09	kg m3	5,30 1.060,00	207,00 95,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 cr Steel Bar Hinges (6 mm dia.)	m)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	148,00 405,00 8,00
	Jalies Jalies			2	No	110,00	220,00
	Subtotal Superstructure					1	4.316,00
4.	Staircase						
	Excavation Excavation	<mark>0,06</mark> 1,00	m3 m3/m3	0,06	m3	80,00	5,00
	Murum	0,06	m3	0.05		200.00	12.00
	Brick Work (Single Brick)	0.17	m3	0,00	115	200,00	12,00
	Bricks (230 × 110 × 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	77	No	3,50	270,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	16 0,04	kg m3	30, 5 1.060,00	85,00 42,00
	Plaster (1:3) Cement Sand	0,01 493 D3 1,070	m3 kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00 11,00
	Subtotal Staircase						452,00
2.							
5.	Other Hardware Urine-Diversion Squatting Pan & Cleansing Bowl			1	No	1.000,00	1.000,00
	Washbash Greywater Pipe Uting Ping			2,5	m	40,00	100,00
	Urine Collection Container (20 I) Cleansing Water Pine			3	No	250,00 40,00	750,00
	Bucket (Cover Material) Bucket (Water)			1	No No	150,00	150,00
	Cleansing Water Infiltration			1	LS	300,00	300,00
						19	
6.	Labour Skilled Unskilled			6 12	days davs	300,00 150,00	1.800,00 1.800.00
	Subtotal Labour						3.600,00
	Grand Total						15.959,00

figure 9: Cost estimate for "Design 6"





			Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundat	lion						
	Excavati	on Excavation	1,28 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum	Murum	0,66 1,05	m3 m3/m3	0,69	m3	200,00	138,00
	Brick Wo	rk (Single Brick) Bricks (230 x 110 x 70 mm)	0,50	m3 No./m3	228	No	3.50	798.00
		Mortar (1:4) Cement	0,246 382,33	m3/m3 kg/m3	47	kg	5,30	249,00
	P.C.C. (1:	sand 4:8)	0,17	m3/m3	0,13	ma	1.060,00	138,00
		Cement Sand	161,95	kg/m3 m3/m3 m3/m3	28 0,08	kg m3	5,30 1.060,00 630.00	148,00 85,00
	Subtota	Quantity Unit Vinit Quantity Unit Vinit Quantity Unit Vinit is ************************************	-	1.743,00				
2	Process	ing Compartment						
	Brick Wo	rk (Single Brick)	0,97	m3				
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	455 0,246	No./m3 m3/m3	441	No	3,50	1.544,00
		Sand	1,070	m3/m3	0,26	m3	1.060,00	276,00
	R.C.C. SI	ab (1:2:4) Cement	0,23 308,53	m3 kg/m3	71	kg	5,30	376,00
		Sand Aggregate Reinforcement	0,440 0,88 35	m3/m3 m3/m3 kg/m3	0,1 0,2 8.1	m3 m3 ka	1.060,00 530,00 41.00	106,00
	Brick Wo	rk (Half Brick) Cover	0,72	m2	4.			
		Bricks (230 x 110 x 70 mm) Mortar (1:4)	53 0,023	No./m2 m3/m2	38	No	3,50	133,00
		Cement Sand Water	382,33 1,070 191	Kgrm3 m3/m3 l/m3	0,02 3	кg m3	5,30 1.060,00 0.00	32,00 21,00 0.00
	Plaster (*	1:3)	0,04	m3			0,00	0,00
		Cement Sand	493,03 1,070	kg/m3 m3/m3	20 0,04	kg m3	5,30 1.060,00	106,00 42,00
	Ventilatio	n System PVC Pipe (4", 20 ft long)			2	No	300,00	600,00
		PVC "T"-Piece (4") PVC Pipe Cover (4")			2	No No	60,00 40,00	120,00 80,00
	Subtota	Processing Compartment					-	4.356,00
1	Superst	ructure						
	Brick Wo	rk (Half Brick) Bricks (230 x 110 x 70 mm)	11,00 53	m2 No./m2	583	No	3,50	2.041,00
		Mortar (1:4) Cement	0,023 382,33	m3/m2 kg/m3	97	kg	5,30	514,00
	Plaster (*	Sand I-3)	1,070	maima m3	0,27	m3	1.060,00	286,00
	, induction (Cement Sand	493,03 1,070	kg/m3 m3/m3	44 0,10	kg m3	5,30 1.060,00	233,00 106,00
	Door	Wooden Battens (5.6 m @ 50 x 25 mm)			0.007	m3	21.200.00	148.00
		Galvanized Plain Steel Sheet (2 sheets @ 75 x 180 Steel Bar Hinges (6 mm dia.)	l cm)		2,70 0,2	m2 kg	150,00 41,00	405,00 8,00
	Jalies	Jalies			2	No	110,00	220,00
	Roof	Corrugated A.C. Sheets (6 mm; 2 sheets @ 105 x 2	250 cm)		5,0	m	130,00	650,00
		Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)			3 1,4	No kg	100,00 41,00	300,00 57,00
	Subtota	I Superstructure					÷.	4.968,00
4.	Staircas	e						
	Excavati	on Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum	Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	Brick Wo	rk (Single Brick)	0,17	m3			0.50	
		Mortar (1:4)	400 0,246 387 33	m3/m3 kg(m3	16	ka	5,50	270,00
		Sand	1,070	m3/m3	0,04	m3	1.060,00	42,00
	Plaster (*	I:3) Cement Sand	0,01 493,03 1.070	m3 kg/m3 m3/m3	5 0.01	kg m3	5,30 1.060.00	27,00
	Subtota	l Staircase					-	449,00
5	Other H	ardware						
	o thời h	Urine-Diversion Squatting Pan & Cleansing Bowl Washbasin			1	No No	1.000,00 160,00	1.000,00 160,00
		Greywater Pipe Urine Pipe			2,5	m	40,00 40,00	100,00
		Cleansing Water Pipe Resident (Cover Material)			2,5	m	250,00 40,00	500,00
		Bucket (Water) Cleansing Water Infiltration			1	No	150,00	150,00
	Subtota	l Other Hardware					-	2.520,00
c	Lak							
u.	LanonL	Skilled Unskiller			6 12	days days	300,00	1.800,00
	Subtota	Labour					.00,00	00,003.8
	Grand T	ofal					-	17 636 00
	or and 1	5.4						10,000

