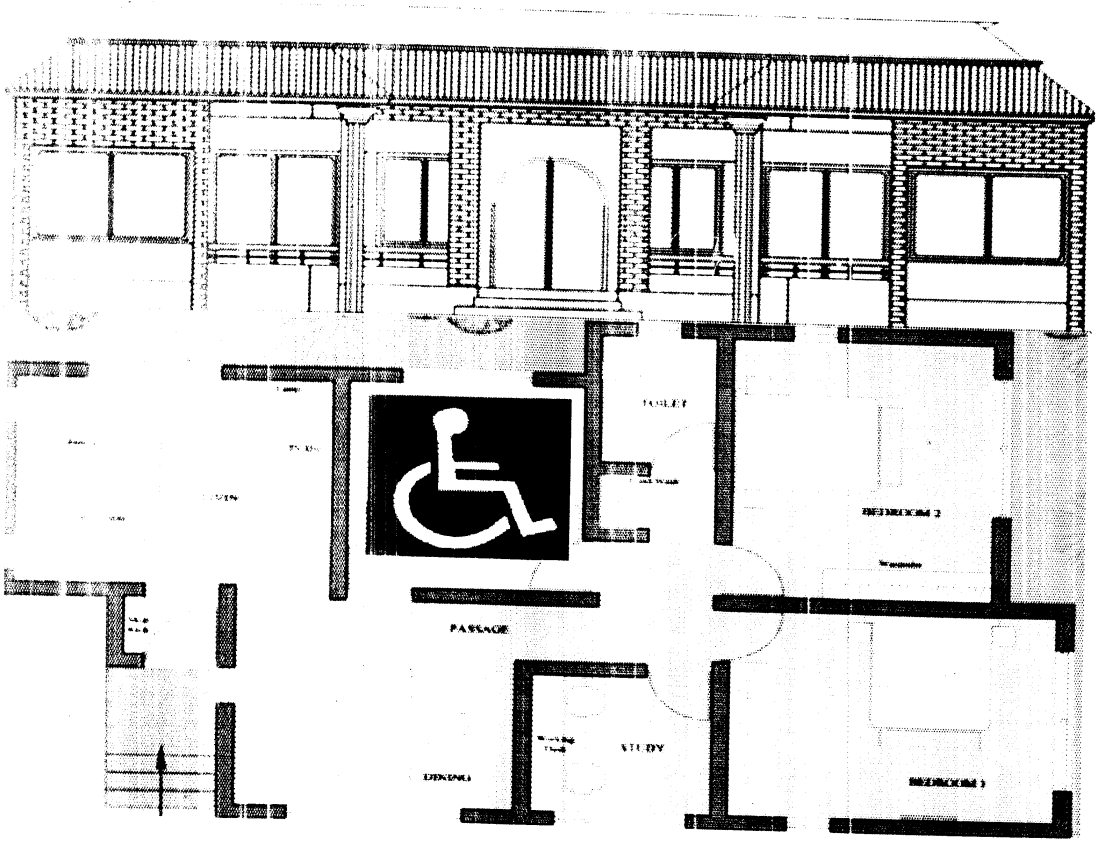
HOUSING AND SPACE MANAGEMENT

RMCS - 244 3(2+1)

Practical Manual

B.Sc. (Hons.) Community Science

Semester - IV



College of Community Science
Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani - 431402

Practical Manual

B.Sc. (Hons.) Community Science

Prepared by

Dr. Madhuri Kulkarni

Dr. Hemangini Sarambekar

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Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani (MS)

CERTIFICATE

Certified that this is the bonafide record of the practical work carried out by Ms / Mr. ----------

Registration Number ---------- under the course of RMCS 244 3(2+1) Housing and Space Management, during IV semester.

Student **Course Professor**

External Examiner

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Experiment - 1

Drawing Material Equipment

Aim To study the different types of drawing material.

Introduction

Plan of the house is the drawing where a house which is later to be physically constructed is first conceived of as an idea. The idea may be conceived on two levels - the representational and mental. The representational conception means reproducing an image of the object either in sketches or diagrams or in the form of miniature model. Drawing the idea in the form of sketches or diagrams requires some tools.

1) Drawing Sheet

Drawing sheet is available in various thickness. Based on thickness and visibility paper is divided into 4 categories.

a) Tissues - Very thin and transparent

b) Sheets - Thin and transparent

c) Cards - Thick and opaque

d) Boards - Very thick and opaque

Drawing sheets are used for presentation of drawings and other purposes. Drawing sheet should have border line of 1.5 cm on 3 sides and 5 cm on left hand side. The position of title and the contents of sheet are to be placed on right hand bottom side of the drawing.

2) Pencils

Pencils are made of lead inserted and glued in 18 cm long wooden cylinders of 6 mm diameter. Hexagonal shape is preferable as it provides better grip. Pencils are available in various grades basically divided into the grades H and B known as HB. H stands for hard and B for brittle soft. B range is used basically for fine art purposes requiring smooth paper and H for technical drawing requiring a bit rough paper. HB is the most common grade, employed universally and H is the most common for draughting.

3) Eraser

A good quality soft eraser is as important as the pencil. Eraser is required to erase the wrong lines in drawing and to insert the different symbols / features in the line diagram.

4) T-Square

A T-square, made of seasonal wood is used to draw horizontal lines by sliding it along the ebony edge fixed on the left side of the drawing board. It should be hang when not in use to keep straight.

5) Set Square

Set Squares are transparent right angled triangles with 45°-60°-90° and 30°-60°-90° angles. They are used to draw vertical lines by sliding along the T-Square. They are also helpful in drawing lines inclined at 60°, 45° and 30° angles.

6) Stencils

For quick and finished accomplishment of written matter lettering stencils in various sizes are available.

7) Templates

To draw various shapes and symbols in various sizes and scales finished templates are available. Apart from regular shapes like circle, oval, square, triangle, polygons, the figures of furniture items, sanitary fittings, electrical symbols necessary to draw in plan are available.

8) Drawing Board

A drawing board made of highly seasoned light weight wood is available in various sizes to accommodate the various sizes of drawing paper sheets. It has a precise ebony edge for the T-Square to slide on for producing perfect parallel horizontal lines.

9) Backing Paper

White, smooth and thick translucent paper sheets or white translucent plastic sheets are fixed to the drawing board to avoid the roughness of grains of wooden board to surface on drawing sheets.

10) Drawing Pins

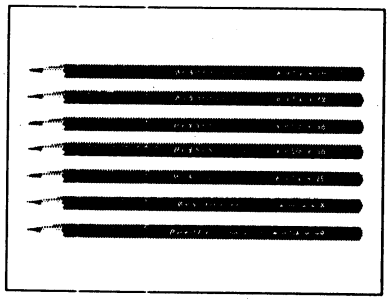
The accuracy of drawing depends on the immovability of paper while drawing. To secure the paper in place pins, clips and cellulose tapes are used. Drawing pins though most handy, are not advisable as they make dents in drawing paper, backing paper and drawing board. Clips are safe and clean but they tend to get loose after some use. Cellulose tapes are most convenient, most neat and least cumbersome.

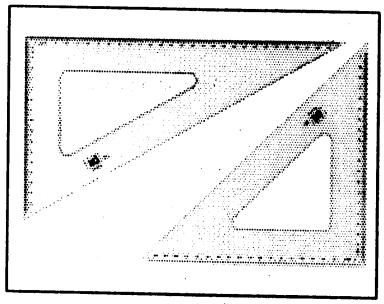
11) Scales

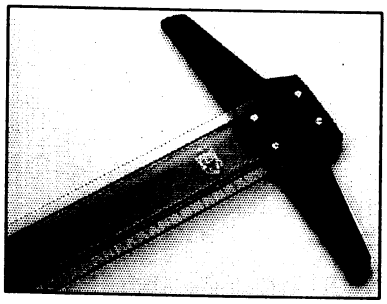
Metal and plastic scales are used to draw the plans with different scales. Drawings are made in 1:10, 1:50, 1:25, ¼ size, ½ size and in full size.

Exercise

1. **Use different grade pencils and draw the figures with different scales.**
2. **Practice the use of T-scale and set squares for drawing.**







Experiment - 2

Architectural Symbols

Aim To learn the architectural symbols to depict various dwelling features in residential plans.

Introduction

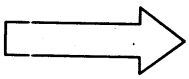
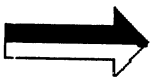
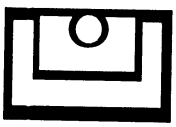
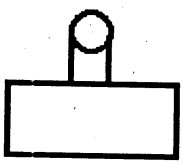
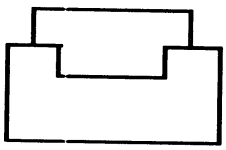
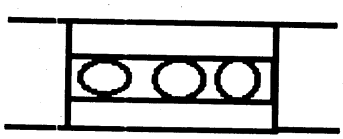
Architectural is supposed to be something creative. The meaning of architecture has undergone many changes during the process of human civilization. At present architecture became identified with imperial function with the creation of buildings intended for the display of status and prestige. But architecture in its entirety concerns itself with strata of society and with every kind of building task. Thus dwellings, schools, hospitals, places of worship, factories, railway stations, stadium, playground and many more fall within the meaning of architecture. To be architectural, space must be man made. It must result from the deliberate use of materials and as per our premise. It must be technically efficient and aesthetically satisfying.

