

## Unit II

### PLANNING

#### I. Planning of Residential Buildings

The planning of residential buildings requires careful consideration on the part of the engineer. A residential building indicates a unit designed for the residence of human beings on a permanent basis or for a considerable time. It is therefore necessary for the Engineer to study in detail the requirements and necessities of type of family likely to occupy the residential building which is planning.

#### Type of Residential Buildings

The residential buildings required in rural areas will be simple in nature and attempts are made to improve the living conditions of the rural population by constructing cheap houses with reasonable facilities.

#### Planning of a Residential Building

The planning of a residential building is done to suit the requirements of the occupants, giving due consideration to the site dimensions, orientation, appearance, ventilation, etc. This part of the work is generally done by an architect except for small or rural buildings for which an Engineer/Supervisor would be expected to draw up plans and estimates.

Location of rooms and their common sizes.

#### Drawing or Living Room

4200 mm x 4800 mm to 5400 mm x 7200 mm. The door should be placed such that minimum space is taken in crossing the rooms.

Drawing room is a common comfortable and attractive place. Generally this is the biggest room of the building so that it can be utilised for some ceremonial functions.

#### Bed rooms

3000 mm x 3600 mm to 4200 mm x 4800 mm. 1.; roof water supply and drainage system is available, a bed room should have attached bath and w.c. The room should be ventilated at the same time privacy is maintained. Cross ventilation should be provided. The minimum window area will be one tenth of the floor area. 9.5 cubic metre and 5.5 cubic metre area should be provided for each adult, and child respectively. Suitable allowance should be provided for furniture.

#### Guest Rooms

3000mm x 3600mm should be located on one side of the building, generally by the side of one side of the building, generally by the side of the drawing room. It should be disconnected from inside the house and should have separate bath and W.C.

#### Verandah

The best location of verandah is south and west. If the frontage of building is east, then verandah is provided on east also. It serves as a waiting room and segregates the private apartment from the entrance area. They have width ranging from 1800 mm to 3000 mm. Office Room 3000 mm x 3600 mm. This should be on one side of verandah disconnected of guest room and vice versa.

#### Dining Room

3600 mm x 3900 mm to 4200 mm x 4800 mm to be connected to Kitchen.

### Kitchen

2500 mm x 3900 mm to 3000 mm x 3000 mm. It should be connected with the dining room and should have one approach from outside also.

### Store Room

2500 mm x 2500 mm to 3000 mm x 3000 mm. It should be located near the Kitchen and should have sufficient number of racks.

### Pantry

This is a small room adjacent to dining room for keeping cooked food. It should have sufficient number of cupboards and shelves. Size 2500 mm x 3000 mm.

### Bath and W.C.

There shall be two ventilators in a bath room. One at a height of 2000 and the other below with frosted glass shutters. Sometimes ceiling height is kept low (2100mm) and upper space is used for storage purpose. Bath and W.C. combined 1500 mm x 1800 mm to 1800 mm x 2500 mm. Bath (separate) 1200 mm x 1500 mm. W.C. (Separate) 900 mm x 1200 mm.

The urban residential building for the purpose of convenience, can be grouped in the following four categories.

1. Detached buildings
2. Flats or apartments
3. Row
4. Semi-detached buildings

### Usual Requirements

The minimum requirements for a family unit are living room, kitchen, bath and wc. But for the purpose of discursion, the usual requirements of a normal residential unit can be as below.

- |                 |                |
|-----------------|----------------|
| 1. Bath and WC  | 7. Living room |
| 2. Bed room     | 8. Open chowk  |
| 3. Dining room  | 9. Passages    |
| 4. Drawing room | 10. Stair      |
| 5. Garage       | 11. Store      |
| 6. Kitchen      | 12. Verandah   |

### Furniture Arrangement

The furniture arrangement of the following building units will be briefly described.

1. Bedroom
2. Drawing room
3. Kitchen
4. Toilet

#### **1. Bedroom**

Fig shows the typical layout of the furniture pieces in a bedroom. The bedroom may also serve the purpose of study room, sitting room or dressing room according to the furniture pieces are accommodated.

