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Learn all the basics, from the components and desired properties of concrete to installation and reinforcement Contrary to popular belief, concrete and cement are not the same thing; cement is actually just a component of concrete. Concrete is made up of three basic components: water, aggregate (rock, sand, or gravel) and Portland cement. Cement, usually in powder form, acts as a binding agent when mixed with water and aggregates. This combination, or concrete mix, will be poured and harden into the durable material with which we are all familiar. Find concrete contractors near me. Following is a group of articles that will be helpful when trying to understand more about concrete and cement. Other items that might be of interest to you include concrete basics such as mix design, and cement information. Popular Concrete Topics: Find Concrete Ready Mix Suppliers Article Contents: Components of a Basic Concrete Mix Desired Properties of Concrete Concrete Admixtures Concrete Reinforcement: Fibers vs. Welded Wire Mesh Adjusting Mixes to Correct Problems Installing Concrete Decorative Concrete Other Concrete Resources Components of a Basic Concrete Mix There are three basic ingredients in the concrete mix: Portland Cement Water Aggregates (rock and sand) Portland Cement - The cement and water form a paste that coats the aggregate and sand in the mix. The paste hardens and binds the aggregates and sand together. Water- Water is needed to chemically react with the cement (hydration) and too provide workability with the concrete. The amount of water in the mix in pounds compared with the amount of cement is called the water/cement ratio. The lower the w/c ratio, the stronger the concrete. (higher strength, less permeability) Aggregates- Sand is the fine aggregate. Gravel or crushed stone is the coarse aggregate in most mixes. Podcast: Hear Jim Peterson, founder of ConcreteNetwork.com, answer top concrete questions on the Ask Danny podcast from Today's Homeowner. Desired Properties of Concrete 1. The concrete mix is workable. It can be placed and consolidated properly by yourself or your workmen. 2. Desired qualities of the hardened concrete are met: for example, resistance to freezing and thawing and deicing chemicals, watertightness (low permeability) , wear resistance, and strength. Know what you are trying to achieve with the concrete. 3. Economy. Since the quality depends mainly on the water to cement ratio, the water requirement should be minimized to reduce the cement requirement (and thus reduce the cost). Take these steps to reduce the water and cement requirements: use the stiffest mix possible use the largest size aggregate practical for the job. Use the optimum ratio of fine to coarse aggregate. Discuss how to achieve your goals for the concrete with your ready mix supplier. Concrete Admixtures: Most Common Types and What They Do Admixtures are additions to the mix used to achieve certain goals. Here are the main admixtures and what they aim to achieve. Accelerating admixture-accelerators are added to concrete to reduce setting time of the concrete and to accelerate early strength. The amount of reduction in setting time varies depending on the amount of accelerator used (see your ready mix supplier and describe your application). Calcium chloride is a low cost accelerator, but specifications often call for a nonchloride accelerator to prevent corrosion of reinforcing steel. Retarding admixtures-Are often used in hot weather conditions to delay setting time. They are also used to delay set of more difficult jobs or for special finishing operations like exposing aggregate. Many retarders also act as a water reducer. Fly Ash- Is a by product of coal burning plants. Fly ash can replace 15%-30% of the cement in the mix. Cement and fly ash together in the same mix make up the total cementious material. Fly ash improves workability Fly ash is easier to finish Fly ash reduces the heat generated by the concrete Fly ash costs to the amount of the cement it replaces Air Entraining Admixtures- must be used whenever concrete is exposed to freezing and thawing, and to deicing salts. Air entraining agents entrains microscopic air bubbles in the concrete: when the hardened concrete freezes, the frozen water inside the concrete expands into these air bubbles instead of damaging the concrete. Air entrainment improves concrete workability Air entrainment improves durability Air entrainment produces a more workable mix Water reducing admixtures-reduces the amount of water needed in the concrete mix. The water cement ratio will be lower and the strength will be greater. Most low range water reducers reduce the water needed in the mix by 5%-10%. High range water reducers reduce the mix water needed by 12% to 30% but are very expensive and rarely used in residential work. Concrete Reinforcement: Fibers vs. Welded