

**LATRINES FOR
IMPROVED METHODS OF
EXCRETA DISPOSAL
IN VILLAGES**

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LATRINES FOR IMPROVED METHODS OF EXCRETA DISPOSAL IN VILLAGES

The status of the health of the people in a village or nation is a measure of the human resources available to produce food, operate industries and to otherwise maintain the standard of living. Poor health not only takes workers from the fields and other places of employment, but it greatly burdens the reduced family income and brings suffering and sadness. The great majority of sickness and deaths now occurring in India can be prevented by proper health practices.

The following shows the average annual number of deaths from filth-borne diseases in India during the period 1940-49 as reported by physicians, health visitors, sanitary inspectors and village officials responsible for reporting the number of deaths and their causes.

Cholera	202,857
Dysentery and Diarrhoea	227,850
Typhoid and other Fevers' (excluding Malaria)	2,313,146

While the information on the number of cases of illness is incomplete a rough estimate could be obtained by multiplying the above number of deaths occurring annually by 20, which would indicate about 55,000,000 cases of the above diseases per year. This does not include hookworm and other worm diseases. Estimates of infection run as high as 75% of population in some areas. These figures represent a great economic loss in absence from work and cost of medical care as well as the untold suffering and loss of life.

The above listed diseases are transmitted through the faces from persons ill with the disease to those who are susceptible. This transmission of disease usually occurs by infected human wastes reaching the water or food supply directly or by flies. In addition, hookworm and other worm diseases are transmitted by the pollution of soil with faces from persons having the worm diseases. Thus the prevention or control of cholera, typhoid fever, diarrhoea, dysentery and the worm diseases depends upon breaking the chain or transmission of infected human excreta from one person to another. Safe water supplies and sanitary methods of human excreta disposal are essential in preventing the spread of these communicable diseases.

There are several sanitary methods of human excreta disposal. These methods meet the basic principles of disposal of excreta so that it will not—

- (1) Contaminate any drinking water or food supply;
- (2) Be accessible to flies and other insects, rodents, animals and other vehicles of transmission which may come in contact with food or drinking water;

- (3) Contaminate the surface of the soil and thus expose humans to hookworm disease;
- (4) Contaminate waters used for swimming, bathing or laundering;
- (5) Create a nuisance due to odour or unsightly appearance.

One method which does not comply with these principles, especially No. 3, is the indiscriminate spread of human excreta on the soil. Cysts of infectious diseases, tubercle bacilli and the eggs of hookworm and round worm disease may survive in excreta for long periods and may not be killed by the usual temperatures reached in composting. Hence, the spread of excreta containing these organisms on to the soil exposes the population to worm and other diseases and also may contaminate the vegetable crops. Another undesirable factor in this practice is the exposure of individuals who handle the excreta to the various filth-borne diseases and thereby maintaining foci from which these diseases may spread to the rest of the community. For these reasons human excreta should not be disposed of indiscriminately on the surface of the soil or handled unnecessarily by individuals. Pending further research to determine the time and conditions required to kill the infectious agents it is suggested that the practice of composting or otherwise using rich soil be discouraged.

Water flush toilets discharging into sanitary sewers and an adequate municipal sewage treatment plant or individual septic tanks provide the best means of sewage disposal. For various reasons these facilities are not practical for the major portion of the rural population, which comprises about 90 per cent of the total in India. Hence, it is essential that other sanitary methods be made available for this large segment of our population.

Sketches of several types of latrines are included here so that a type suitable to local conditions can be selected. These designs were developed by the States as indicated on each drawing. Other States may have equally suitable plans for latrines which were not readily available for inclusion in this brochure. In view of this and the fact that each State Directorate of Health Services is concerned with the improvement of village sanitation, a representative of that Directorate should be consulted for guidance and assistance in sanitation as well as other health problems.

Some of the most important factors which apply to each type of latrine follow :—

1. *Location* :—Latrines should be located at least 50 feet from a well water supply and should be at a lower elevation, so that the direction of flow of the ground water will be away from the well. Where there are creviced rock formations, such as lime-stone, utmost care must be exercised in locating the latrine to avoid contaminating the ground water supply. In such cases, the latrine pit or bore hole should not extend into the ground water table. Where possible, latrines should not be located in areas usually subject to flooding. The latrine plate should be surrounded by a compacted earth mound, the top of which should be above the usual storm water level.

2. *Squatting Plate.*—It is important that the squatting plate and foot rests be of the dimensions shown in the sketches in order to minimise soiling. The plate should be constructed of impervious materials, preferably porcelain or burnt clay. Where concrete is used, it should be given a hard and smooth finish.

3. *Vents.*—The size of the vent depends on the type of latrine. Wire mesh or other comparable screening should be used to the mosquito and-fly-proof vent at the top.

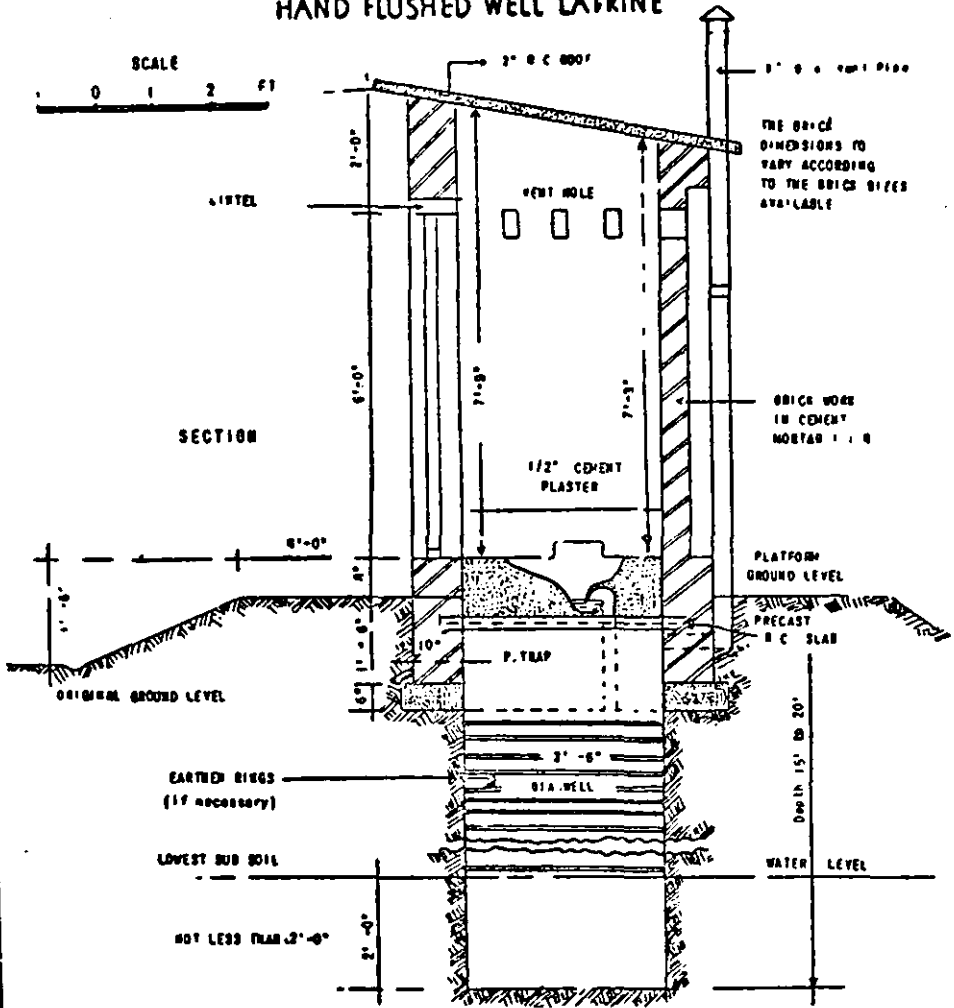
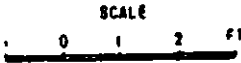
4. *Superstructure.*—Locally available materials should be used for the superstructure to provide shelter and privacy. While these are the primary purposes of the building a neat and attractive structure usually is better maintained.

