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Concrete slab types pdf



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There are various types of slabs are used in construction, the slab is constructed to offer a flat surface, it is usually horizontal within the floor, roof, bridge, and various structures. Slabs can be supported by walls or reinforced concrete beams that are cast along the slab, structural steel beams, and columns from the ground. The slabs are made of reinforced concrete that receives the load through the beams to the columns then footings to the soil below used in both load-bearing structures and framed structures. In a load-bearing structure, the load is transferred from the slab to the load-bearing walls, the thickness of the slab varies from 100 mm to 500 mm. Different types of concrete slabs in Construction: 1. Flat slab: This slab is a reinforced concrete slab supported directly by a concrete column or caps. Flat slab does not have beams so they are also known as beam-less slabs which are supported on the column and load is transferred directly to the column. In this type of construction, a plain ceiling is obtained which gives an attractive appearance in terms of architecture. Plain roofs disperse are considered less sensitive to fire than traditional beam slab construction. Flat slabs are easy to construct and require less formwork with the thickness of the flat slab is a minimum of 8 inches or 0.2m. Types of Flat Slabs: Slab without drop and column without column head (capital). Slab with drop and column without column head. The slab without drop and column with column head. Advantages of Flat Slab: This slab reduces floor-to-floor height when a deep false ceiling is not required. The height of the building can be reduced. The auto sprinkler is easy. Short build time. This increases the shear strength of the slab. Also, reduces the moment in the slab by reducing the apparent or effective duration. Disadvantages of Flat slab: In a flat plate system, it is not possible to have a large span. Brittle masonry is not suitable for supporting partition. High slab thickness. Uses of Flat Slabs: To provide better diffusion of light to the plain roof surface. It is easy construction with economy. Large headroom or short story height and pleasing appearance. These slabs are given in the parking lot. Flat slabs are usually used on parking decks, commercial buildings, resorts or places where beam projections should not be desired. 2. Conventional Slab: The slab that supported on beams and columns is called a conventional slab. In this way, the thickness of the slab is small whereas the depth of the beam is large and the load is transferred onto the beam and then the column. This requires extra formwork when compared with flat slabs. In traditional slabs, there is no need to provide a column cap, the thickness of conventional slabs is 4 inches or 10 cm, while 5 to 6 inches is recommended if the concrete will receive heavy loads, such as motor homes or garbage trucks occasionally. Reinforcement is provided in conventional slabs, while the straps that are installed in the horizontal are called main reinforcement bars and the straps that are installed in the vertical are called distribution bars. Types of Conventional Slabs: One Way Slab: The one way the slab is supported by a beam on two opposite sides to move the load in one direction. The ratio of longer span (l) to short duration (b) is equal or greater than 2 considered as one-way slab. In this type, the slab can be rotated in one direction i.e. within a path along its shorter span. Although a minimum reinforcement referred to as distribution steel, primary reinforcement resistance is provided to uniformly distribute the load over long intervals above temperature and shrinkage stresses. Generally, the size of the slab is 4 meters, however, the length of 1 side is 4 meters and the size of another side is more than 4 meters hence it satisfies the above equation. The principle reinforcement is provided within the short run and the distribution reinforcement is supplied in the long run. The principle bars are cranked to withstand the formation of pressure. Example: All cantilever slabs are usually one-way slabs. Traditional concrete slabs are square in shape and 4 meters in size, chajas and verandahs are examples of one-way slabs. Two-way slab: The two-way slab is supported by beams from all sides and the load is carried along both directions. In a two-way slab, the ratio of long duration (l) to short duration (b) is less than 2. The four supporting sides are likely to be bent along both directions so distribution reinforcement is provided in both directions. In such types of slabs, the length and width of the slab is more than 4 m. Distribution strips are provided in two-way slabs at two ends to resist stress formation, this slab is used in the construction of multilevel building floors. 