



Human Settlement Planning & Training Division
National Building Research Institute

2026

BEYOND THE TENT

Designing Transitional/ Temporary Shelters for
Long-Term Recovery & Upgradability



Beyond the Tent:
Designing Transitional/Temporary Shelters for
Long-Term Recovery and Upgradability

2026 March

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01. Beyond the Tent: Designing Transitional/Temporary Shelters for Long-Term Recovery and Upgradability

The National Building Research Institute (NBRI), as the focal point for landslide risk management in Sri Lanka, has been involved in the resettlement of landslide-affected communities over the past decade. Accordingly, affected communities are required to be resettled in safer locations based on comprehensive technical assessments. This process usually takes several months, as it involves a series of administrative procedures required to ensure safe resettlement.

However, affected communities cannot remain for long periods in temporary shelters, which are constructed with temporary materials and intended only for short-term evacuation purposes. To address this issue, transitional shelters have been introduced to provide safe and temporary accommodation for a limited period, typically from six months to one year.

Under this process, safer lands are identified with the support of the Divisional Secretariat Divisions, and the selected lands are systematically allocated to beneficiaries for permanent residential purposes. Once beneficiaries obtain suitable land through the Divisional Secretariat, they are permitted to construct transitional shelters on the allocated land.

NBRI has been actively involved in developing transitional shelters since the Aranayake Resettlement Programme. The concept of transitional shelters has gradually evolved in terms of planning and design aspects, and improved temporary shelter models have been developed through research and field investigations. This document presents the current concept of transitional shelters and their design guidelines.

1.1 What is a Transitional Shelter?

Transitional Shelter is defined as an incremental process that supports families affected by disasters, allowing them to rebuild their lives while awaiting the construction of a permanent home. It is the necessary stage that moves displaced families out of high-density emergency shelters (like tents, schools, or public buildings) and into a safe, secure, healthy, and dignified living environment that is crucial for their psychological and livelihood recovery. (Refer diagram 1)

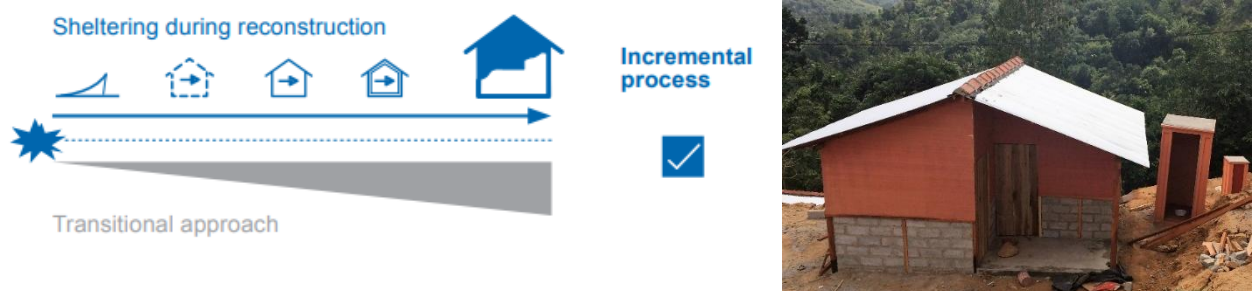
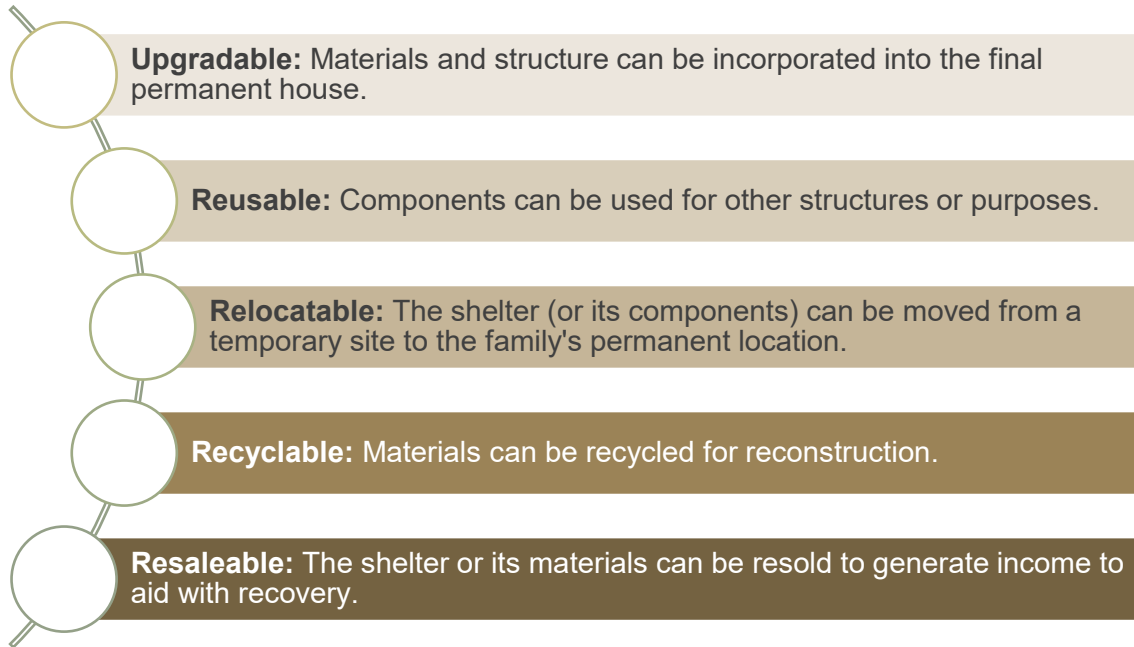