5. *Maintenance.*—The length of time the bore hole, well or trench will be serviceable depends on several factors, including soil conditions, number of users, care in usage etc. The latrine should be used only for the intended purpose and not for the disposal of refuse or other debris which will rapidly fill the trench, well or other receptacle. The squatting plate should be washed down daily and the latrine otherwise kept clean. When the hole or other receptacle becomes filled to within two feet of the top, its use should be discontinued and earth should be compacted in the remainder of the place. A new trench or well should be made and the squatting plate moved to drain into it.

6. *Use.*—Each member of the household should be informed as to the importance of the latrine from the stand point of the health of the family, as well as the village. They should be encouraged to use the latrine at all times and to see that it is properly maintained.

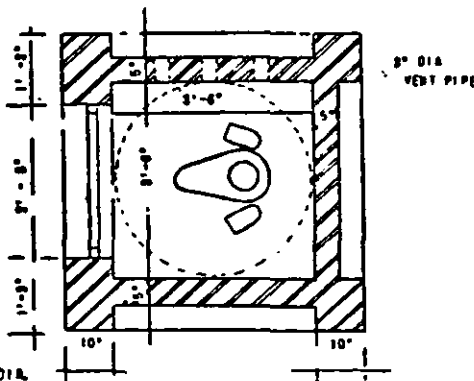
TYPE DESIGN
HAND FLUSHED WELL LATRINE

DRG No. 4-1



THE BRICK DIMENSIONS TO VARY ACCORDING TO THE BRICK SIZES AVAILABLE

PLAN

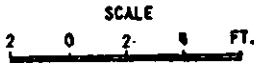


With courtesy of
Chief Engineer,
P. M. Engineering,
West Bengal.

ISSUED WITH SLIGHT MODIFICATIONS BY
THE MINISTRY OF HEALTH, GOVT. OF INDIA.

TYPE DESIGN HAND FLUSHED WELL LATRINE

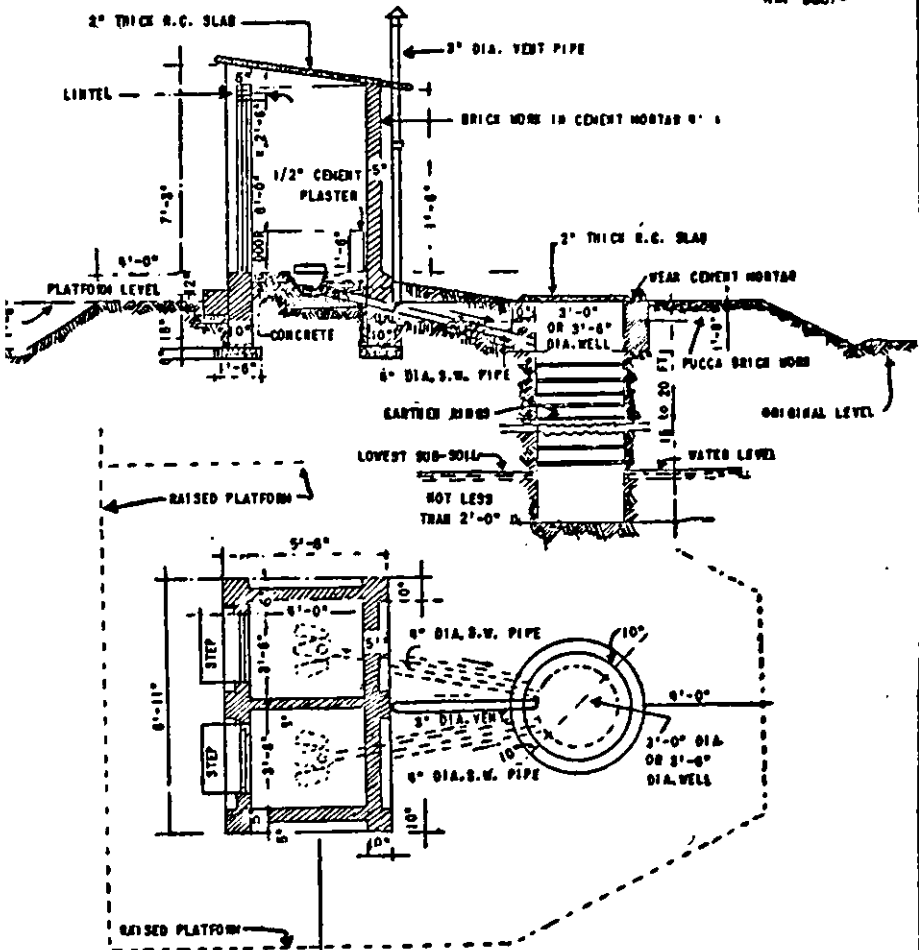
DRG. No. A-2



Brick dimensions to vary according to the brick sizes available

Latrine per seat ... Rs. 310/-
3'-0" Dia.
Earthen Ringwell ... Rs. 120/-
Sanitary fittings
Including pan..... Rs. 100/-
Rs. 530/-

SECTION



with courtesy of Chief Engineer,
P. N. Engineering, Govt. of West Bengal.
ISSUED WITH SLIGHT MODIFICATIONS BY THE
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SIX SEATED TRENCH LATRINE FOR VILLAGES