Thus, architecture is defined as "Conscious creation of utilitarian spaces constructed from materials in such a way that the whole is both technically and aesthetically satisfying". Difficulty of architecture lies in question of communicability. Basic Architecture can be explained through drawing plans on paper. Plan is nothing but the line diagram showing the design of house. The details in the drawings are shown through architectural symbols. Architectural symbols are called as draftsman's language which is capable of expressing information and ideas which can not be adequately explained by spoken words. Since these symbols are universally accepted in all countries, it is a universal language as far as that art is concerned.

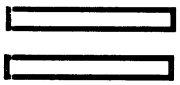
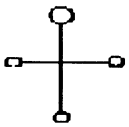
Exercise

Study the architectural symbols with description and practice the drawing.

ARCHITECTURAL SYMBOLS

SYMBOLS	DESCRIPTION
	ONE PANEL DOOR
	TWO PANEL WATER
	FRONT ENTRANCE
	BACK ENTRANCE
	COMBINED ENTRANCE
	SINK
	WATER CLOSET
	BATH
	FIRE PLACE
	WINDOW

ARCHITECTURAL SYMBOLS

SYMBOLS	DESCRIPTION
	STAIR CASE
	SHOWER
	HALLOW WALL
	DUST BIN
	NORTH POINT

Experiment - 3

Different types of House plans

Aim To study the different types of house plans

Introduction

Plans are the line diagrams explaining the idea of the house structure in advance. Plans transmit the ideas through drawing to the person who is responsible to construct the house. Different types of plans are essential to be submitted to local authorities as a part of building bye laws before starting construction of house.

The plans usually required in connection with buildings are

1. Site plan

Site plan contains of a drawing, in which the location of the particular building in the particular plot is shown with reference to the surrounding building plots and particularly the nearest street or road giving access to the place.

2. Floor plan

Floor plan is line diagram of house in horizontal plane. It is also called as top view of house.

3. Cross Sectional plan

It is sectional drawing in vertical plane with details in building. It is useful for the person who is involved in actual construction of house.

4. Elevation plan

Elevation plan is line diagram drawn to actual size to express view of building from front and rear sides.

5. Perspective plan

This represents a picture of the proposed house closely resembling to its true image as in photographic representation of the finished product. Such drawings are prepared because few people can really understand the working drawings and can visualize the true appearance from a flat elevation.

6. Landscape Plan

Landscape plan is a plan in which dispositions of the various planings, shrubbery, paths and car drives etc. are shown. The beauty of a building is enhanced by creating surrounding and giving an atmosphere to it which will make it as an abode of people of taste and refinement.

Exercise

Study the illustrated plans

Experiment - 4

Developing conceptual drawings-Site plan of House

Aim **To learn to draw site plan of house.**

Site plan Site plan explains exact location of plot in particular area

Guidelines to draw a site plan

- Lengths of boundaries of the plot showing its outline with its distinguishing number or mark such as plot number or survey number.
- The plots adjoining it on all sides with their numbers,
- The nearest street or road or lane giving access to the plot.
- The north direction shown by an arrow with the letter 'N' drawn at its head.
- The exact location of the proposed building, out-houses and other permanent structures in the plot.
- The public water main from which supply is to be obtained.

Exercise

Draw the site plan of house

Experiment - 5

Developing conceptual drawings-Floor Plan of house

Aim To draw a floor plan of house

Introduction

Floor plan is the line diagram showing general arrangement of different rooms, the length and breadth of each individual room, thickness of walls, positions of doors, windows and cupboards, which can be seen in a horizontal plane. Hence it is described as birds eye view plan. In addition to this floor plan explains relation of various rooms to each other and traffic lanes through house. In floor plan the key is to emphasize spaces not the structure. In a very carefully drawn floor plan in addition to the above details each individual room is separately planned in respect of the furniture and fittings.

Guidelines to draw a floor plan

- Start by making a rough outline sketch of the room. Mark the position of doors and windows. Note down the measurements
- Once the measurements are accurately entered transfer the rough sketch of plan on a graph or squared paper
- The rooms are best defined by drawing the walls black or heavily shaded
- Thickness of exterior wall range between 8" and 12" and for interior wall between 4" and 8"
- Show the position of doors and windows on wall
- Built-in features which can be seen in horizontal plane should be noted down
- A drawing title and scale should be added

Exercise

Draw a floor plan of house

Experiment - 6

Developing conceptual drawings -Cross sectional plan of house

Aim To draw the cross sectional plan of house

Introduction

Cross section plan is difficult for layman to understand but it is very important to the Contractor and Supervisor because it shows to them the architect's ideas at a glance which can not be seen in any other drawing. There are number of important details in the vertical plane which cannot be shown in floor plan such as heights of windows and cupboards, their positions above the floor level, thickness of floor and beams, width, thickness and depth of footings of foundation below ground. While drawing cross section plan, the architect or the engineer imagines himself to be walking along a particular line shown on the plan and records all details on vertical lines from roof to foundations,

Guidelines to draw a cross sectional plan

- Select the section on which more constructional details are existing
- Make a sketch of the wall with measurements
- Note down the measurements of doors and windows and skirting borders
- Measure the length and heights of opening from roof line and floor line
- Fill black or with heavy shade the wall, roof, and floor line
- Wall thickness should match with floor plan
- Show important openings in the wall
- Cut wall should be shown with diagonal line
- Various floor levels and important elevations should be indicated
- A title and scale for the drawing should be included

Exercise

Draw a cross sectional plan of house

Experiment - 7

Developing conceptual drawings -Elevation plan of house

Aim To draw an elevation plan of house.

Introduction

The architectural beauty of a structure depends upon the relative proportion of the different parts to each other and also to the entire structure. They must form together harmonious combination pleasing to the eye. This can be seen only in a view of that side drawn to a scale. The type and location of windows, placement of doors, the designs and location of balconies, the roof lines all these together influence outside appearance of the house. If the view drawn in this way looks dull, the architect brings out some central feature which at once makes it attractive. In elevation plan both near and distant objects are drawn to their actual size. This makes it rather difficult for a layman to understand it properly still it gives a good idea as to how the building will look on a particular face.

Guidelines to draw an elevation plan

- The ground line should be drawn thick with footings and foundations indicated below.
- Shades and shadows should be drawn
- Use the line thickness to show the depth
- The scale should be same as floor plan
- Drawings should be titled and scaled

Exercise

Draw the front elevation plan of house

Experiment - 8

Developing conceptual drawings -Perspective plan of house

Aim To learn to draw a perspective plan of house.

Introduction

This represents a picture of the proposed house closely resembling to its true image as in photographic representation of the finished product. Such drawings are prepared because few people can really understand the working drawings and can visualise the true appearance from a flat elevation.

Guidelines to draw a perspective plan of house

- Take a view by standing in one corner of house
- Visualise minimum two sides of house
- Draw the close feature larger in dimensions and distant feature small in proportion as in the camera view
- Title the plan

Exercise

Draw the perspective plan of house

Experiment - 9

Developing conceptual drawings -Landscape plan

Aim To study a landscape plan of house

Introduction

Landscape plan is a plan in which dispositions of the various plantings, shrubbery, paths and car drives etc. are shown. The beauty of a building is enhanced by creating surrounding and giving an atmosphere to it which will make it as an abode of people of taste and refinement.

Guidelines to draw a landscape plan

- Draw the location of the building in the plot
- Draw compound wall and gate of entrance
- Show the path drives along with garden plan around the house

Exercise

Draw a landscape view of house or give an illustration

Experiment - 10

Kitchen Plans

Aim To study and draw the different types of kitchen

Introduction

The total environment of kitchen includes general plan, the layout of the work area, floor, walls, counter space, storage areas and lighting and ventilation. The location of the kitchen is an important factor to consider and it should have direct connection with the dining area. It should have an independent entrance so that worker need not have to walk through the living area with groceries or garbage. Irrespective of size a kitchen should be a cheerful space in which to work, eat or carry on other kinds of activities.

The Work Triangle

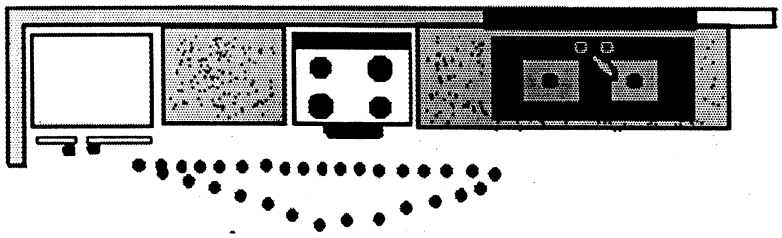
The major work of kitchen is usually planned around three major appliances - Refrigerator, sink and range. Each appliance is related to a major function in food preparation; the refrigerator for storing; the sink for preparation and cleanup and the range for cooking, together these appliances and the surface areas form the work triangle. The layout of this triangle is important to its efficiency and its convenience as a work area. It is usually desirable to have the sink and the range on the same wall or on adjacent walls because most activity of food preparation takes place between or near these two areas.