Diagram 1: A transitional shelter

(Source: International Organization for Migration et al., 2010)

1.2 Characteristics of the Transitional Shelter

The International Organization for Migration (IOM) identified the characteristics of transition shelters in 2010. For a shelter to be considered transitional, it must be designed with the long-term recovery process in mind, featuring the following five characteristics:



(Source: International Organization for Migration et al., 2010)

This transitional shelter is constructed on a portion of the allocated land, allowing beneficiaries to move from temporary evacuation shelters while they complete the construction of their resilient permanent houses. NBRI has gained considerable experience regarding the extended use of transitional shelters for other purposes. For instance, some of these shelters have later been used for storing household goods, small commercial activities, and as additional space for the permanent house.

1.3 Standard Measurements for Components of a Transitional Shelter

NBRI conducted various research studies related to the transition shelter development and their research improvements. Accordingly, standards are considered to develop transition shelters as well as resettlement activities with the support of international organizational documents. As result, standards and procedures have been identified to develop transitional shelters for the landslide victim communities.

Below are the standard measurements and guidelines for various components of transitional shelters based on internationally recognized minimum standards for emergency / temporary / transitional shelter principally given by Sphere Project (via its Sphere Handbook) and guidance by UNHCR and specific findings from post-disaster recovery programs, particularly in Sri Lanka.

1. Living/ Personal Space

- Personal Space: At least 3.5 m² (37.67 sq ft) per person for tropical climates, and 4.5–5.5 m² per person for colder climates.
- Total floor area for a family: A 14 m² (150.7 sq ft) minimum floor area for a family of 4.

2. Supporting Land Area

- Minimum 60 m² (645.83 sq ft) for each transitional shelter to accommodate the shelter, access paths, sanitation, and water facilities.

3. Wall and Roof Construction

- Wall height: 2.4 meters for adequate ventilation and headroom.
- Roof slope: Between 15–30 degrees to ensure proper water drainage.
- Roof overhang: 30–50 cm to protect from rain and sun exposure.

4. Sanitation and Water Facilities

- Water supply: A minimum of 15 liters per person per day.
- Toilets: One toilet for every 20 people in shared facilities or individual latrines in personal shelters.
- Sanitation area: 4–6 m² allocated for toilet and washing facilities per household.

