

Residential Buildings

Introduction :

UNIT-2

* A Residential Building is one which is used fully (or) partially for a considerable time (temporarily) or permanently for human habitation.

* Prior to plan a residential Building. It is essential for the planner to consider the following :

- a) Dimensions & location of the plot
- b) Specific Requirements of the occupants
- c) funds & Resources available
- d) Locally available materials for construction
- e) Geological conditions of the area

* To fulfill the needs of human activities the residency is divided into 3 major areas

1. Living Area
2. Sleeping Area
3. Service Area

Living Area :-

- This Area is for general use
- The living & drawing rooms should be plan near the entrance
- It shouldn't ^{be} provide direct Entrance to the Bed room & Bath room
- It should be comfortable & spacious to accommodate furniture & proper circulation Area
- It should be sufficiently lighted & offered an attractive view of the surroundings

→ It should be in either north (or) south directions

Sleeping Area : —

- This Area is for relaxation use & provided as Bedroom
- Bed rooms may be with attached toilets i.e. Bathrooms & water closets
- The size depends upon the No. of Beds.
- It should be located to give privacy, accommodate Beds, cupboards etc.....
- It should be in North west (or) South west aspects

Service Area :

- This Area includes kitchen, Dining, Room, Bath rooms, & Water closets
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Selection

Site Selection for Residential Building :

1. Selection of a site for any Building is very important experts Job & should be done very carefully by an Experienced Engineer.
2. The Site which is suitable for Residential Building may not be suitable for other buildings.
3. So, all the buildings proposed for different purpose having different requirements for their site selection
4. The following suggestions are considered for selection of building site
 - a) The site should be in fully developed area
 - (or) In the area which has potential of development.

- b) The site should have a good view of landscape like rivers, lakes etc....
- e) There should be good transport facilities such as railways, bus services for going to different employment, colleges, markets etc....
- d) Civic services such as water supply, electrical lines, telephonic lines etc... should be nearer to the selected site.
- e) Building site if choosed in depression causes, Drainage problems (decreasing areas)
- f) The ground water table at the site shouldn't be very high
- g) The Residential House site should be nearer to schools, markets, Hospitals, etc....
- h) Good foundation soil should be available at reasonable depths and this aspect saves the cost of the Building.
- i) Residential House site should be located far from the Busy Commercial Roads.
- j) These Houses shouldn't be located nearer to factories, workshops, Industries etc.... because of continuous pollution.
- k) Avoiding of sites in Quarry areas, lime kilns which are not kept clean
- l) The shape of site shouldn't be very Irregular
- m) Area of the site should be enough for your present requirements with sufficient provisions of future requirements.
- n) Don't make Hurry in Buying of Site & also Don't invest more than 30% of your budget

o) While making site selection for any building it is better to go through master plan of the city, it will give an idea at which site the better development is available.

p) In the short the site selection involves the following considerations,

- * Physical conditions
- * Type of soil
- * Sanitary ^{drainage} requirements
- * Civic facilities
- * Climatic conditions

Living Room :

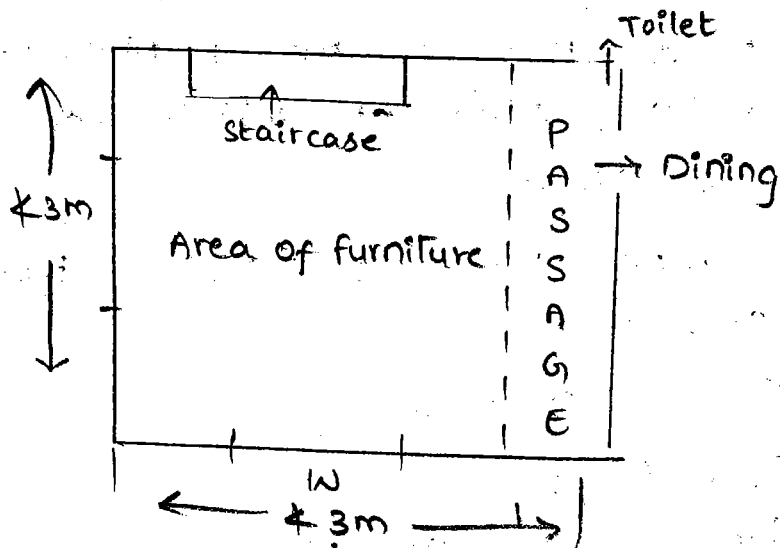
* It is the first room of the house as we enter

Purpose :

→ It is the congregation room of the members of the family and outsiders

Its main functions are :

- a) To draw guests
- b) Acts as lounge, sitting (or) relaxation room
- c) Listening to Radio (or) watching T.V
- d) Playing chess, cards
- e) For social functions like gettogethers & religious acts.
- f) As a temporary Bed room for guests
- g) Study room for children & music room for others.