Wire Mesh Fibers can be added to the concrete mix in lieu of welded wire mesh. The problem with welded wire mesh is that it often ends up on the ground from being stepped on as the concrete is being placed. (particularly if no support blocks are used). Another problem is that mesh does not prevent or minimize cracking-it simply holds cracks that have already occurred together. If you could look into a section of concrete poured with fibers you would see millions of fibers distributed in all directions throughout the concrete mix. As micro cracks begin to appear due to shrinkage as water evaporates form the concrete (plastic shrinkage), the cracks intersect with the fibers which block their growth and provide higher tensile strength capacity at this crucial time. Click here for how fibers are an important part of "how to build high quality slabs on grade." ADJUSTING CONCRETE MIXES TO CORRECT PLACING PROBLEMS When the concrete sticks to the trowel when it is lifted off the concrete, or concrete sticks to the finishers kneeboards, too much sand in the mix or higher than necessary air entrainment are most likely the causes. Excessive bleedwater will delay the finishing operation and can cause serious problems with the surface of the concrete. Adding more sand to the mix, adding more entrained air, using less mix water, or adding cement or fly ash are possible cures. Make sure your ready mix supplier knows if you will be pumping concrete. Pumping mixes require a sufficient amount of fines and there are limits to the size of the aggregate in order for the mix to be pumpable. Fly ash and air entrainment improve workability and pumpability. Setting time of the mix can be slowed with retarders. The mix may be cooled in hot weather by replacing part of the mixing water with ice, sprinkling water on the aggregate pile at the ready mix plant, or injecting liquid nitrogen into the batch. Setting time of the mix can be sped up with accelerators. The mix can be heated at the ready mix plant by heating the mix water and aggregates. Installing Concrete Placing Concrete Normal concrete weighs approximately 150 pounds per cubic foot and should be placed as near as possible to its final position. Excess handling can cause segregation of the course and fine aggregates. Wetting up the concrete so it can be raked or pushed into a location far from where it is discharged is not acceptable. Concrete is poured directly from the chute of the ready mix truck, wheeled into place with a buggy, or pumped into place with a concrete boom pump (see concrete pumping). Concrete is normally specified at a 4-5" slump. Industrial, commercial, and some residential projects require an inspector on concrete pours who monitors the concrete slump and takes slump measurements at the required intervals. Also see, How To Build High Quality Slabs on Grade Spreading Concrete The purpose of spreading fresh concrete is to place concrete as close as possible to finish level to facilitate straightedging/screeding the concrete. Short handled, square ended shovels are recommended for spreading concrete. A come-along (a tool that looks like a hoe and has a long straight edged blade) can also be used. Do not use a round edge shovel for spreading concrete since it does not spread the concrete evenly. Any spreader used should be rigid enough to push and pull wet concrete without bending: Normal concrete weighs approximately 150 pounds per cubic foot. Cold weather concreting Hot weather concreting Curing concrete Decorative Concrete Introduction to decorative concrete Decorative concrete glossary Concrete countertop glossary Decorative concrete mix designRelated Information: Concrete History: An Interactive Timeline How Long Does Concrete Last? Concrete Contractors: Find A Concrete Product Supplier or Distributor Other Concrete Resources What is Concrete?-University of Illinois Urbana-ChampaignConcrete Industry Management-Middle Tennessee State UniversityACI Free Downloads-American Concrete Institute (ACI)Cement and Concrete Basics-Portland Cement Association (PCA) concrete, in construction, structural material consisting of a hard, chemically inert particulate substance, known as aggregate (usually sand and gravel), that is bonded together by cement and water.Among the ancient Assyrians and Babylonians, the bonding substance most often used was clay. The Egyptians developed a substance more closely resembling modern concrete by using lime and gypsum as binders. Lime (calcium oxide), derived from limestone, chalk, or (where available) oyster shells, continued to be the primary pozzolanic, or cement-forming, agent until the early 1800s. In 1824 an English inventor, Joseph Aspdin, burned and ground together a mixture of limestone and clay. This mixture, called portland cement, has remained the dominant cementing agent used in concrete production.Aggregates are generally designated as either fine (ranging in