5. Doors and Windows

- Door width: Minimum 0.8 meters to accommodate mobility and storage.
- Window dimensions: At least 10% of the floor area should be window space for ventilation and natural light.

6. Ventilation

- Ventilation openings: 0.5 m² of opening per person for sufficient airflow.
- Window height: Windows should be 0.6–1.0 m above the floor to maintain privacy and allow for air circulation.

7. Kitchen Area

- Cooking space: Minimum 2 m² (21.52 sq ft) for cooking activities.
- Cooking height: Stoves and cooking surfaces should be 80–90 cm from the ground for ergonomic use.

8. Safety and Resilience

- Wind resistance: Shelters should be designed to withstand local wind speeds, typically between 40–80 km/h.
- Water resistance: Shelters should be elevated at least 10–20 cm above the ground to prevent water ingress during rains.

9. User Satisfaction Features

- Privacy: Internal partitions or curtains for privacy, with a minimum partition length of 1.5–2 m per person.
- Lighting: 1 solar LED light per shelter to provide basic illumination at night.
- Storage: At least 2–3 m² (32.29 sq ft) of storage space for personal belongings.

1.4 Minimum size of the transitional shelter

The minimum building size of the transitional shelter was defined based on established standards. According to these standards, the living area is approximately 150 square feet, while the cooking area is estimated at 21.5 square feet. In addition, a lockable room is required within the transitional shelter to ensure privacy, equity, and gender considerations. Therefore, a minimum space of 80 square feet has been allocated for a lockable room. As a result, a total minimum floor area of **approximately 250 square feet** has been identified as the basic requirement for a transitional shelter.

This concept was approved following discussions with several stakeholders involved in disaster risk management activities. Accordingly, transitional shelters were constructed in several landslide-affected locations, and beneficiary feedback was collected to further improve the resettlement process. The following section discusses the lessons learned from resettlement activities conducted during the 2016–2017 period.

It was also observed that when transitional shelters were constructed without proper consideration of the layout of the future permanent house, they often had to be demolished during the construction of the permanent structure. As a result, additional costs were incurred in the resettlement process.

1.5 Lesson Learned

Temporary shelters were constructed at several resettlement sites in Kegalle and Ratnapura Districts in 2016 and 2017, respectively, with the support of USAID and the International Organization for Migration (IOM).

Kegalle Resettlement – 2016



Location:	Wasanthagama, Kalugala
Total Units:	About
Housing Components:	Kitchen, Master bed-room, Verandah
Area:	About 286 sqft
Material:	Cement block foundation Timber Stud Columns Cement Block Work Timber Panel Board Asbestos Roof Covering Timber Roof Frame

Since the temporary shelters were constructed in the middle of the land without consulting the NBRO, they will need to be demolished in most cases when constructing the permanent shelters. As a result, the use of these temporary shelters became ineffective.



Rathnapura Resettlement – 2017



Location:	Dombagammana Site
Total Units:	About 120 units
Housing Components:	Kitchen, Master bed-room, Verandah
Area:	About 286 sqft
Material:	Cement block foundation Timber Stud Columns Cement Block Work Timber Panel Board Aluminum Roof Covering Timber Roof Frame

The area selected for the temporary shelters was determined in consultation with NBRI, which identified the most suitable location. As a result, the temporary shelters are still being used for other purposes.



1.6 Planning and Designing Guideline for Placing the Transitional Shelter

Concerning the problems and feedback associated with the transitional shelters, the following planning guideline was designed to practice in future transitional shelter programmes.

1. **Setting out the transitional shelter on land:** The transitional shelter should be located on side of the land, which has adequate space for construction of the permanent shelter.