Requirements :

- This room should be comfortable & spacious
- It should get adequate natural light & Breeze
- A No. of doors in a drawing room should be as few as possible
- Entrance door should be wider than any other door.
- The size of doors should be less than $1\text{m} \times 2\text{m}$

$\begin{array}{|c|} \hline < 2\text{m} \\ \hline < 1\text{m} \\ \hline \end{array}$
- The No. of windows in a drawing room should be as many as possible
- A minimum of 2 windows one facing north and another towards East are desirable
- The size of window should be less than $1.2\text{m} \times 1\text{m}$
- A minimum Illumination of 100 lux (or) 100 lx
- The minimum Window Area should never be less than 10% of floor area but 20% preferred
- The minimum showcase Area shouldn't be less than to floor area of 15 sq.m to 20 sq.m but 20 sq.m to 40 sq.m is preferred

→ If it is to be used as a bed room very frequently the min floor area req is 23 sq.m to 28 sq.m.

→ A room of size 3.5 m ~~to~~ 5.5 m is a small drawing room

→ It is 5m x 6m is a comfortable one & 7.0m x 9.0m is a luxurious room

Dinning Room :-

Purpose :

* It is a place where some (or) all family members take their Breakfast, lunch & dinner.

* As the total activity of dining in a day may take less than an hour so that it may incidentally be used as a study place for children gathering place for remaining.

* Therefore providing a separate dining room is a luxury for middle income group family

Requirements :

* It should be cool and connected to the kitchen.

* For people who are accustomed to squatting on floor for dining or who need more privacy or for orthodox families kitchen come dining is better suited.

* A brightness of 50 lux shall be adequate. Light roof doors and windows should be provided in dining room.

* The minimum size of dining room is 4x3m so as to accommodate dining space for 6 persons with proper & sufficient space for circulation around the table.

* A dining room of 4m x 5m is comfortable one and 5m x 6m is spacious one.

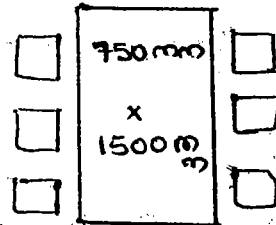
Dinning tables:

They may be rectangular, Elliptical, boat, Square (or) circular shapes.

1. Rectangular dinning table:

These tables are most common of a minimum size 750mm x 1500mm for 4 users

It is the only shape suited for dinner and party's on a large scale.



2. Elliptical dinning table:

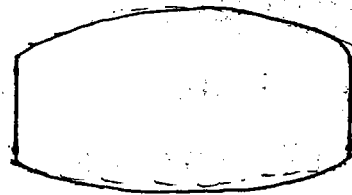
Elliptical dinning table are rectangular table with semi-circular short end.

They offer more space for the chairs besides looking artistic.



3. Boat shaped dinning table:

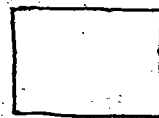
Boat shaped dinning table are convex shaped length wise and straight line width wise.



They are available with minimum size of 1000mm x 2000mm for 8 people uses.

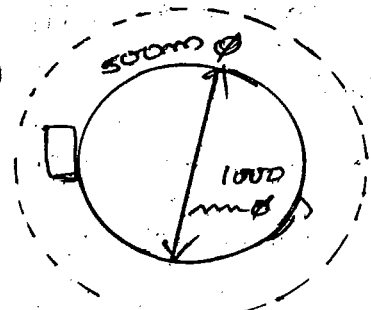
4. Square dinning table.

Square shaped dinning tables (or) rarely used with 900mm² for 4 users.



5. circular dinning table:

It looks more artistic with a central rotating disk for dishes 1000mm wide may be used for 4 users.



A wash basin is to accommodate in a minimum width of 1m and minimum clearance of 600mm is required so that a person can be comfortable to use the wash basin.

Kitchen:

It is a place where food is prepared and stored for consumption.

Health, comfort and happiness of the family directly depend upon the quality and cleanliness of the food prepared in kitchen.

Their fore effective planning of kitchen is important as the house wife spends most of her time in it.

Purpose:

→ depending upon the position of the fire place (or) the cooking range it is classified as 2 types.

1. setting type:

An age old oriental custom is to cook using fire wood (or) cow dung cakes for which the fire place is at the floor level.

More chances do exist for sorry to catch the fire and also the knife hurting when cutting is at floor level.

Fire at the floor level inside a thatched hut of roof touching the ground is accumulated as much carbon dioxide and CO as that by a chain smoker.

Consuming 20 packets of cigarettes per day

It is Probing Fodle (dangerous) to pregnant Ladies cooking on stove provided on a kitchen flat form is highly desirable as the cooking Range.

Standing Type :

Cooking on stove provided on a kitchen platform is highly desirable as cooking range at a high improves the draught of air and as a result the smoke and gases of cooking easily get regulated & diluted - Besides less health problem do exist for the housewives as and incur the back pain. All data regarding personal movements and measurement is known as Anthropometric. These studies dictate the horizontal & vertical limits of reach both in standing & sitting position.

