



## WALL, FLOOR AND CEILING TREATMENTS

**Dr. KHYATI TRIVEDI**

*Faculty of Family and Community Sciences, The Maharaja Sayajirao  
University of Baroda, Vadodara, Gujarat.*

DOI: <https://doi.org/10.52458/9788196897444.nsp2024.eb.ch-06>

Ch.Id:-NSP/EB/HHABITS/2024/Ch-06

***About the Author:** Dr. Khyati Trivedi holds a B.Sc., M.Sc., and a Ph.D. in Interior Design from The Maharaja Sayajirao University of Baroda, Vadodara. With nine years of teaching at the same institution, she's actively engaged in the Department of Family and Community Resource Management, Faculty of Family and Community Sciences. Dr. Trivedi has contributed significantly to academia, presenting 13 papers at national and international seminars, co-authoring two books, and publishing nine research papers in renowned journals. Her scholarly pursuits include two patents and one copyright, and she's deeply involved in Teaching, Research, and Extension activities, showcasing her multifaceted commitment to her field.*

### 6.1 INTRODUCTION

According to Dodsworth (2009), a well-designed interior provides a new depth to a place. It may improve our efficiency in our daily lives while also adding depth, insight, and significance to the built world. A thoughtful and well-crafted design makes a room simpler to grasp, and experiencing such a space lifts the soul as well. It is thus more than simply an aesthetic discipline; it is also a practical and philosophical one. Beautiful environments reveal a logical and sensible questioning of the current quo and might be an honest endeavour to uncover new and interesting ways to spend our lives.

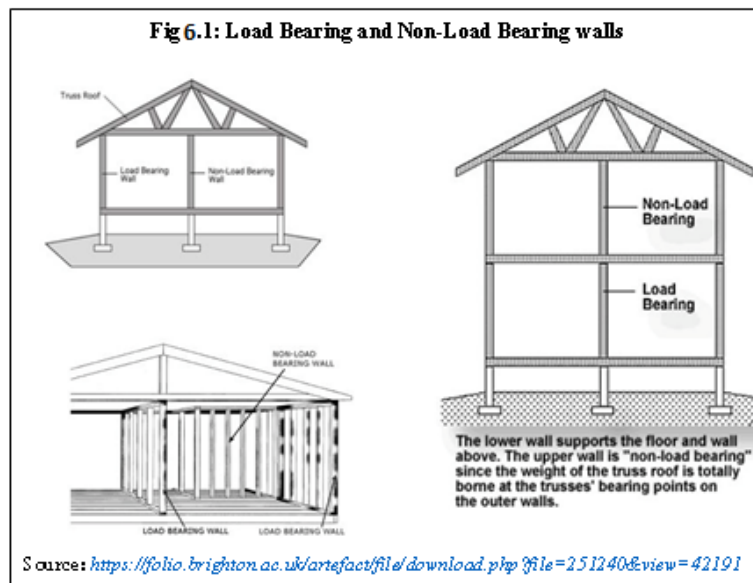
The phrases 'interior architecture,' 'interior design,' and 'interior decorating' are occasionally utilized interchangeably. What is the difference between the various professions? The distinctions are not absolute. Several variables influence where borders are drawn. Professionally, it may come down to which country the designer is working in (or, maybe more accurately, whatever regulatory framework the designer is working under). The descriptions below, while not exhaustive, provide an insight into the many tasks and duties of people whose work involves the design of livable spaces. Planes (walls, floors, and ceilings) are used by architects to describe the volumes (spaces) that make up a structure. They are taught how to build structures from the ground up. They will evaluate both intellectual and practical factors, and the building's design will be influenced by its location. Some architects may keep

their involvement to a minimum, while others will meticulously arrange furniture layouts and create ornamental schemes.

Interior architects are typically concerned with adapting existing structures to new purposes. They will take into account a building's prior existence and generally allow this information to offer some relationship between the fabric of the structure and the newly built interior. Interior decorators typically deal with pre-existing rooms that do not require physical changes. They will modify the aesthetic of a space by using colour, light, and surface finish, possibly making it appropriate for a different use than that for which it was originally planned, but with very little or no modification to the structure of the building. Interior designers bridge the gap between interior architects and decorators. The extent of the tasks executed will range from essentially cosmetic to those requiring significant structural alteration to achieve the requirements. An interior designer will skilfully manage space planning and the construction of ornamental schemes while also taking into account important structural alterations. None of these individuals will be experts in every component of a project and will need to rely on other specialists (such as structural engineers or lighting designers) to completely implement their ideas. (Dodsworth, 2009).

## 6.2 WALLS

The wall is the most significant component of the structure. A wall's primary role is to divide a building's area to make it more practical and usable. Walls provide privacy, security, and protection from natural elements such as heat, cold, sun, and rain. It is also sturdy since it supports floors and roofs. A wall is essentially a vertical load-bearing element with a width that is greater than four times its thickness. There are two kinds of walls: load-bearing walls and non-load-bearing walls. Load Bearing walls are designed to support superimposed loads in addition to their weight. Non-load-bearing walls solely support their weight. The primary function of non-load-bearing walls is to divide or serve as partition walls.



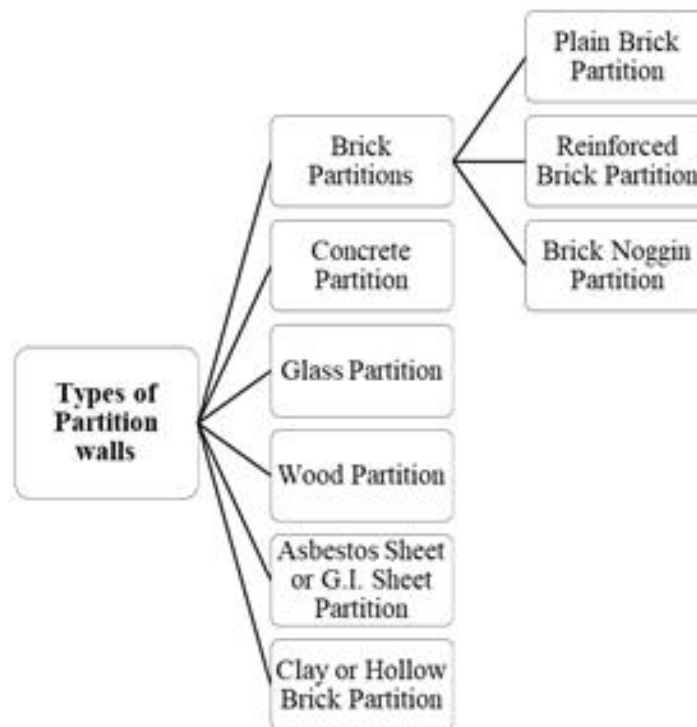
One another type of wall is a cavity wall. A cavity wall is made up of two independent walls with a space between them. The cavity is typically 5cm to 10cm (2" to 4"). If the hollow wall is not load-bearing, the two leaves can be of equal thickness, or the inner leaf can be thicker than the outer leaf to suit structural requirements. Cavity walls are built to prevent wetness from being transmitted to the inner walls. It also improves the building's thermal insulation.

There are benefits of cavity walls such as; it provides excellent sound insulation. Moisture is prevented by two walls with a gap. The two leaves of cavity walls have a layer of air that is a non-conductor of heat, reducing heat transfer from the exterior phase to the inside of the structure. Cavity walls have been shown to have a 25% higher insulating value than solid walls.

Other types of walls apart from load and non-load-bearing walls and cavity walls are partition walls. A partition wall is a wall that is built to split an area or component of a structure into sections. Partition walls are often built of bricks, wood, glass, concrete, metal, and other materials. They are primarily non-load-bearing walls that may be folded, collapsible, or fixed depending on the situation. They are there to provide seclusion. A good partition wall should be thin, light in weight, work as a sound barrier, be fire resistant, sturdy and strong, affordable and easy to build, and serve an aesthetic role.

### 6.2.1 Partition Made with Bricks

Brick partitions are the most popular and least expensive kind of house partitions.



- **Plain Brick Partition:** This half-brick-thick partition is built by placing bricks as stretchers in cement mortar and plastering both sides of the wall.
- **Reinforced Brick Partition:** At every third stage, bricks are strengthened with iron straps or steel bars that are 25 to 28 mm broad and 1.6 mm thick.
- **Brick Nogging Partition:** It is made out of bricks that are usually half the thickness of a brick within a timber frame. Vertical components called studs are spaced 4 to 5 times the length of the bricks and are kept in place by horizontal members called nogging pieces. The nogging components are contained in the studs at 60 to 90-cm vertical intervals. The wooden structure supports the wall from lateral stresses and vibrations induced by opening and adjacent doors and windows.
- **Concrete Partition:** Plain or reinforced concrete partitions are readily available. It can be cast in place or made from precast panels or blocks. These dividers are stiff and robust both vertically and horizontally. Precast slabs 32mm thick are utilized and are put into the grooves of the precast post, with the seams filled with cement mortar.
- **Glass Partition:** Glass walls can be created from either sheet glass or hollow blocks. A wooden frame is used to secure glass sheets in a glass sheet divider. The wooden framework contains horizontal or vertical poles that divide the entire area into several panels. This sort of barrier is light in weight, simple to build, and offers good sound insulation. Glass dividers are both soundproof and fireproof.
- **Wooden Partition:** A wooden framework supports the floor and is attached to the side walls of wooden partitions. The wooden structure is made up of horizontal and vertical components and can be plastered or covered with boards or other materials from both sides. Wooden partitions are prone to deterioration or being eaten by white ants, and they can also catch fire easily due to their lack of fire resistance. The main advantage of utilizing such dividers is their lightweight, however, they are more expensive.
- **Asbestos Sheet or G. I. Sheet Partition:** To secure the asbestos or galvanized iron sheet for the divider, a wooden structure is employed. This sort of partition is lightweight, thin, and less expensive than other partitions. Specially made slabs of asbestos cement sheet are used to create a robust divider. Two plain asbestos cement sheets are joined on both sides of each slab consisting of a core of corrugated asbestos cement sheet in such partitions. This sort of divider is more fire-resistant and provides excellent heat and sound insulation.
- **Clay or Hollow Brick Partition:** The bricks/blocks used for these dividers are constructed of clay, terracotta, or concrete. They are lightweight, stiff, sturdy, cost-effective, and provide superior heat and sound insulation. The hollow blocks come in a range of sizes depending on the material used to make them. The blocks are divided into top, bottom, and side groups, which offer solid connections and facilitate plastering. These blocks are laid with cement mortar.

