

Optimization of materials and resources – Design and Construction Interventions



20th Edition of India GBC's Green Building Congress 2022
Theme: Advancing Net Zero - Buildings and Built Environment
20- 22 Oct 2022, Hyderabad International Convection Center, Hyderabad

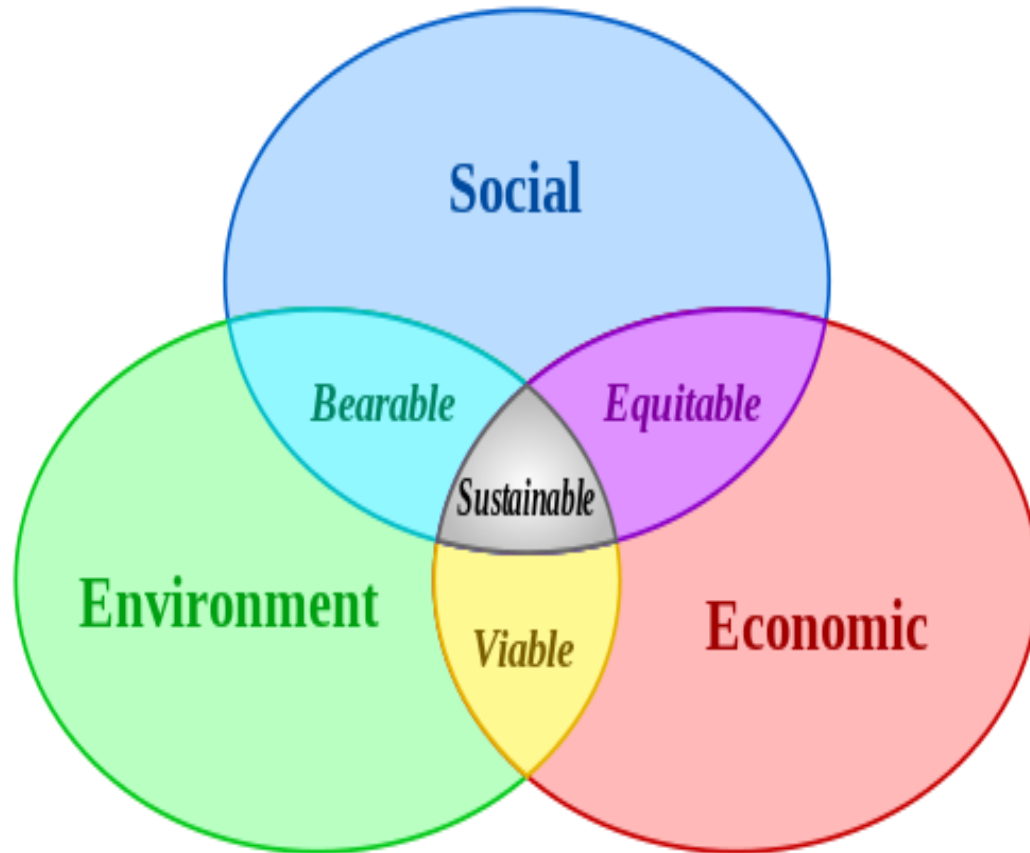
Sustainable Development



A development which

- ✓ recognizes the needs of everyone,
- ✓ maintains stable levels of economic growth and employment
- ✓ uses natural resources prudently, whilst protecting, and if possible enhancing, the environment.

Sustainable Development



Sustainability looks to protect our natural environment, human and ecological health, while driving innovation and not compromising our way of life.

Why Sustainability in building sector ?