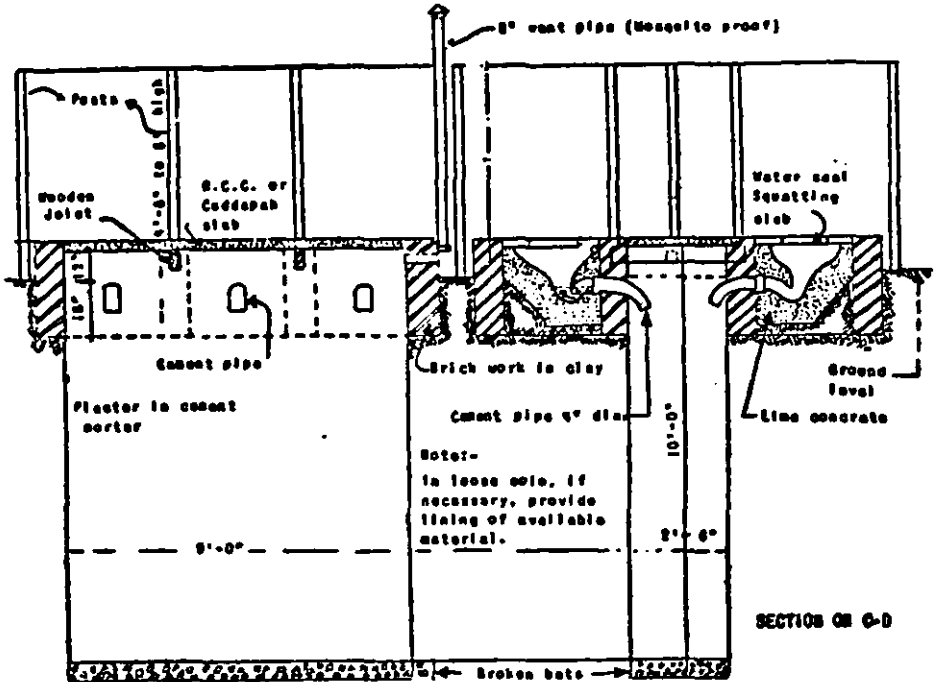
DRG. No. A-3

Suited to stiff soils

SCALE

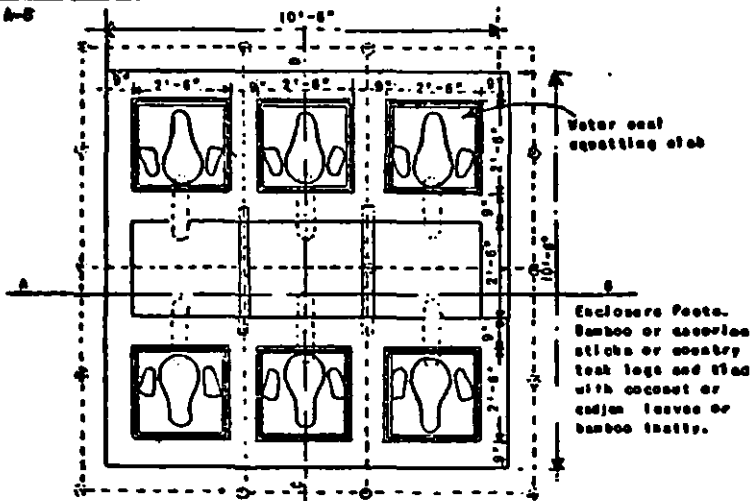
0 3 FT.

Brick dimensions to vary according to the brick sizes available.



SECTION ON G-D

SECTION ON A-B



With courtesy of Govt. of Madras.
ISSUED WITH SLIGHT MODIFICATIONS BY
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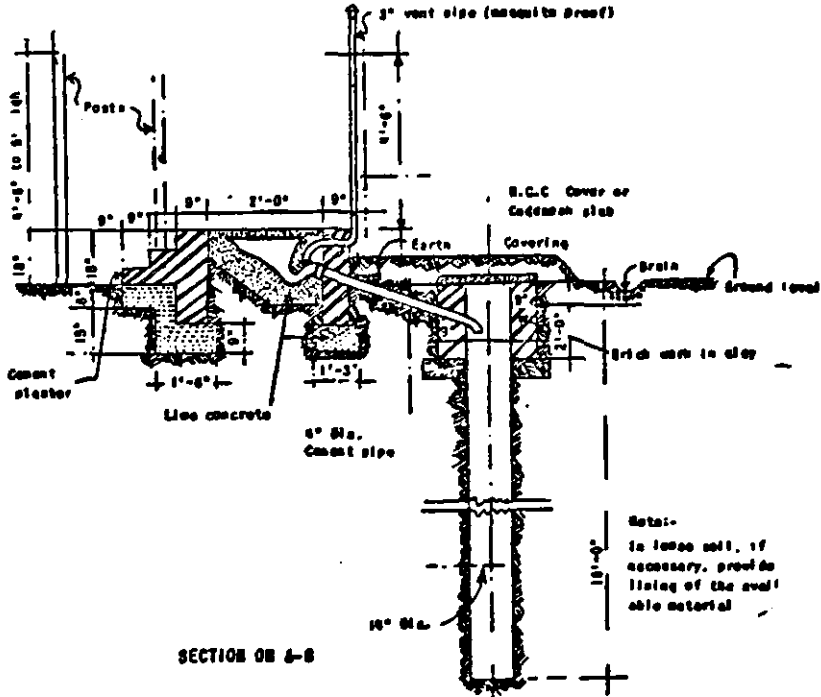
DESIGN FOR A SINGLE SEATED WATER BORNE BORE HOLE LATRINE

DRG. NO. 4-9

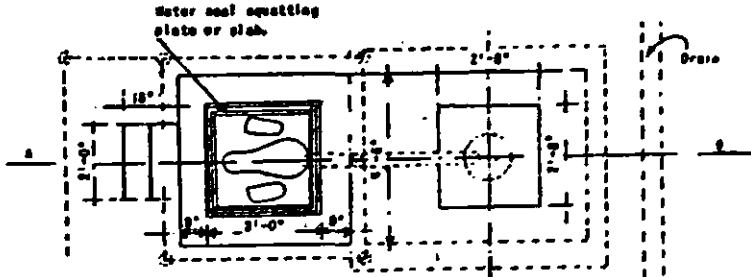
SCALE



Brick dimensions to vary according to the brick sizes available.



Note:-
In loose soil, if
necessary, provide
lining of the avail-
able material

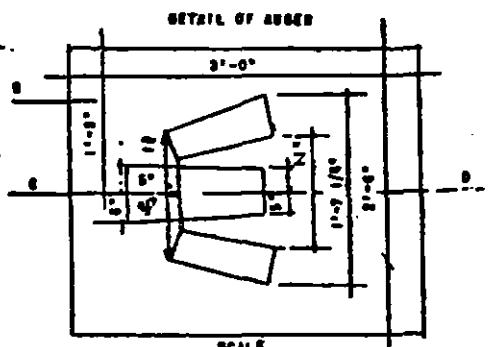
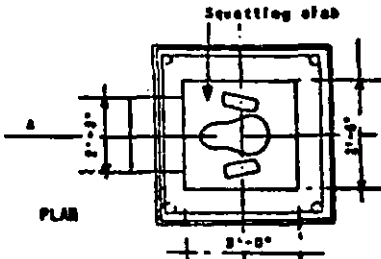
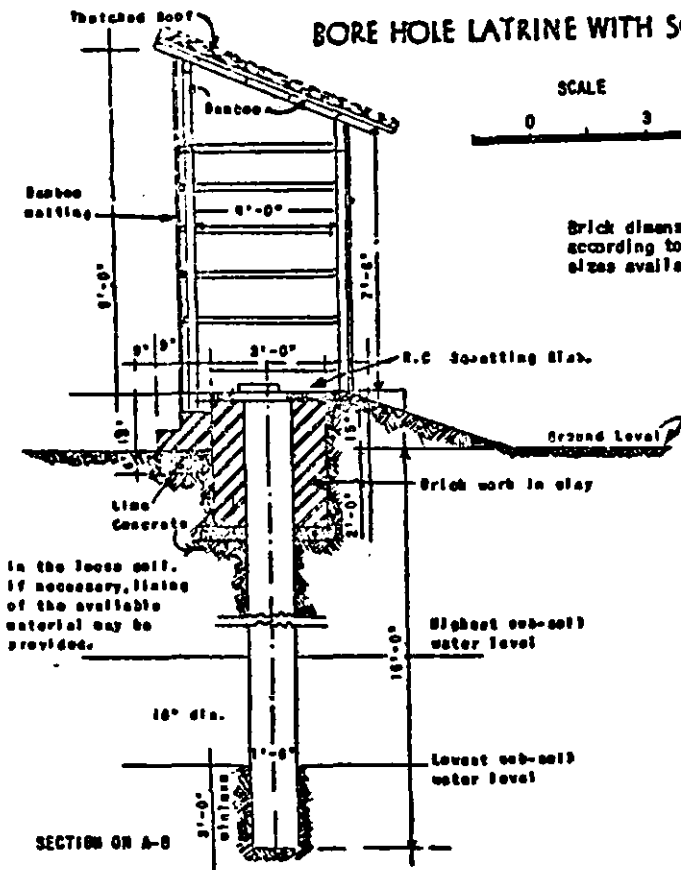


Enclosure Posts. Bamboo or casuarina sticks or country teak logs and tied with coconut or cadjan leaves or bamboo thally.