The dimensions of the triangle as well as layout affect its efficiency as a work area. As a rule the sum of the sides of the work triangle should not be smaller than 15 ft (4.9 m) or larger than 22 ft (6.7 m). In a large kitchen the sum may be increased to 26 ft (7.9 m).

Basic Plans of Kitchen

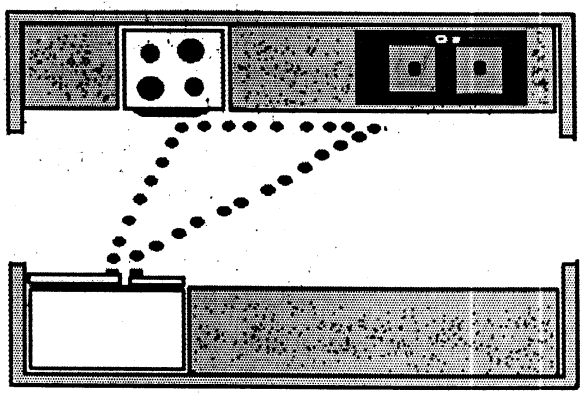
One Wall Kitchen

One wall kitchen has all work centres arranged on a single wall. One wall kitchen provides an efficient work area in a small apartment or in a home with limited space. For maximum efficiency in this kitchen the sink should be placed between the range and the refrigerator, with counter space on both sides for stacking dishes. The single wall or galley kitchen has all three centres in a line. The shape is usually for small kitchens; the distances are kept short, but work space is very limited



One / Single-wall kitchen

Parallel / Corridor Kitchen/ Two wall kitchen

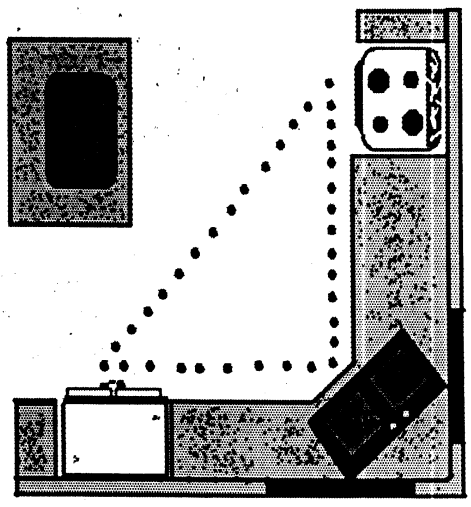


Parallel / corridor Kitchen

Work centres are arranged on two parallel walls leaving a corridor free for movement. The two-wall or corridor kitchen is an efficient design. It provides the maximum amount of under counter storage space for its size. However, if the kitchen has an outside door at one end and a door to the dining area of family room at the other end traffic through the work area may become a problem. To reduce hazards and increase working efficiency in a corridor kitchen, the sink and range should be placed on the same wall. Counter space is necessary on each side of sink and range for a work area or a place to stack dishes and cooking utensils.

L-Shaped Kitchen

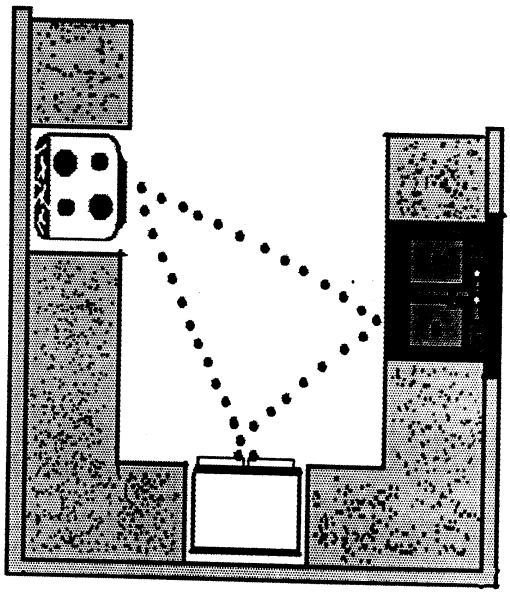
Work centres are organized on three adjacent walls. The L-shaped or corner kitchen is an efficient design because work areas are uninterrupted by traffic. In this kitchen two adjacent walls are taken up by cabinets and appliances, the other two wall are free for doors and windows, a cleaning closet, an area for cating. L–shaped kitchen has two centres on one wall or in one work area and the third centre at right angle. It is more open



L-shaped layout

than a U –shaped kitchen. It has only one corner to restrict storage options and promotes the use of an island for preparation and dining.

U-Shaped Kitchen



Work centres are arranged on three adjacent walls. The U-shaped or two corner kitchen is popular because it is compact, step saving and usually free of cross traffic. The sink should be placed at the inside or center of the U at least 12 inches (30.48 cm) or 15 inches (38.10 cm) from each corner. In an unbroken U, with no spaces between centres, there can be no through household traffic to interfere with the work. Advantage of the U –shaped kitchen is the large amount of counter space, short walking distances, and restricted traffic.

Exercise

Draw the kitchen plans with work centres organized in various shapes

Experiment - 11

House Plans for different income level

Aim To draw the house plans for different income levels

Introduction

Having a new house built to a design is one of the most popular ambitions of every individual. Building the house on your own land requires many decisions and one has to plan and manage the whole thing in a careful way.

If one is really hoping to build a house on own land then one has to sort out the dream from reality and to do this one must look hard at these essentials.

1. First of all one need to consider designs in relation to the financial situation, Know what you can afford to spend and work out what you can build within your budget.
2. Secondly the building of house should be thought as an investment. It rnust increase in its value.
3. Thirdly home should be exactly the building that you want to live in, suiting your life-style with the appearance and atmosphere.
4. Calculate rough estimate of construction. Average cost per Sq.Ft. multiplied by the number of Sq.Ft. in a design gives a very rough indication of total cost.

This can be related to your budget costs. This is an essential step in deciding what you can afford.

Before considering the actual cost of the particular house know the approximate cost of construction for this you must know some figures.

a) <u>Floor area</u>:

For most technical and legal purposes the floor area of building is not the overall area but it is the area enclosed by the internal faces of the external walls, which is in general 10 per cent less than plinth area.

b) <u>Plinth area</u>: The total area of dwelling with external faces of all walls.

c) Cost per square feet which depends upon three factors

1) What you build, 2) how you build and 3) where and when you build.

One of the best ways of getting reliable up-to-date costs is to look at the figures quoted by the companies who provide a package service for individual sites.

Size of the house in relation to number of rooms.

Sq. ft. area	Rooms in house	Income Level
300-350 Sq.ft.	One bed room/Drawing room Kitchen, Bathroom and Water Closet	Low
600 - 700 Sq. Ft.	Bedroom, Kitchen, dining room, drawing room, bathroom & Water Closet	Medium
800 - 900 Sq. Ft.	Two bedroom Bungalows with larger kitchens or a separate dining room	HIgh

Exercise

1.Collect the information on prevailing cost of construction

2. Develop floor plans for different levels of income

Experiment -12

Modifying the existing house plan for convenience

Aim To modify the existing house plan as per resident's requirement.

Introduction

House should afford the family shelter, comfort, convenience, privacy, rest and quiet. In the choice of a house for the family home, each family wants the best it can get in terms of its own needs and its ability to pay. While planning or building a house, many times the things cannot be exercised to have the desired plan of house. Many times it is difficult to get the house which meets fully the needs of the group.

The floor plan of .house should be studied properly in relation to activities carried out in respective rooms. It should be such as to facilitate pleasant and efficient family living. Desirable characteristics in the house plan should be established in the light of the activities of the home and the interests and desire of the family members. After determining family needs and desires the next major consideration is how these may best be met. Wide information concerning the successful relation of the house to the family needs and also the relation of the house to its environment is essential to make the plan convenient for inmates.

Complete dismantling of the structure of house is an expensive task. Similarly the size of the structure cannot be extended. But little changes in the existing plan could make it better for living. Modification in the existing plan must be carried out on paper and shown to architect for the possibilities and estimation.

Exercise

Develop the conceptual plan of the modified house for convenience of inmates

Experiment -13

Special Needs and Anthropometric Requirements

Aim To enlist the special needs and study the anthropometric requirements

Introduction

Anthropometrics also includes consideration of physical, behavioural, cognitive, and social issues when designing an artefact or system. Many problems are generated if users' physical characteristics are not considered during design.

- Anthropometry is the study of the dimensions and abilities of the human body. Wheeled mobility devices are used by people with mobility impairments to support their mobility in buildings and in the community, e.g. manual wheelchairs, power wheelchairs and scooters. Static anthropometry is the measurement of body sizes at rest and functional anthropometry is the measurement of abilities related to tasks. In the case of wheeled mobility, static anthropometry includes measurement of people and their devices.
- Functional anthropometry includes measurement of reaching abilities, manoeuvring and other aspects of space and equipment use from a wheeled mobility device.