- Largest contributor to global GHG
- Approx. 1/3rd of Global Energy End-Use
- Consumes > 1/3rd of Global Resources, (12% of Fresh Water Use)
- >40% Generation of Solid Waste
- Therefore, **the Building Sector is Central to any attempt to use resources more efficiently.**

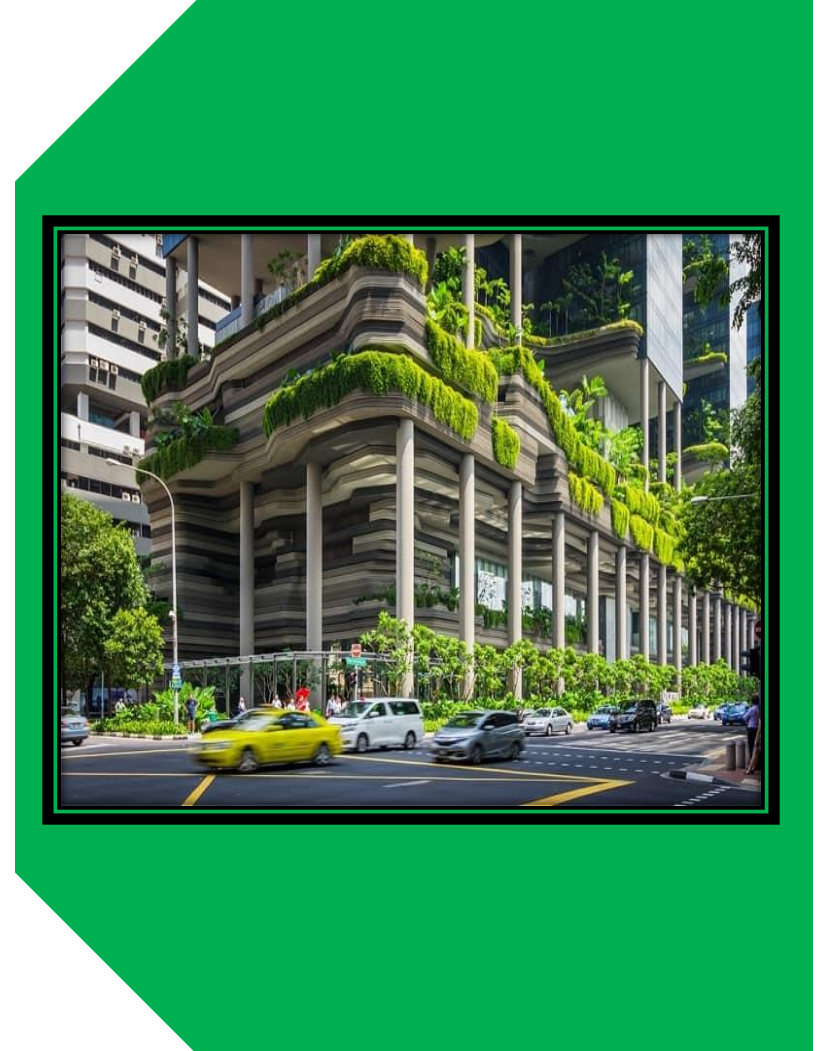
Source : Towards Green Economy

Why Sustainability in building sector ?

**With a population rapidly approaching that of China,
crammed into just 1/3rd of the area,
India too suffers from resource scarcity on a level
like any other nation**

The Focus...

- ❖ **Reducing Energy in Use**
- ❖ **Minimising External Pollution and Environmental Damage**
- ❖ **Minimising Internal Pollution and Damage to Health**
- ❖ **Reducing/ Optimizing Embodied Energy and Resource Depletion**



Why to Optimize ?