Requirements :-

A housewife stays for more hours of day in the kitchen. Hence all the conducive conditions for her comfortable stay while cooking must be provided. The atmosphere of kitchen should be cheerful. Eastern & North east is best location for the kitchen. A minimum illumination of 200 lux is provided both day and night. For that a window towards north to provide light without heat and another towards east to receive the morning sun is needed. An exhaust fan may be provided for remove pungent smell for food preparation. The window area should be a min of 15% of floor area should be limited to 2. A minimum floor area 5 sq.m is to be adopted. It is in kitchen cum dining, the floor area should be min 7.5 m². Kitchen is only place of house where major and minor accidents, cuts & bones are inflicted and even explosions occur. Hence sharp, rectangle projecting corner of wall, columns, slabs and even kitchen sinks are to be avoided.

Corners b/w floor and walls are to be rounded off for easy cleaning.

A small kitchen is 1.5m x 3m, 3m x 5m is a comfortable one & 4m x 6m is a big one.

Bed room : -

Purpose : -

A man spends 32-40% of his life in a bed room either by sleeping (or) relaxing.

Requirements : -

Any Bed room is designed for one (or) two adults but not more.

Size of family

No. of Bed rooms

A couple

1 double bed room

A couple with 1 child

1 double & 1 single bed room

A couple with 2 children

1 double & 2 single bed rooms

A couple with 3 children

2 double & 1 single bed rooms with a room in spare

A man

- A minimum floor area of 10 square mts is to be provided
- A room of 3x3 mts shall be a small bed room & 4x4 mts is relatively comfortable one
- A minimum of 2 windows to the two outside walls with each window area should be minimum 10% of floor area are to be provided
- only one door is to be provided and this ~~door~~ doesn't take into account the door to toilet (or) dressing room
- The minimum space required for an adult is 8.5 m² and for a child is 5.5 m²
- privacy is the most important factor to be considered during the planning of Bed rooms so that toilets &

dressing rooms are to be grouped with the bedroom for better privacy.

→ Trees, shrubs should be planted on the window side to screen outsiders vision into the bedroom

Bathroom & Water closets :—

→ Bathroom is a place where inmates take bath and the waste water is collected & conveyed off in a Hygienic manner

→ water closet is the place of collection of the human discharges of foul nature and conveyed off hygienically

Requirements :

- * Bathroom should have a minimum breadth of 1.2m and length of 1.5 m
- * A minimum floor area of 1.8 Sq. m is to be provided
- * The floor area of combined bath and water closets shouldn't be less than 2.8 m²
- * Additional space is to be provided for wash basins, geasers and showers
- * Bath Tap may be provided at a height of 1200 mm above floor level.
- * Shower rows should be kept at min height of 800 mm above floor level
- * The height of the towel rail is 900 mm above floor level
- * Water closet (W.C) should have a min width of 0.9m and a min length of 1.2 m.
- * A minimum clearance width of 750 mm is needed along the waist of the user on the commode.
- * A minimum floor area of 1.1 Sq. m is to be provided for water closets

- * Flooring should be non greasy, non-Absorbent & Non-slippery
- * Glazed Tiles are provided to the walls to a Height of 1m
- * The Floor level of the Bath is to be depressed by 50 mm compared to the floor level of the other rooms. So that the used water will never get stagnated, but will run off quickly towards the gully trap
- * They are to provided with single door shutter of a min width of 650 mm and a Height of 1750 mm.
- * The doors of water closets and Bathrooms shouldn't open directly into kitchen (or) cooking space
- * A ventilator of 500 mm x 300 mm is to be provided at a height of 1.8 m above the floor level, or an exhaust fan may be provided to suck the Inside gases
- * Roof slab of Bath & water closets may be provided at a height of 2.1 m above floor level
- * A small Toilet may be of 1.5 m x 2 m and 2 m x 3 m is a big one, a toilet of 3 m x 4 m shall be the biggest with a bath tub, wash basin, geaser & shower

Characteristics of Residential Buildings :-

Detached Houses (or) Duplex Houses :-

A Bungalow is a type of detached house, mostly it is used to be single storeyed

But these days even two storeyed houses are called as Bungalow

The two storeyed may have kitchen, dining, store, Garage etc... on ground floor and all the bed rooms, study rooms, library etc... on first floor

Generally, the requirements for a detached house

depends upon the size of the family.

* It may have an out house in the premises with a 2 rooms and Waranda

Semi Detached Houses : —

These are like detached houses either with single or double storeyed.

Terrace Houses or Apartment Houses : —

→ These are constructed where land is very costly and population to be accommodated in limited area

→ A flat is a unit of 2 or more rooms of accommodation for one family.

→ There may be several such flats on one floor and these may be even upto seven storeyed provided with lift or staircase for vertical circulation

→ Planning of a flat as to be carried out keeping in the view the factors such as privacy, Approach from main road, staircase location and grouping of sanitary unit.

→ Normally 50% of the site area is used for construction of the buildings and the remaining area is used for play grounds, gardens etc.....

Row Houses : —

In this system the houses are located by the sides of each other in a row. Having front and rear veranda

usually in this houses there are 2 rooms minimum one has Dining cum kitchen & another has Bed cum living

- Sanitary facilities for such type of houses are generally in common and located in a separate room either at the end of the row houses (O) centrally behind the row.
- In case of a 2 storeyed house on ground floor kitchen cum dining and on first floor bed cum living is provided
- Row type houses are cheaper than the terrace houses