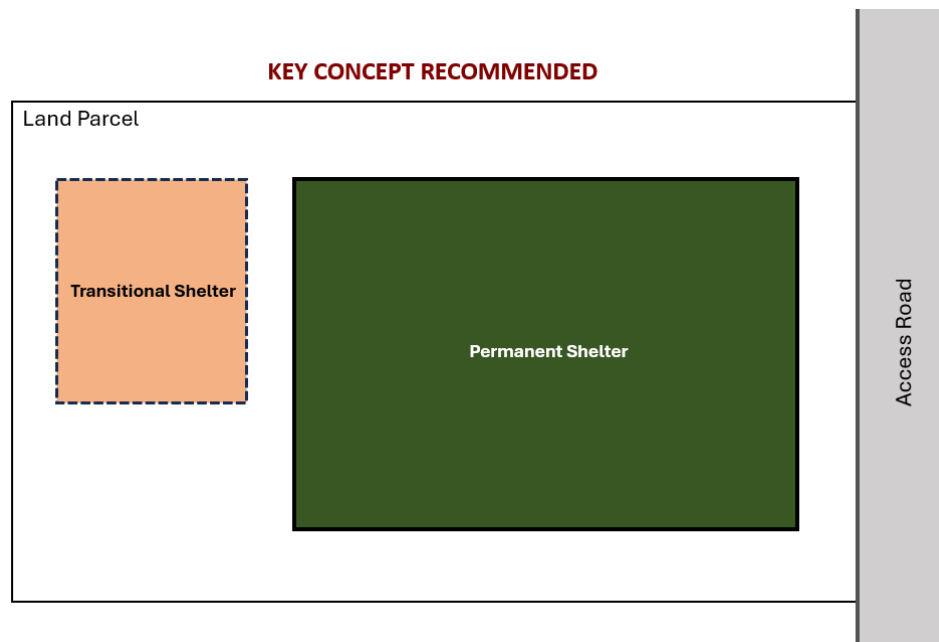


Diagram 2

2. **Should be located on original flat or gently sloping land:** The transitional shelter does not have very high structural strength; therefore, it should be constructed on flat or gently sloping ground. Furthermore, it should not be constructed on filled land, as such surfaces may undergo settlement and the structure may not be able to withstand ground movement.
3. **Ventilation and floor area:** Ventilation and minimum floor area should be maintained according to the general housing guidelines.
4. **Foundation:** A shallow foundation is typically provided for the transitional shelter, which is not suitable for long-term residential purposes. Therefore, the permanent house should be constructed as soon as possible. A simple foundation such as two layers of cement blocks with a concrete layer, or a similar design, can be used.
5. **Floor:** A 2-inch thick concrete floor can be provided in the transitional shelter to help prevent insects and moisture seepage from the ground.
6. **Wall construction:** Cement blocks should be used up to a height of about 3.5 feet to protect the structure from rainwater and other external impacts. The remaining wall area can be constructed using temporary materials.
7. **Doors and windows:** Door and window frames, as well as shutters, can be made using timber boards or permanent materials so that they can later be reused in the permanent house.
8. **Structural frame:** A timber column framework should be installed to connect the roof and wall structures. This framework helps to properly support the roof above the temporary wall materials. The timber columns should be securely tied to the cement block base to provide additional structural stability.
9. **Roof structure:** The roof structure should be lightweight and securely fastened to the timber framework.
10. **Sanitation:** A temporary or permanent toilet facility should be provided.
11. **Drainage:** Earth drains should be constructed around the transitional shelter to ensure proper surface water drainage.
12. **Basic services:** Minimum lighting and basic plumbing requirements should be considered.