There is a very important criteria while planning interiors for special needs. Compared to able bodied persons, the Anthropometries vary with persons with different handicapped. The reaching heights and distances also vary with the types degree of handicap and mobility. Perhaps the most difficult problem presented by this population is its diversity. Disabilities may be caused by a wide variety of diseases and injuries as well as genetic and congenital conditions.

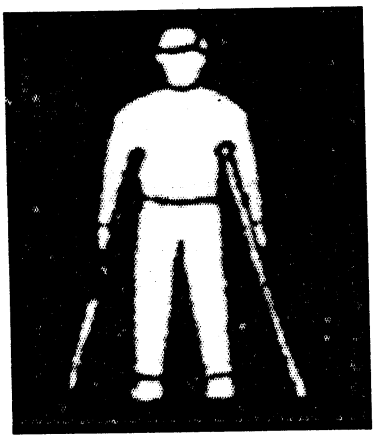
Various disabilities under special needs are broadly classified under four categories.

1. Non-Ambulatory

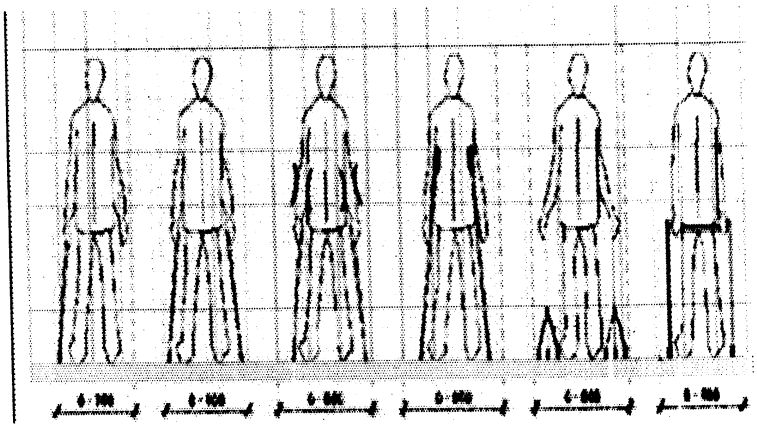
Impairments that, regardless of cause or manifestation, for all practical purposes, confine individuals to wheel-chairs are non-ambulatory disabilities. The main problem for wheelchair users are about moving and working from a sitting position; thus many requirements are associated with the dimensions and other aspects of wheelchairs.

Semi-Ambulatory

Impairments that cause individuals to walk with difficulty or insecure. Individuals using braces or crutches, amputees, arthritics, spastics and those with pulmonary and cardiac ills may be semi-ambulatory. For walking aids users to move securely, ground and floor surfaces should be even and slip resistant. Handrails should be provided on stairs and ramps. Resting places should be provided along travel routes



Semi Ambulatory Disabilities

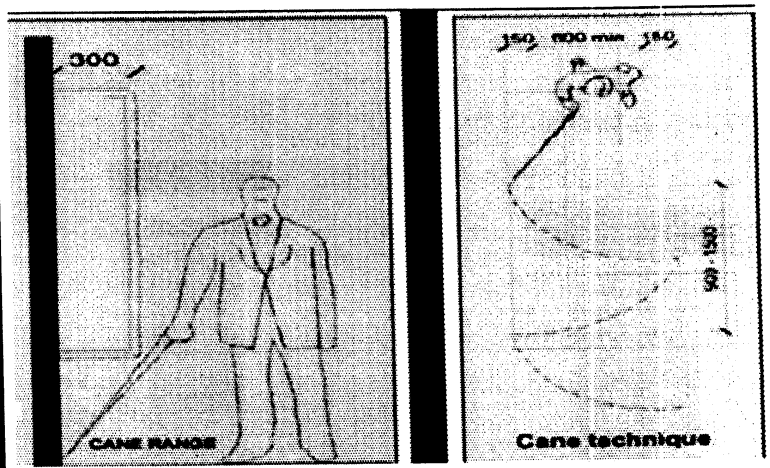


Dimensions of Walking Aid Users

Sight disabilities

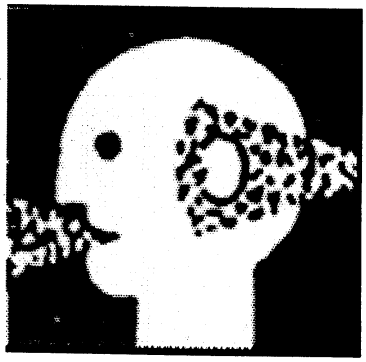
Visual impairment (or vision impairment) is vision loss (of a person) to such a degree as to qualify as an additional support need through a significant limitation of visual capability resulting from either disease, trauma, or congenital or degenerative conditions that cannot be corrected by conventional means, such as refractive correction, medication, or surgery. Total blindness or impairments affecting sight to the extent that the individual functioning in public areas is insecure or exposed to danger

Sight disabilities



Dimensions of the blind

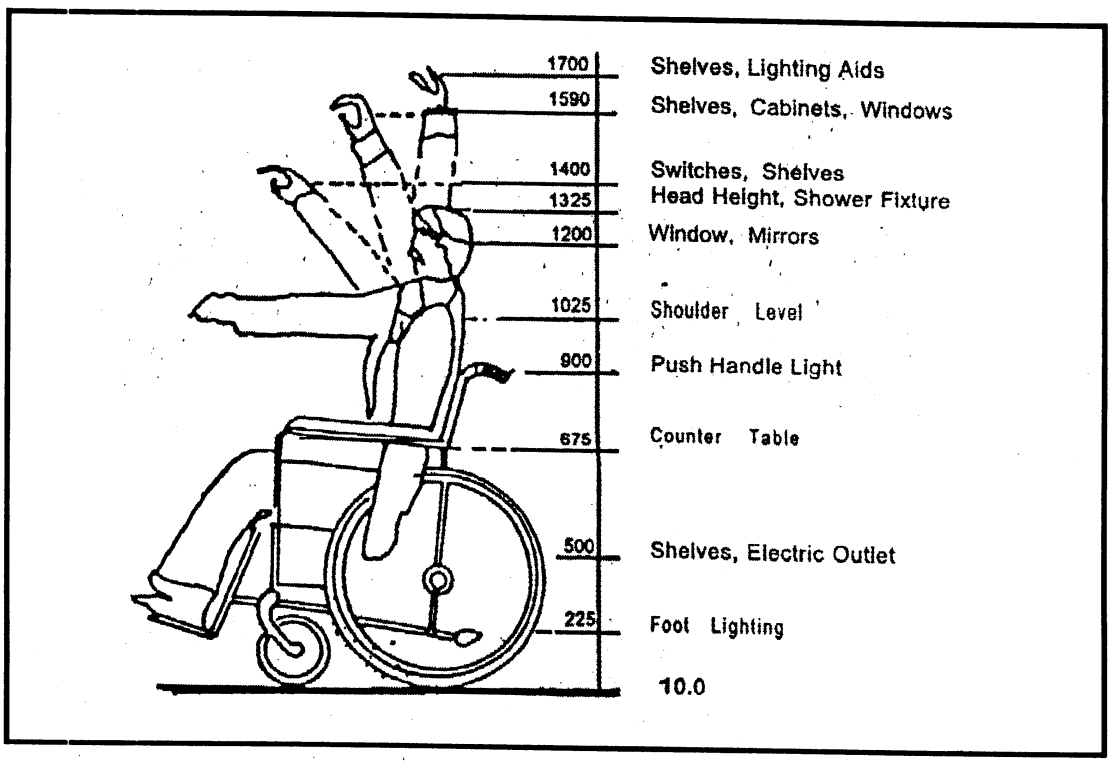
Hearing disabilities



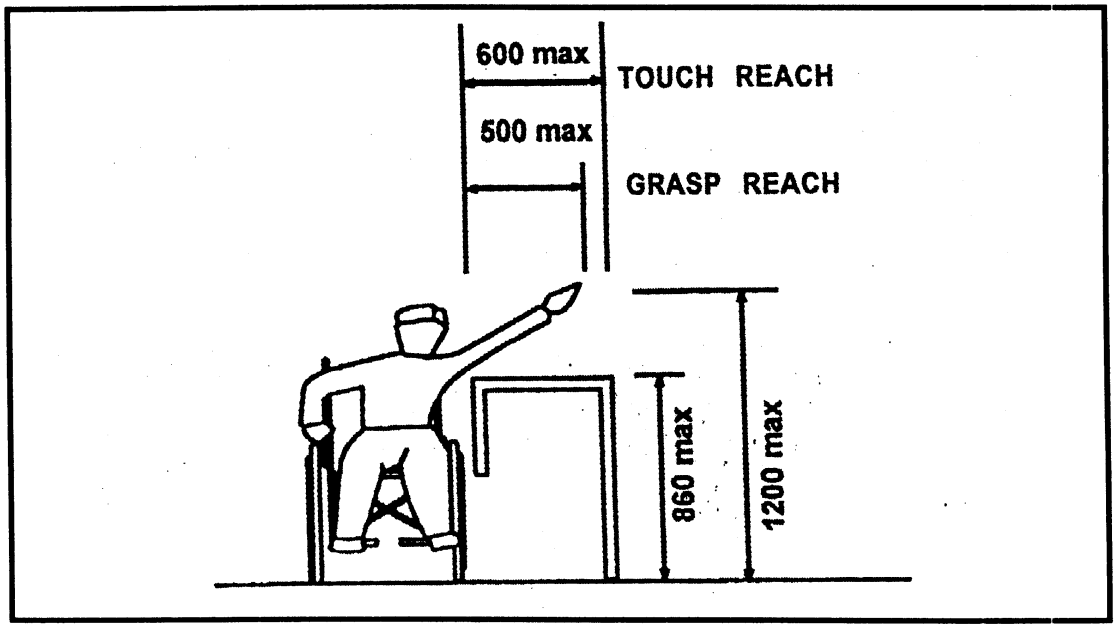
Hearing impairment or hard of hearing or deafness refers to conditions in which individuals are fully or partially unable to detect or perceive at least some frequencies of sound which can typically be heard by most people. Mild hearing loss may sometimes not be considered a disability. People with impaired hearing have difficulty in understanding words and sounds in noisy environments. Rooms should be acoustically insulated and supplementary visual information should be provided for example in airport and buses and for the use of lifts, alarms, bells.