With courtesy of Govt. of Madras.

ISSUED WITH SLIGHT MODIFICATIONS BY THE
MINISTRY OF HEALTH, GOVT. OF INDIA.

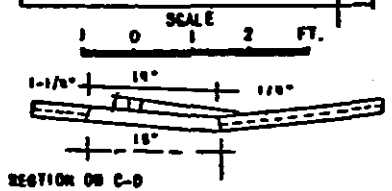
BORE HOLE LATRINE WITH SQUATTING SLAB



Enclosure Parts. Bamboo or Coarling sticks or country bamboo poles are tied with coconut or other leaves or banyan thaly.

With courtesy of Chief Engineer, P.W. Engineering, West Bengal.

ISSUED WITH SLIGHT MODIFICATIONS BY THE MINISTRY OF HEALTH, GOVT. OF INDIA.

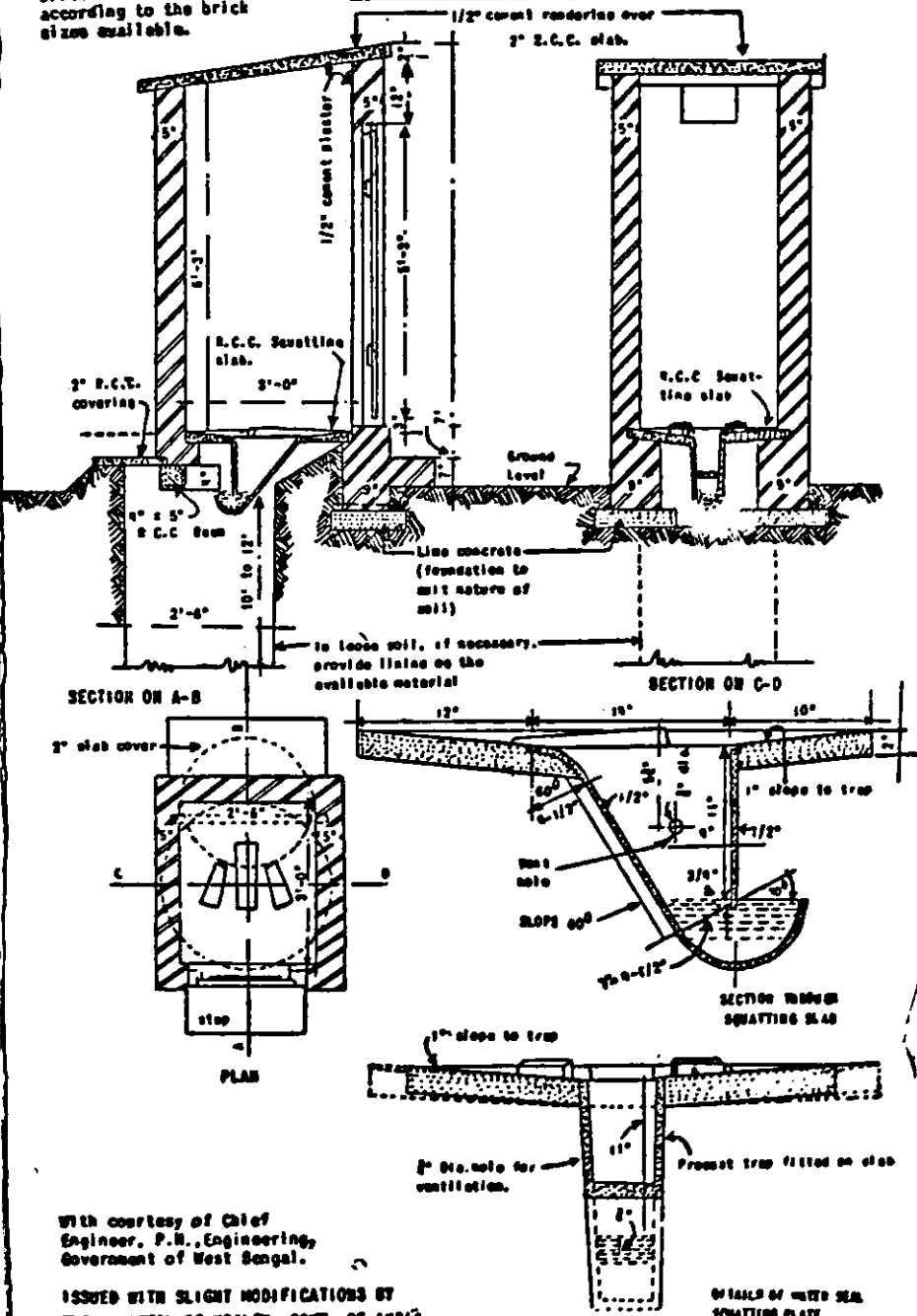


DUG WELL LATRINE

DES. No. 2-6

Brick dimensions to vary according to the brick sizes available.

0 SCALE 2 FT.



With courtesy of Chief Engineer, P.M., Engineering, Government of West Bengal.

ISSUED WITH SLIGHT MODIFICATIONS BY THE MINISTRY OF HEALTH, GOVT. OF INDIA.

DETAIL OF WATER SEAL SQUATTING PLATE.

DIRECTORATE GENERAL OF HEALTH SERVICES

New Delhi, 19th April, 1953.

“Supplement to Improved Methods of Excreta Disposal in Villages”

The brochure on the above subject issued on 24th January 1953, mentioned the importance of sanitary methods of human waste disposal set forth the more important factors of latrine construction and maintenance and included drawings of several types of latrines. This memorandum and the attached sheets are to supplement that brochure with more information on each type of latrine including detailed estimates of material required and the cost of construction.

The cost estimates of the several types of latrines are based on the kind of materials shown in the sketches and the cost of such materials and labour in the Delhi area. This cost will vary according to the price of materials and wage rates in different areas. Significant reductions in total cost below that shown in following pages may be achieved through the use of cheaper indigenous materials especially for the superstructure.

In the previous brochure it was recommended that the use of night soil for fertilizer be discouraged until research indicates the time required to kill worm eggs and amoeba cysts through composting or simple storage of human excreta. The All-India Institute of Hygiene and Public Health has been requested to investigate this problem. This investigation will require several months. In the meantime where the use of human excreta for fertilizer is an important economic factor and the people desire to use it, the excreta should not be taken from the compost pit or the latrine before it has been stored for atleast six months. Present information indicates that under proper conditions, storage of human excreta for six months gives some protection against the spread of worm diseases and amoebic dysentery.

Further information on various types of latrines follows :

Hand Flush Well Latrine

This type of latrine is shown in drawing No. A-I of the brochure entitled “Latrines for improved methods of excreta disposal in villages”. The excreta is discharged directly from the water seal into the well. The water seal prevents fly and mosquito breeding in the well or the earth pit. The well may be circular or rectangular and the depth may be less than that suggested in the drawing. The amount of water used for hand flushing and ablutions may be sufficient to maintain proper biological decomposition of the material. However, decomposition may be more

satisfactory when the well is deep enough to penetrate the ground water. A well 10 feet deep and $3\frac{1}{2}$ feet in diameter should last a family of five for several years.