#### **2. Drawing room**

The fig shown the typical layout of the furniture pieces in drawing room. The size and shape of the furniture will depend upon the living standard of the family and may include costlier bulk furniture pieces like sofas, cabinets, etc.

#### **3. Kitchen**

Figure shows the typical layouts of the furniture pieces of kitchen. The sequence of operations requires to be taken into account while planning the kitchen. A working kitchen normally requires sink, cooking range, working table, water storage, refrigeration, gardens, etc.



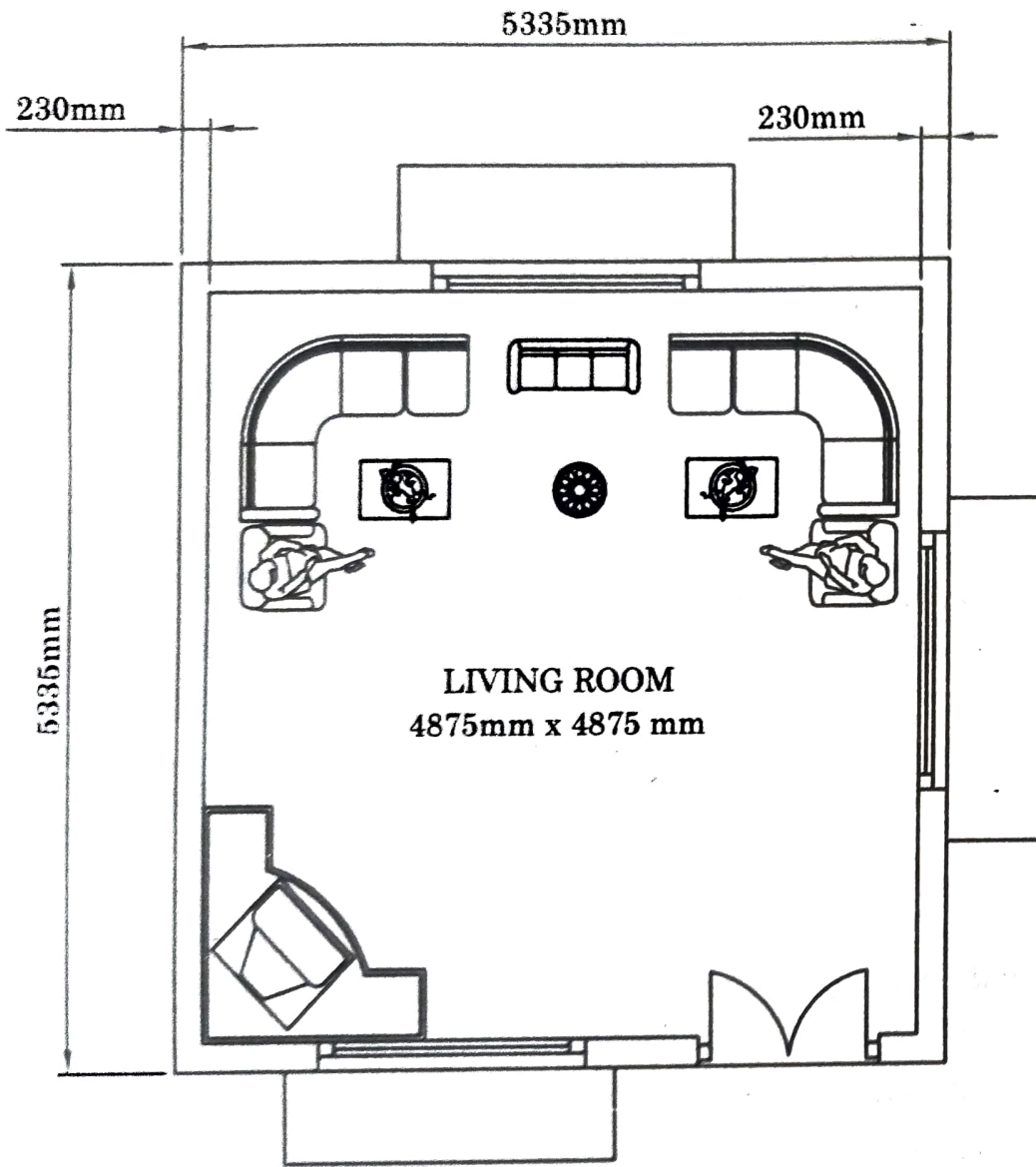


PLATE No : 3(a)  
LIVING ROOM

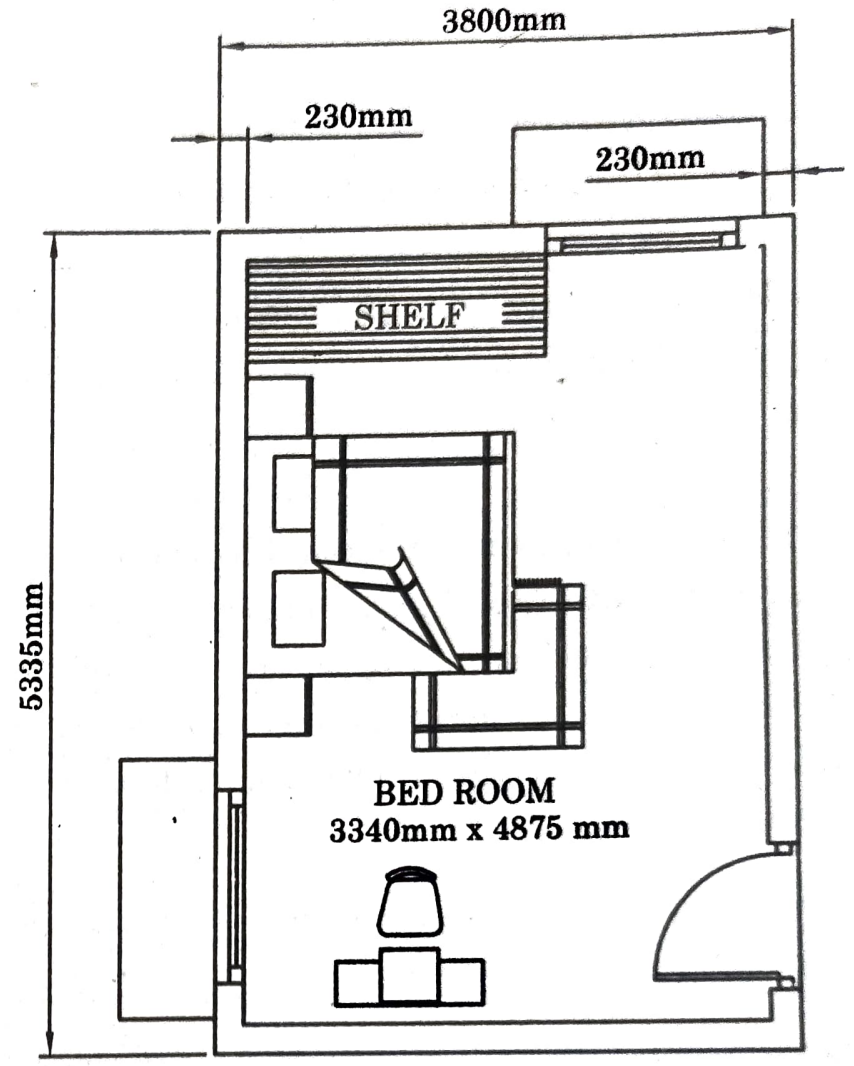


PLATE No : 3(b)  
BED ROOM

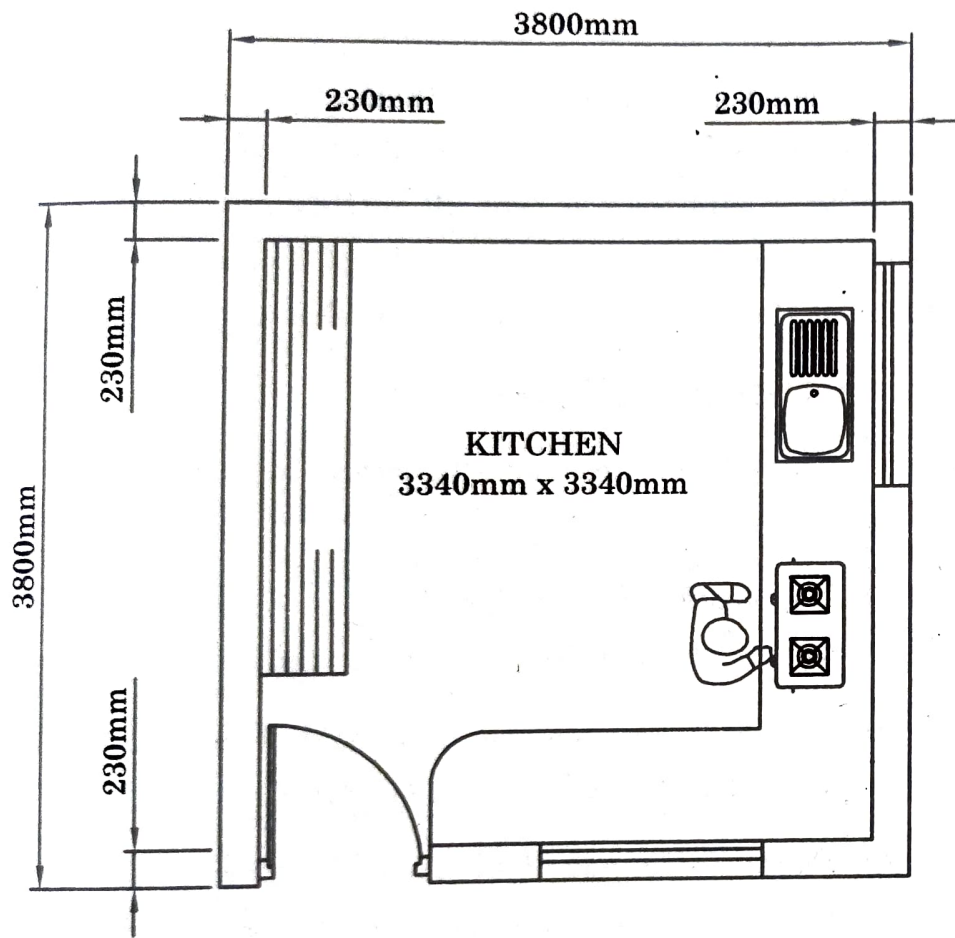


PLATE No 3 : (c)  
KITCHEN

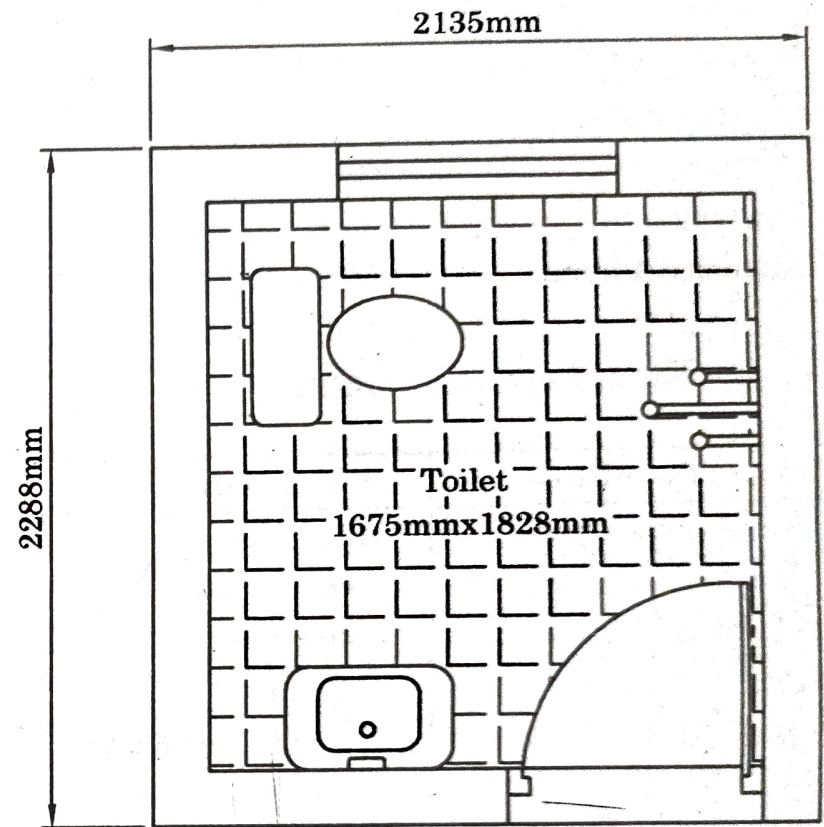


PLATE No : 3 (d)  
TOILET

#### 4. Toilet

Figure shows the typical layouts of the furniture pieces in toilets. A modern toilet normally requires water closet, bidet, bath tub, showers, wash basin, mirror, towel racks, instant geysers, built-in shelves for keeping tooth brushes and dentifrice, soap, floor cleaning brush, etc. The approximate allowable space which may be covered by the furniture in certain rooms is as follows.