Learning difficulties

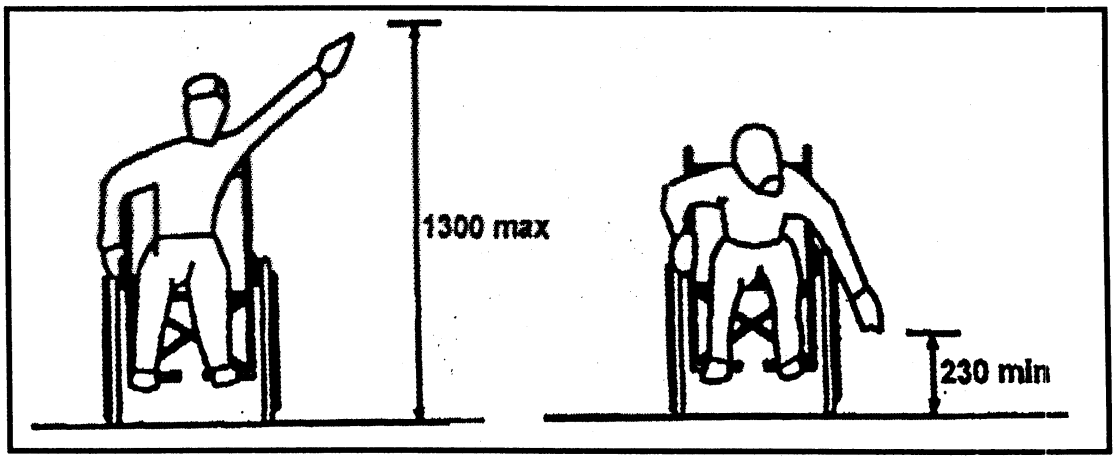
These people form a very heterogeneous group. They can face difficulty in orientation. Simple design is preferred with clear and unambiguous signposting.



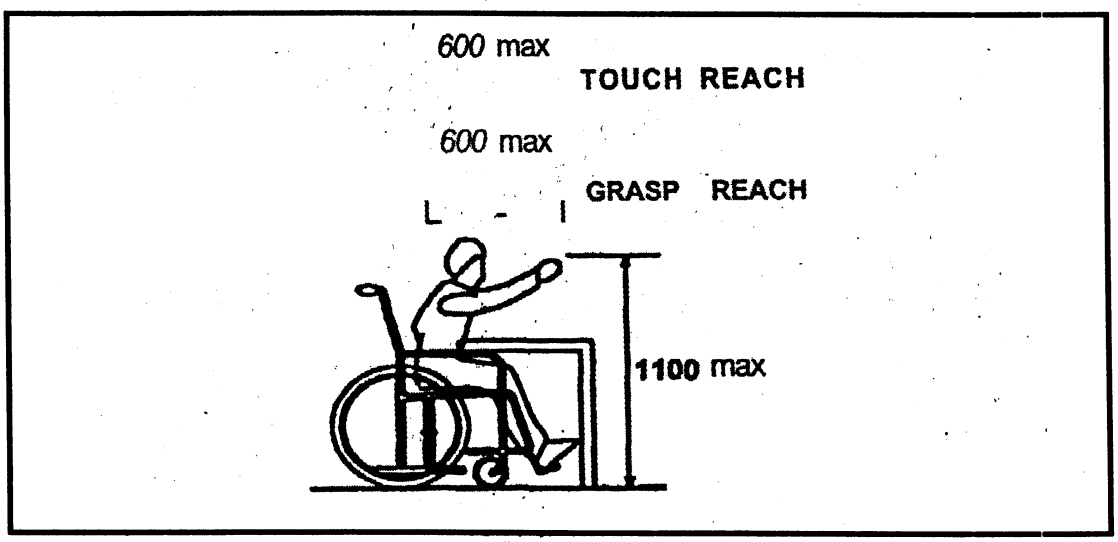
Typical Dimensions for Essential uses within easy reach