figure 10: Cost estimate for "Design 7"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
1.	Foundation						
	Excavation Excavation	<mark>1,28</mark> 1,00	m3 m3/m3	1,28	m3	80,00	102,00
	Murum Murum	0,66	m3 m3(m3	0.69	m3	200.00	138.00
	Brick Work (Single Brick)	0,50	m3	220		2.50	700.00
	Bricks (230 x 110 x 70 mm) Mortar (1:4) Cement	455 0,246 382.33	NOJM3 m3/m3 ka/m3	47	N0 ka	3,50	249.00
	Sand	1,070	m3/m3	0,13	m3	1.060,00	138,00
	Cement Sand Aggregate	161,95 0,470 0,95	kg/m3 m3/m3 m3/m3	28 0,08 0,16	kg m3 m3	5,30 1.060,00 530,00	1 48, 00 85, 00 85, 00
	Subtotal Foundation					-	1.743,00
2.	Processing Compartment						
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,97 455	m3 No./m3	441	No	3,50	1.544,00
	Mortar (1:4) Cement Sand	0,246 382,33 1.070	m3/m3 kg/m3 m3/m3	91 0.26	kg m3	5,30 1.060.00	482,00 276.00
	R.C.C. Slab (1:2:4)	0,23	m3				
	Cement Sand Accente	308,53 0,440 0.88	kg/m3 m3/m3 m3/m3	71 0,1 0,2	kg m3 m3	5,30 1.060,00 530.00	376,00 106,00 106,00
	Reinforcement	35	kg/m3	8,1	kg	41,00	332,00
	Brick Work (Half Brick) Cover Bricks (230 x 110 x 70 mm) Monter (1-4)	0,72 53 0.023	m2 No./m2 m3(m2	38	No	3,50	133,00
	Cement Sand	382,33 1,070	kg/m3 m3/m3	6 0,02	kg m3	5,30 1.060,00	32,00 21,00
	Plaster (1:3) Cement	0,04 493,03	m3 kg/m3	20	kg	5,30	106,00
	Sand Ventilation System	1,070	m3/m3	0,04	m3	1.060,00	42,00
	PVC Pipe (4", 20 ft long) PVC "T"-Piece (4")			22	No No	300,00 60,00	600,00 120,00
	PVC Pipe Cover (4") Subtotal Processing Compartment			2	No	40,00	80,00 4.356.00
	-						
3.	Superstructure Adobe Brick Work (6'')	2.46	m3				
	Adobe bricks and mortar Clayey Soil	0,50	m3/m3	1,23	m3	0,00	0,00
	Strawikice Husk Dung	0,35	m3/m3 m3/m3	0,86 0,37	m3 m3	0,00	0,00
	Mud Plaster (3:1) Sand Clavey Soil	0,13 0,75 0,25	m3 kg/m3 m3(m3	0,10	m3	1.060,00	106,00
	Lime Plaster (21)	0,04	m3	0,00			0,00
	Lime Clayey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00	0,00 0,00
	Door Wooden Battens (5.6 m @ 50 x 25 mm) Galvanized Plain Steel Sheet (2 sheets @ 75 x Steel Bar Hinges (6 mm dia.)	180 cm)		0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48, 00 405, 00 8, 00
	Roof Corrugated A.C. Sheets (6 mm; 2 sheets @ 105	іх 250 cm)		5,0	m	130,00	650,00
	Bamboo Sticks (ca. 4 cm dia., 18 ft long) Steel Bar Hinges (6 mm dia.)			3 1,4	kg	41,00	300,00 57,00
	Subtotal Superstructure						1.674,00
4.	Staircase		i nati				
	Excavation Excavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	Murum Murum	0,05 1,05	m3 m3/m3	0,05	m3	200,00	10,00
	Brick Work (Single Brick) Bricks (230 x 110 x 70 mm)	0,17 455	m3 No./m3	77	No	3,50	270,00
	Mortar (1-4) Cement	0,246 382,33 1,070	m3/m3 kg/m3 m2/m2	16	kg	5,30	85,00
	Plaster (1:3)	0,01	m3	0,04		1.000,00	42,00
	Cement Sand	493,03 1,070	kg/m3 m3/m3	5 0,01	kg m3	5,30 1.060,00	27,00
	Subtotal Staircase						449,00
5.	Other Hardware Unne-Diversion Squatting Pan & Cleansing Bow	л		1	No	1.000,00	1.000,00
	Washbasin Greywater Pipe Urine Pine			1 2,5	No m	160,00 40,00	160,00 100,00 60.00
	Urine Collection Container (20 I) Cleansing Water Pipe			2	No	250,00 40,00	500,00
	Bucket (Cover Material) Bucket (Water)			1	No No	150,00 150,00	150,00
	Subtotal Other Hardware			4	19	- 00,00	2.520,00
e	Labour						
α.	Skilled Unskilled			6 16	days days	300,00 150,00	1.800,00 2.400,00
	Subtotal Labour						4 200,00
	Grand Total					-	14.942.00