02. Transitional House Design

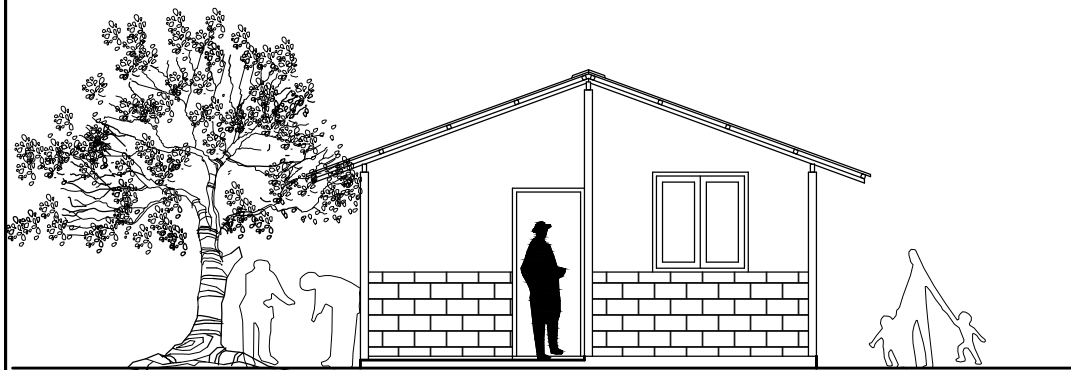
The transitional shelter has been designed in alignment with the established standards and specifications, which are as follows:

Total Area	285 SQ. FT.
Housing Components	Living and Dining area Kitchen 01 Bed Room (Lockable) Verrandah
Material	Cement block foundation Timber Stud Columns Cement Block Work Timber Panel Board Aluminum Roof Covering Timber Roof Frame