The service required by this latrine is very little consisting only of flushing properly after each use and keeping the squatting plate clean. After several years use when the well becomes filled to within 2 feet of the top, a new one should be dug and the squatting plate and superstructure moved to the new location and the old well and contents covered with compacted dirt.

The bill of materials and estimate of cost for this type of latrine are shown in Table A-1. The total cost as per drawing is Rs. 280. By using cheaper materials for the superstructure and W.C. the cost of this unit could be reduced to Rs. 75 (excluding labour costs).

Well Latrine

This latrine is similar to the one shown in drawing No. A-1 except the superstructure and squatting plate are not located directly over the well. One advantage of this arrangement is that when the first well becomes full, a new one can be dug nearby and the drain pipe from the water seal moved to discharge into the new well without moving the latrine superstructure. Another advantage of this type is that two squatting plates can drain into a single well where double latrines are used.

The total estimated cost for this type of latrine with two squatting plates as shown in the drawing is Rs. 530 based on the W. Bengal prices. This estimate has been recomputed on Delhi prices and as shown in Table A-2 is Rs. 515. The use of cheaper materials for superstructure and W.C. and voluntary labour for excavation etc. together with the elimination of vent pipe would reduce the cost of this unit to about Rs. 125.

Six Seated Trench Latrine For Villages

At institutions, factories and other public places, multiple squatting plate latrines as shown in drawing No. A-3 may be practicable. However, before such a latrine is installed definite arrangements should be made for policing and properly maintaining these public latrines. Otherwise they are used improperly and become a nuisance.

The bill of materials and estimated cost are given for this six-seated latrine in Table A-3. The total cost is estimated at Rs. 875/-.

Single Seated Water-borne Bore Hole Latrine

The bore hole latrine with water seal and superstructure not directly over the hole is shown in drawing A-4. This type is very satisfactory where the soil is stable and rock formations are not encountered. Where the soil is unstable and the hole will fill by caving of banks or where rock makes it impracticable to go to a depth of about 15 feet, another type of latrine should be selected. The offset type of bore hole latrine does

not require moving of superstructure after a few years when a new hole is needed. The drain from the water seal can be moved to drain into the new hole.

The materials required and the cost estimate are shown in Table A-4. The total cost as per original drawing is Rs. 360. Footnotes in the table indicate certain items in the construction can be made available locally, others completely eliminated or substituted for. Thus the cost would be substantially lowered to Rs. 115. A further reduction in cost may be obtained in using local prices for materials.

Bore Hole Latrine With Squatting Slab

Drawing A-5 shows this type of latrine which is simple to construct and under proper conditions gives reasonably satisfactory service. There is no water seal and therefore flies and mosquitoes may breed in hole contents. However, if the hole is of maximum depth and it is not continued in use when it is filled to within about 5 feet of the top, darkness in the hole may discourage flies and mosquito breeding. When a new hole is bored, the squatting plate and superstructure must be moved to the new location and the old hole filled with earth.

The material required for construction is shown in Table A-5. The estimated cost as per drawing is Rs. 200. Many of the items listed in the Table can be provided by the villagers, as well as much of the labour. In this case the total cost of construction is estimated at Rs. 50.

Dry Well Latrine

This type is shown by drawing A-6. The superstructure may be located over about half the well shown in the drawing. However this involves extra cost for the concrete slab covering for the remainder of the well. This cover slab permits removal of the contents from the well which should be avoided except in unusual circumstances. The superstructure could be located directly over the well which would eliminate these features but require moving the superstructure when a new well is needed. The water seal can be constructed from concrete and set into the squatting plate with less difficulty than the water seals shown in other types of latrines.

The bill of materials and cost of this type are shown in Table A-6.

The total estimated cost is Rs. 225. By use of voluntary labour and local materials for superstructures the cost of this unit would be much less.

Water Seal Pit Latrine

This type is shown in drawing A-7. It has been especially designed for use in villages where the income is low, a factor which would prohibit the construction of the types shown in previous bulletin.

The essential sanitary features have in no case been sacrificed by this design. The major modification is in the superstructure where cheaper materials are used to replace brick and other expensive items. The

squatting slab illustrated here includes a water seal of simplest variety. This seal can be constructed of moulded clay and set into the concrete slab with very little difficulty or it can be of concrete as shown in the alternative detail on the drawing.

The bill of materials and cost are shown in attached Table A-7.

The total estimated cost is Rs. 65. By use of voluntary labour and local materials for the superstructure the cost would be reduced to about Rs. 12.

Simple Bore Hole Latrine

The latrine shown in drawing A-8 is designed to further reduce cost of construction while maintaining adequate sanitary features. In areas where soil conditions are suitable this bore hole design will prove quite satisfactory. The superstructure in this case is merely to provide privacy and slight protection from the elements. It may be constructed of mud or any indigenous material available locally.

The bill of materials and cost of this latrine as per drawing are shown in Table A-8.

The total estimated cost is Rs. 35. By use of voluntary labour and local materials, the cost of this latrine would be reduced to about Rs. 10.

TABLE A-1
Hand Flushed Well Latrine

Item No.	Sub-heads and items of works	Quantity	Rate Rs.	Per	Amount Rs.
1	Earth work in excavation for foundation and banking in 9" layers	20 cft.	28	1000 cft.	1
2	Digging 3' 6" diameter well 15 feet deep	575 cft.	4	100 cft	23
3	Lime concrete with 1 1/2" brick ballast and mortar 1 lime and 3 J Sand	14 cft.	88%	% cft.	12
4	R.C. concrete slabs 2' thick with steel upto 5 lbs.	8 1/2 cft.	4	cft.	34
5	Brick walls in cement mortar 1 : 4	110 "	50	% cft.	55
6	Door as per drawing	1	20	each	20
7	Vent pipe 3" diam. with guard and elbow fittings	12r ft	1/8	rft.	20
8	Indian type white glazed earthen ware W.C. Pan size 23" (Indian make) with 4" H.C.I. trap complete	1	42	each	42
	Add 5% contingencies				207] 10
				TOTAL	217

Excluding village labour and the vent and using cheaper materials for superstructure, and W.C. the cost of this unit could be reduced to about Rs. 75.

TABLE A-2

A-2 (Un-numbered on sketch)

Hand Flushed Well Latrine (2 seats)

Item No.	Sub-heads and items of work	Quantity	Rate Rs.	Per	Amount Rs.
1	Earth work in excavation for foundation and banking in 9" layers	40 cft.	28	1000 cft.	2
2	Digging 3' 6" diameter well 15 feet deep	575 cft.	4	100 cft.	23
3	Lime concrete with 1 1/2" brick ballast and mortar 1 lime and 3 sand	32 cft.	88	% cft.	28
4	R.C. concrete slabs 2" thick with steel upto 5 lbs.	50 sq. ft.	109	% sf.	55
5	Brick walls in cement mortar 1 : 4	150 sq. ft.	50	%sf.	75
6	Doors as per drawing	2	20	each	40
7	Vent pipe 3" diam. with guard and elbow fittings	18 rft.	2/8	rft.	45
8	Indian type white glazed earthenware W.C. pan size 23" (Indian make) with 4" H.C.I. trap complete	1	42	each	42
9	Soil pipe 4" H.C.I. to connect W.C. to well	Add 24 rft.	3/3	rft.	3210
					77
					387
					19
					406
				TOTAL	406

15

The use of cheaper materials for superstructure and W.C. and voluntary labour for excavation etc., together with eliminating the vent would reduce the cost of this type to about Rs. 125.