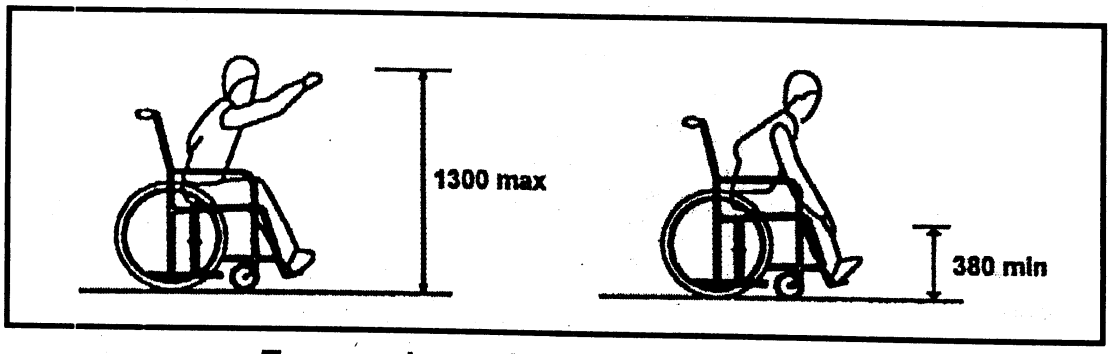
Side reach over obstruction



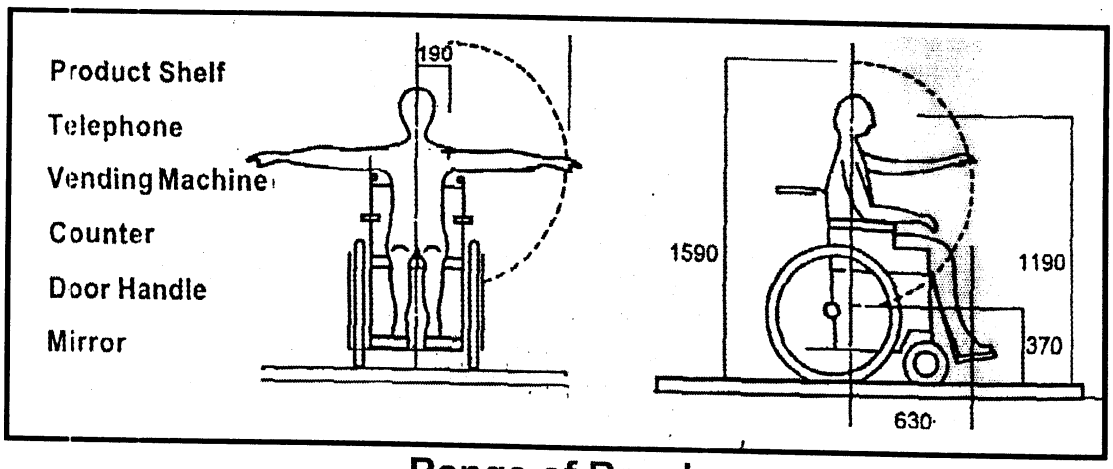
Side reach without obstruction



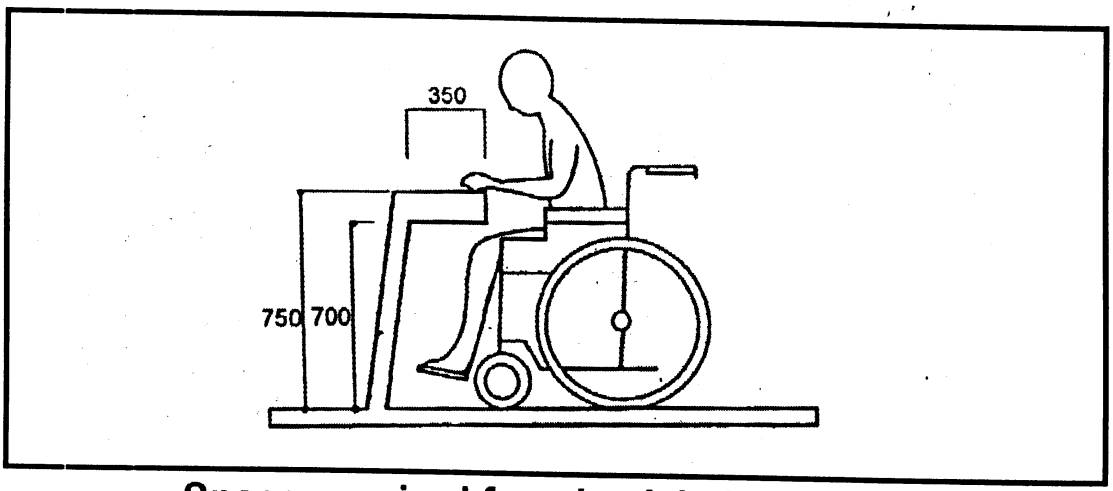
Forward reach over obstruction



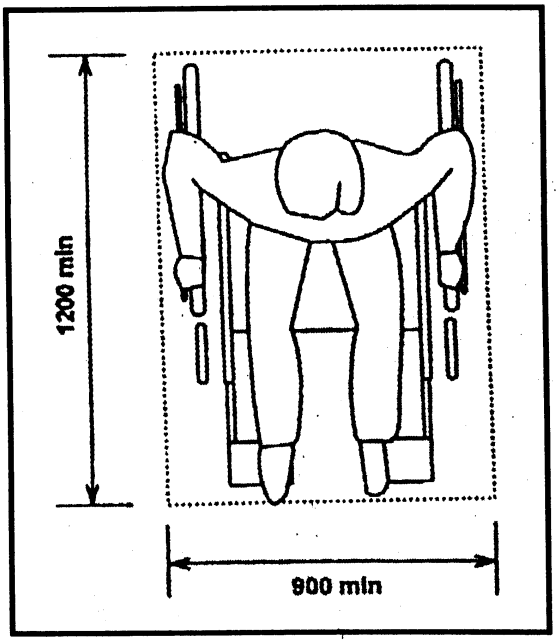
Forward reach without obstruction



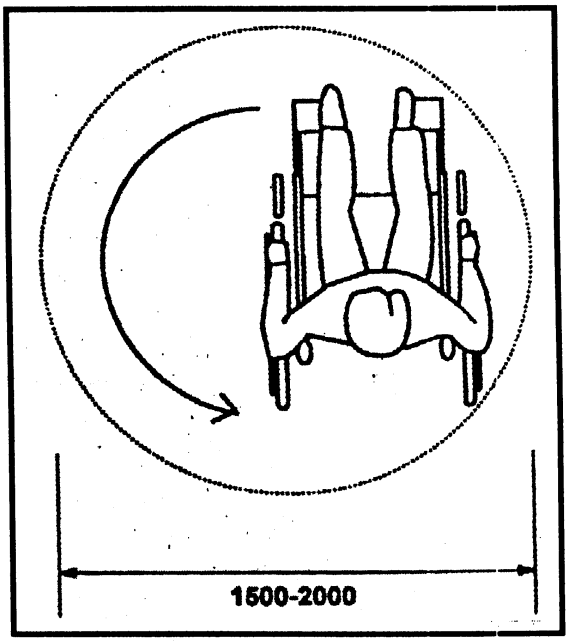
Range of Reach



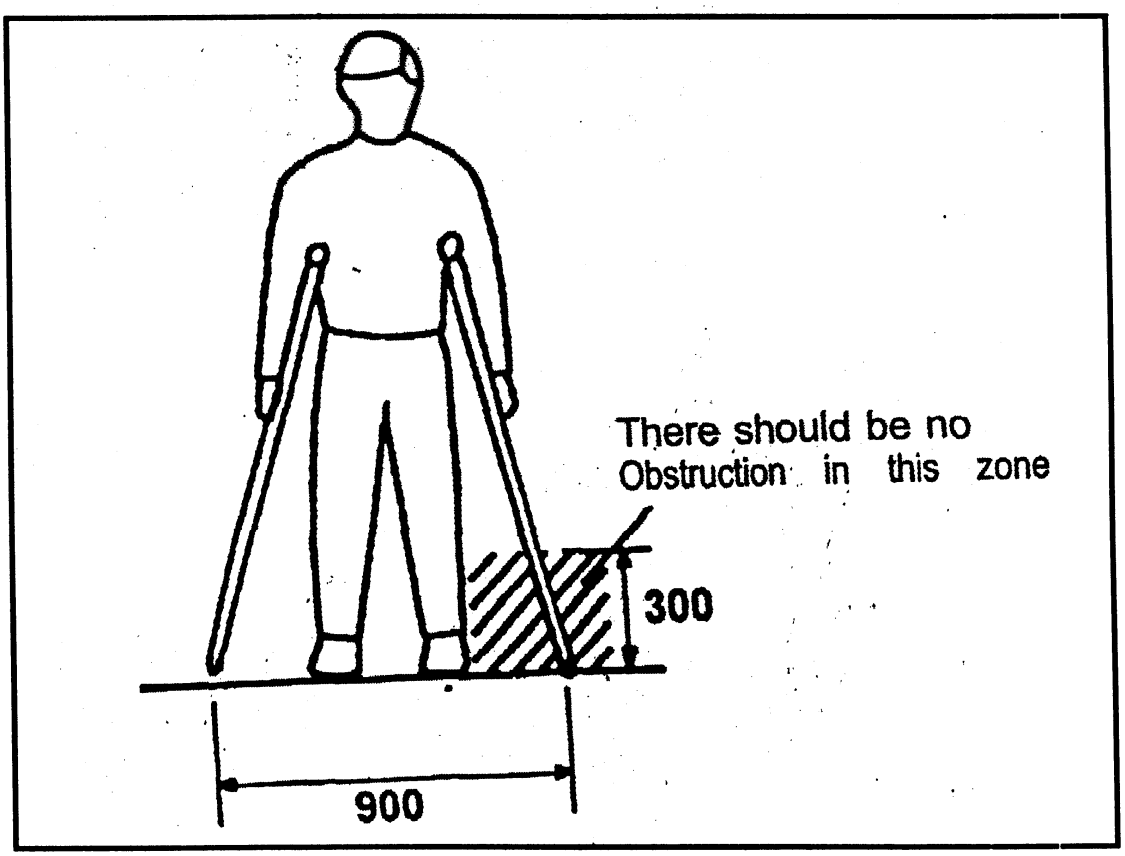
Space required for wheelchair footplate



Space Allowance



Space Allowance



Space Allowance

Exercise

Learn and practice the anthropometric requirements of special needs.