figure 11: Cost estimate for "Design 8"





		Quantity	Unit/Unit	Quantity	Unit	Unit Costs [INR/Unit]	Costs [INR]
n		0.61	m3				
q	cavation	1,00	m3/m3	0,61	m3	80,00	49,00
u	rum	0,81 1,05	m3 m3/m3	0,85	m3	200,00	170,0
(Canala	3:1) nd wey Soil	0,18 0,75 0,25	m3 kg/m3 m3/m3	0,14 0,05	m3 m3	1.060,00 0,00	148,00
0	undation						367,00
g	Compartment						
ł	Mork (6'') obe Bricks and Mortar	0,86	m3	maka	5007aa-	el acura	
	Clayey Soil Straw/Rice Husk Dung	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	0,43 0,30 0,13	m3 m3 m3	0,00 0,00 0,00	0,01 0,01 0,01
(Can	3:1) nd	0,05 0,75	m3 kg/m3	0,04	m3	1.060,00	42,00
a ((2:1)	0,25	m3/m3	0,01	rn3	0,00	.0,0
a	ne ivyey Soil	0,67 0,33	kg/m3 m3/m3	0 0,01	kg m3	0,00 0,00	0,00 0,00
ar	mboo Sticks (ca. 4 cm dia., 18 ft long)			15	No	100,00	1.500,00
u	d Plaster (31) Sand Clavev Soil	0,75	m3 kg/m3 m3/m3	0,12 0.04	m3 m3	1.060,00	127,00
	rstem						
V V	C Pipe (4", 20 ft long) C "T"-Piece (4") C Pipe Cover (4")			2 2 2	No No No	300,00 60,00 40,00	600,00 120,00 90,00
n	ocessing Compartment					interest of	2.469,00
:1	ture						
۱ di	Mork (6'') obe Bricks and Mortar	2,46	m3				
	Clayey Soll Straw/Rice Husk Dung	0,50 0,35 0,15	m3/m3 m3/m3 m3/m3	1,23 0,86 0,37	m3 m3 m3	0,00 0,00 0,00	0,00 0,00 0,00
(Can	3:1) nd	0,14	m3 kg/m3	0,11	m3	1.060,00	117,00
((2:1)	0,25	m3	0,04	ina	0,00	0,00
a	ne nyey Soll	0,67 0,33	kg/m3 m3/m3	0 0,02	kg m3	0,00 0,00	0,00 0,00
a	oden Battens (5.8 m @ 50 x 25 mm) Manized Plain Steel Sheet (2 sheets @ 75 x 180 cm) el Bar Hinges (6 mm dia.)			0,007 2,70 0,2	m3 m2 kg	21.200,00 150,00 41,00	1 48,00 405,00 8,00
olian	rrugated A.C. Sheets (6 mm; 2 sheets @, 105 x 250 c mboo Sticks (ca. 4 cm dia., 18 ft long) sel Bar Hinges (6 mm dia.)	m)		5,0 3 1,4	m No kg	1 30,00 1 00,00 41,00	650,00 300,00 57,00
u	perstructure					8.	1.685,00
(cavation	0,05 1,00	m3 m3/m3	0,05	m3	80,00	4,00
	rum	0,05	m3 m3/m3	0.05	m3	200.00	10.0
1	Mork (6")	0,17	m3	2000	936373		10400
dı	obe bricks and mortar Clayey Soil Straw/Rice Husk	0,50	m3/m3 m3/m3	0,09 0,06	m3 m3	0,00 0,00	0,00
(Dung 3:1)	0,15 0,08	m3/m3 m3	0,03	m3	0,00	0,00
ar	nd iyey Soil	0,75 0,25	kg/m3 m3/m3	0,06 0,02	m3 m3	1.060,00 0,00	64,00 0,00
((2:1) 18 19	0,01 0,67	m3 kg/m3 m3/m2	0	kg	0,00	0,0
t	aircase	0,00	morino	0,00	1113	-	78,00
1	ware						
a	ne-Diversion Squatting Pan & Cleansing Bowl Ishbasin Privater Pine			1 25	No No m	1.000,00 160,00 40.00	1.000,00 160,00 100,00
rii	ne Pipe ne Collection Container (20.0			1,5	m	40,00	60,00
e	eansing Water Pipe			2,5	m	40,00	100,0
J	cket (Water) ansing Water Infiltration			1	No	150,00	150,0
t	her Hardware					3	2.520,00
k	lled			6	days	300,00	1.800,0
2	skilled			16	days	150,00 -	2.400,00
a							4.200,00
a	bour						