3. Hollow core ribbed Slab or Hollow core slab: These slabs derive their name from voids or cores that run through units. Cores can act as service ducts that reduce the self-weight of slabs with maximizing structural impact, it also has advantages in terms of stability in reducing the amount of concrete used. Units are usually available in standard 1200 mm width and 110 mm to 400 mm depth, the units have complete freedom in length. This type of slabs is precast, where the building is to be executed quickly which has 4 and 6 longitudinal cores operating between them. With the core being intended to reduce weight and the materials throughout the ground maintain maximum strength. To improve the strength, the slab is reinforced with a 12 mm diameter steel strand, which lasts longer. Advantages of Hollow-core slab: These slabs reduce the cost of construction and the overall weight of the construction. Excellent fire resistance and sound insulation are other properties of hollow-core slabs due to their thickness. This eliminates the need for electric and plumbing units to drill into slabs. Easy to install and requires less labor. Fast construction speed. No additional formwork or any special construction equipment is required to reinforce hollow block masonry. Disadvantages of Hollow core slab: If not handled properly, hollow-core ribbed slab units may suffer damage during transport. It becomes difficult to create a satisfactory relationship between precast members. Also necessary to arrange special equipment to lift and move precast units. Not economical for short spans. Hard to repair and strengthen. 4. Hardy Slab: These slabs are commonly used in Dubai and China manufactured by Hardy Bricks. The hardy bricks are made from the hollow blocks of concrete used to fill the slab components. Hardy slabs save the amount of concrete therefore the weight of the slab is decreased and has a higher thickness of 0.27 m than the conventional slab. The method of installing hardy slabs is completely different from the standard slab. This slab has dimensions are 40 cm x 20 cm x 20 cm. Types of Hardy slabs: One way Hardy Slab Two way Hardy slab Advantages of Hardy Slab: Hardy slab reduces the weight of the slab by reducing the quantity of concrete under the neutral axis. They are easy to assemble, particularly when all the beams are hidden beams. Economical for spans up to 5 m with the medium live load. Improves insulation for sound and heat. Disadvantages of Hardy Slab: If not handled properly, it may suffer damage during transport. It is not economical for short spans. They are difficult to improve and strengthen. Uses of Hardy Slab: Hardy slabs are used at very high temperatures to prevent the temperature from being increased above the slab thickness. The heat coming from the walls is stabilized using special bricks which contain the thermocol, as it is the best insulator in



sunlight.5.Waffle Slab:The waffle slab is a reinforced concrete roof or floor that has square grids with slabs with darker sides also called a grid slab.These slabs are used for the symbolic view at the entrance of hotels, malls, restaurants, and for installing artificial lighting.This slab where we find a hollow hole in the slab upon removing the formwork.First, the PVC tray (pod) is placed on the shuttering, then reinforcement is provided between the pods and a steel mesh is offered over the pods then the concrete is stuffed.After the concrete is set, the formwork is removed and the PVC pods are usually not removed, creating a hollow gap with closed outlets at one end.Concrete waffle slabs are often used for industrial and commercial buildings whereas wooden and metallic waffle slabs are used in many different construction sites.Types of Waffle slabs:Waffle slabs are classified into triangular pod system and square pod system based on the size of the pod (PVC tray).Advantages of Waffle slabs:Waffle slabs are capable of carrying heavier loads and travel longer distances than flat slabs because these systems are lighter in weight.These slabs can be used as both roof and floor slabs.They are suitable for spans of 7 m - 16 m, spans may be possible after prolonged stress.These systems are light in weight, therefore, ensure considerable savings in the framework as light frameworks are required.Disadvantages of Waffle slabs:Waffle slabs usually are not used in particular building projects.The casting forms or moulds required for precast models are very costly therefore it's economical when mass manufacturing of similar units is desired.Construction requires strict supervision and skilled labor.Uses of Waffle Slab:A waffle slab has a hole, which gives the appearance of a waffle.It is commonly used where large spans are required to avoid multiple columns intrusive with space (such as auditoriums, cinema halls).Therefore thicker slabs spanning between the wide beams (to avoid beams below the bulging for aesthetic reasons) are needed.The main purpose of employing this technique