size from 0.025 to 6.5 mm [0.001 to 0.25 inch]) or coarse (from 6.5 to 38 mm [0.25 to 1.5 inch] or larger). All aggregate materials must be clean and free from admixture with soft particles or vegetable matter, because even small quantities of organic soil compounds result in chemical reactions that seriously affect the strength of the concrete. Building Blocks of Everyday Objects Concrete is characterized by the type of aggregate or cement used, by the specific qualities it manifests, or by the methods used to produce it. In ordinary structural concrete, the character of the concrete is largely determined by a water-to-cement ratio. The lower the water content, all else being equal, the stronger the concrete. The mixture must have just enough water to ensure that each aggregate particle is completely surrounded by the cement paste, that the spaces between the aggregate are filled, and that the concrete is liquid enough to be poured and spread effectively. Another durability factor is the amount of cement in relation to the aggregate (expressed as a three-part ratio—cement to fine aggregate to coarse aggregate). Where especially strong concrete is needed, there will be relatively less aggregate.concreteWorkers using trowels to smooth freshly poured concrete.The strength of concrete is measured in pounds per square inch or kilograms per square centimetre of force needed to crush a sample of a given age or hardness. Concrete’s strength is affected by environmental factors, especially temperature and moisture. If it is allowed to dry prematurely, it can experience unequal tensile stresses that in an imperfectly hardened state cannot be resisted. In the process known as curing, the concrete is kept damp for some time after pouring to slow the shrinkage that occurs as it hardens. Low temperatures also adversely affect its strength. To compensate for this, an additive such as calcium chloride is mixed in with the cement. This accelerates the setting process, which in turn generates heat sufficient to counteract moderately low temperatures. Large concrete forms that cannot be adequately covered are not poured in freezing temperatures.Concrete that has been hardened onto imbedded metal (usually steel) is called reinforced concrete, or ferroconcrete. Its invention is usually attributed to Joseph Monier, a Parisian gardener who made garden pots and tubs of concrete reinforced with iron mesh; he received a patent in 1867. The reinforcing steel, which may take the form of rods, bars, or mesh, contributes tensile strength. Plain concrete does not easily withstand stresses such as wind action, earthquakes, and vibrations and other bending forces and is therefore unsuitable in many structural applications. In reinforced concrete, the tensile strength of steel and the compressional strength of concrete render a member capable of sustaining heavy stresses of all kinds over considerable spans. The fluidity of the concrete mix makes it possible to position the steel at or near the point where the greatest stress is anticipated.Another innovation in masonry construction is the use of prestressed concrete. It is achieved by either pretensioning or posttensioning processes. In pretensioning, lengths of steel wire, cables, or ropes are laid in the empty mold and then stretched and anchored. After the concrete has been poured and allowed to set, the anchors are released and, as the steel seeks to return to its original length, it compresses the concrete. In the posttensioning process, the steel is run through ducts formed in the concrete. When the concrete has hardened, the steel is anchored to the exterior of the member by some sort of gripping device. By applying a measured amount of stretching force to the steel, the amount of compression transmitted to the concrete can be carefully regulated. Prestressed concrete neutralizes the stretching forces that would rupture ordinary concrete by compressing an area to the point at which no tension is experienced until the strength of the compressed section is overcome. Because it achieves strength without using heavy steel reinforcements, it has been used to great effect to build lighter, shallower, and more elegant structures such as bridges and vast roofs. In addition to its potential for immense strength and its initial ability to adapt to virtually any form, concrete is fire resistant and has become one of the most common building materials in the world. If you take your time and accurately calculate how much concrete you need, you can greatly reduce potential costs by eliminating finish up deliveries. So, how do you correctly determine the cubic yardage needed for a project? Use our online calculator (Please note that your grading needs to be perfect for this as just an inch or two off can result in many extra yards needed) Contact us today for one of our experts to help you calculate the yardage. This is a completely free