1. Bedroom : 40%
2. Drawing : 35%
3. Kitchen & Dining : 55%

#### Size of Furniture Pieces

No	Name of Furniture	Size in cm
1.	Chairs without arms	45 x 45
2.	Coffee table	100 diameter
3.	Double bed	140 x 210
4.	Dressing stool	40 x 40
5.	Club chair	75 x 90 (or) 65 x 75
6.	Single bed	90 x 200
7.	Small chair	45 x 45
8.	Small desk	120 x 60
9.	Small dressing table	45 x 90
10.	Twin chair (or) sofa	75 x 140
11.	Writing table	135 x 75

#### Position of Stairs

If the residential unit consists of more than one floor, stair of suitable width is to be provided at proper place in the plan. It should be

checked that the stair fits suitably in the plan of upper floors and does not cause any disturbance in the utility of upper floors. The stairs should be located well lighted and ventilated. In public building it is near to entrance in residential centrally located.

#### Position of Lift

For buildings having more than three floors (exclusive of ground floor) Lift shall be provided at the rate of one lift for 20 family units or part thereof. The lift shall be provided from ground floor and its minimum capacity shall be of 6 persons. If the height of building is 25m or more, at least two lifts shall be provided.

#### Positions of Doors and Windows

- 1) Door should preferably be located near the corner of the room.
- 2) Doors and windows should be located in such a way as to cause least disturbance to privacy and internal decoration.
- 3) The sill of a window opening should be preferably be located at a height of 80cm from the inside floor level.
- 4) Doors and windows should be so located that light and ventilation are evenly distributed and provides necessary privacy.

#### Standard sizes of Doors, Windows and Ventilators

Doors	(i)	900mm	x	2100 mm
	(ii)	1000mm	x	2100mm
	(iii)	1100mm	x	2100mm
Windows	(i)	900mm	x	1200mm
	(ii)	1000mm	x	1200mm



	(iii)	1200mm	x	1200mm
	(iv)	1500mm	x	1200mm
Ventilators	(i)	600mm	x	300mm
	(ii)	600mm	x	450mm
	(iii)	900mm	x	450mm

### House drainage

The drainage of a locality is broadly divided into two categories.

1. Public
2. Private

Sewers are laid across public roads to serve the area on either side. Private plot holders construct the sewer line in their own land and its final point is then jointed to the public sewer. The main purpose of knowledge of house drainage is to provide an efficient drainage system.

### Principles of house drainage

1. The sewers to lay by the side of building.
2. Drains should be laid straight.
3. The entire system should be properly ventilated.
4. The house drainage system contain enough number of traps.
5. The joints should be water tight.

### Sanitary Fitting

The term sanitary fittings is used to indicate, in its broad sense, all the fittings required in house drainage for efficient collection and removal of waste water from the house to the house drain.

### The following are usual sanitary fittings

- |                       |                  |
|-----------------------|------------------|
| 1. Bath tubs          | 5. Urinals       |
| 2. Drinking fountains | 6. Wash basins   |
| 3. Flushing cisterns  | 7. Water closets |
| 4. Sinks              |                  |

### Sump/Water Tanks

#### Sumps

These are constructed at ground level or slightly projecting above ground level. They are covered at top and a manhole is provided for inspection.

The size of the underground water storage tank is generally more as water is stored and pumped to overhead water storage tank from it. The sump is filled up by gravity from the connection obtained from a nearby water main line of local authority.