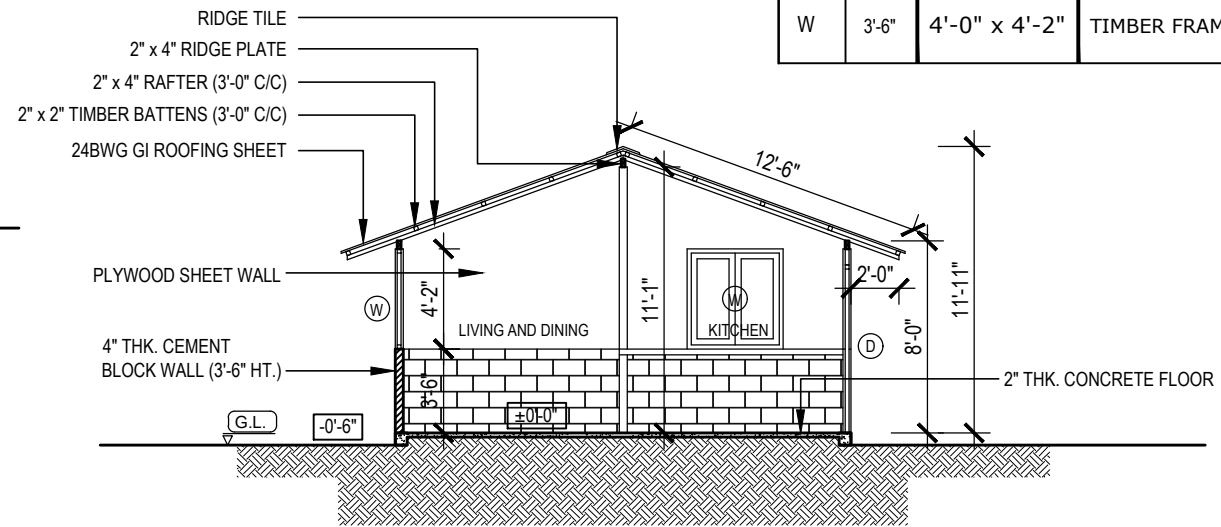


SCHEDULE OF DOORS & WINDOWS

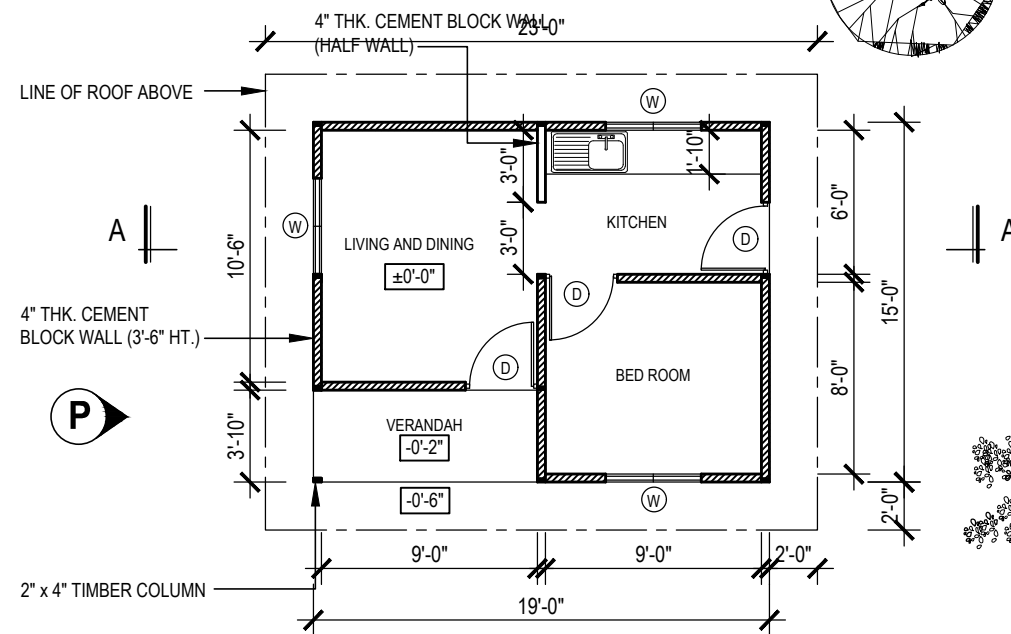
TYPE	SILL HT.	SIZE	DESCRIPTION	NOS
D	-	3'-0" x 7'-0"	TIMBER FRAMED PLYWOOD DOOR	3
W	3'-6"	4'-0" x 4'-2"	TIMBER FRAMED PLYWOOD WINDOW	3



FRONT ELEVATION

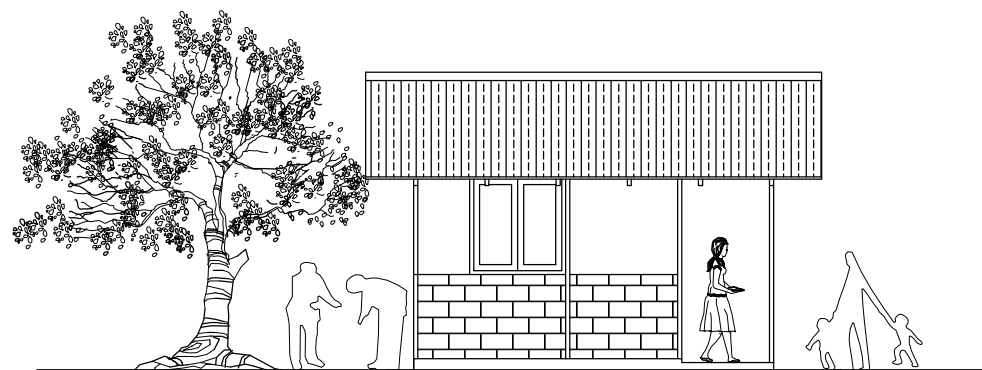


SECTION A-A



FLOOR PLAN

FLOOR AREA - 285 SQ.FT.