service and we will be glad to come look at your project for you! Ensure the jobsite is accessible and the finisher is ready You are given one hour to get the concrete off the truck and anything after that is charged by the minute! If you think it might take longer than an hour, make sure to tell us so we can discuss available solutions to keep concrete from setting up too quickly! Once the concrete is batched is has a very finite shelf-life…order only when you are 100% ready! Determine correct strength Concrete is classified by compressive strength. (Ex, 3,000 psi concrete would withstand a minimum of 3,000 lbs. per square inch before it started to fail.) While commercial jobs strength specifications are determined by the engineer on record, the strength requirements for residential concrete are often set by local building codes. Most commonly, we see 2,500 psi as the minimum requirement for residential concrete, however, we recommend not going below 3,000 psi. Don’t hesitate to ask one of our specialists if you don’t know what strength to use! Discuss the following with one of our Customer Service Representatives: Your location and access to jobsite: Our trucks are 8’ wide, over 35’ long and weigh over 60,000 lbs when fully loaded! Let us help you make sure that our truck can get to the job Correct PSI for the job Additives / reinforcement options The dimensions of your project (we can double check your calculations to save you money in the long run!) Best delivery time An ever-evolving world needs constantly developing construction ways. In the present world, concrete is one of the most widely used construction materials. This can be due not alone to the large choice of applications that it offers, however, besides, its behavior, strength, affordability, durability, and flexibility play vital roles. Therefore, constructing-building works have faith in concrete as a secure, strong, and simple object. It is utilized in all sorts of buildings (from residential to multi-story workplace blocks) and infrastructure comes (roads, bridges, etc). Concrete is used for the development of foundations, columns, beams, slabs, and different load-bearing components. In this article, we are going to cover the following topics: What is Concrete? Composition of Basic Concrete Mix Types of Concrete Mix So, then let us dig into the details: What is Concrete? Concrete Definition: Concrete, an artificial stone-like mass, is the composite material that is created by mixing binding material (cement or lime) along with the aggregate (sand, gravel, stone, brick chips, etc.), water, admixtures, etc in specific proportions. The strength and quality are dependent on the mixing proportions. The formula for producing concrete from its ingredients can be presented in the following equation: Concrete = Binding Material + Fine & Coarse Aggregate + Water + Admixture (optional) Concrete is a very necessary and useful material for construction work. Once all the ingredients -cement, aggregate, and water unit of measurement mixed inside the required proportions, the cement and water begin a reaction with one another to bind themselves into a hardened mass. This hardens the rock-like mass in the concrete. Concrete Source:rg-group.co.uk Concrete is powerful, easy to create, and can be formed into varied shapes and sizes. Besides that, it is reasonable, low cost, and instantly mixed. It is designed to allow reliable and high-quality fast-track construction. Structures designed with the concrete unit of measurement are plenty durable and should be designed to face up to earthquakes, hurricanes, typhoons, and tornadoes. This is an incredible advancement. With all the scientific advances there are in this world, there still has not been a way of preventing nature's injury. Composition of Basic Concrete Mix If we evaluate the concrete composition to see what concrete is made of, we can see there are four basic ingredients within the concrete material mix: Binding materials like cement or lime Aggregates or Inert Materials Fine aggregate (sand) Coarse aggregate (stone chips, brick chips) Water Admixture (e.g. Pozzolana) A brief description of the concrete ingredients is given below. Binding Materials Binding material is the main element of a concrete material mix. Cement is the most commonly used binding material. Lime could also be used. When water is mixed with the cement, a paste is created that coats the aggregates within the mix. The paste hardens, binds the aggregates, and forms a stone-like substance. Aggregates Sand is a fine mixture. Gravel or crushed stone is the coarse mixture in most mixes. Water Water is required to with chemicals react with the cement (hydration) and to supply workability with the concrete. The number of water combined in pounds compared with the number of cement is named the water/cement quantitative relation. The lower the w/c quantitative relation, the