### 6.2.2 Purpose of Walls

The material used in constructing the walls would affect the amount of heat, light, and sound being transmitted inside any room or area. Walls with a lot of glass area would, for example, give a lot of light in the room while solid opaque walls would restrict light. Heat-resistant materials used in the construction of walls reduce cooling costs. Sound-absorbing textures on the wall do not allow the sound to echo in a room.

Walls also govern the size, shape, and character of the room. They make rooms large or small, square, or rectangular, high, or low. The size, shape, and material used in the construction of the wall give it a definite character. It reflects one's needs and preferences. It shows whether one is formal or informal, active, or passive, extrovert or introvert. Walls also serve another function; they provide background for the furniture and other decorative object. They give background to the living and make the space liveable. The walls help to relate furniture to the architecture of the room and can be used for built-in storage or furnishings.

### **6.2.3 Character Expressed in the Design of Walls**

According to Seetharaman & Pannu, 2005, Walls acquire a personality based on the materials used and how they are placed when they are built. The size, form, and lines emphasized in the material arrangement give walls a distinct personality. The hue and texture of the walls add a new depth to them. Some of the themes that may be expressed through wall design are addressed below:

- **Formality:** Formality is conveyed by walls that are hard, sturdy, and accurate in their shape and form. The use of symmetrical balance in the design of doors and windows emphasizes this concept as well. The shapes should be uniform, sturdy, and exact. The wall-to-room-size relation should be vertical, i.e. the room should have a high ceiling. The smooth surface and suitable and somber tones provide the impression of seriousness.
- **Informality:** An informal feeling may be generated by adopting irregular forms. This effect may be achieved using line modifications such as a semi-circle or any protruding niche. Low or less-than-ceiling height walls are also considered casual. The stone and exposed brick walls provide the impression of informality. The casual proportion of doors and windows also expresses informality. The unique or diverse textures and hues demonstrate that the house's owner does not value formality. It conveys a sense of friendliness and warmth.
- **Horizontality:** When horizontal lines are emphasized in wall design, the perceived height of the space is reduced. A horizontal appearance is created by low ceilings and furnishings, large doors and windows, and horizontal lines in material arrangement.
- **Verticality:** To create the illusion of height in space, the ceiling should be high and light in colour, and vertical lines should be emphasized in the design of doors and windows. The arrangement of materials used in wall building might also be done to emphasize vertical lines.
- **Largeness of Scale:** The largeness or smallness of scale can be emphasized by effective wall layout. The use of large and strong shapes and textures emphasizes the large scale. The required appearance can be achieved by using huge blocks of wallboard or large print wallpapers. Colours that captivate the eye also call attention to them. These treatments take up less visible areas yet are quite effective.
- **The Smallness of Scale:** Inconspicuous little delicate shapes, patterns, and colours create a smallness of scale in a room. The texture should not be too bright but should blend seamlessly with the backdrop so that it integrates with it. Colour contrast should be kept to a minimum, and the arrangement of little strips of information should be consistent and organized.
- **Enclosure:** To give a space an enclosed appearance, the walls should be composed of opaque and substantial-looking materials such as stone, brick, and wood. The combination of warm tones and visible textures also

contributes to the intended impact. Doors and windows should be painted in contrasting hues, tiny, and individually framed. The window panels can also be tiny, allowing for very little glass surface.

- Openness: Those who desire a lot of openness should arrange light-colored walls with receding colours. The patterns and textures utilized should be subtle and fit in with the backdrop rather than stand out. Wide openings, such as large doors and windows, bring the outdoors within. Glass apertures from floor to ceiling eliminate the confined feeling. The consistency of materials and hues on the walls also creates the illusion of space. Transparent walls allow the most light in, whereas transparent glass diffuses the light more efficiently.
- **Light Absorption:** The right use of colours and materials on the walls might absorb too much light entering the space. It (89%) and black (2%), respectively. To lessen the glare caused by too much light entering the space, use dark hues and irregular textures, particularly on walls facing the apertures from which the light enters.
- **Light Reflection:** Most of the time, the light entering a room is insufficient because the doors and windows are tiny, few in number, and positioned incorrectly. As a result, it is necessary to ensure that whatever light enters the room is reflected and illuminates the space. Light hues and smooth textures should be used to obtain this look. The surface of the walls should be smooth, and mirrors are sometimes put on the walls to reflect light adequately. Light-coloured walls are often refreshing and improve the perceived size of the room. The smooth surface and bright hues make it simple to lighten the room.
- **Sound Absorption:** Outside noise and noise made within the home or office make it hard to work with focus. As a result, the necessity for sound-absorbing materials is felt. Sound-absorbing materials, such as cork or fibre boards, can be used. The use of porous materials and uneven textures can help prevent sound from resonating and spreading to other sections of the structure. Upholstered furniture and thick curtains absorb a significant amount of sound.
- **Sound Reflection:** If the walls are tiny and open, with few floor-to-ceiling partitions, the sound is reflected and transmitted all over the space. Sound is reflected through the use of a smooth finish and a parallel plain surface.
- **Durability and Maintenance:** The durability and maintenance of a wall is utmost important aspect for selecting wall materials. The walls which require a lot of care and maintenance reduce the satisfaction they give to one. Materials such as plastered walls or those covered with tiles of concrete, ceramic, or plastic are quite durable and easy to maintain. Wooden panel walls need to be protected from insects and polished regularly. Glass walls have the danger of breaking and difficulty keeping clean. Therefore, one needs to consider the kind of use a wall gets how easily it is damaged, and how easily it can be repaired and replaced. The time and effort involved in keeping them clean also is an important consideration while choosing the material and finishes used on walls. The wall materials and finishes should be durable which requires minimum maintenance.

#### 6.2.4 Wall Finishes

Today too many wall finishes are available to be installed. These finishes are installed or applied over the original wall surfaces. Different varieties of materials are pre-pasted surfaces for wallpapers, self-adhesive wall tiles, wooden planks with interlocking grooves, stick-quick plastic mouldings, and modular ceiling tiles. These are available with easy and practical installation methods. There is considerable standardization in the sizes and shapes of interior covering for walls, ceilings, and floors. In applying colour, designs, and materials to walls, one should always be aware

that a large span of the room's surface is being used up. Wall coverings define the mood and become the principles setting against which we place all other objects in the room. Design experts, decide on the type of wall covering to be used according to how colourful, active, textural, and functional the room is intended to be. Depending on the selection of the wall covering, the room can look larger/smaller, noisy/quiet, formal/informal, light/dark, cluttered/ empty, festive/serious, or bright/dull.

**Selection of Wall Coverings:** The selection of wall covering will depend upon the role the walls are likely to play in the overall decorating scheme of the room. Because of their extensive area and high visibility, walls constitute the most important decorating element in any room. This major element of the walls can certainly be used to establish the basic colour scheme or to provide a subtle foil for more dramatic, smaller components. If bold or bright prints for draperies and upholsteries are chosen, the neutral background of plain painted walls will give them the needed visual space in which to flourish. Similarly, when a space is desired to display an art collection, it is better to keep the walls unobtrusive and non-competitive. A room furnished with handsome antiques, on the other hand, seems to call for a more elaborate and traditional frame in which the furniture can be properly displayed. Wall coverings may make a major decorating statement or even provide the entire decoration for the room. A small room occupied only for brief periods can have an extravagant wall decoration which may prove too strong for a bedroom or guest-room. Forceful red-and-gold wallpaper, for instance, might overwhelm one's senses in a living room or lounge but would produce a feeling of pleasurable astonishment in a front room. In an entrance hall, a large mural painted on one wall might provide interest and even a subject for conversation. Wall treatments can be designed to cure defects of dimension or to camouflage awkward structural necessities like protruding columns. If the ceiling of the room is too high, it can be brought down by artful wall decoration. The other way of lowering the ceiling visually is to paint the walls in pale colour and the ceiling in a darker shade or to cover the ceiling with bright boldly patterned wall paper.

A room's look is greatly influenced by its walls. Because they may alter the appearance of a space and are available in a broad range of materials, it is essential to evaluate and comprehend the elements that determine their selection:

1. **Scale of Walls and Room Dimensions:** The scale of the walls the space dimensions and other things in the room must be considered while choosing wall coverings. Walls with dramatic patterns, such as huge rough stone or concrete textured surfaces, can be overwhelming in a tiny space with light and delicate furniture. Wallpaper with a little design in a light single cover, on the other hand, provides the illusion of a bigger size to space. In general, light hues or tiny-scale patterns are good in small spaces, whereas big-scale patterns are appropriate in large areas. A large wallpaper design or extremely dark wood paneling would overshadow a tiny room, whilst a delicate pattern may seem insignificant in a more generously proportioned area. Thus, before making a final decision on the type of wall coverings for a room, the scale of the walls and the space measurements must be examined.
2. **Open/Enclosed Looking Walls:** The look of the walls, including the colours, textures, and materials used to cover them, determines whether a space seems open and airy or enormous and heavy. While space is limited, there is a trend towards creating wide and open environments. This appearance may be accomplished by using basic, discreet wall coverings and flat texture-less finishes that are thin, light, and unobtrusive. Rooms that open

into one another should have a uniform colouring scheme. Picking up a colour from one to use in the other – the rug colour from one room for the walls of the room it adjoins or a wall paper that echoes the paint colour of a neighbouring wall tends to give a feeling of space and continuity.