TABLE A-3
Construction of six seated latrines for villages—vide Drg. No. A-3

Item No.	Sub-heads and items of work	Quantity or No.	Rate Rs.	Per	Amount Rs.
1	Earth work in excavation in trenches in all soils including banking in 9" layers dressing etc. lead upto 1 chain and lift upto 5'-0"	90 cf.	28/-	0/00 cf	3-0
2	Mixed class brick work in mud mortar in foundation and plinth	140 cf.	73/-	%cf.	102-0
3	Reinforced cement concrete slab 3" thick 1:2 :4 mix. (1 cement, 2 B. sand and 4 D.R. stone ballast 3/4" gauge) and steel 5 lbs. per c/f rendering exposed surface, centering and shuttering etc.	45"	138/-	,,	62-0
4	Lime concrete with 1 1/4" Delhi Q.Z. stone ballast and mortar 1 lime : 3 sand	80	93/-	,,	74-0
5	Sal wood wrought and framed	3·1	11/13	,,	37-0
6	Providing and fixing split bamboo matting etc.	420 sf.	-/4/-	per sf.	105-0
7	Painting with wood preservative vis. coal tar	840 sf.	1/12	%cf.	15-0
8	Providing and fixing 4" H.C.I. soil and vent pipe	10 rft	3/3	rft	32-0
9	Providing and fixing 4" terminal guard for vent	1 No.	4/12	each	24-0
10	Providing and fixing 4" H.C.I. plain bend of the required degree	1 No.	5/10	each	6-0

TABLE A-3 (Contd).

	Quantity or No.	Rates Rs.	per	Amount Rs.
11 Providing and fixing 4" lead caulked joints to 4" H.C.I. pipes and fittings	8 Nos.	2/15	each	24-0
12 Providing and fixing Indian type white glazed earthenware W.C. pan-size 23" (Indian made) with 4" H.C.I. trap complete	6 Nos.	42/-	each	252-0
13 Providing laying and pointing 4" dia. unreinforced cement pipes with mortar 1:3 (1 cement :3 sand) for drainage	18' rft.	1/2	rft	20-0
14 Constructing soak pits 9'-0" X 2'-6" 10'-0" deep with lime lining etc.	1 No.	60/-	each	60-0
15 1½" thick cement concrete flooring 1:2:4 (1 cement, 2 BS and 4 D. R. Stone Ballast ¾" gauge) finished with a floating coat of neat cement	38 sft	40/-	% sft.	15-0
16 ½" cement plaster 1:3 (1 cement : 3 sand) finished with a floating coat of neat cement	140 sft	23/8	% sft.	33-0
				<hr/>
				835-0
				40-0
				<hr/>
				875-0
				<hr/>

Add 5% contingencies

Total

TABLE A-4

Constructing single seated water-borne, bore-hole latrine —Drawing A-4 of "Improved methods of excreta disposal in villages"

Item No.	Sub-head and items of work	Quantity or No.	Rate Rs.	Per	Amount Rs.
*1	Earth work in excavation in all soils and filling in foundations, plinth etc. in 6" layers i/c ramming, watering etc. lead upto 1 chain and lift upto 5'	58 cft.	28/-	%cft.	2
2	Lime concrete with 1½" D. Q. stone ballast and mortar (1 lime & 3 J.S.)	31cft.	93/-	%cft.	29
3	Mixed class brick work in mud mortar in foundations and plinth	37cft.	73/-	%cft.	27
4	Providing, laying and jointing 4" dia : unreinforced cement pipe with cement mortar 1:3 (1 cement : 3 Jamuna sand)	6 rft.	1/2/-	rft.	
**5	Providing and fixing Indian type white glazed earthenware W.C. from size 23" (Indian make) with 4" H.C.I. trap complete	1 No.	42/-	each	42
***6	Providing and fixing H.C.I. vent pipe	6 rft.	2/8/-	rft.	15
***7	providing and fixing 3" H.C.I. plain bend of the required degree	2 No.	3/13/-	each	8
***8	Providing and fixing 3" H.C.I. terminal guard	1 No.	3/6/-	each	3

Table A-4 (Contd.)

	Quantity or No.	Rates Rs.	per	Amount Rs.
*9 Boring hole in all sorts of soils (dia . of hole 14")	1			5
10 R.C.C. slab* thick 1:2:4 mix (1 cement , 1 Badarpore and 4 D.Q. ballast 3/4" guage) and steel 5 lbs./cft. i/c rendering the exposed surface centering and shuttering etc.	7 sqft.	138/	%sq. ft.	10
*11 P/F split bamboo jafri with matting etc. complete with jointings etc. wherever necessary	141 ,,	-/4/-	%1,,	34
12 1 1/4" thick C.C. flooring L; 2:4 (1cement, 2 Badarpore sand and 4 D.Q. stone ballast 3/4" gauge) finished with a floating coat of neat cement	20"	40-	%sq. ft	8
				190
				10
				200
				19

Add% contingencies

Total

* Where this type of latrine is being constructed in villages these items should be available locally.

** This is the Delhi commercial price for glazed W.C. This item can be constructed from concrete, at a cost of about Rs. 10/-.

*** These items can be eliminated without great difficulty.

TABLE A-5

Construction of a bore hole latrine with squatting slab as per Drawing No. A-5.

Item No.	Sub-heads and items of work	Quantity or No.	Rate	Per	Amount Rs.
*1	Earth work in excavation in all soils including in 9" layers dressing etc., lead upto one chain and lift upto 5 ft.	110 cft.	28/-	1000 cft.	3
*2	Boring hole 16" dia. in ordinary soil				
3	Lime concrete with 1 1/2 D. Q., Stone ballast and mortar 1 lime and 3 sand	4 cft.	93/-	% cft.	5 4
4	Mixed class brick work in mud mortar in foundation and plinth	23 cft.	73/-	% cft.	17 8
5	Providing and fixing R. C. C. squatting slab size 3'-0" x 2'-6" including ft. rests	1 No.	10/-	each	10
*6	Bamboo matting walls	140 sft.	-/4/-	sft.	35
*7	Thatch roofing	27 sft.	30	% sft.	7
					81
	Add 5% contingencies				4
				Total	85

Or About Rs. 30 excluding local labour and materials.

*These items usually can be provided by the villagers as well as much of the labour and materials for the

TABLE A-0

Construction of a Dug Well Latrine vide Drawing No. A' 6 6 6 6

Item No.	Sub-heads and items of work	Quantity or No.	Rate Rs.	Per	Amount Rs.
*1	Earth work in excavation in all soils including banking in 9' layers lead upto one chain and lift upto ft.	18 cft.	28/-	1000 cft.	1
2	Boring 2 1/2" dia. hole in ordinary soil upto 10 to 12 ft. deep	245cft.	4/-	100 cft.	10
3	Lime concrete with 1 1/2" brick ballast and mortar 1 lime and 3 sand	4cft.	88/-	,,	4
4	Providing R. C. C. beam proportion 1:2:4 (1 cement 2 sand 4 ballast 3/4 gauge) using steel upto 5 lbs.	1 cft.	4/-	cft.	4
5	R. C. C. slab 2" thick using steel upto 5 lbs.	2.5 cft.	4/-	,,	10
6	Providing and fixing pre-cast trap and squatting slab	1 No.	12/-	each	12
*7	Mixed class brick work in cement mortar 1: 6—1 cement 6 Jamuna sand in Foundation and Plinth	13 cft.	98/-	% cft.	13
*8	4 1/2" brick wall in cement mortar 1: 4—1 cement 4 sand	71 sft.	50/-	,,	36

TABLE A-6 (Contd.)