Extraction



Manufacturing



Transport

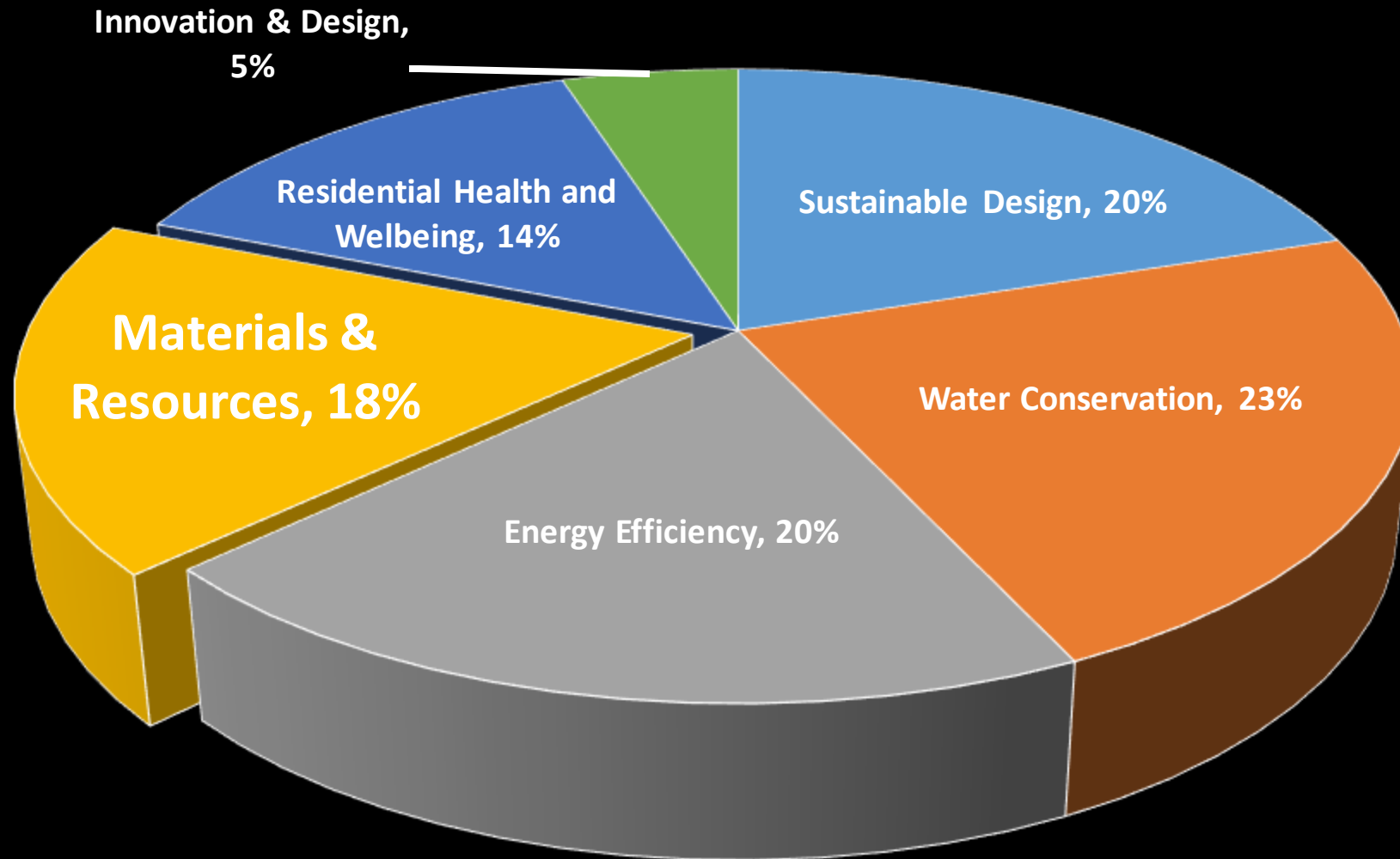


Consumption



Building materials consume a significant amount of energy

IGBC Green Homes Rating System



Ways to Optimize

- ✓ Green Procurement Policy
- ✓ Optimization in Structural Design
- ✓ Certified Green Products
- ✓ Local Materials
- ✓ Eco-friendly Wood Based materials
- ✓ Alternative Construction material
- ✓ Handling of C & D Wastes
- ✓ Post-occupancy, OWM
- ✓ House-hold waste segregation
- ✓

Local Materials:



Environmental impacts of transportation

Use building materials manufactured within
400km of site vicinity



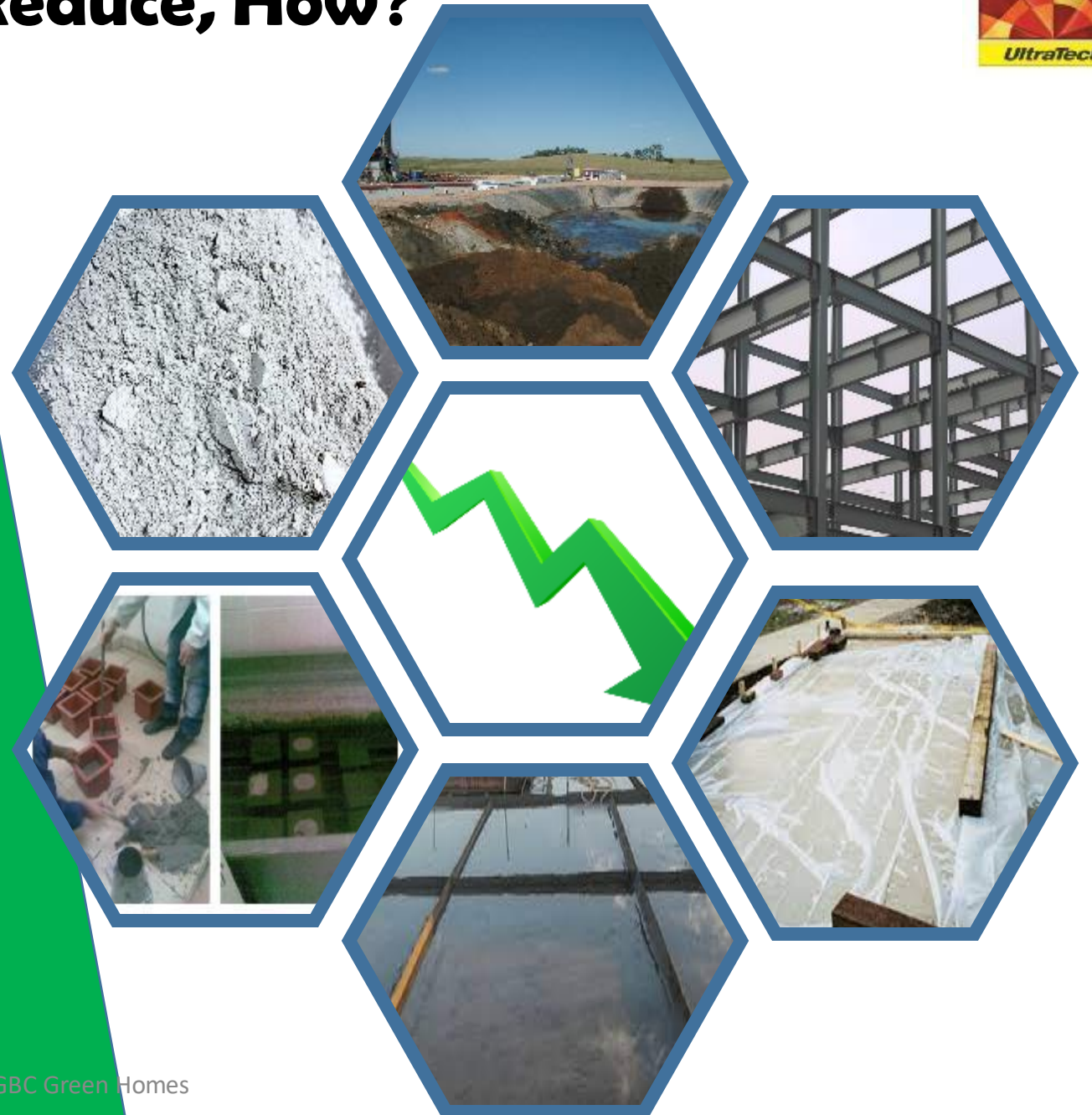
The 3 R's

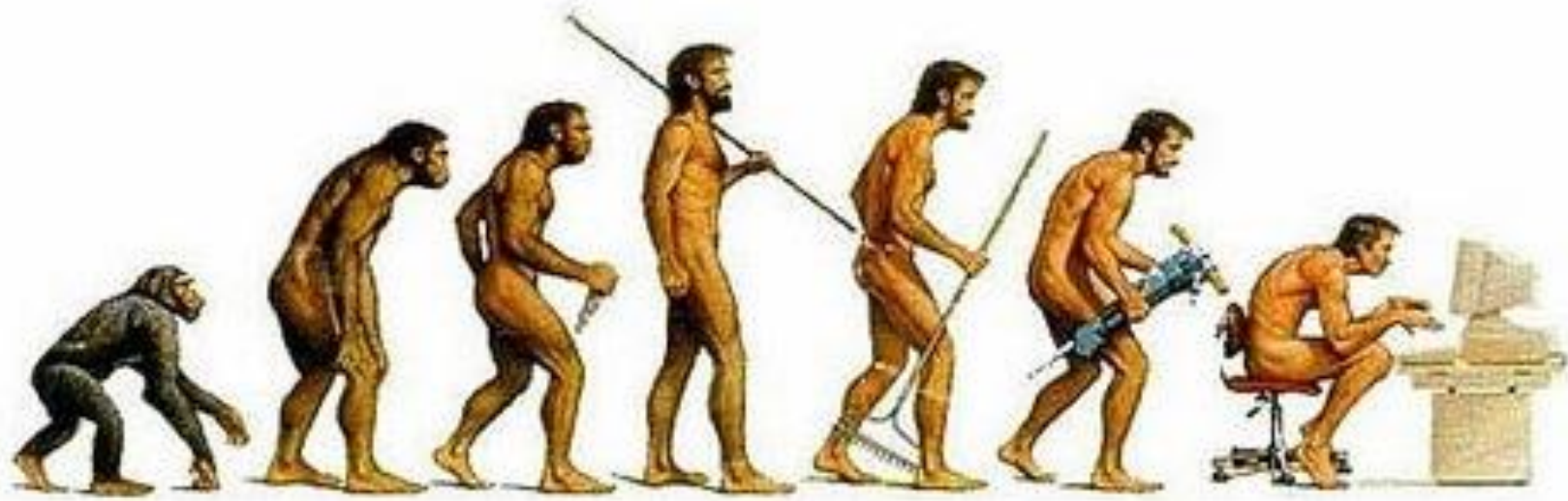


For optimizing the materials and resources implement RRR...

Reduce, How?

- ❖ Use of Blended Cements – PPC, PSC etc.
- ❖ “Optimize Design” to conserve materials, while maintaining structural integrity.
- ❖ Use of light-weight materials
- ❖ Change in Curing from ponding to membrane-curing
- ❖ ...Innovate, locally





As Man has Evolved



Living in Caves



Load bearing



Framed structure



Monolithic construction

So has the Process of Construction

Evolution of Concrete



Precast Concrete



Ready Mix Concrete



Machine Mix Concrete



Hand Mix Concrete

New /Alternative Construction Materials



Compressed Stabilized Earth Block



Autoclave Aerated Concrete Blocks



Manufactured Sand



Ground Granulated Blast Furnace Slag

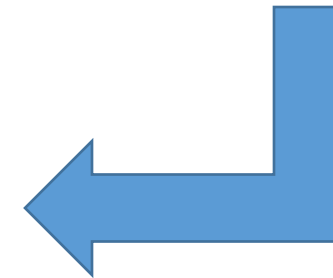


Eco-Friendly Wood based material
IGBC Green Homes



Cork Board

Handling of Construction and Demolition Waste



Reuse or Recycle materials thereby reducing the waste being sent to landfill

Recycle:



Composite/Agri-based/Recycled Wood



This block contains several images related to composite materials made from agricultural and recycled waste. It includes:

- Recycled Wood Waste:** A photograph showing a pile of wood scraps and shavings.
- Baggase – Sugarcane Waste:** A photograph showing a pile of sugarcane baggase.
- Rice Husk:** A photograph showing a pile of rice husks.
- Rice Husk Particle Board:** A photograph showing a sample of particle board made from rice husks.
- Ceiling in Class Room:** A photograph showing the ceiling of a classroom, which is made of the composite material.