3. **The Complexity or Simplicity of The Wall:** The wall can become a centre of interest - a focal point and the main determinant of the appearance and mood created in a room. Patterned wall papers, textured wood grains, and colourful tiles suggest a sense of movement that becomes an active part of the room, competing for attention with the furnishings. It can be said that active wall surfaces should require less furniture and simpler arrangements, for; the wall itself acts as a buys space filler and creates visual interest. A wall of a single neutral or off-white colour having a smooth surface may recede into the background, playing a passive role in the room's appearance. It gives a sense of cohesiveness to the room as the neutral colour may bring diverse elements and furnishings together. Variations in wall treatment may create contrasts and accentuate the different areas of a room. Therefore, the wall treatment depends upon this factor – whether a person wants to segregate the different areas of a room by using variations in wall treatments or to have uniform, continuous inter-linked activity areas in one room using single subdued colour treatment for the entire walls of a room.
4. **The Texture of Walls:** The room comprises other textures as well in addition to the texture of the wall covering, thus all the textures should be kept in mind to create an overall harmonious impact. Like the textures of the other items in a room, the texture of the room's walls can also suggest formality or informality; the smooth white wall reflecting a great deal of light is associated with formal, whereas textured walls of wood or cork suggests more intimacy and less formality. The various types of plastics or even glass or mirrors to rough stony/brick surfaces or textured painted areas.
5. **Durability of the Wall Coverings:** The wall covering is one thing that is generally changed more often as compared to other things in the room. Thus flexibility to change the room's appearance through new types of wallpaper, paint/colours/textures should be there. Also, it is important to know who will use the room and for what purpose. For example, in a guest bedroom where the family with children going to stay; then that is area is going to be used rough. So the wall paper and wall paint should be washable, so it becomes easy to clean and maintain. A shopper should be able to judge the durability of a wall covering if a factual label was provided with it. She can get definite information about the wear-resistance materials from the Bureau of Indian Standards and the standardization/certification marks mentioned on the label.
6. **Sound and Light:** Owing to noise pollution, sound seems to be a problem for many because of the use of sound systems and the greater amount of sound that children make; we depend on walls and ceilings for the insulative qualities. Generally speaking, soft coverings such as cork, padded fabrics, and acoustical material absorb sound whereas smooth, hard surfaces such as plastics or wood are not likely to lessen sound and bounce it around the room.

**Light** must also be considered in the treatment of wall surfaces. For rooms that lack natural lighting, it would look better if an appropriate wall covering is provided. Light-coloured walls increase the apparent size of a room and make it easier to illuminate. Smooth and glossy surfaces on walls make the best light reflectors for the rooms.

7. **Functional Consideration:** The selection of wall finishes will also depend in part on the physical impacts they are likely to undergo. The accumulation of moisture in a bathroom, for instance, requires that the wall covering be resistant to damage by water. For this reason, ceramic tiles and porcelain enamel are conventional and highly satisfactory choices for bathroom walls. On the other hand in the kitchen, where spattering grease and water are inevitable, washable wall surfaces such as tiles, glossy enamel, or plastic laminates are preferred. Vinyl wall papers not only introduce colour and pattern in the kitchen but also provide washable and grease or water-proof surfaces. They are also durable and easy to clean and maintain.
8. **Decorative Accent:** Walls need to be restricted to the purely passive role of providing background. They can also be utilized to punctuate a decorating scheme as in the case of a kitchen where a wall of colourful or patterned tiles can prompt such an effect. They may also serve to unify a decorating scheme by covering one wall of a bedroom with a fabric that matches the bedspread and the curtains. They can also be used to establish visual organization in a multi-purpose room, with the use of wallpaper at one end of a room to identify it as a dining area.
9. **Use of Colour:** In the distribution of colour, nature is taken as the source of inspiration. Just as the earth is darkest, trees are medium, and the sky is light, so the floors might well be the darkest, walls medium, and ceilings light. However, interesting variations can be the opposite of this. One colour idea throughout the entire background is usually desirable – for example, beige walls, ceiling, wood trim doors, floors, and rugs, with some areas darker than others. Various tints and shades of grey-green for the walls, ceiling, woodwork, carpet, and draperies would make a cool, delightful background that could be relieved by dull yellow and salmon in the furnishings. However, two colours are often effective in backgrounds, such as greyed lime walls (somewhat off-white) with muted orange floor covering.
  - Although the ceiling is now considered a part of the room, not a separate item, and is usually treated exactly like the walls, many different solutions are possible where a more novel effect is desired. For instance, the colour of the ceiling can be like the background/foreground colours of the wallpaper the colour in the drapery, or colour of woodwork, doors, or absolute white when a tall effect is desired.
  - Nowadays, people choose to create dramatic effects by painting, one-wall, two-walls, three-walls, or all four walls in a different colour. This may be an interesting way to create emphasis or for the sake of variety. The principle of proportion can also be applied to colouring. For instance, an increasingly large room may be made to appear a bit small by applying a warm colour on all four walls, or a long-narrow room can be made to appear some-what wide and small, by using warm and cool colours alternatively on the narrow and long walls, respectively.
  - The imperfect walls in the rooms can be improved upon by the use of colours like light green, light blue, flesh colours, or ivory. The colours like lemon-yellow and white exaggerate irregularities. The dark rooms should have white yellow or peach colours for their reflecting qualities. A large room should have warm, advancing colours, whereas a small room should have cool coloured walls. The vertical stripes improve too low ceilings whereas the horizontal stripes improve too high and small rooms.

- Neutral colours like white, off-white, grey, beige, brown, and natural colours are good for backgrounds. It is recommended to have white in enormous quantities to contrast with brown/dark grey. The most preferred colour for the ceiling is white because of its highest receding effect.
  - The colours like greyed lime, greyed pink, greyed peach, light slate blue, light turquoise-blue, sky blue, sage-green, pale lemon – yellow and golden yellow can be combined with other colours. Beautiful effects can be created in an otherwise well-balanced room with colours like blue-green, clear medium blue, cherry-red/ chartreuse, or ivory white.
  - Whenever a colour arrangement is planned, it is desirable to consider the backgrounds and furnishings together. This concept, if kept in mind, will create an interior that unifies and creates a total effect. A unifying effect for the entire area can also be created by planning the colour schemes for all the rooms together. The planning should start with the colour scheme for the living room, then the passage/corridors, then the bed rooms, and so on. If one colour is made to run in the colour schemes for all the rooms it would help to create unity in the entire area.
- 10. Types of Wall Finishes:** Finishing both the interior and external walls is critical for functional reasons. Because the walls are the most visible surface in the interior of any space, they must be finished with care. Today's marketplaces provide a plethora of possibilities for wall coverings to produce colour effects, illusionary space, or a room's theme, atmosphere, or style. As a result, wall coverings are employed not only for utilitarian objectives but also for aesthetic and other reasons. The following section discusses a few popular wall-finishing materials.
- i. Wood Panelling:** The charm of wood as a wall covering arises from its warm colours and beautiful grain, which provide a rich but restrained background for all styles of decoration. Wood offers, in addition to warmth, texture, and vibrancy a living material and is thus a valuable complement to materials such as gold, glass, stone, or metal.
- Plywood panels have been known for their finest decorative paneling effects for a long time. There are, however, modern substitutes like a veneered wood panel. The stiff, non-warping character of plywood, as a result of its laminated cross-grain construction, eliminates many difficulties of installation and uncertainties of stability. Because the veneer is wood, it can be finished exactly like any other lumber, with varnish, stain, wax, or paint. Plywood is available as pre-finished sheets as well. They, therefore, require no further treatment.
- As a low-cost substitute for veneered plywood, manufacturers of wall paneling make wood grain hard-board. The authentic wood-grain pattern is reproduced on a vinyl film by a combination of photographic and modern lithographic print methods, and the vinyl film is then fused to the hardboard base to provide an almost indestructible surface. Besides the cost of real wood paneling, this process also eliminates unsightly irregularities like knots.
- ii. Paint:** The major reason for the continued popularity of paint as a wall covering undoubtedly is its low cost. Besides being inexpensive, there is also the scope for changing the decorating scheme frequently. Paints also permit precision in matching colours that are virtually impossible with any other wall covering. While replacing or renovating or repairing, it becomes necessary to take a sample to the market for colour matching, and it may not always be available at the time of need. Paint, however, can be got easily, and if not, can also be matched with existing colours or mixed to the prescribed colour specifications.

The application of paint is also easy. Its application is fast, unlike wallpaper, wood paper, wood paneling, fabric, etc., which must be cut to measure and match. The application of paints presents fewer problems for an amateur. The required equipment is also not complicated and does not demand extra skill in application. Any blemishes that do appear can simply be repainted. Thus, paint is ideally suited to “do-it-yourself” projects.

### Types of Paints

- **Emulsion Paints:** Emulsion paints dry quickly and do not leave any brush marks. They can be touched up at any time without highlighting that it is a second coat. Only in a few hours, the surface hardens and you can touch it.
  - **Latex Paints:** These paints have rubber or synthetic rubber as a binder. It is mixed with water. These types of paints make a very durable finish. For interior plaster shellac, latex, or a combination of both is used. The latex paints dry rapidly and are very durable, they can be washed often.
  - **Paints with Fine Chips:** The newest in paint finish are synthetic paints in which fine pieces of stone or plastic are mixed and applied to the wall. These types of paints give a coarse-textured appearance to the wall although on touch the surface is smooth. The textured appearance is decorative and does not give a monotonously plain smooth surface. It absorbs light and gives a finished look to the room. It is available in a variety of colours to suit your colour scheme.
  - **Solvent Thinned Paints:** In these paints oil of one type or other is used as a binder or vehicle. The most used oil is linseed oil (raw or boiled); soybean oil or other oils. They are available in a dull, semi-glossy, or glossy finish. They take a lot of time to dry and give a peculiar smell. Normally, it is used on woodwork but it can also be used on walls of bathroom and toilet as well as kitchen. They are washable but may peel off if there is dampness in the wall.
  - **Enamels:** These are the type of oil paints in which colour pigments are added to a varnish binder that has a synthetic resin basis. A dryer is also added to speed up the drying process which is otherwise very slow. Enamels are therefore fast drying and durable. They can provide a mat, semi-glossy or glossy finish. Enamels are also suitable for wooden walls or wood work on walls and can also be used in bathrooms and toilets. Some use it in the kitchen. They are used in places where water is used and they protect the walls.
  - **Metallic Paints:** Aluminium, copper, bronze, and golden colour paints are now available. They are available in very small spray cans. The metals are finely powdered and then mixed with varnishes and thinners. These paints may not be applied all over the wall but sprayed on decorative arches or railings.
  - **Fireproof Paints:** These are ordinary paints in which finely ground asbestos or any other fireproof material is added especially borax. These paints are applied on inflammable surfaces like wood and certain composition boards. This is necessary on all heated walls.
- iii. **Cork:** This resilient material is valued for its acoustical properties and because of its surface that can be punctured repeatedly, without noticeable ill effect. In a study or library, where silence is required, cork provides efficient sound absorption.