stronger the concrete. (Higher strength, less permeability) Types of Concrete Mix Concrete is employed for various projects starting from little homemade comes to large subject field buildings and structures. It is used for sidewalks, basements, floors, walls, and pillars at the side of several alternative uses. Many sorts of concrete are utilized in the development works. Based on the variations in concrete materials and purposes, concrete can be classified into three basic categories- Lime Concrete Cement Concrete Reinforced Cement Concretes There are four concrete sorts to settle on from counting on the work being done. Such as- Dry Ready Mix Ready Mix Bulk Dry Materials Transit Mix There are other various types of concrete for different applications that are created by changing the proportions of the main ingredients. Such as: Regular Concrete High-strength Concrete Stamped Concrete High-Performance Concrete Self-consolidating Concretes Vacuum Concrete Shotcrete Roller-Compacted Concrete Glass Concrete Asphalt Concrete Rapid Strength Concrete Polymer Concrete Limecrete Light-Transmitting Concrete Brief Descriptions of all these 21 types of concrete are discussed below: Lime Concrete Lime concrete uses Lime as the binding material. Lime is usually mixed with surki and khoa or stones in the proportion 1:2:5 unless otherwise specified. The khoa or stones are soaked in water before mixing. Lime concrete is used mainly in foundation and terrace roofing. Advantages of Lime Concrete Lime concrete is cheaper than cement concrete. Lime concrete is more workable than cement concrete. Lime concrete has a lower heat of hydration, which makes it suitable for mass concrete works. Lime concrete has good resistance to fire. Lime concrete has good resistance to sulfate attack. Disadvantages of Lime Concrete Lime concrete has a lower strength than cement concrete. Lime concrete is not as durable as cement concrete. Lime concrete is susceptible to attack by frost. Cement Concrete Most engineering construction uses cement concrete composites as the main building material. It consists of cement, sand, brick chips, or stone chips of the required size. The usual proportion is 1:2:4 or 1:3:6. After mixing the required amounts of concrete materials, the mix is cured with water for 28 days for proper strength building. Cement concrete is a versatile construction material with a wide range of applications. It can be used in structural applications such as beams, columns, slabs, and foundations. It can also be used in non-structural applications such as paving, curbing, and landscaping. Cement concrete is also a popular choice for precast applications such as pipes, paving stones, and sewer systems. The main advantages of cement concrete are its strength, durability, and fire resistance. It is also relatively low maintenance and can be easily repaired if damaged. However, cement concrete is a relatively heavy material and can be difficult to work with. It is also susceptible to cracking and can be damaged by extreme weather conditions. Reinforced Cement Concretes For enhancing the tensile strength of concrete, steel reinforcements are added. Sometimes, RCC is prestressed under compression to eliminate or reduce tensile stresses. The resulting concrete is known as Prestressed Concrete. The word 'Reinforced' means 'strengthened' or 'supported'. Reinforced Cement Concrete, therefore, is a composite material consisting of concrete and steel reinforcements. The steel reinforcements used in RCC can be in the form of rods, bars, wires, meshes, etc. The concrete is cast around these steel reinforcement bars or rods to form the desired shape. The steel reinforcement bars are placed in such a way that they provide enough support to the concrete against the expected loads. The steel reinforcement bars are placed in such a way that they provide enough support to the concrete against the expected loads. Dry Ready Mix Concrete This is the combination that may be found at most home improvement and hardware stores. It comes in baggage typically starting from sixty to eighty pounds. Dry ready mix is simple to combine and this is often the combination that almost all homemade comes would require. The tools needed for the mixture are a bucket or cart, shovel or hoe, trowel, and a measured quantity of water. Ready Mix Concrete The distinction between dry ready-mix and ready-mix concrete is that the water is already supplementary to ready combine. This concrete comes pre-mixed and is for larger homemade comes or for people who do not need to combine their own concrete. It is typically brought in an exceedingly little trailer, typically with an intermixture drum connected to stay it dampish and mixed. The ready combine is usually costlier and might be troublesome to search out. It additionally should be used quickly as an alternative it will set while not unfolding properly. {adselite} Bulk Dry