figure 12: Cost estimate for "Design 9"





table 5: Cost comparison of "Design 1" to "Design 9"

Item	Design 1	Design 2	Design 3	Design 4	Design 5	Design 6	Design 7	Design 8	Design 9
Footing	546,00	546,00	546,00	1.561,00	798,00	798,00	1.743,00	1.743,00	367,00
Processing Compartment	2.975,00	2.975,00	2.975,00	3.424,00	4.023,00	4.023,00	4.356,00	4.356,00	2.469,00
Superstructure	4.846,00	2.686,00	2.700,00	4.846,00	4.968,00	4.316,00	4.968,00	1.674,00	1.685,00
Staircase	800,00	800,00	800,00	797,00	452,00	452,00	449,00	449,00	78,00
Other Hardware	2.520,00	2.520,00	2.520,00	2.520,00	2.520,00	2.520,00	2.520,00	2.520,00	2.520,00
Labour	2.400,00	2.700,00	2.400,00	2.400,00	3.600,00	3.600,00	3.600,00	4.200,00	4.200,00
Total	14.087,00	12.227,00	11.941,00	15.548,00	16.361,00	15.959,00	17.636,00	14.942,00	11.319,00





7 CONCLUSION

With this paper it is aimed to assess different UDD-toilets designs with respect to the construction materials used and the associated costs.

Three commonly applied building materials viz., country burned bricks, cement hollow blocks and Ferro Cement and two alternative building materials (i.e. sun-dried mud bricks and bamboo) have been investigated as main construction materials for UDD-toilets. But, there are many more possible combinations of construction materials/techniques (e.g. solid blocks made from locally available rock such as Laterite, etc.) than could be assessed. Finally, the choice of construction material, and the actual design of the UDD-toilet, strongly depends upon the availability or let's better say the non-availability of certain construction materials and the user's preferences towards one or the other material.

From figure 4 to figure 12 and table 5 it can be seen that processing compartments made from CHB atop a PCC slab foundation is the cheapest combination of conventional construction materials (second to processing compartments made from adobe bricks atop a mud floor, only). Cost for the PCC slab foundation and the CHB masonry are INR 546 and INR 2,975, respectively.

Total costs range from ca. INR 11,300 (Design 9) to ca. INR 17,600 (Design 7).

The preferred type of sanitation facilities in many parts of India is the stand-alone toilet that is not directly attached to the house, but is situated a bit off. But, by situating the UDD-toilet in such a way that one or 2 walls of an existing building may be used, construction costs can be brought down considerably.





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9 SKETCHES

ecosan ecological sanitation Assessment of Urine-Diversion Dehydration Toilet Designs with Respect to Construction Materials Used and Associated Costs Version 1, December 2nd, 2008





(source: M. Wafler)

figure 13: Schematic sketch of "Design1"







(source: M. Wafler)

figure 14: Schematic sketch of "Design2"


Assessment of Urine-Diversion Dehydration Toilet Designs with Respect to Construction Materials Used and Associated Costs Version 1, December 2nd, 2008





(source: M. Wafler)

figure 15: Schematic sketch of "Design3"





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