SIDE ELEVATION (P)

IMPORTANT NOTES:

- 1) THIS DRAWING IS PREPARED BASED ON A HYPOTHETICAL SCENARIO, ASSUMING FLAT TERRAIN AND NORMAL GROUND CONDITIONS.
- 2) ALL DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO CONSTRUCTION.
- 3) INTERNAL AND EXTERNAL WALLS SHALL COMPRISE 4" THICK CEMENT BLOCKWORK UP TO A HEIGHT OF 3'-6", WITH THE UPPER PORTION CONSTRUCTED USING SUITABLE PLYWOOD SHEETS OR APPROVED EQUIVALENT LIGHTWEIGHT MATERIALS.
- 4) ALL MATERIALS USED SHALL BE OF SOUND QUALITY, DURABLE, AND APPROPRIATE FOR TRANSITIONAL SHELTER APPLICATIONS.
- 5) THE PLINTH LEVEL SHALL BE RAISED ADEQUATELY ABOVE THE EXISTING GROUND LEVEL (MIN. 4") TO PREVENT SURFACE WATER INGRESS.
- 6) THE ROOF STRUCTURE SHALL BE SECURELY FIXED TO WITHSTAND LOCAL WIND CONDITIONS, USING APPROPRIATE ANCHORING AND BRACING METHODS.
- 7) PROPER CONNECTIONS BETWEEN STRUCTURAL ELEMENTS (FOUNDATION, WALL, AND ROOF) SHALL BE ENSURED TO MAINTAIN OVERALL STABILITY.
- 8) ADEQUATE SITE DRAINAGE SHALL BE PROVIDED AROUND THE STRUCTURE TO PREVENT WATER ACCUMULATION.

PROJECT TITLE :
PROPOSED TRANSITIONAL SHELTER FOR
DISASTER AFFECTED FAMILIES

DRAWING TITLE :
ARCHITECTURAL DRAWING

SCALE :
 NTS

PREPARED BY :
NATIONAL BUILDING RESEARCH ORGANISATION
 HUMAN SETTLEMENTS PLANNING AND TRAINING DIVISION



03. Cost Estimation

Item No.	Description	Unit	Quantity	Unit Rate		Amount	
				Rs.	Cts.	Rs.	Cts.
1	Solid cement block (4"×8"×16")	Nr	440	160.00		70,400.00	
2	Cement (50kg Bags)	Nr	20	2,100.00		42,000.00	
3	Sand	Cube	1	30,500.00		30,500.00	
4	Metal 1"	Cube	1	10,900.00		10,900.00	
5	Metal 1½"	Cube	0.5	10,700.00		5,350.00	
6	Timber 4"×4" class II	L.ft	125	900.00		112,500.00	
7	Timber 2"×2" class II	L.ft	380	80.00		30,400.00	
8	15mm Thick Marine Plywood Boards (1200mm×2400mm)	Nr	13	3,665.00		47,645.00	
9	G.I. sheet 28G (12'-0"×4'-0" Roof covering)	Nr	16	6,930.00		110,880.00	
10	G.I. sheet 28G (8'-0"×4'-0" Roof covering)	Nr	3	4,930.00		14,790.00	
11	G.I. sheet 28G (8'-0"×4'-0" Roof covering) Rigde Cover	Nr	3	6,930.00		20,790.00	
12	Wire nails	kg	5	420.00		2,100.00	
13	Hasp and staple 2½"	Nr	8	160.00		1,280.00	
14	Steel hinges 4" Tee	Nr	20	280.00		5,600.00	
15	Steel tower bolt 4"	Nr	8	215.00		1,720.00	
16	Pad lock ¾"	Nr	1	300.00		300.00	
17	Ledged, braced & battened door sash (size 7'-0"×3'-0") class II	Nr	2	16,750.00		33,500.00	
18	Plywood Door 3'-0"×6'-9"	Nr.	2	7,000.00		14,000.00	
19	Ledged, braced & battened window sash (size 4'-0"×2'-0") clas	Nr	6	7,850.00		47,100.00	
20	Stainless steel sink (480mm×450mm×300mm)	Nr	1	9,500.00		9,500.00	
21	Bidet Spray P.V.C.	Nr	1	2,300.00		2,300.00	
22	Bib tap P.V.C.	Nr	2	480.00		960.00	
23	Squatting Pan	Nr	1	10,500.00		10,500.00	
24	Soap tray	Nr	1	280.00		280.00	
25	Plastic 1/2" Stop tap with T-handle	Nr	2	350.00		700.00	
26	4' dia.Sockage pit rings (concrete)	Nr	3	7,850.00		23,550.00	
27	18" Flexible Hose - water Tec	Nr	1	400.00		400.00	
28	Thread seal tape	Nr	2	70.00		140.00	
29	Solvent cement (glue) 50g	Nr	1	280.00		280.00	
30	P.V.C 1/2" dia. Angle Valve (double valve)	Nr	4	670.00		2,680.00	
31	P.V.C 1/2" dia. Concealed Valve "Rocell" brand	Nr	1	870.00		870.00	
32	Shower rose p.v.c.	Nr	1	260.00		260.00	
33	uPVC Pipe 1/2" dia. (20 mm) (PNT 14)	Nr	1	800.00		800.00	
34	uPVC Pipe 3/4" dia. (25 mm) (PNT 11)	Nr	1	1,750.00		1,750.00	
35	uPVC Pipe 1 1/2" (50mm) dia (PNT 7)	Nr	1	2,850.00		2,850.00	
36	uPVC Pipe 4" (110mm) dia (PNT 7)	Nr	1	13,900.00		13,900.00	
37	uPVC Clips 4"	Nr	4	225.00		900.00	
38	110mm (4") Elbow(90°) (type 600) (PNT 7)	Nr	2	1,580.00		3,160.00	
39	110mm (4") Bend (type 600) (PNT 7)	Nr	1	1,800.00		1,800.00	