	Quantity or No.	Rate Rs.	per	Amount Rs.
*9 Providing and fixing a shutter as per design . . .	1 No.	20/-	each	20
10 $\frac{1}{2}$ " thick cement rendering over slab . . .	36 sft.	13/8/-	% sft.	8
*11 $\frac{1}{2}$ " thick cement plaster to walls in 1: 6 cement mortar (1 cement 6 sand)	135 "	13/8/-	"	18
				<hr/> 136
		Add 5% contingencies		6
			Total	<hr/> 142 ₹

*By use of voluntary labour and local materials for superstructure, cost of these items would be much less

	Water Seal Pit	Latrine	Rs.
1	Excavation of pit 36 cft.	. . . . .	2 0 0
2	Pit lining—22 sq. ft. @-/4/- sq. ft.	. . . . .	5 8 0
3	Brick foundation . . . . .	. . . . .	1 0 0
4	Concrete slab and water seal with about 5 lbs. reinforcing steel	. . . . .	12 0 0
5	Bamboo siding 90 sq. ft. @-/4/- sq. ft.	. . . . .	22 8 0
6	Posts and framing . . . . .	. . . . .	15 0 0
7	Thatch roof 20 sq. ft. @ Rs. 30/- 100 sq. ft.	. . . . .	6 0 0
		Total	64 0 0

23

*By use of voluntary labour and of material found locally, the cost of all materials may be eliminated except possibly the concrete slab and reinforcing steel. Hence the construction cost would be about Rs. 12/-.

TABLE A-8

Simple Bore Hole Latrine.

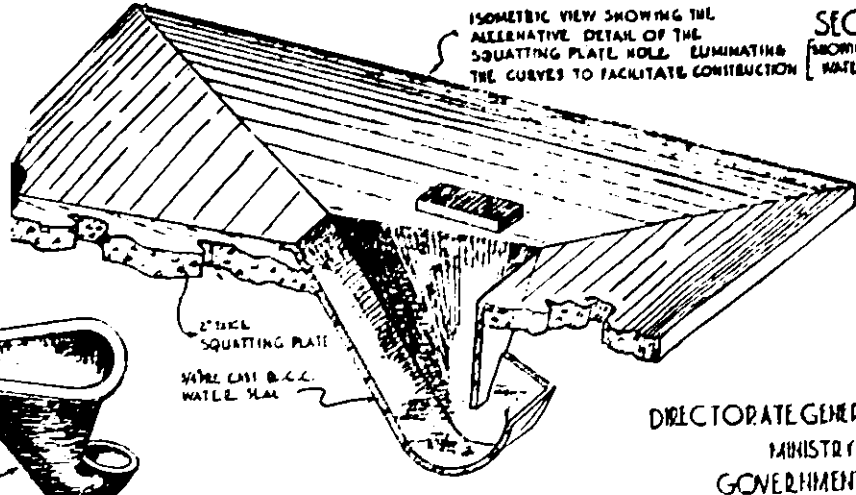
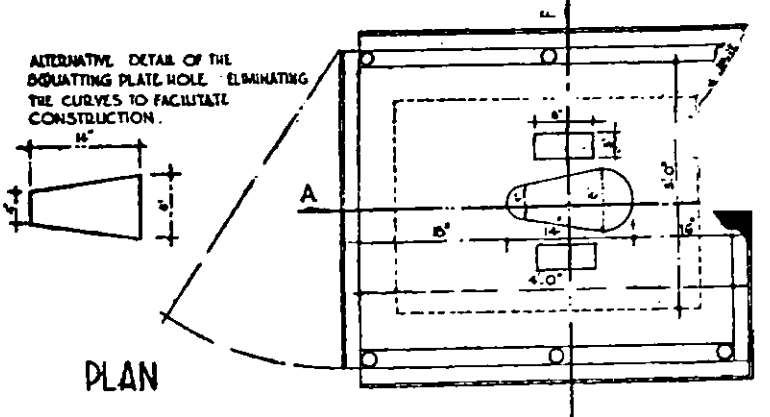
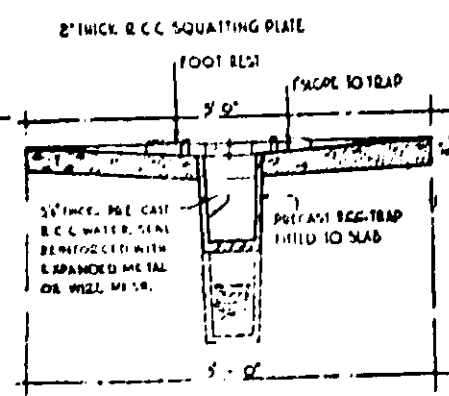
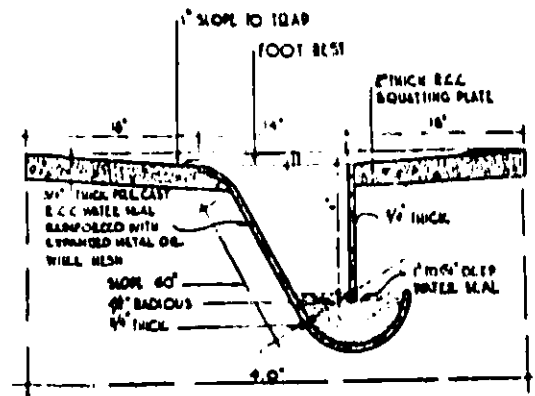
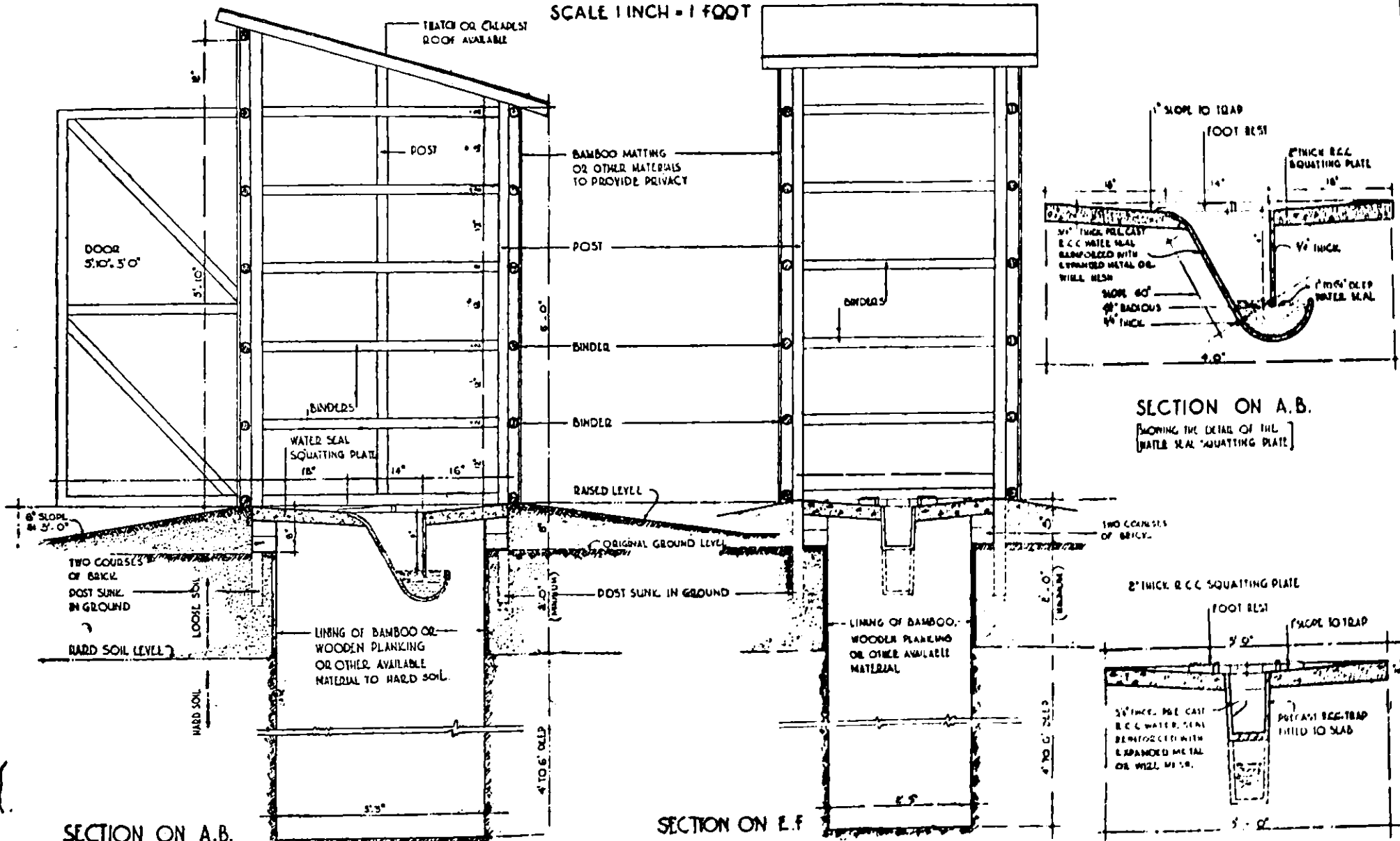
											Rs.	
1	*Boring hole	.	.	.	.	.	.	—Is	.	.	.	5 0 0
2	*Brick foundation	.	.	.	.	.	.	.	.	.	.	1 0 0
	Concrete squatting slab	.	.	.	.	.	.	.	.	.	.	10 0 0
3	*Mud walls	.	.	.	.	.	.	.	.	.	.	5 0 0
4	*Bamboo for door	.	.	.	.	.	.	.	.	.	.	3 0 0
5	*Thatch for roof 200 sq. ft. @ Rs. 30/100 sq. ft.	.	.	.	.	.	.	.	.	.	.	6 0 0
6	*Posts and framing	.	.	.	.	.	.	.	.	.	.	5 0 0
Total											35 0 0	