Made from the inner of the cork oak, the wall covering is made of small particles of cork held together with a composition binder. Its colour is generally a combination of tan and mustard yellow, but tinted cork panels are also available. The material is available in flexible sheets, square tiles, and plywood-backed panels.

The recent development in cork wall coverings is the use of large, irregular particles of cork fused to heavy, burlap-like fabric. This fabric may either be matched or contrasted with the cork particles so that, for instance, bright red burlap may occasionally show between particles of dark brown cork. Cork's chief disadvantage is its vulnerability to stains, particularly those caused by grease. To overcome this problem, a clear vinyl coating provides sufficient protection.

- iv. **Leather:** A luxurious wall covering, leather was popular in the seventeenth century. In Holland, the effects of great splendour were achieved with heavily embossed "Spanish" leather. Treasured examples of this material are still carefully preserved in museum collections. At present, less expensive vinyl sheets designed to resemble leather are often used where a masculine setting of a particular richness is desired. The surface of this material, like that of real leather, may vary in colour, and texture, from suede through soft glove leather to shiny patent leather. Leather-covered walls are often ornamented with moulding strips or with brass-headed studs.
- v. **Masonry:** Most true masonry walls are part of the structure, and they are often regarded as old buildings. Masonry works such as brown stones, brick-walls, rock-stones, stones, pebble finishes, etc. are all popular for their natural finishes. In most cases, these walls require very little maintenance except occasional cleanings and the application of a sealant to protect the porous surface of the masonry against a build-up of soot and dust. At times, stone and brick walls are simulated with moulded polyester sheets. This relatively light weight wall covering reproduces the texture of a brick wall both in its larger scale and in its smaller scale. An alternative use of these also produces a patterned effect. These sheets are popular since their installation is made simple by nailing and finishing the nail heads with a matching point.
- vi. **Mirrors:** Mirrors make the walls glittery and therefore, are currently fashionable as the major component of the super shiny interiors. Besides providing a sparkle of their own, mirrors reflect the dazzle of the bright metals and sharp spot-lights that are also an inseparable component of this style. It is no wonder that shops selling gold and silver jewellery, artificial jewellery, and cosmetics are made up of mirror walls! A major function of mirrors in interior decoration is, of course, to create illusionary space. A single mirrored wall can double the apparent size of a small room. Facing mirrors carries space out to infinity. Mirrors are relatively expensive to install, costing three times as much as medium – priced wall paper. In compensation, however, the material is for all practical purposes, permanent. The threat of breakage is quite slight if the mirrors have been properly framed and braced.
- vii. **Murals:** Wall pictures, the oldest known interior decoration, remain a favourite way to give room individuality. Murals provide a forceful and exciting presence, although other decorations must be restrained if the total effect is not to appear excessive. A mural, properly speaking, is necessarily a specially commissioned work of art. At a considerably more modest level, a poster may be considered as a substitute. Colour posters, in all sorts of antique and modern designs, are obtainable in sizes ranging from large to enormous. Costing very little, these disposable murals allow a lot to experiment with.
- viii. **Tiles:** Two special properties of ceramic tiles –imperviousness to moisture and its imperviousness to moisture and its wash ability – make them a customary choice for bathroom and toilet room walls. Despite its high initial cost, it may prove a long-range bargain, if family members habitually take long, hot showers that would shorten the life of a less durable material. The only maintenance required for ceramic tile is the occasional recalling of

the wall joints, and with the development of the plastic caulking compound, this problem is comparatively reduced at present. Bathroom wall tiles are also available in solid vinyl and in porcelain enamel (a metal tile with a vitreous surface). All these materials come in a range of colours, and all are suitable for installation in bathrooms, water closets, kitchens, etc. Ornamental tiles used near the fireplace, add an air of special distinction to any interior. Most retail stores have catalogues of the available patterns, and one can choose and order any of them. The tiles are also available in standard sizes and therefore it is easier to replace broken, cracked, or otherwise damaged tiles.

- ix. **Wall Papers:** They have become so attractive and exciting in recent years that it's tempting to go all out for them. The romantic history of wallpaper dates back to ancient times, but its popular use can be traced back only to about the seventeenth century. Wallpaper was first made to take the place of high-priced tapestry and textiles. At the outset Italian book lining papers in small sheets were used; later they were followed by Domino papers, which were small marbled squares. Subsequently, France produced the present type of wallpaper of continuous design but printed by hand and as picture papers and scenic wallpapers. Machine-printed wallpapers such as we have today were the next development. Today the diversity of wallpapers presents a real challenge to the imagination and creative ability of interior decorators. Wallpapers may be used to create not only an atmosphere; they may also be used in new and different ways to create an infinite variety of novel effects. The wide range of textures, colours, patterns, and interesting special designs almost defies any attempt at classification. Some papers introduce architectural features into a room and still others prove scenic effects. The traditional all-over patterns are ever present, but panels and 'spot' motifs have become extremely popular. Wallpaper is no longer confined to walls. It may be used on folding screens, furniture, and decorative accessories. Closets and other storage areas lined with wallpaper are often more attractive and may even be more useful. For example, cedar wallpaper may make a closet repellent to moth damage in the walls.

### **Advantages of Wallpaper**

- It can be applied to walls by amateurs, especially now that the pasting medium is already on the paper.
- It is very useful in covering imperfect surfaces. Defects and blemishes in the wall surface can be easily covered or camouflaged.
- A problem area can be made interesting and attractive. A small foyer, a long, narrow passageway can become a dramatic center of interest without the use of furniture. Difficult or uninteresting alcoves can be given importance with the use of wallpapers.
- Colour, texture, and patterns of the wallpapers lend a distinct individuality to the characters of the room. It can establish the colour scheme for the entire room and introduce the element of design into it – a design as everyone knows is exceptional.
- Colour and patterns can create illusions. A large, sweeping design can make a room look smaller; a small room can be given unity with tiny-patterned paper and matching furnishing fabrics.
- Vertical stripes on the wallpaper will make the room seem higher. To make the ceiling seem lower, the papering should be only as far as a moulding or border placed below the ceiling.

- A boldly patterned paper calls for comparatively plain floor covering and fabrics in the room. Thus, the choice of patterns and colour plans has become increasingly interesting.
- Patterned wallpaper effectively contributes to the theme of a room. Polka dots or gingham plaids suggest intimate cottages; broad five-inch stripes / stylized motifs add to Modern effects; Greek motifs contribute to the formality of an Empire room; western military or nautical motifs usually suit a boy's room with floral patterns in pastel shades can help to create a feminine effect.
- Wallpaper may be used to emphasize or to minimize architectural features that are either pleasing or unattractive. A large room may be made to appear smaller and vice versa. The design of the paper may change the apparent proportions of the room; for example, an emphatic treatment of one wall will make it advance, or natural scenic patterns like a garden to recede.
- Wallpaper can be used both to separate and to coordinate areas when other means are impractical. One end of a small living room can become the dining area without a room divider simply by the use of a different wall covering.
- Wallpapers can emphasize a furniture arrangement or make a center of interest more dramatic. A popular application is a panel or spot design at the headboard of the bed in an otherwise plain bedroom.
- A wide variety of designs are available in the market to select from. Thus the wall papers offers a great variety of choices according to one's likes and requirements.

#### **Disadvantages of Wallpapers:**

- The major disadvantage of wallpaper is that after two or three layers have been applied to a wall, they must be removed before a new finish is applied.
- With professional steam equipment, old wallpaper can be removed quite easily, but sometimes the amateur without equipment must soak the paper with hot water and then scrub it off. This can be very time-consuming and an expensive affair as this can damage the final plastering of the walls.
- The wrong choice of pattern of wallpaper can become tiresome and irritating. This may call for either a patient till the time a family budget finds enough funds to replace them or an immediate demand for extra expenditure to replace the existing one with a dissatisfying note.

**11. Types of Wall-Papers:** The wallpaper industry has offered the consumer various kinds of wallpaper at different price levels. The pre-pasted paper that can be simply moistened and applied to the wall has made the use of wallpaper more popular as it is not time-consuming. The wide variety of materials that are available now almost defies classification.

- **Non-washable coverings:** These papers have been printed with water-soluble dyes and so, any application of water may quickly damage the design. Many of the foil (or metallic-looking) wallpaper fall into this category.
- **Washable covering:** Various degrees of imperviousness are produced by special finishes that set the colours and make it possible to wipe the paper with a damp cloth to remove surface soil. A thin coating of a

finish on the paper is applied to make it washable. More vigorous treatment of spots and stains will remove the coating and possibly damage the design.