is for the strong foundation characteristics of crack and sagging resistance.They also carry a higher quantity of load than conventional concrete slabs.6.Dome Slab:This dome slab is normally made for temples, mosques, palaces, while the dome slab is built on the traditional slab and the thickness of the dome slab is 0.15 m.The dome is semi-circular in shape and shuttering is done on a conventional slab in a dome shape and concrete is stuffed in shuttering forming dome shapes.7.Pitch roof slab:The roof of the pitching slab is a sloping slab, usually made at resorts for a natural look and the tile sheets used in pitch roof slabs are extremely mild compared to conventional roofing materials.This weight savings reduces timber or metal structural requirements leading to significant cost savings.Tile sheets are tailored for every project providing labour price savings and reduced site wastage, while the thickness of the slab depends on the tiles used for 2- 8 inch, it is one of the types of concrete slabs.Advantages of Pitched roof type of Slab:The rain shed closed the roof shed in better way.This slab gives you internal storage or room space.It is very unlikely to leak.It is cheaper to cover the roof.If it is a standard pitch, the construction material is less expensive.Disadvantages of slab roof type:This slab is not suggested for long spans.Plumbing repairs such as slabs are tough to restore or electric wiring on the slabs.8.Slab with Arches:This slab generally adopted within the construction of bridges as they are subjected to vehicles loads and wind loads.Slabs with arches are adopted at a location where the wind load needs to be redirected and these slabs are adopted if there is a long rotation in the direction of the slab.It resists the collapse of the bridge due to heavy wind load originally made of stone or brick, but in recent times they have been made by reinforced concrete or steel.This materials allows arch bridges to be longer with lower spans.9.Post tension slab:The slab that is in tension after forming the slab is called post tension slab, reinforcement is offered to withstand compression.The reinforcement within the post-stress slab is replaced by cables/metal tendons.Post-tensioning gives means to overcome the natural weakness of concrete under stress and to higher utilize its strength in compression.Advantages of Post stress slab:This enables slabs and other structural members to be thinner.This enables us to form slabs on extension or smooth soil.The cracks that form are held together tightly.Post-stress slabs are glorious methods for constructing strong buildings at an inexpensive price.This reduces or eliminates the shrinking cracking, so there is no need for joints or fewer joints.This allows us to design longer in advanced members such as floors or beams.Disadvantages of Post tension slab:Post-stress slabs can only be made by skilled professionals.The use of a post-stress slab is that if precautions are not taken during installation, it may cause a crash in the future.Sometimes ignorant workers do not fill gaps in tendons and wiring.These gaps cause wiring corrosion that can break untimely causing some failures unexpectedly.10.Pre Tension Slab:The pre-tension slab is tensioned before inserting the slab is known as pretension slab, this slab has some characteristics like a post-tensioning slab.11.Cable Suspension Slab:If the span of the slab is very long, then we go for the cable suspension slab which is supported on the cable like London Bridge, Howrah Station, etc.Typically, in building houses for every four meters, we provide a column whereas for every 500 meters we offer a column in a cable suspension slab.This slab is provided where the span size is longer and there may be a problem in forming columns.The slab is fixed with a cable and attached to the cable column.12.Low Roof Slab:The slab given above the door for storage purpose known as a low roof slab.This slab is closed at all ends and open at one end, it is below the actual slab and above the level of the door cob used in homes.13.Estimated Slabs Types:In these slabs one side is fixed and the other side is free, it is known as a projected slab or cantilever slab.This type of slabs are usually built in hotels, universities, function halls, and many others to make use of that area for dropping or selecting up zone for loading and unloading areas.14.Grads Slabs/ Slab on grade:The slab that is put on the earth's surface is called a ground slab, generally used on the basement floor.Types of grade slabs:Usually, after placing the plinth beam, the sand is filled at an altitude of 0.15 m then the sand level is erodedThe PCC is then poured over the sand to the height of the plinth beam, it is an economical method of constructing a ground slab that uses prominently in India.After the construction of the plinth beam, termites are controlled in the middle of the beam in tall buildings then polythene sheets are laid inside the