Item No.	Description	Unit	Quantity	Unit Rate	Amount
				Rs. Cts.	Rs. Cts.
40	110mm (4") joint socket (type 600) (PNT7)	Nr	1	820.00	820.00
41	UPVC Clips 1 1/2"	Nr	4	45.00	180.00
42	UPVC Elbow 1 1/2" dia.	Nr	4	250.00	1,000.00
43	UPVC faucet Elbow 1/2" dia.	Nr	2	50.00	100.00
44	UPVC faucet socket 1/2" dia.	Nr	2	45.00	90.00
45	UPVC Socket 1 1/2" dia.	Nr	2	160.00	320.00
46	UPVC Socket 3/4" dia.	Nr	3	50.00	150.00
47	25mm x 20mm Reducing socket	Nr	4	55.00	220.00
48	UPVC Gulley trap 4"	Nr	1	1,360.00	1,360.00
Material cost(Excluding electrical material)					683,575.00
S	Electrical materials				
49	Distribution board 32A/2 pole MCB-1, 40A 30mA RCCB-1,				
50	16A MCB-1, 6A MCB-1, 500 ABC BOX-1	Nr	1.00	12,000.00	12,000.00
51	P.V.C. Copper 7/.029" (7/.67 mm) cable Twin -2.5mm2	L.ft	50	90.00	4,500.00
52	PVC Copper 7/.029" (7/.67mm) earth cable - 2.5mm2	L.ft	30	40.00	1,200.00
53	Conduite pipe (5/8") 13ft	Nr	3	180.00	540.00
54	Bulb holder pin type (B22)	Nr	6	120.00	720.00
55	Two gang one way switch	Nr	3	450.00	1,350.00
56	One way sunk box	Nr	6	180.00	1,080.00
57	Led 12W Bulb	Nr	6	750.00	4,500.00
58	Socket outlet 13 Amp 3 pin squar type	Nr	4	650.00	2,600.00
Total Electrical material cost					28,490.00
Total Material cost					712,065.00
Labour cost					
59	Special Skill labour	Days	20	5,000.00	100,000.00
60	Skill labour	Days	8	4,550.00	36,400.00
61	Un / Skill labour	Days	32	3,550.00	113,600.00
Total labour cost					250,000.00
Total Cost of Materials and Labour					962,065.00

Note:

- Above list of materials and labour include for construction of 5'-0"×4'-0" Toilet consiste of 4" thick Solid Block walls, GI Roof with Frame work and necessary Bathroom fittings.