- **Scrubbable coverings:** Some wallpaper has a design that is impregnated or coated with durable protective finishes that make them quite resistant to spots and stains. This finish is highly protective, and therefore it can usually be washed with soap and water, in addition to the coated papers, there are various coated-fabric wall coverings. In general, these tend to be more expensive than the wallpapers, but they are durable and easier to maintain.
- Paper may be given a plastic finish that is quite tough and resistant to scrubbing; however, the more durable Scrubbable covering has a fabric backing. A light weight canvas may be impregnated with a coating that has the design applied in such a way that will withstand repeat washings. Both vinyl coatings on cloth and nonwoven vinyl coverings are available. These are resistant to spots and stains and can withstand constant washing with soap and water. They are virtually indestructible, and a light gauge vinyl wall covering may be a worthwhile investment in an area that receives punishing use, such as the kitchen or the children's room. Olefin, a spun-bonded fabric, is another plastic rapidly gaining favour as a wall covering. Its structure consists of a single filament of olefin plastic randomly laid to cover an area, then treated with heat and pressure to fix its texture. This material has remarkable dimensional stability and toughness.

**12. Kinds of Wall-Papers:** If anything fits the phrase "an abundance of riches", it has to be today's wallpapers. The choice in every respect – pattern colour, design, and texture is overwhelming. Some wallpaper to consider are those with floral patterns of big and small sizes. Traditional and stylized patterns may include: Grass cloth surfaces, Thin wood surfaces, Solid colours, Marbled patterns, Polka dots, Plaids and checks, Stripes, Diamonds/stars, Leaf forms, Copies of botany prints, Copies of period prints, French trite flower patterns, Damask, and Geometrics

- **Scenic Paper and Murals:** Scenic wall-papers, usually landscapes, but sometimes including figures and buildings, are produced in both traditional and contemporary styles. Scenic paper and murals give depth to a wall, and as the perspective 'pushes' the wall further back, it makes the room seem larger. These centres of interest are particularly impressive above a stained wood or painted dado. It is probably the most difficult kind to select and use, but it is sometimes hung as a background for period furniture where it is historically authentic. Halls and dining rooms, where people do not remain long, seem to be favourite places for it. The person who has scenic paper should treat it with proper respect. There should be no high furniture to cut the figures in the wrong places. An effort should be made to fit the motif to the wall places adequately. Since there is little restraint in the pictorial aspect of scenic paper, it is usually advisable to select a one-color effect, preferably brown or grey. The woodwork and doors in the same room should usually repeat the chief light colour in the scenic paper.
- **Grass Cloth Paper:** Textured wall coverings include such genuinely textured materials as grass cloth, a lustrous material woven in the Orient, and silky, coarse silk resembling shantung. Grasscloth paper from Japan is a straw-like material that comes in many colours and variations of texture. Its textural effect is

interesting but subtle and does not compete with patterned or textured materials used elsewhere in the room. The appearance of these materials is often reproduced photographically on wallpapers and dimensional textures are added where appropriate, by embossing.

- **Wall-Paper Flocked:** It has the texture and feel of cut velvet. It belongs to a very formal and elegant atmosphere and excels at creating one, as in a dining alcove. Flock papers are made more practical nowadays and so are also popularly used. Flocking is made of chopped synthetic fibres. Instead of silk or wool fibres. When this flocking is applied to a vinyl ground, the paper can be washed with soap and water. When flocking is applied to the foil, it produces a contrasting shiny background and velvety figures, which produce extravagantly dramatic wallpaper patterns. Both flock papers and foils require special care during installation. Flocking highly attracts paste. For this reason, selvage is ordinarily not trimmed until the strip is stuck on the wall, and the paste is removed immediately using a sponge.
- **Metallic Wall-Paper:** These are the latest in wall coverings. Dramatic and rich-looking in themselves, they have the room-deepening effect of mirrors but reflect light much more softly. Their shimmering colours and designs respond instantly to light changes. Particularly effective in modern rooms, foyers, and dressing rooms, they can provide a glowing and appropriate touch in formal rooms.
- **Metallic Foils:** Metal foil wall papers follow the current decorating vogue for slick, smooth, and shiny surfaces. Gold and silver leaf have been used in the past when interior decorators wanted to create an effect of special splendour. These metal pieces were not only expensive, but the intensive labour involved in their installations also added to their costs. However, modern technology requires only a thin sheet of metal – usually, gold, silver, or aluminium – bonded to a sheet of paper to toughen the material and to facilitate hanging. Patterned foils are also available. They can be printed with transparent inks with a gleam of metal, or with opaque inks, producing a highly effective contrast of visual textures. Designs are very often geometric prints, in two or more colours, or luxurious imitations of marble or tortoise shell.

**13. Selecting A Wall-Paper:** It is difficult to select wallpapers because so few good patterns are available, and because those that appear satisfactory as samples may become overpowering on large areas. Many wallpapers are now water-proof and washable. A general thumb rule is to choose a wall-paper design according to the size of the room – small-scaled patterns for small rooms, medium-scaled patterns for average rooms, and large patterns for large rooms. But many other factors must also be considered. In a small room, for example, a dramatic effect can be created with a large-scaled pattern on one wall, or a scenic design can lend a perspective that can increase the apparent size of the room area. A large room that has many doors, windows, or other architectural features may have a chopped-off appearance if papered with a large pattern. The theme of design and the colour tones must, of course, blend with the decoration of the room. Small, delicate/quaint patterns seem appropriate for less formal rooms; large motifs and scenic designs lend themselves better to formal and elegant themes.

**Some wall-papers to avoid are those with:**

- Weak, tailing, or scattered flowers or leaves.
- Pressed or embossed surfaces.

- A spotty effect with motifs of dark colours.
- Figures that are out of scale with the rooms.
- Mixed motifs combine both delicate and bold figures.
- Strong diagonals (opposed to architectural unity).
- Papers that have three-dimensional effects.
- Contrasting colour schemes.
- Brocade and satin stripes and medallions.
- Restless busy patterns suggest movement.
- Silver or gilt.
- Pictorial patterns, like hunting scenes.
- Imitations of draped or puffed materials.
- Imitation plasters effects.

**14. Installing Wall-Papers:** The techniques for hanging wall-papers include measuring the wall space, preparation, cutting, matching, and gluing. Special circumstances, however, will require special handling. Fine wall-papers – antique scenic wall-papers, for example – are customarily mounted on an underlay of muslin to ensure a smooth surface and to protect the paper against cracks. More importantly, the muslin lining facilitates removal so that the paper can be hung elsewhere. The removal of these fine papers is, however, a difficult job that should be entrusted only to a top-notch professional. It is a good idea to use a lining under flock papers and foils. Both these wallpapers depend on a smooth surface to display their best qualities, and foil; in particular, will reflect any irregularities in the surface it covers. When the wallpaper is bought, the dealer should be asked to provide the installation instructions. Some papers may require special adhesives. Directions generally accompany the papers and should be made available by the dealers. When these instructions are followed with care, one can achieve the best results. If anyone wishes to install the wallpaper at home, the general procedure to be followed is given in the following paragraphs.

- **Taking Measurements:** The dealer can figure out the required number of wallpaper rolls if he is given the dimensions of the walls, windows, and doors. Therefore, it is necessary to take the measurements of the doors and windows, besides taking the measurements of the walls.
- **Preparation:** Any electrical fixtures and switch plates should be removed before fixing the wallpapers. All materials and equipment/tools such as table, steel straight edges, roller knife, seam roller, smoothening brush, etc. should be gathered. Other materials required are a sponge, scissors, yardstick, paste, brush, and a string chalk line. Keep the wallpaper roll ready for measuring and cutting.
- **Surface Preparation:** The surface needs to be free from oil, grease, and dirt. Plaster of Paris is used to repair undulated surfaces and bridge cracks. If walls are freshly plastered or painted, treat them with wall "size". Then a thin coating of glue is applied with a brush.
- **Cutting:** The wallpaper is unrolled for measuring, and cutting. Extra allowance for trimming at the baseboard ceiling and for matching patterns should be provided. After measuring the first strip, the wallpaper is cut to the desired size. The subsequent pieces are cut using the same procedure.

- **Application:** Phenol-resin or its equivalent mixed with a hardener in powder form is applied on the walls and then on the paper. This is then struck to the walls. Creases and air bubbles, if any, are removed by applying pressure in the right direction. Then the second strip is hung by matching the pattern. The wallpaper should be stuck, beginning at the top and then rolled towards the floor. A wet sponge is rubbed against the wallpaper to remove excess paste. If the paper is not washable, a clean cloth is used to wipe the paste.
- **Care and Maintenance:** Most wallpaper, if printed with insoluble oil-based or vinyl inks, can be cleaned with mild soap and warm water. To make sure that the wallpaper is washable, washing can be done in a small corner that is ordinarily hidden by furniture. Detergents are harmful to wallpaper and should, therefore, be avoided. The cleaning process starts with simple washing in sections. After soaping, the wallpaper should be rinsed with clear water and then wiped with a clean cloth. Walls should be washed from the bottom to prevent stains caused by dripping water. Dirty streaks are easily sponged off clean walls but may form ineradicable stains if surface soil is allowed to accumulate for a long period. For non-washable wallpapers, commercial cleaners are available. A gum cleaner, resembling plastic wax is used as an eraser to remove surface dirt. The cleaner should be re-kneaded after some use, to work with only the clean area. Wallpapers can also be cleaned with a cloth dipped in dry borax. Some products may be applied to newly hung wallpapers to make them spot-resistant. Grease spots can often be removed with dry cleaning fluid or with a hot iron and blotting paper. Vinyl wallpapers are grease-resistant, but grease spots should be sponged off immediately. Although vinyl flock papers can be washed, this treatment should not be repeated very often, as the flocking will eventually shed. Flock papers can easily be cleaned with a vacuum cleaner and a soft brush. Tough vinyl-coated and vinyl-impregnated wall coverings can be scrubbed fairly but should be scoured with abrasives. Whatever may be the kind of wallpaper, all of them require regular attention. They should be dusted and wiped often with a clean cloth. Occasionally they should be washed by the process mentioned above. Any kind of damage – torn, scratched, loosened seam edges, the appearance of air bubbles, etc. – should be attended to, immediately. If minor, the damage can be repaired at home, but a professional can be called to repair heavy damages. (Seetharaman & Pannu, 2005)

### 6.3 FLOOR AND FLOORING MATERIALS

The flooring used in buildings protects the slabs on the various floors and adds a good decorative touch to the floors. Flooring materials are also an important component of the building since they improve the overall aesthetic of the home. The purpose of providing flooring is to make the carpet area firm, levelled, and visually appealing. Among the many requirements for a proper floor, one of the most critical is that the flooring be water resistant. Flooring entails hammering the ground and then laying a layer of red dirt or sand 150 mm below the completed floor level. For effective packing, this layer is carefully crushed using tamping rods. The surface is maintained damp during ramming to ensure adequate compaction.