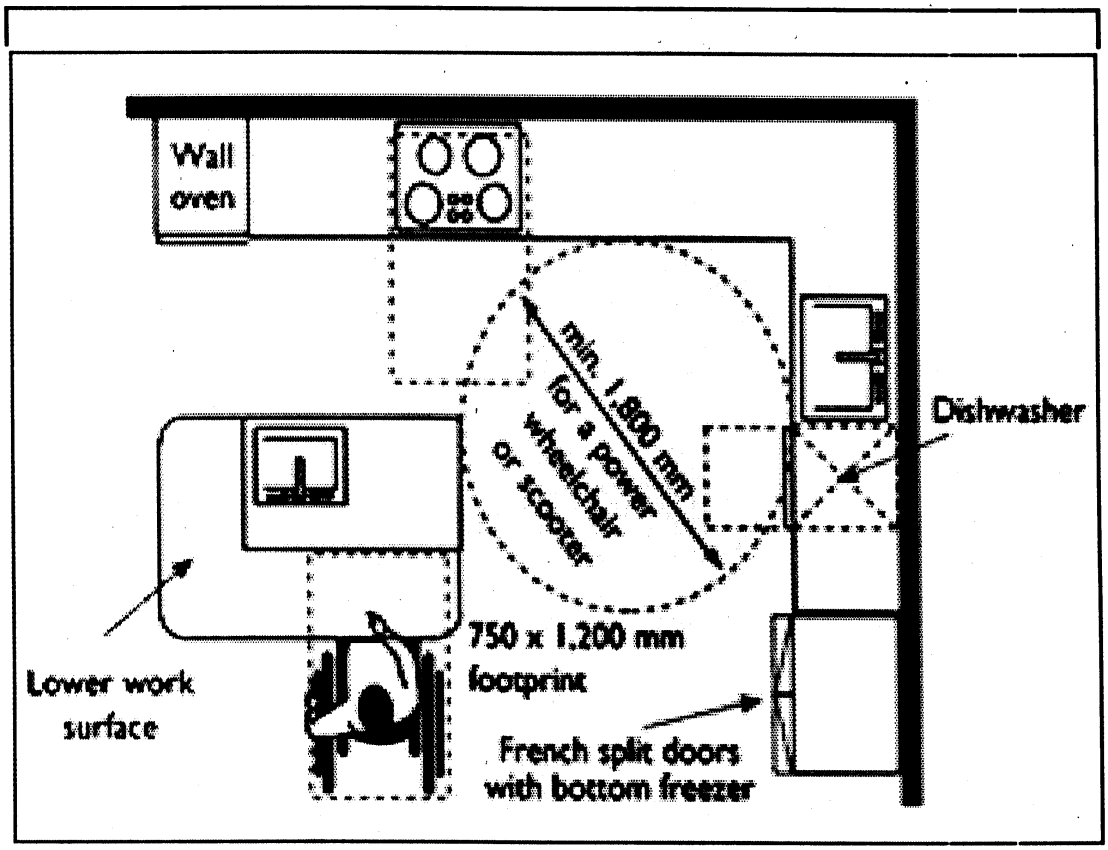
Experiment -14

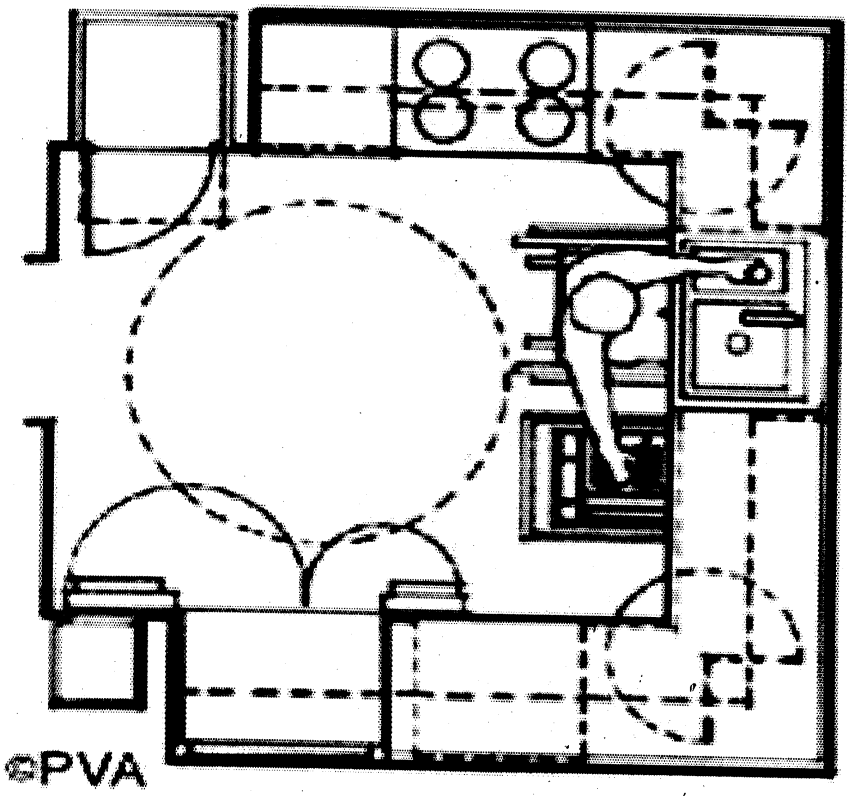
Kitchen Designs for Special needs

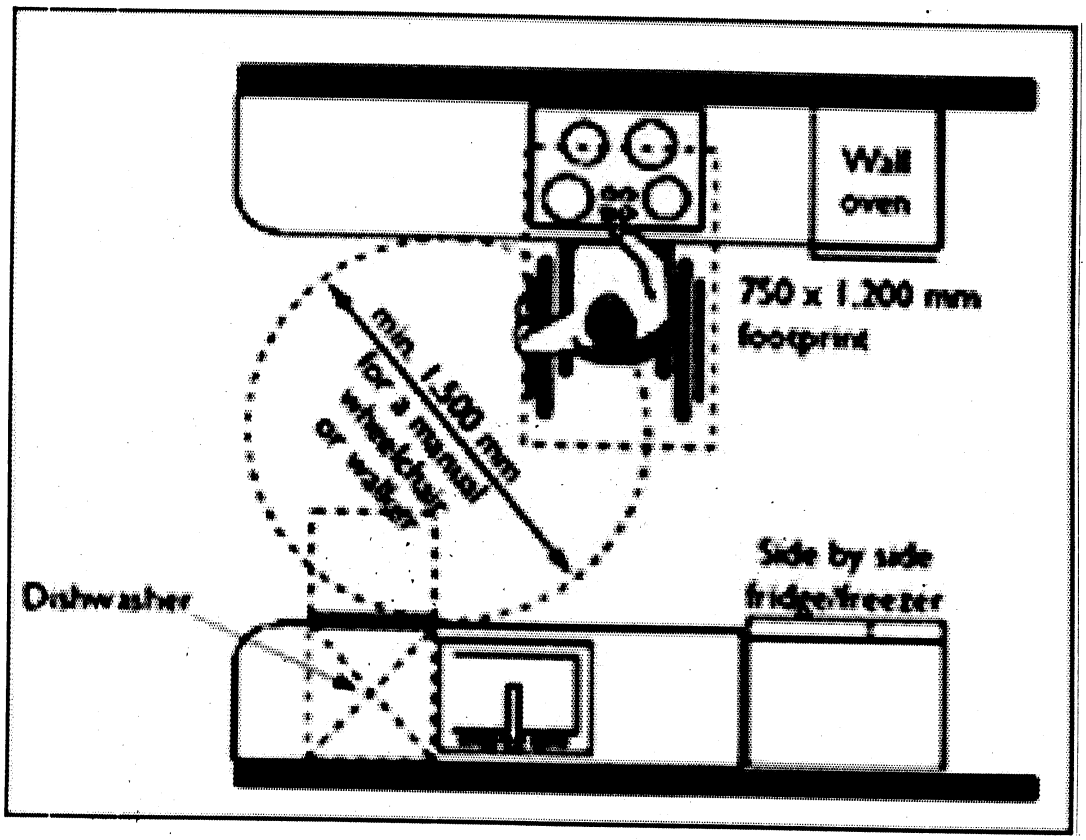
Aim Designing kitchen for special needs

Introduction

kitchen is one of the main rooms in the house where the impact of physical limitations is felt. The design of a kitchen should not limit a person's independence and ought to be adaptable to accommodate specific individual's needs. To accommodate a wheelchair user or other seated occupant, portions of the work surfaces should be constructed at a lower level than those for standing users with leg room provided under work benches. To enable such changes to occur easily kitchen joinery can be installed using modular components which allow for easy removal or modification of individual components rather than the reconstruction of the entire joinery layout. Such components should be installed after the non-slip floor finish is completed to avoid replacement at a later stage.







Exercise

Develop a plan of kitchen for disabled person

Experiment -15

Bathroom Designs for Special needs

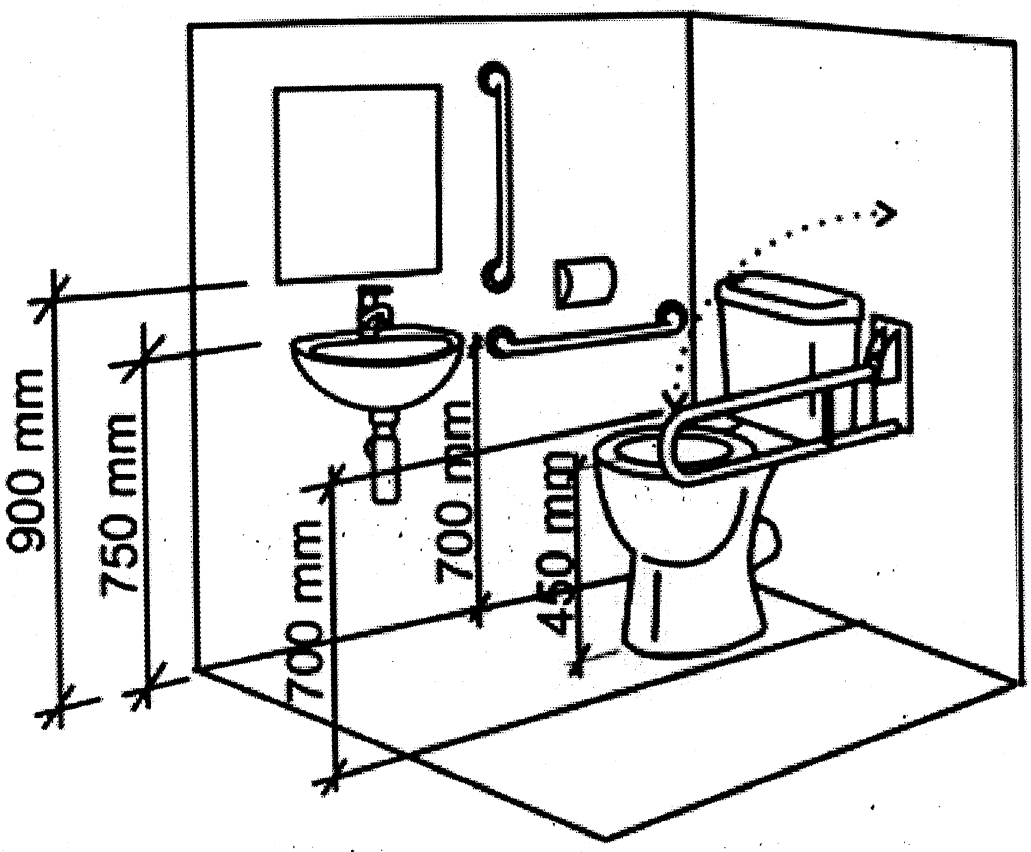
Aim Designing bathrooms for special needs