slab to avoid termites, and then a steel mesh is provided and concrete is filled.15.Sunken Slab:Slabs provided under the washroom to hide sewage pipes or sewer pipes are called sunken slab.In this type, pipes carrying water are hide under the floor, special precautions are taken to avoid leakage problems.After the sewage pipe is inserted into the slab, it is crammed with broken pieces of coal or bricks.16.Miscellaneous Slabs Types:Room Chajja or Loft:These slabs are offered for the storage of the contents of the drawing-room and kitchen.The common difference between a low ceiling slab and a room chajja is a low roof slab that hides house materials sometimes the room chajjas or loft do not hide house materials that are open and provided above the door.Kitchen Slab:A slab has been provided in the kitchen for its platform for holding stoves and other kitchens is called kitchen slabs.Its width is 0.5 m and the length and thickness of the wall is 2 inch.Lintels:Lintels are provided inside the building above the doorways and windows to re-direct the highest load.Types of Lintels:Precast lintels: Lintels manufactured in factories are called precast lintels.In situ cast: Lintels are cast on the site, referred to as cast in situ lintels.The size of the lintel is bigger than the size of the door and width of the wall and the thickness of the lintel is 0.1 m.Sun Shade slab:Sun sheds slabs are provided outside the building over the doors and windows, it prevents rain from entering the building and direct sunlight.Also read: Types of Structures, Types of Buildings & Types of FootingConclusion:In a typical structural system, the various types of slabs prevent transverse forces on their plane, and greater structural efficiency can be achieved.

THE TOOLS YOU NEED TO BUILD A CONCRETE SLAB. I've made a list of the 14 tools you will need to build a concrete slab. The list includes the tools you need to form the slab and the tools to pour the concrete also. CHECK IT OUT HERE. HOW TO FORM A CONCRETE SLAB. 1. Lay out all the boards around the perimeter as straight as possible. 2. Control joints can be incorporated into the slab to prevent shrinkage cracking. The joints will open up as the concrete slab gets smaller. 2. Expansion concrete cracks. Just like a balloon, heat causes concrete to expand. When concrete expands, it pushes against anything in its way (a brick wall or adjacent slab for example). 7. Hollow Deck Slab: Hollow deck slabs are special types of prefabricated concrete slabs that use the fundamentals of the stress developed in a section for the design. The concrete takes care of the compression while the steel takes care of the tension. There is no specific use for the concrete in the tension zone other than to provide a solid ... Types of Concrete Topping Slab 1. Unbonded Topping Slab. In this system, the topping slab is not bonded to the underlying concrete slab. The thickness of unbonded topping may influence final floor elevation and may interfere with other service requirements such as doorway clearances. Basic concrete slab cost. MY UPDATED PRICES! I'll base my price on what my actual estimate would be to install a 6" thick concrete slab for one of my customers. Base cost for a 6" thick concrete slab -- \$6.00 per square foot. Take the length of the concrete slab x the width of the slab to get the total square footage. Jan 15, 2022 · To make it easier for you to choose the best flooring, we have compiled a list of flooring types that you can put on a concrete slab. For the money, The best flooring types for concrete slabs are luxury vinyl tile (LVT) or planks (LVP) and ceramic or stone tile. These products are durable and work well in any room. Slab-on-grade foundation. As the name suggests, a slab is a single layer of concrete, several inches thick. The slab is poured thicker at the edges, to form an integral footing; reinforcing rods strengthen the thickened edge. The R value for an uninsulated concrete slab is approximately 0.1 per 150mm. A higher R value means that the material has better insulation properties. 40mm Slabmate will add R1 to the concrete slab. Types Of Concrete Slabs . There are many types of concrete slabs including slab-on-ground, suspended slab and precast slab. 12. Slab on grade. The slab which is cast on the surface of the earth is called a Ground slab. Generally, slab on grade is classified into three types: 1. Slab on ground. It is the simplest type of slab on grade which is a composite of stiffening beams constructed from concrete around perimeter of the slab, and has a slab thickness of 100mm. Minimum thickness of the concrete slab totally depends on types of slab-like one way or two way, a span of slab, design load. The minimum thickness of concrete slab is near about 4 inches but not less than that according to standard code, but the slab thickness entirely depends on the design load and the span of the slab.

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