According to Ching & Binggeli (2018), the final layer of floor construction is finish flooring. Because flooring is exposed to direct abrasion and occupies a substantial amount of a room's total area, it should be chosen with both

functional and aesthetic requirements in mind. Durability, ease of maintenance, foot comfort, slip resistance, and impact noise are all significant considerations when choosing a flooring material. It should be resistant to physical wear, denting, and scuffing. It should be dirt, moisture, oil, and stain resistant, particularly for task areas with frequent use. Foot comfort is connected to resilience and, to a lesser extent, warmth. Hard, slippery flooring materials should be avoided, especially in damp areas such as bathrooms, wash areas, and laundry rooms. Some impact noise can be reduced by resilient flooring. Flooring materials that are soft or porous absorb impact and airborne sound. The dirt that naturally accumulates on a floor can be hidden by a combination of middle-toned, neutral colours, a pattern that hides surface stains and dirt, or a substance whose inherent colour and texture stand out more dirt.

According to Watson et al. (1999), the choice of flooring is an essential design choice, both technically and aesthetically. People usually look at the ground and whatever direction it may point to get a sense of their stability, direction, and motion. Due to continual and frequently intense use, flooring is the one interior building component that is most exposed. Thus, flooring must offer:

- Given the amount of walking (and wheel) movement and extent of use, durability and endurance are required.
- Abrasion resistance caused by misuse, spillage of chemicals and other liquids, and usage of dirt or sand particles.
- Resistance to moisture incursion or permeability to other moisture vapour migration.
- Resistance to impact-generated damage, such as dimensional changes to the substrate and other building materials.
- Capability to be repaired, maintained, or replaced entirely.
- Immunity against pest invasion.

**Consequently, the following performance standards for flooring selection might be listed:**

- Robust to withstand accidental strikes, abrasion, indentation, compression, dust, and grime.
- Chemically inert to withstand spilled cleaning agents, disinfectants, solvents, lubricants, and other liquids.
- Safe, non-slippery, non-tripping, non-flammable, as well as non-conductive or non-static; comfortable to decrease fatigue from walking, standing, and/or running.

The floor's finished surfaces, and the places where they may first show signs of usage, will also "mirror" any irregularities, cracks or holes, joints, or other flaws on the flooring material, necessitating similar attention in the design and installation of the complete flooring system. (Watson et al., 1999)

### **6.3.1 Types of Flooring Material**

According to Seetharaman & Pannu, 2005 the floor is the basis for comfort as well as a beautiful background, therefore the beauty of space begins with it. The shell of the space is formed by the floors, walls, and ceilings. Floors are the biggest colour area in the house interior, second only to walls. In general, the floor is intended to last a long time without requiring substantial maintenance. Floors are flat horizontal surfaces that are intended to be walked on. It connects all the aspects of a room. It stores furnishings and provides insulation against the earth's chill and darkness. It receives the most wear and dust in a space. So the material selection for the floor is essential. Various materials are

used for flooring. Every material has different characteristics. One needs to choose wisely as per the usage and requirement of the space.

**Various flooring materials are as follows:**

- i. **Asphalt Tiles:** This floor is water-resistant, junction-resistant, acid-resistant, and appealing in appearance and feel. It is also anti-skid and soundless. Asphalt flooring is a flat plane covering made of asphalt, chrysotile, paint, and glass beads. It is normally 1/8 or 3/16 inch flat, impermeable, flameproof, inexpensive, and simple. Asphalt flooring incorporates implicit surfaces, trickle, veranda, flyover, footbridge, terrace, parking spaces, and other features. It is most applicable to an existing concrete foundation. As a result, releasing footbridges, patios, and other structures is beneficial. Asphalt flooring is used in most nations due to its longevity and firmness. Asphalt flooring provides various advantages, such as garages, flyovers, footpaths, runways, and so on. (Machhi, 2022)
- ii. **Cork Tile:** Although cork flooring has been available for decades, it has lately gained popularity owing to the notion that it is a "green" renewable resource that can be utilized without the guilt that comes with utilizing beautiful hardwoods from old-growth forests or tropical rainforests. Cork is produced from the bark of the oak tree and is taken regularly from live trees in commercial plantations. As a result, cork is an entirely natural, repeating, and easily replenishable material.<sup>1</sup> Cork is crushed up, compressed, and shaped into sheets joined with resins to make flooring goods. Cork is also biodegradable and at the end of its life cycle, it will degrade into the environment. To be true, cork flooring has numerous advantages, and its current popularity has resulted in cork installation nearly everywhere in the home. However, this flooring is not as reliable as other flooring materials and is prone to a variety of damage. To make an informed choice about employing cork in a certain area, it is critical to be familiar with its fundamental properties. (Lewitin, 2022)
- iii. **Vinyl Tile:** Vinyl square tiles are constructed of 100% polyvinyl chloride plastic, sometimes known as PVC, and come in a variety of sizes. Small bits of coloured PVC are heated first, then pressed into thin layers that are attached to make flexible vinyl sheets. The sheets of vinyl are then cut into tiles. Vinyl tiles and plank flooring may be coloured and textured to seem like a range of materials such as wood, ceramic, porcelain, and stone. They come in interlocking and groutable varieties. (Commerce, 2021) Vinyl flooring is often regarded as a highly durable material. However, several crucial aspects influence how long your floor will survive. The quality of the material, how it was made, and how well it was fitted, for example, will all influence the durability and life expectancy of your vinyl flooring. (What is vinyl flooring and how is it made?)
- iv. **Linoleum:** Linoleum flooring is a common choice among homeowners searching for flooring that will last the test of time while sourcing different flooring alternatives. Linoleum flooring is extremely adaptable and long-lasting. It also works in almost every room in the house. Linoleum is frequently confused with vinyl flooring, although the two are not the same. Linoleum flooring is produced from a combination of natural, renewable ingredients. While the exact composition varies depending on the maker, it is generally composed of linseed oil, jute, cork powder, tree resin, and wood floors. Linoleum, unlike vinyl flooring, has the design integrated throughout the substance rather than in many layers. Linoleum flooring has a consistent colour and pattern that runs the whole thickness of the material. This may limit the design choices, but it also means that the pattern will not fade over time. Linoleum makers use modern printing processes to print vibrant colours, patterns, and even natural-looking

effects. This enables them to produce an endless number of design variations while retaining the functionality and usability of linoleum. (Orentas, 2023)

- v. **Rubber Tiles:** Simply said, rubber flooring is a protective flooring option. It is constructed using recycled resources including tyres, sporting goods, and even shoes. It may also be made by removing organic rubber from the *Hevea brasiliensis* tree, often known as the "Amazonian rubber tree." Rubber tiles have many benefits; such as, it is recyclable, it has versatile quality, it is highly durable and maintenance free, it is resistant to water, stain, and mold, it is also slip and fire resistance. With all these benefits, rubber flooring becomes extremely useful in places like gyms, outdoor play areas, sports areas, etc. (Bryant, 2021)
- vi. **Wood Flooring:** Nowadays, practically all builders in India include wooden flooring in new homes. There is a valid explanation for this. Wooden floors can boost the market value of the home. Buyers may choose residences with wooden flooring since they are more durable. Natural floor coverings, engineered wood flooring, and wood laminate flooring are the three most popular forms of wooden flooring in India. Solid wood flooring is constructed entirely of actual wood and then treated with a protective coating. This flooring is both outdoors and indoor the house. To prevent moisture from leaking in, these hardwood tiles are often joined together by tongue and groove joinery and hammered firmly to the concrete floor. In the face of scratches or dents, the top layer can be sanded and resealed. These flooring are fire and flood-resistant and may last a hundred years or more if properly maintained. Factory-made engineered wood is more resistant to moisture and environmentally beneficial. They are also hypoallergenic and may endure over up to thirty years. When compared with solid timber flooring, the cost per square foot for such tiles is also lower. This is due to two factors: first of all, engineered wood tiles are less expensive, and additionally they are easier to install. Since this type of wood tiling isn't precisely moisture-resistant, it should be installed in places with less dampness. However, it is regarded as one of the least expensive and most straightforward wooden flooring solutions on the market. Some of these tile kinds also contain antimicrobial resins, making them mould and bacterium resistant. This flooring is comprised of laminates with grained surfaces that mimic textured wood floors rather than actual wood. Incorrect installation and excessive exposure to light might cause the colour of these tiles to fade over time. A large majority of owners prefer light-colored, fumed-wood tiles that appear naturally grey in shade. Additionally, as the use of ecologically friendly materials becomes more popular, owners opt for bamboo or preserved wood flooring. (Singh, 2022)
- vii. **Ceramic Tiles:** The flooring, walls, backsplashes, countertops, and bathrooms commonly include ceramic tiles. The only flooring choice which works in every room of the house may be ceramic tile. Ceramic tiles offer a solid, hard surface that won't trap or hold onto allergies like pollen, dust, or grime. Both owners and tile contractors favour ceramic tiles. That is a result of its timeless beauty and a wide range of feasible designs. Even though ceramic floor tiles are growing in popularity in India, bear in mind that each type of tile has a unique set of benefits and drawbacks. (Granito, 2023) Sand, organic materials, and clays are the main ingredients of ceramic tiles. They are burned in a kiln after being formed into the desired shape. Ceramic tiles come in two varieties, glazed ceramic tiles and unglazed ceramic tiles. During the firing process, a second coating of glass is placed on the tiles to make them glazed tiles. Compared to unglazed tiles, these are less dense, less slip-resistant, and more prone to scratches. These, however, come in a huge selection of hues and finishes and are very stain-

resistant. Unglazed ceramic tiles have a natural, earthy tone and are slip-resistant. They are also denser. They require a sealer, though, as they are susceptible to stains. Ceramic tiles are incredibly long-lasting and simple to keep clean. In terms of cleanliness, these tiles can be easily cleaned with a simple mop or sponge and do not gather pollen, dust, or filth. These tiles' hardness and poor ability to retain heat is a drawback. In the winter, it may become very chilly there. They require careful installation because they are hefty and bulky. (Hemrajani, 2023)