*By use of voluntary labour and materials found locally, the cost of this latrine can be reduced to that of concrete slab—Rs. 10/-.

WATER SEAL PIT LATRINE

DRAWING NO. A.7.

SCALE 1 INCH = 1 FOOT



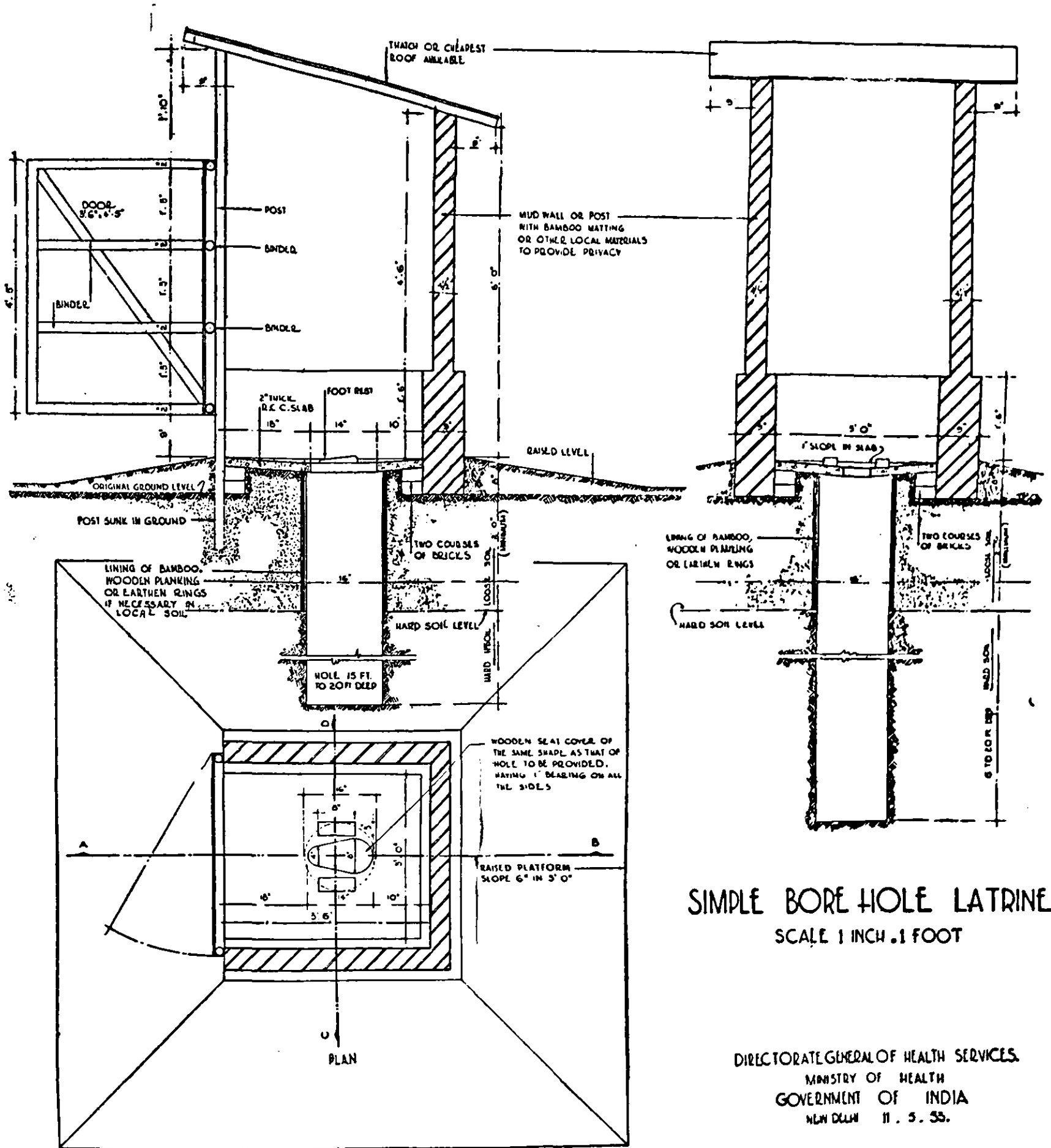
ISOMETRIC VIEW OF THE CIRCULAR WATER SEAL, AS SHOWN IN SECTION ON A.B. AND E.F. THE SAME MAY BE MOULDED OUT OF BURNT CLAY.

DIRECTORATE GENERAL OF HEALTH SERVICES,
MINISTRY OF HEALTH
GOVERNMENT OF INDIA
NEW DELHI 11.5.55.

SECTION ON A B

SECTION ON C D

DRAWING NO. A 6



SIMPLE BORE HOLE LATRINE
SCALE 1 INCH = 1 FOOT

DIRECTORATE GENERAL OF HEALTH SERVICES,
MINISTRY OF HEALTH
GOVERNMENT OF INDIA
NEW DELHI 11. 5. 55.

DRAWN BY S. R. PALMA