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ANCIENT ANDMODERN CONSTRUCTION MATERIAL - A REVIEW

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ABSTRACT

With the passage of time, there has been a significant increase in the development of new technology. Science is getting more modernized day by day. With this there has been a great development in the construction technique which depends upon the materials used. From woods, bones which were used to construct houses to rod's which are used now days for construction and from water to chemical's made a great revolution in the field of construction. In Ancient days there were no consideration related to eco-friendly i.e. waste materials and recycled materials. But the main moto for using materials, let it be Modern or Ancient, the main objective is to obtain high strength, long age and many other physicals & chemical properties. They focus on obtaining high strength within a short period time. Ancient construction materials were the new starting era for construction. But as per now the modern materials are the best and have high strength and the most important is they are Eco-friendly. They provide more advantages and many other good features as compared to ancient materials.

1. INTRODUCTON

Many years past there has been a significant change in the construction technique and the material used for the construction. There have been many changes and many new methods adopted ie use of waste and recycled materials. But this method was not common among engineers previously ie during ancient period. The method which was used has many satisfactory and desired properties in short period of time. The use of this materials is now days becoming famous. The addition of various chemicals and minerals admixture in the concrete helps in workability of concrete, reduces the permeability and give more strength. It also plays an important role in resisting ie thermal etc. It has a good resistance against attack from salt and sulphate present in the soil and sea water. New development in recent year ie light weight concrete, polymer concrete, fibre reinforcement concrete,self-compacting concrete, super plasticizer concrete. Fly ash has one of the best used materials as due to its excellent properties. In this study we compare the different materials used for construction in past and modern.

2.ANCIENT BUILDING MATERIALS:

The following are the ancient building materials

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2.1.Stones

Fig. 1. Stone

Stones are one of the major part or component for construction, if u considered modern or ancient construction it plays a major role. It is quite durable and have a good strength. The building made with stone are not economical and does not require any finish and painting. Also, the stones are not available in all places easily. Now days M-sand are used which is made with stone. Stones used in ancient uses special skill labour for the construction of stone buildings but the only disadvantages is it is not easily available. These stones were also of different shapes ie irregular pattern.

2.2.Thatch

Fig. 2. Thatch

It is a grass as grass is a good insulators and easily harvested. This is the oldest building material and is mainly practised by African tribes. This has been practised now in many European countries but the revolution of industrialization made a drawback. In recent the buildings in Netherland's have many new Buildings that have thatched roof with special ridge tiles on top.

2.3. Wood

Fig. 3. Wood

It is also the oldest building materials, but this came in light after few years only. It is also considered as one of the oldest buildings materials. They were mainly used for roof purpose to support in huts etc. There were different types of woods depending upon the different types of trees species. But in today's engineering world is becoming very common in industrialized countries.

2.4. Straw

Fig. 4. Straw

It is one of the oldest building material used for construction as it is very light weight materials. But these material started in the middle ages. It is given for natural appearance, but they do not have good durability. They have poor fibre resistance properties. As these draw back make it unstable for the construction purpose.

2.5. Wattle & Daub

Fig. 5. Wattle & Daub

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It is one of the composite materials used in ancient times which is commonly materials was commonly knowns as Wattle and Daub. In this wattle means wood stripes is generally prepared by mixing of cow dung, clay, wet soil and straw. As it was having one drawback as it was used to make walls, so these walls should be protected from rain and damp. It has one more drawback as these walls requires patching up. It does not require skilled labour and there is no use of expensive materials as in ancient times there was no much money. It is now not widely used as a building materials.

3. MODERN MATERIALS USED FOR CONSTRUCTIONS

With the development there has been a significant & a great achievement in the construction materials. The use of minerals admixture, the fibres. These increase the properties of concrete, but still there has been a significant increase in the construction materials or you can say sustainable.

3.1.Fly Ash

Fig. 6. Fly Ash

It is one of the mineral admixture. It is a fine powder. It is the by-product of burning pulverized coal in electric generation power plant. It replaces Portland cement in concrete as it improves strength and ease of pumping concrete. It is used in PCC pavement as embankment. It provides economic benefit. But the major concern about using flash concrete is:

- Slower strength gain
- Seasonal limitation
- Increase in air-entraining admixture

The main advantages of this is it is environmental friendly.

3.2. Composite

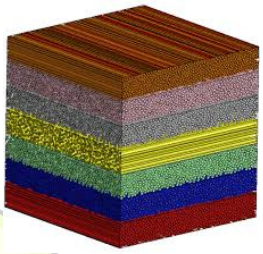

Fig. 7. Composite

These are the materials which are made from 2 or more constituent materials which significally differ in chemical or physical properties. The materials produced are having different characteristics properties. In composite one of the materials forms a continuous matrix whereas the other materials provide the reinforcement. The composite materials possess greater toughness, high tensile strength and durability etc.

3.3. Silica Sand

Fig. 8. Silica Sand

It is waste product of glass which is used as a replacement for sand and cement also. It is used for the replacement for natural aggregate. The main use of silica sand is glass, ceramic, filtration, foundrycasting, pigment etc. It is mainly used as 10%,20%,30%,40%,50%,60%,and 70%.

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Concrete made from silica sand waste as fine aggregate was studied for workability, compressive strength, Split tensile strength and Flexural strength. They are also used for the replacement from 3-24% for cement. It is a very durable material resistant to heat andchemical attack.

3.4. M-Sand

Fig. 9. M-Sand

It a manufactured sand which came into light to save the river sand as the river sand is depleting at a fast rate. It is manufactured by crushing hard granite stone. The normal size of manufactured sand is less than 4.75mm. M-Sand does not contain organic and soluble compound that effect the setting time and properties of cement. It is a dust free and a well graded. Advantage of Manufactured Sand(M-sand) are:

- It is well graded means the proportion is same as per the requirement.
- It does not contain clay, dust etc.
- It increases the quality and durability of concrete.

3.5. Reinforced concrete

Fig. 10. Reinforced Concrete

It is a composite material which contain concrete and steel rods. As this combination increases the tensile strength and durability. The concrete resists squeezing and steel resists bending and stretching. All the construction work is done basis on this. As this can support more strength but still there has been many research going on to reduce the usage of the steel ie to reduce the steel concentrations. it gives a good bond with the concrete so the strength increases.

3.6. GGBS

Fig. 11. GGBS

Ground Granulated Blast Furnace. It is normally added around 20-45%.it hardens slowly but it is added in combination with PPC. Its use gives more strength in very less time as it obtains by quenching molten iron slag form blast furnace in water or steam to produce glassy, granular product that is dried and then made in powder form. The advantage of using GGBS are:

- They have lower heat of hydration.
- Higher durability
- Higher resistance to sulphate attack.
- Higher resistance to chloride attack.
- It is environmental friendly as it minimizes the use of cement which release CO_2.

4. CONCLUSION

The use of modern construction materials has a great significance as compared to ancient materials. The use of modern construction hasa good property as compared to ancient construction materials i.e. it gives high strength in very early days, high durability, thermal resistance, excellent resistance against corrosion and chemical attack. The use of modern

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construction materials is more eco-friendly as compared to ancient modern construction. So finally we conclude that the use of modern construction materials is more beneficial and has many advantage properties as compared to ancient construction materials.

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