- viii. **Vitrified Tiles:** When materials such as clay, silica, quartz, and basalt are hydraulically pressed together, they form non-porous ceramic tiles known as vitrified tiles. These kinds of tiles, which come in a broad range of hues, are typically used as a substitute for marble and granite floors. Based on the production technique, these tiles may be divided into four categories: Double-charged vitrified tiles, Whole Body Vitrified Tiles, Vitrified tiles with soluble salts, and Glazed body vitrified tiles. Double-charged vitrified tiles are created by feeding two different colours through a machine, which creates a very thick coating of a double-colored pattern on the tile. This colour and pattern layer is around 3 to 4 mm thick. In the Whole Body Vitrified Tiles-making technique, the tile is uniformly pigmented throughout, making any blemishes on the surface virtually undetectable. In the making of vitrified tiles with soluble salts soluble salts are employed to permeate the vitrified tile and impart colour, designs, and patterning. Glazed body vitrified tiles are tiles that have a coating of liquid glass applied to the finish. Both interior and outdoor uses are possible with vitrified tiles. They are simple to lay and maintain and have a constant design and pattern. These tiles are also resistant to stains and scratches. (Hemrajani, 2023)
- ix. **Stone Flooring:** A type of flooring known as natural stone flooring is made by cutting stone blocks at the quarry. In contrast to manufactured stone items, natural stone is made from a variety of mountain-born minerals and is often composed of marble, granite, travertine, limestone, and sandstone. Stone flooring is long-lasting, works inside and outside, maintains its natural cooling, and also eliminates allergens. But stone flooring is also expensive, slippery, and prone to water damage and needs expert installation. (Orentas, 2022)

## 6.4 CEILING

A ceiling is an above-interior surface that defines the upper limit of a room. It is not a structural element, but rather a completed surface that conceals the bottom of the floor or roof structure above. Ceilings are categorized based on their design or construction. A cathedral ceiling is any towering ceiling region, such as those seen in churches. The final surface of a dropped ceiling is built anywhere from a few inches to several feet below the structure above it. This can be done for aesthetic reasons, such as obtaining a desired ceiling height, or for utilitarian reasons, such as giving room for HVAC or pipes. An elevated floor is the inverse of this. A concave or barrel-shaped ceiling is curved or rounded upward, generally for aesthetic or acoustical value, whereas a coffered ceiling, sometimes known as a "lacunar ceiling," is split into a grid of recessed square or octagonal panels. A cove ceiling has a curved plaster transition between the wall and the ceiling; it is named after cove moulding, which has a concave curvature. (Reddy & Singh, 2014).

### 6.4.1 False Ceiling

A false ceiling is also known as a dropped ceiling. Everyone is familiar with the term "concrete ceiling." However, the term "false ceiling" has revolutionized interior design. Because of the adaptable nature and other key features of the fake ceiling, it has become an indispensable component for every commercial area, whether it is in an office, business place, commercial complex, IT business, restaurant, theatre, or stadium. False ceilings of various forms have become commonplace in all of these locations. A dropped ceiling is a supplementary ceiling that is suspended under the primary (structural) ceiling. It is a hallmark of modern construction and design in both residential and commercial applications and is also known as a drop ceiling, T-bar ceiling, false ceiling, suspended ceiling, grid ceiling, drop-in ceiling, or drop-out ceiling. (Reddy & Singh, 2014).

### 6.4.2 Goals of Ceiling Design

Building design must balance numerous objectives, including aesthetics, acoustics, environmental considerations, and integration with the building's infrastructure, not to mention the expense of construction and long-term operation.

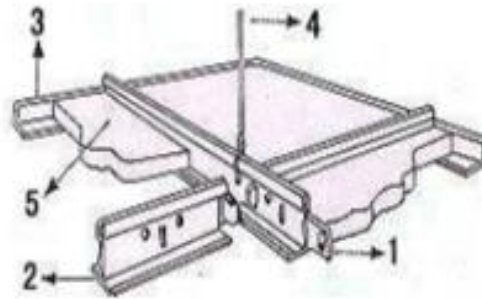
- i. **Aesthetics:** Ceilings are essential architectural features. Modern dropped ceilings were originally designed to conceal building infrastructure such as plumbing, wiring, and/or ducts by providing an extensive area above the dropped ceiling while enabling access for maintenance and inspections. Drop ceilings can also be utilized to conceal issues such as structural deterioration. Furthermore, slide-down ceilings can conceal sprinkler systems while still offering complete fire suppression performance. Dropped ceilings were traditionally made of basic white tiles, but modern innovations now provide a plethora of sizes, colours, materials (including retro designs and faux leather, wood, or metal), visual effects and shapes, patterns, and textures, as well as support systems and ways to access the plenum. Custom runs of specialty ceiling tiles may now be produced at a reduced cost when compared to the past.
- ii. **Acoustics:** Another early goal of lowered ceilings was the maintenance and balancing of the acoustics. An energetic space can overstimulate its inhabitants, whereas an overly quiet environment might appear monotonous and uninviting. The acoustic performance of suspended ceilings has significantly improved over time, with increased sound absorption and reduction. This is often accomplished by placing Sound Attenuation Batts (SABs), sometimes known as "sound batts," above the panels to assist in deadening sounds and make neighbouring rooms quieter.
- iii. **Environmental factors:**
  - o **Indoor environmental quality:** Indoor environmental quality includes ventilation, VOC emissions, lighting and thermal system control, thermal comfort, natural lighting, acoustics, and optimizing outdoor view availability.
  - o **Sustainability:** Many modern dropped ceiling manufacturers have sustainability as a goal. This may include the following:

- Energy efficiency, including daylight effectiveness. The ceiling surface is used to reflect daylight as well as electrical illumination to maximize lumen efficacy, which improves the comfort and usefulness of interior spaces.
  - Less resources are required for tile creation.
  - Materials that are recyclable, reusable, or renewable.
  - o **Integration with Infrastructure:** With dropped ceilings, integration with mechanical, electrical, and plumbing (MEP) systems is critical because most of these systems are by definition above the ceiling. Fortunately, most ceiling systems are now built with this connection in mind. Decisions made here can have an impact on both aesthetics and access and upkeep.
  - o **Cost:** Dropped ceilings may provide a greater return on investment (ROI) than open ceilings. (Reddy & Singh, 2014).
- iv. **Objectives of False Ceilings in Interior Spaces:** False ceiling enhances aesthetic appearance (shape, colour, treatment, etc.) and proportions by regulating room - heights primarily, and the remaining are as follows: (Reddy & Singh, 2014)
- It hides ducting and lowers room volume.
  - Ugly structural parts, such as beams that normally detract from the appearance of the space are hidden.
  - It provides heat insulation and acoustical enhancement.
  - As a design element, it may be used to produce a variety of forms and curves.
  - The many types of ceilings available provide varying levels of fire protection.
  - Bio-contamination management is critical in healthcare environments such as hospitals and big commercial kitchens.
  - It also enhances the ability to reflect light.
  - To make room for lighting systems and to give lighting effects such as concealed lights, and decorative lights.
  - In certain areas, to conceal unsightly trusses (usually known as attics) soundproof spaces such as study rooms, meeting rooms, conference rooms, and so on, demand a quiet atmosphere.
  - Reduction of echoes in cinemas and performance venues.
  - Sound absorption lowers noise and reverberation inside the ceiling's coverage area.
  - Reduces the total volume of the area, lowering the cost of air conditioning.

### 6.4.3 False Ceiling Components

According to Reddy & Singh, 2014, a suspended ceiling system is made up of three parts: primary members, secondary members, and main ceiling material or tiles such as acoustic boards, fabric, and so on.

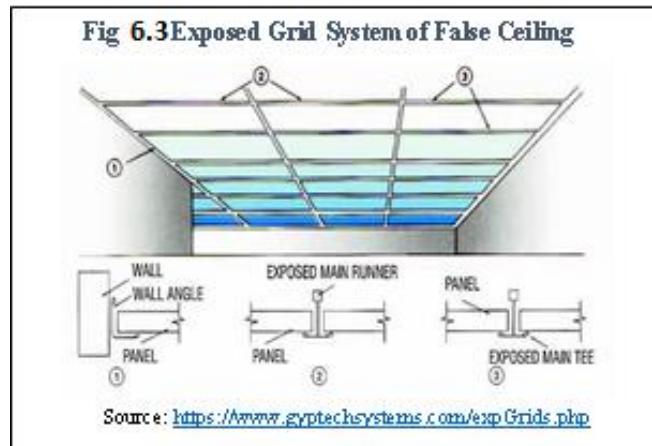
These primary and secondary parts are referred to as structural members, and they serve as the framework to which the boards, lighting fixtures, and A.C. ducts are attached. The following graphic displays all of the critical components of the false ceiling (suspended ceiling) system:



The components of a suspended ceiling (Reddy & Singh, 2014) are Main Runners, Secondary members, Perimeter section, Hanging member, Tile

### False Ceiling Systems

Metal grid systems hanging below the ceiling or roof deck are used to produce suspended ceilings. The grid is subsequently filled up with ceiling tiles composed typically of mineral fibre composites. False ceilings are grouped into two main categories based on the look and visibility of the members. They are exposed grids and concealed grids.



