

Seminar Presentation on

GREEN CONCRETE

Submitted to-
Mr. S.C. Verma
Civil Engg. Department
COER

Submitted By:-
Mohan Tiwari
Civil Engg.-4th year
Section – E (T2)
Roll No.- 46

WHAT IS CONCRETE

- Concrete is the mixture of cement, sand , water and coarse aggregates which can be poured into formwork and form a hard structure like a stone.



Types of concrete

1. Reinforced cement concrete(R.C.C.)
2. Plain cement concrete
3. Ready-mix concrete
4. Light weight concrete
5. Fiber reinforced concrete
6. Green concrete

INTRODUCTION : GREEN CONCRETE

- Green concrete is revolutionary topic in the history of concrete industry , this was first invented In Denmark in year 1998.
- Green concrete is the type of concrete which is much like the conventional concrete but the production of such concrete requires minimum amount of energy and causes least harm to environment .
- Green concrete has nothing to do with colour.

WHAT IS GREEN CONCRETE ?

- A concrete that made with concrete waste and uses less energy in its production & produces less carbon dioxide than normal concrete..
- This is called eco-friendly and reduced environmental impact for e.g. Energy saving ,co2 emissions, waste water.



ACTUAL DEFINITION :-

Green concrete can be defined as the concrete with material as a partial or complete replacement for cement or fine or coarse aggregates.

The substitution material can be of waste or residual product in the manufacturing process.



Why Green Concrete ?

- ✓ The main ingredient in concrete is cement and it consists of Limestone (Calcium Carbonate CaCO_3).
- ✓ During manufacture of cement, its ingredients are heated to about 800 - 1000°C.
- ✓ During this process the Carbon Dioxide is driven off.
- ✓ Approximately 1kg of cement releases about 900gms of Carbon Dioxide into the atmosphere.
- ✓ Therefore, green concrete came into existence to reduce the emission of carbon dioxide.



Materials for Green Concrete

- ✓ Recycled Demolition Waste Aggregate
- ✓ Recycled Concrete Aggregate
- ✓ Blast furnace Slag (BFS)
- ✓ Manufactured Sand
- ✓ Glass Aggregate
- ✓ Fly ash



green concrete...

Materials for Green Concrete

Coarse Aggregates are:



Fresh local aggregate



Recycled Demolition Waste Aggregate



Recycled Concrete Material (RCM)



Blast Furnace Slag (BFS)

Materials for Green Concrete

Fine Aggregates are:



Manufactured Sand For Concrete



Recycled Glass Aggregate



Blast Furnace Slag (BFS)



Fly Ash

Cementitious materials – ‘Fly Ash’

Fly ash is a by-product produced during the operation of coal-fired power plants. The finely divided particles from the exhaust gases are collected in electrostatic precipitators. These particles are called Fly ash.



Advantages Of Using Fly Ash in Concrete:

1.Utilization of fly ash as a part replacement of cement or as a mineral admixture in concrete saves on cement and hence the emission of CO₂.

2.Use of good quality fly ash in concrete has shown remarkable improvement in durability of concrete, especially in aggressive environment.



Some of the technical benefits of the use of fly ash in Green Concrete are:

- a) Higher ultimate strength
- b) Increased durability
- c) Improved workability
- d) Reduced bleeding
- e) Increased resistance to alkali-silica reactivity.
- f) Reduced shrinkage.



Green lightweight aggregates

Synthetic lightweight aggregate produced from environmental waste is a viable new source of structural aggregate material.

The uses of structural grade lightweight concrete reduce considerably the selfload of a structure and permit larger precast units to be handled.

Water absorption of the green aggregate is large but the crushing strength of the resulting concrete can be high.

The 28day cube compressive strength of the resulting lightweight aggregate concrete with density of 1590 kg/m³ and respective strength of 34 MPa.

Most of normal weight aggregate of normal weight concrete is natural stone such as limestone and granite.



APPLICATIONS:-

- Following are the major applications of green concrete :-
 1. It is used in the construction of bridges.
 2. It is widely used in the building construction.
 3. Used in the construction of columns.
 4. Can be used in road construction.

APPLICATION OF GREEN CONCRETE



Green concrete columns



Green concrete bridge



Green concrete dam



Green concrete building

SUITABILITY OF GREEN CONCRETE IN STRUCTURES

Several factors which enhances the suitability of green concrete in structures include:

1. Reduce the dead weight of a structure of a facade from 5 tons to about 3.5 tons.
2. Reduce crane age load; allow handling, lifting flexibility with lighter weight.
3. Good thermal and fire resistance, sound insulation than the traditional granite rock.
4. Reduction of the concrete industry's CO₂-emission by 30 %.
5. Increased concrete industry's use of waste products by 20%.
6. No environmental pollution and sustainable development.
7. Green concrete requires less maintenance and repairs.



=: ADVANTAGES :-

- 1.Green concrete having better workability than conventional concrete
- 2.Reduction in shrinkage & creep.
- 3.Green Concrete uses local and recycled materials in concrete.
- 4.The heat of hydration of green concrete is significantly lower than traditional concrete.
- 5.Good thermal resistant and fire resistant.
- 6.Compressive strength and Flexural behaviour is fairly equal to that of the conventional concrete.



LIMITATION

- ✓ By using stainless steel, cost of reinforcement increases.
- ✓ Structures constructed with green concrete have comparatively less life than structures with conventional concrete.
- ✓ Split tension of green concrete is less than that of conventional concrete.



SCOPE IN INDIA

Green concrete is a revolutionary topic in the history of concrete industry.

As green concrete is made with concrete wastes it does not take more time to come in India because industries having problem to dispose wastes.

Also having reduced environmental impact with reduction in CO₂ emission.



CONCLUSION

- Green concrete having reduced environmental impact with reduction of the concrete industries CO₂ emissions by 30%.
- Green concrete is having good thermal and fire resistant.
- In this concrete recycling use of waste material such as ceramic wastes, aggregates, so increased concrete industry's use of waste products by 20% .
- Hence green concrete consumes less energy and becomes economical.
- So definitely use of concrete product like green concrete in future will not only reduce the emission of CO₂ in environment and environmental impact but also economical to produce.``