Materials It is price effective to purchase dry materials in bulk. This may let the project be custom-built to the particular wants and usage of the concrete. The drawback of shopping in bulk is that there will be much space for the materials to be kept before getting used. The materials will over probably be delivered to the positioning. Transit Mix Concrete This is the mix that almost all cast-in-place concrete comes can use. it is typically trucked in using concrete trucks that have a massive drum that keeps the concrete from setting up while in transit. It permits for one continuous pour so fewer seams and stronger concrete overall. For big comes, transit combine is a far additional value effective than getting bulk materials or ready-mix since in each those the workforce to combine the concrete would get to be patterned into the value. Regular Concrete The most common type used is regular concrete which is referred to as traditional weight concrete or traditional strength concrete. This pertains to the concrete that is promptly on the market within the retailer’s marketplace for personal and residential usage. This includes usage directions that are written within the packaging of the product. It utilizes sand and different materials to function as aggregates and is consolidated in temporary vessels. High-strength Concrete High-strength concrete combined possesses compressive strength that is over six thousand pounds per area unit. This can be processed by lowering the water-cement quantitative relation to a minimum of 0.35 or lower. The low water-cement quantitative relation makes this sort of cementless feasible. to combat this weakness, superplasticizers are other than the present concrete combine. Stamped Concrete Stamped concrete is a subject area concrete wherever realistic patterns almost like natural stones, granites, and tiles will be obtained by inserting the impression of skilled stamping pads. This stamping is applied to the concrete once it is in its plastic condition. totally different coloring stains and texture work can finally provide an end that's terribly almost like costlier natural stones. A high aesthetic look will be obtained from a sealed end economically. This is often utilized in the development of driveways, interior floors, and patios. High-Performance Concrete High-performance concrete refers to a freshly developed concrete combine that has properties that are a notch higher compared to regular concrete mixes. This includes increased strength, durability, and workability, simplicity of usage, compaction while not segregation, long-run mechanical properties, porosity, density, toughness, and volume stability. Air-entrained agents may be utilized to customize this concrete combine for severe environments. Read More: Advantages of High-Performance Concrete Self-Consolidating Concrete The concrete combined once placed can compact by its own weight and is considered self-consolidated concrete. No vibration should be provided for an equivalent individually. This combination has higher workability. The slumping price is going to be between 650 and 750. This concrete because of its higher workability is named flowing concrete. In the areas wherever there is thick reinforcement, self – consolidating concrete works best. Vacuum Concretes Concrete with a water content of quite the desired amount is poured into the formwork. The surplus water is then removed out with the assistance of an air pump while not looking forward to the concrete to endure setting. Thus, the concrete structure or the platform is going to be able to use earlier in comparison with traditional construction techniques. These concretes can attain their 28 days compressive strength within an amount of 10 days and therefore the crushing strength of this structure is 25 you bigger compared with the standard concrete sorts. To learn more about vacuum concrete read- Vacuum Concrete | Definition, Procedure and Advantages Shotcrete Shotcreting refers to a method within which compressed air forces mortar or concrete through a tube and taps onto a surface at a high speed and forms structural or non-structural parts of buildings. Shotcrete is currently applied to the wet-mix method and has gained universal acceptance in several countries. In wet-mix application cement, aggregate, admixture, and water are mixed along before being wired through a hose and atmospherically designed. On the opposite hand, in dry-mix applications cement, aggregate, and admixture are mixed along, and sent pneumatically through a tube so, at the tap via a water ring, water is injected equally throughout the combination because it is being designed. Roller-Compacted Concrete This type of concrete has been placed and compacted with the assistance of earthmoving instrumentality like serious rollers. This concrete is principally utilized in excavation and filling wants. These concretes have cement