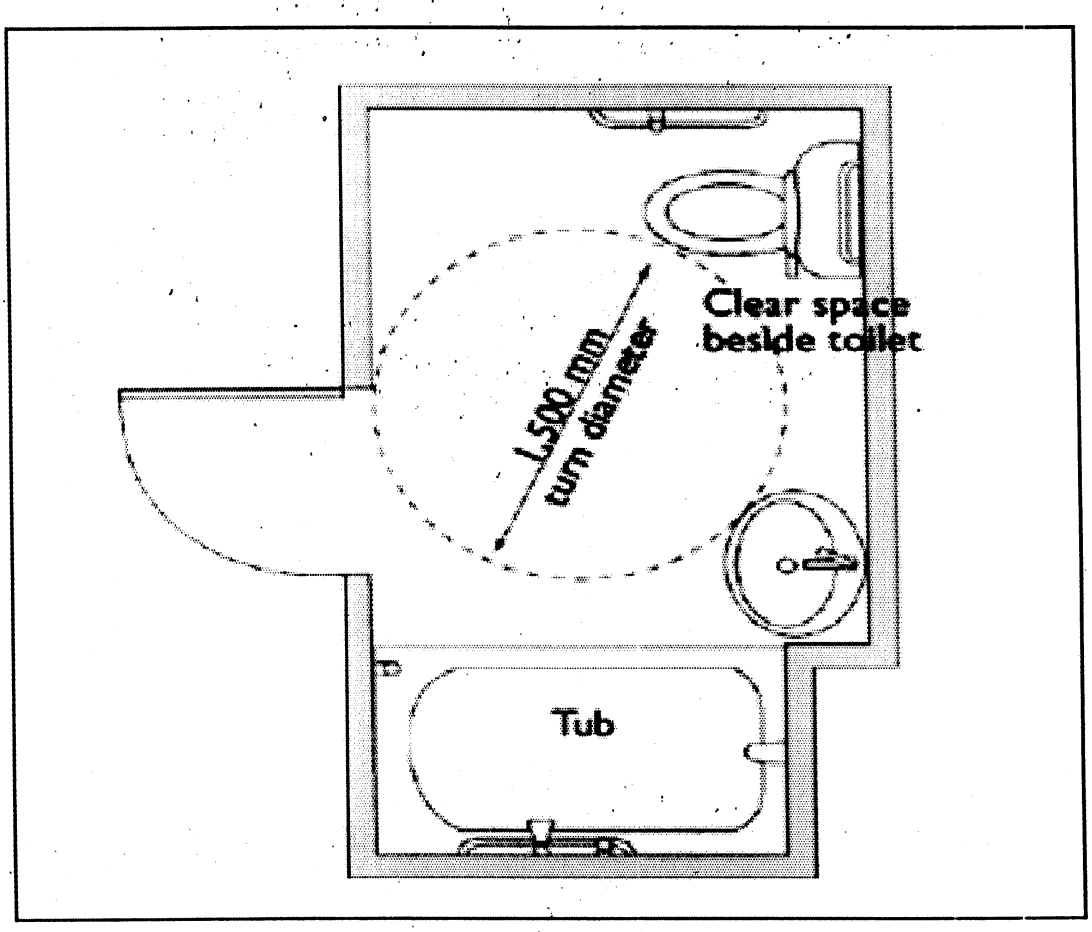
Introduction

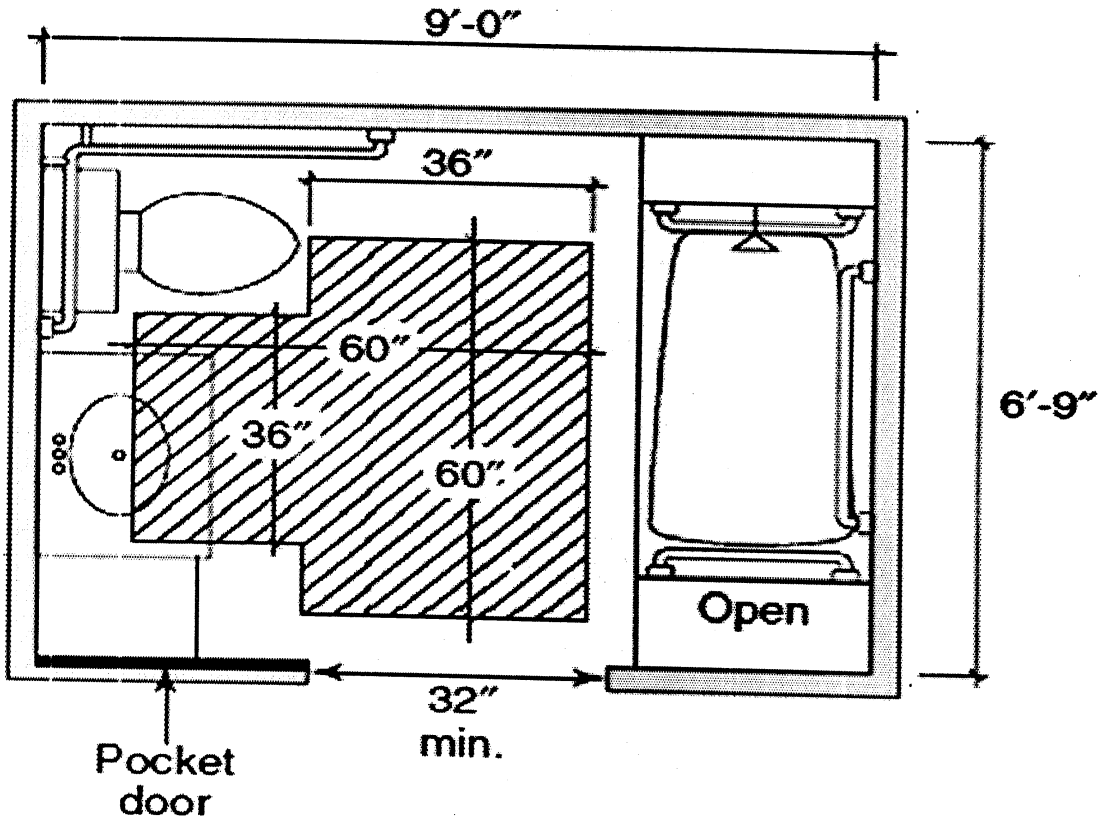
When designing a wheelchair accessible bathroom there are many things to take in to consideration. The first priority in bathrooms designed for people who use wheelchairs is plenty of room for access and maneuvering. You should start with the entrance or doorway. Barrier-free bathrooms are normally larger than average, if possible having an open area within the bathroom that's at least 5 feet in diameter to allow for easy turning. Also it is advisable to have 4 feet of clear space in front of each fixture, as well as between the sink and the toilet, if both fixtures share the same wall.

General bathroom access and safety

- An accessible bathroom needs to be 30" x 48" for mobility devices in front of each plumbing fixture and room to turn around in a wheelchair.
- Doorway will need to be widened for wheelchair access. A door into bathroom should be a minimum of 34" wide for wheelchair users. Use lever style door handles that are easier to use than doorknobs.\\
- A door that swings outward instead of inward will allow more space inside the bathroom.
- Using a pocket door in small spaces is another good option for constructing optimal space.
- If space allows when designing a bathroom, it should be considered if there is enough space for 2 people if an attendant is needed to assist a user in personal care.


900 mm
750 mm
700 mm
700 mm
450 mm


1,500 mm
turn diameter
Clear space
beside toilet
Tub



Exercise

Study and develop a plan of bathroom for wheel chaired

Experiment -16

Building Materials

Aim Study of Building Materials

Introduction

Building material is any material which is used for construction purposes. The speed of construction, safety, durability and performance of houses greately depend on the type of building materials used and appropriate technology of construction.

Classification of building materials in the stage of industrialization

A. **Building material for basic construction**

1. **Bricks, blocks and tiles** - Clay fly ash bricks, acid resistant bricks, vitrified and paving bircks, bricks from red and marine soils, lime bricks
2. **Natural Stones** - Sandstone, slate, laterite, basalt
3. **Man-made/ Artificial Binder** - Sintered fly ash, bloated clay, foam slag
4. **Other Binders** - Pozzolona cement, slag cement, high magnesia cement, oil-well cement, masonry cement
5. **Concrete** - Portland cement concrete, fibre reinforced concrete, cellular, light weight concrete, polymer concrete

B. **Special purpose materials**

1. Composites 2. Plastics and polymers

C. **Protective and Decorative materials**

1.Paints and water proofing materials

It is the most important item of finishing in enhancing the look of a building. There are broadly two types of paints. Ordinary paint known as ready mixed paint is oil based. It is slow in drying. Enamel paint is synthetic resin as against oil for ready mixed paint. It is more durable. Paints ate applied in thin coats. All new works are given a cost of primer and two coats of paints. The major properties of strength at normal and high temperatures, porosity and permeability, water resistance and volume stability, weathering resistance under different exposure conditions are important to be tested as they dictate their field of application for durability.

2. Sealants

a substance such as paint or polish that is painted onto a surface to protect it from other liquids going into it, or is put in the space between two materials for the same reason

Exercise

Conduct a market survey for building material and present a report