#### Water Tanks

These are placed or constructed at terrace level. It is necessary to take sufficient precautions with respect to structural stability of portion under this tank. The provision of an water tank ensure of water supply for all the day. The main components of water tank are manhole cover, inlet pipe, outlet pipe, over flow pipe and work water pipe.

#### Plumping pipes

Following are the various materials which are used for pipes to convey water.

1. Asbestos cement pipe
2. Cast iron pipe
3. Cement concrete pipe
4. Copper pipe
5. Galvanized iron pipe
6. Lead pipe
7. Plastic pipe
8. Steel pipe
9. Wood pipe
10. Wrought iron pipe

**Preparation of line drawing for given requirements with dimensions. (not to scale)**

**Preparing a Line Plan**

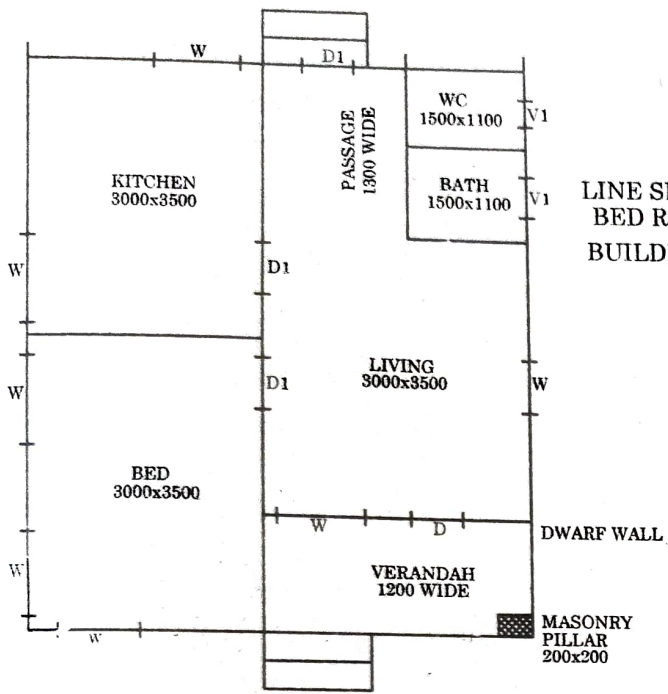
A building consultant's (Engineer/Architect) foremost job is to satisfy the clients. Consultant should get the requirements from the clients regarding number of rooms, size of rooms and other facilities. After studying the plot dimensions, general features of the locality, the probable amount the client can spend, the consultant shall make a number of preliminary sketches and finally the detailed plan showing the proposed building shall be prepared (Fig. 1.1). Each line plan should have the following details.

1. Number of rooms
2. Size of rooms
3. Locations and positions of doors, windows and ventilators.
4. Positions of cupboard, loft, sunshade, etc.
5. Entrance, exit and facing direction.

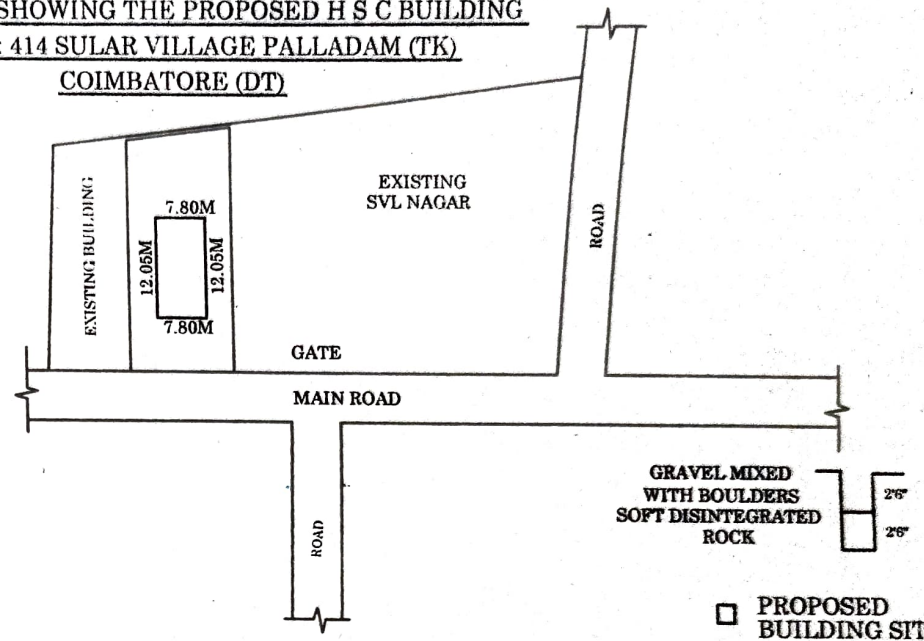
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**SITE PLAN SHOWING THE PROPOSED H S C BUILDING  
IN SF NO : 414 SULAR VILLAGE PALLADAM (TK)  
COIMBATORE (DT)**