content in lesser quantity and are stuffed for the realm necessary. once compaction, these concretes give high density and eventually cure into a powerful monolithic block. Glass Concrete The recycled glass may be used as aggregates in concrete. Thus, we tend to get concrete of recent times, glass concrete. This concrete can increase the aesthetic appeal of concrete. They can give long strength and higher thermal insulation. The use of recycled glass in concrete has become more popular in recent years. It has been used as a decorative aggregate, to provide a sparkle effect in concrete countertops and flooring. It is also used as a partial replacement for traditional aggregates in concrete. There are a number of benefits to using recycled glass in concrete. It is a sustainable material that can help reduce the demand for traditional aggregates. It is also lighter than traditional aggregates, which can reduce the overall weight of concrete. Additionally, it can provide a unique look to concrete. However, there are a few challenges to using recycled glass in concrete. It is a difficult material to work with and can be difficult to get a consistent color. Additionally, it is more expensive than traditional aggregates. Asphalt Concrete Asphalt concrete may be a material, the mixture of aggregates and asphalts ordinarily accustomed surface roads, parking tons, and airports, yet because of the core of mound dams. Asphalt concrete is known as asphalt, blacktop, or pavement and tarmac or bitumen, macadam, or rolled asphalt in other countries. Rapid Strength Concrete As the name implies these concretes can acquire strength within a few hours once it's manufactured. Therefore, the formwork removal is created simply and the building construction is roofed quickly. These have a widespread application within road repairs, as they'll be reused once in some hours. Polymer Concrete In polymer concrete, the aggregates are restrained with the polymer rather than cement. The assembly of polymer concrete can facilitate the reduction of the volume of voids within the mixture. This may cut back the quantity of polymer that is necessary to bind the aggregates used. Hence, the aggregates are ranked and mixed consequently to attain minimum void. This kind of concrete has totally different classes: Polymer Impregnated Concrete Polymer cement concrete Partially Impregnated Limecrete The cement is replaced by lime during this concrete kind. The most application of this product is on floors, domes, likewise as vaults. These not unlike cement have several environmental and health advantages. These products are renewable and simply clean. Advantages of Limecrete Limecrete is a more sustainable product than cement since it is made from renewable materials. Limecrete is also much easier to clean than cement since it does not absorb dirt and stains as easily. Limecrete is also much cooler than cement, making it more comfortable to walk on in hot weather. Disadvantages of Limecrete Limecrete is not as strong as cement, so it is not suitable for all applications. Limecrete can also be more expensive than cement since it is not as widely available. Light-Transmitting Concrete Concrete that has a density lesser than 1920kg/m3 is classified as lightweight concrete. The utilization of lightweight aggregates in a concrete style can provide us with lightweight aggregates. Aggregates are the vital part that contributes to the density of the concrete. The samples of lightweight aggregates are stone, perlites, and scoria. The lightweight concrete is applied for the protection of steel structures and is used for the development of long-span bridge decks. These are used for the development of the building blocks. To conclude, concrete is the basic need for building or other constructional works. Thus, the knowledge of different types of concrete should use wisely by consumers to take advantage of its properties for their construction engagements. Join TheConstructor to ask questions, answer questions, write articles, and connect with other people. When you join you get additional benefits. Have an account? Sign In Concrete has several properties that make it an ideal building material for various applications. Here are some of the most important properties of concrete: 1. Poisson's ratio- measures the ratio of lateral strain to axial strain when a material is stretched or compressed. Poisson's ratio can affect the overall strength and stability of concrete structures. 2. Workability - This refers to the ease with which the concrete can be mixed, transported, and placed into its final position. A high degree of workability is essential for achieving the desired shape and finish of the concrete. 