1. **Exposed Grid Systems:** a system in which panels are arranged and the grid is visible. The exposed grid-type ceiling has a grid that is completed in colours that complement or contrast with the panels. The most frequent form of a suspended ceiling is one with an exposed grid. They are made up of large metal strips known as "mains," which are joined by shorter metal pieces known as "tees." The mains and tees create a grid structure that is subsequently covered with acoustical ceiling tiles. Exposed grid-suspended ceiling systems can help guard against passive fires. It is simple to install and allows for easy access to the ceiling space.
2. **Concealed Grid Systems:** Acoustic tiles are used in concealed grid systems to conceal the grid system. This results in a smooth, clean, visually pleasant surface. The tile used has a tiny groove around the perimeter that glides over the mains and tees to hide them. This category includes many metals and a few types of Plaster of

Paris (POP) ceilings. This is a more costly system than an exposed system. It is difficult for maintenance personnel to access places above the ceiling using this type of false ceiling system.

#### 6.4.4 False Ceiling Materials

Depending on the location of use, the desired mood, and the available budget, the most popular false ceiling materials include Plaster of Paris and Gypsum Boards. There are other materials also available which are also used in false ceilings, i.e.; Metal, Mineral wool board, Polyvinyl chloride (PVC), UPVC, Wood, Polystyrene, Glass, and Acrylic.

- i. **Gypsum Board:** Gypsum board false ceilings are constructed from gypsum plasterboards fastened to a metal frame affixed to the ceiling. There are fewer joints as gypsum plasterboard comes in larger sheets than POP sheets. To finish the joints, a jointing compound is applied. Because there is less waste and dust created as a result of the technique, installing gypsum plasterboard is a faster, cleaner, more convenient, and safer process. POP is less durable than gypsum plasterboard. One of the primary reasons gypsum boards are utilized for artificial ceilings is their hydrophobic properties. Plasterboards, also known as gypsum boards, are formed of gypsum, a hydrated calcium sulphate with a long shelf life. Prefabricated gypsum boards are manufactured in a factory and assembled on-site using metal frames. These boards are commonly available in sizes of 4 6 feet, 4 8 feet, and 4 10 feet, as well as thicknesses of 9, 12, and 15 mm. For long-term durability, always use high-quality, rust-resistant metal frames. These are typically employed in locations with a central air-conditioning system.
- ii. **Plaster of Paris:** Plaster of Paris is a construction material that mostly consists of gypsum. Because it can be readily moulded to any shape, it is used for artificial ceilings and covering walls, as well as for constructing architectural elements such as ornamental patterns, cornices, and so on. Plaster of Paris powder is used to make POP drop ceilings. This POP powder is added to the chicken net, which gives it mechanical strength. On-site, the POP powder is combined with water and applied to the mesh that is connected to the local metal frame system; this is then treated and dried. There is a lot of waste here! To put it simply, it is made as a dry powder that when combined with water forms a paste! It is entirely dependent on the design and its minute features to complete the POP drop ceiling. POP ceilings are not only time demanding, but also dirty, with dusty rots giving an unpolished appearance! It has its pros and cons. POP ceilings are lighter and more durable. It is thermally inefficient. POP does not shrink as it is being set. As a result, it does not fracture when heated or set. It has high fire resistance and hence is an excellent heat insulator! After curing, it develops a robust surface that can withstand common hits! It mixes well with water and is simple to distribute and level. It adheres well to fibrous materials. Plaster of Paris (POP) provides a hard surface for the colours to settle over. POP has no discernible chemical impact on paint and causes no alkali attack! Plaster of Paris adds a beautiful touch to the home's interior design. (Parmar, 2018)
- iii. **Metal:** Metal ceilings are appropriate for a wide range of applications. Metal plates are used to build the false ceiling. Which are soundproofed by combining them with insulating materials? They are perfect for hiding ducts and wires since they are simple to install and maintain. Generally, 600mm600mm aluminum or steel panels are utilized. The panels can be hung from the ceiling by rods on a visible steel grid with T-sections or cross-sections.

As a result, the surface is sturdy, long-lasting, and easily accessible. The panels can also be clipped to one other or form a spring-loaded suspension system. The panel margins are not visible with this method of installation. The final technique involves stretching the metal sheets into various forms that may be hung from the ceiling. This treatment is great for forming metal into a variety of forms while maintaining its soundproofing properties.

- iv. **Wood:** Wooden false ceilings are ornamental ceilings that appear to be made of wood. They are commonly utilized in households, but they may also be used for commercial settings such as workplaces and restaurants. These ceilings are often constructed of wood, although they can also be built of other materials. Wood is one of the various materials used to make artificial ceilings. It may also be used with other materials like POP, gypsum, metal, glass, and so forth. In this configuration, wood in the form of hollow blocks, boards, and panels is utilized to create a faux wood ceiling line. They are also available in a variety of finishes like melamine, natural varnished wood, lacquers, CPL laminates, and so on. (Mishra, 2023) Plywood ceilings are popular due of their aesthetic attractiveness. These ceilings are made from ply strips that have been glued or nailed together. The strips are kept together and reinforced by ply supports spaced at equal intervals. Ply ceilings are commonly utilised in snowy areas. However, ply ceilings are difficult to maintain since they are susceptible to termite attack. To lower humidity in the air, the space must be thermally regulated. Furthermore, the wood is susceptible to warping and other physical changes over time. (Reddy & Singh, 2014)
- v. **PVC:** PVC ceiling systems are lightweight and moisture resistant, reducing condensation and consequent leaking from the ceiling onto work surfaces. The non-absorbent, cleanable surface is UV stable and will not discolour. By offering a bright, resilient, and hygienic surface that is readily maintained, PVC ceiling systems alleviate the problem of unclean, unsanitary ceilings that are difficult and expensive to clean. This incredibly useful ceiling system is appropriate for any application that requires a permanent, non-porous, non-fibrous, and non-absorbent ceiling. Because they are non-porous and non-absorbent, they may contain flush fittings, lights, access hatches, air vents, and sprinklers. They are waterproof, termite-proof, fire retardant, affordable, and maintenance-free. It is simple to install and comes in a variety of hues and tints, with no need for painting or polishing.
- vi. **Fiberboard and Fiber/Mineral Reinforced Tiles:** Natural resources, recycled materials, and processed materials are used to make mineral fibre board panels. They're comprised of recycled newspaper, perlite, fibreglass, mineral wool, and binding agents, and they're a highly dependable sound-absorbing solution. Mineral fiberboard provides excellent acoustic and fire resistance properties. Mineral fibre board false ceilings, like metal false ceilings, are supported by a suspended T-Grid system. The environmentally friendly product is lightweight and simple to install. Mineral fibre has the most major drawback of being weak and readily broken. Furthermore, mineral fibre boards are porous to water and humidity, making painting over the surface impracticable. Because to their composition, the tiles should be handled with caution during the manufacturing, installation, and maintenance processes. (Gopinath, 2021)
- vii. **Fabric and Cloth:** Fabric false ceilings are constructed from fabric, synthetic leather, or mesh. Fabric ceilings, in contrast to the false ceilings described above, are mostly employed for aesthetic purposes and have few practical features. They cannot be utilized alone and must be used in conjunction with other artificial ceiling

materials. Though they are utilized in the lobby and other common spaces permanently, they are mostly employed as a temporary setup for events or as art pieces for ambiance. Because they are fragile, they may not be the greatest option for a permanent false ceiling solution. However, compared to other false ceiling materials, it is an excellent choice for short-term usage because of its diverse design potential and simple and rapid installation method. (Siga, 2022)

The ceiling is an integral part of the indoor and now instead of leaving it plain, the false ceiling is created to create a lighting effect as well as an aesthetic appearance of the space. As there is a wide variety of False Ceiling materials available in the market, the selection of the material depends on the space and usage of the space. One needs to choose wisely the material applicable to their space and accordingly should make the selection.

### End of Chapter Exercise

1. What are Walls? Explain the types of walls in detail.
2. Explain in detail about the different types of wall finishes.
3. Elaborate on different types of flooring materials applied in interiors.
4. Which are the various materials applied on the ceiling? Explain in detail.

### REFERENCES

1. Ching, F. D. K., & Binggeli, C. (2018). *Interior Design Illustrated (Third)*. Wiley. J. F. Pile, *Interior Design, 4th ed.*, Pearson Education, 2008, Ch.1, pp.30-32. R. Kilmer and W. O. Kilmer, *Designing Interiors*, Harcourt Brace Jovanovich College Publishers, 1992, Ch. 13, pp. 358-417 Seetharaman, P.; Pannu, P. (2005). *Interior Design and Decoration (First)*. CBS Publishers and Distributors.
2. Dodsworth, S. (2009). *The Fundamentals of Interior Design [PDF]*. AVA Publishing SA. M. Kang and D. A. Guerin. (2009). *The state of environmentally sustainable interior design practice*. *American Journal of Environmental Sciences*, vol. 5, no 2, pp. 179-186.
3. Reddy, S. P.; Singh, J. (2014). <https://www.scribd.com/document/259272717/Paper-on-False-Ceiling-libre#> Gopinath, V. (2021). *Mineral fiber false ceiling*. *vin civilworld*. <https://vincivilworld.com/tag/mineral-fiber-false-ceiling/>
4. Siga, R. M. (2022). *8 types of false ceiling materials*. *Medium*. <https://medium.com/@amisiga/8-best-false-ceiling-materials-in-construction-9bd1997a8c8d> Lewitin, J. (2022). *Eco-friendly cork flooring: Alternative to Hardwood*. *The Spruce*. <https://www.thespruce.com/cork-flooring-pros-and-cons-1314688>
5. Granito, A. (2023). *Advantages & Disadvantages of Ceramic Tiles*. *AGL Tiles: Best Tiles Company in India*. <https://www.aglasiangranito.com/blog/advantages-disadvantages-of-ceramic-tiles#:~:text=Ceramic%20tiles%20are%20commonly%20used,%2C%20pollen%2C%20or%20other%20allergen> S.