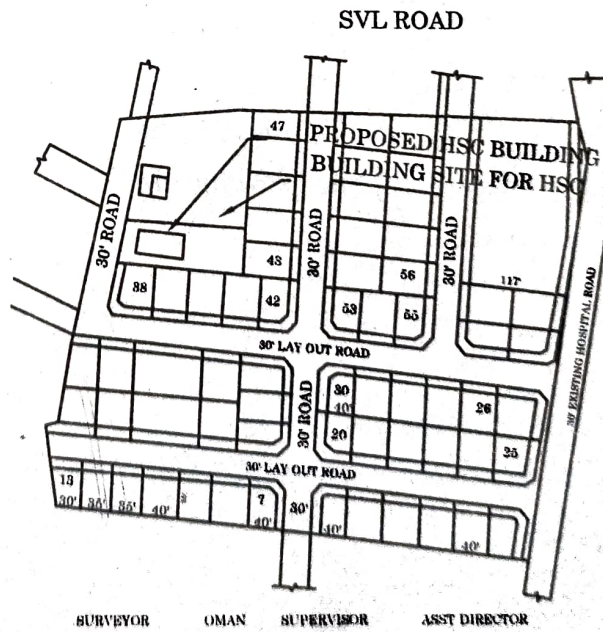
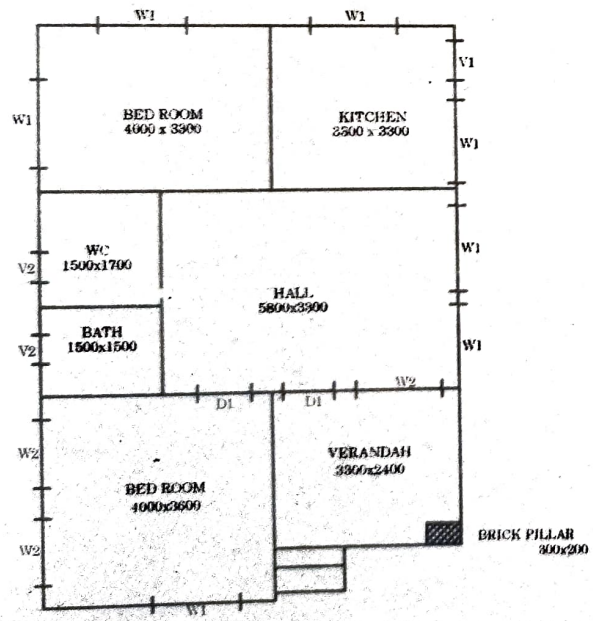
LINE SKETCH FOR A SINGLE  
BED ROOM RESIDENTIAL  
BUILDING OF 50M<sup>2</sup> PLINTH  
AREA



SULUR TOWN PANCHAYAT  
LAY OUT OF HOUSE IN S.F.NO 472/1 PART  
OF SULUR VILLAGE (NON-SCHEME AREA)  
SCALE INCH = 66 FEET  
C.NO 215/87CDNR

- PROPOSED BUILDING SITE
- PROPOSED H S C SITE

**LINE SKETCH FOR A DOUBLE BED ROOM RESIDENTIAL  
BUILDING OF 75M<sup>2</sup> PLINTH AREA**



- BUILDING SITE FOR H S C
- PROPOSED H S C BUILDING SVL NAGAR SITE NO III SE.NO.472

SURVEYOR OMAN SUPERVISOR ASST DIRECTOR