3. Strength - Concrete is known for its strength and can withstand heavy loads and stresses. The compressive strength of concrete can vary widely depending on its composition and curing time. 4. Durability - Concrete is highly durable and can withstand environmental exposure, including water, wind, and extreme temperatures. Proper curing and maintenance can extend the lifespan of concrete structures. 5. Creep refers to the gradual deformation of concrete under sustained loads over time. If not accounted for during the design and construction process, creep can result in structural damage. 6. Shrinkage - Concrete can shrink as it dries, which can result in cracking and other damage. Proper reinforcement and curing can help minimise the effects of shrinkage. 7. Unit weight - The unit weight of concrete refers to its density and can vary depending on its composition and strength. A higher unit weight can result in stronger, more durable concrete. 8. Modular ratio - This refers to the relationship between the elastic moduli of concrete and the steel reinforcement used to reinforce it. A higher modular ratio can result in stronger, more durable structures. Uses of Concrete 1. Partitions and Walls: Concrete blocks or panels are used for creating internal partitions or walls in homes. They are especially effective in areas that need soundproofing or added durability. 2. Staircases: Concrete staircases are commonly used in homes due to their strength, safety, and long-lasting durability. Concrete steps are fire-resistant, and their solid construction can support heavy weight, making them a safe choice for both interior and exterior stairways. 3. Retaining Walls: Concrete is commonly used for retaining walls, as it can withstand the pressure from soil and water behind it. These walls prevent erosion, support landscaping features, and provide stability for elevated areas in your yard. 4. Fencing: Concrete is a sturdy material for fencing, especially for privacy or security fences. Concrete fences are durable, low-maintenance, and capable of withstanding the elements better than traditional wood or metal fences. 5. Driveways and patios - Concrete is an ideal material for driveways and patios due to its durability, low maintenance, and versatility. Concrete can be stamped or coloured to match the aesthetics of the surrounding area, making it an attractive option for homeowners. Additionally, concrete can withstand heavy loads and is resistant to cracking, making it a long-lasting and reliable choice. 6. Sidewalks - Concrete is a popular choice for sidewalks due to its strength, affordability, and ease of installation. Concrete sidewalks can withstand heavy foot traffic and can be easily repaired if damaged. They are also low maintenance and resistant to weathering and erosion. 7. Parking - Concrete is a common material used for parking lots due to its strength and durability. Parking lots made of concrete can withstand heavy traffic and can last for many years with proper maintenance. Additionally, concrete is slip-resistant and can be painted with visible markings for safety. 8. Streets - Concrete is a preferred material for street paving due to its durability, skid-resistance, and ability to withstand heavy loads. Concrete streets are low-maintenance and can last for many years with proper care. They are also resistant to oil and gas spills, making them an ideal choice for high-traffic areas. 9. Footings/Foundation - Concrete is commonly used for building foundations and footings due to its strength, durability, and ability to resist water. Concrete foundations can support the weight of a building and protect it from moisture and water damage. Additionally, concrete can be reinforced with steel bars to further increase its strength and durability. 10. Mid-Rise and High-Rise Buildings - Concrete is an ideal material for constructing mid-rise and high-rise buildings due to its strength, durability, and ability to resist natural disasters like earthquakes and hurricanes. Reinforced concrete structures can withstand high winds and seismic forces, making them a reliable choice for tall buildings. Additionally, concrete buildings can be designed to be energy-efficient and can have a long lifespan with proper maintenance. Since concrete is used in nearly every aspect of the home-building process, it’s essential to give it due consideration. From foundations to driveways, patios, and even sidewalks, the concrete mix you choose will directly affect your home's overall durability and longevity. The right concrete not only impacts the strength of your foundation but also ensures that your home can withstand environmental factors such as extreme weather, moisture, and heavy foot or vehicular traffic. Choosing the right concrete mix for each application is not just a technical decision—it’s an investment in the strength and stability of your home for decades to come. When you build your home, you get only one chance to get it right. With concrete involved in everything from structural foundations to outdoor elements, this is a choice you can’t afford to compromise on.