A red arrow points from the "Baggase – Sugarcane Waste" image to the "Rice Husk Particle Board" image.


Use of Certified Green Products:

Sample Documentation

Green Procurement Policy

For the construction of this project, the following guidelines were developed to purchase building products and materials.

- High recycled Content
- Greater energy efficiency
- Reduced water consumption
- Materials with low toxic emitting substances
- Certified Green Products



Green Renovation Policy

Vakran Kota Golffields has made a long term commitment to follow environmentally responsible material procurement practices for all future constructions and renovations. To this effect the following criteria will be adhered to during all future construction activities within the site.

At least 25% (by cost) of the building material will be sourced from salvaged or reused materials.

Salvaged materials or reused materials are building materials recovered from existing buildings or construction sites and reused. Common salvaged materials include furniture, flooring, doors, cabinets, brick and tile.

Rehabilitated materials are products that could have been disposed of as solid waste. These products have completed their life cycle as consumer items and are then rehabilitated for reuse without substantial alteration of their form. Rehabilitating includes renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality, or value of a product.

The total recycled content of building materials will constitute at least 10% of the total cost of the material's cost in Vakran Kota Golffields.

Post-Consumer Recycled Content: End-use waste material that is generated by households as a by-product of consumption, which can no longer be used for its intended purpose, and is therefore made into new products. Examples include construction and demolition debris, materials collected from curbside or drop-off recycling programs, discarded products, etc.

Pre-Consumer Recycled Content: Material that is diverted from the waste stream during the manufacturing process and used to make new products. Examples include plane shavings and sawdust in plywood, grain covers, slag and flyash in cement, etc. This is often referred to as pre-manufactured recycled content.

At least 20% (by cost) of the building materials will be manufactured within a distance of 400 kms from Vakran Kota Golffields.

The criteria encourages the reduction of environmental impacts from transportation through the selection of locally sourced materials, which are manufactured or extracted less than 400 kms from the project site.

Green Housekeeping

Keeping the site clean is important because it helps remove harmful contaminants such as mold and bacteria. But many conventional cleaning products can also cause health problems such as asthma or allergies.

Vakran Kota Golffields has a green cleaning and procurement policy in place that ensures only non-toxic cleaning chemicals are used in all its common buildings. All cleaning products purchased are GreenPro certified or equivalent. The GreenPro standard includes product performance requirements and environmental and health considerations. The checklist containing all certified green cleaners is available at the link below. The facility management team can use this as a handy guideline to procure environmentally responsible products.

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Confederation of Indian Industry

CII-Green Products and Services Council

hereby certifies that

UltraTech, Portland Pozzolana Cement

(GPUT104001)

Manufactured by UltraTech Cement Limited meets the requirements of

GreenPro Ecolabel and qualifies as Green Product.

*This certification is valid till **December 2023***



Jamsheed N Godrej
Chairman, CII-Godrej GBC



Parasarman R
Chairman, CII-Green Products & Services Council



K S Venkatagiri
Executive Director, CII-Godrej GBC

Supporting Council and programme




Using certified green products to reduce the environmental impacts due to construction and have greater energy efficiency.

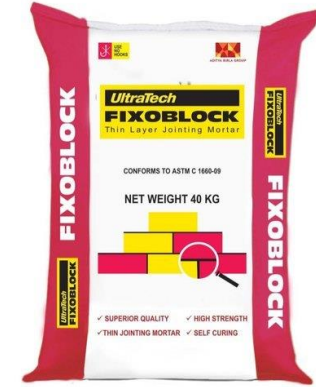
Ready-mix products to use



Ready Mix Concrete



Ready Mix Plaster



AAC Block jointing mortar



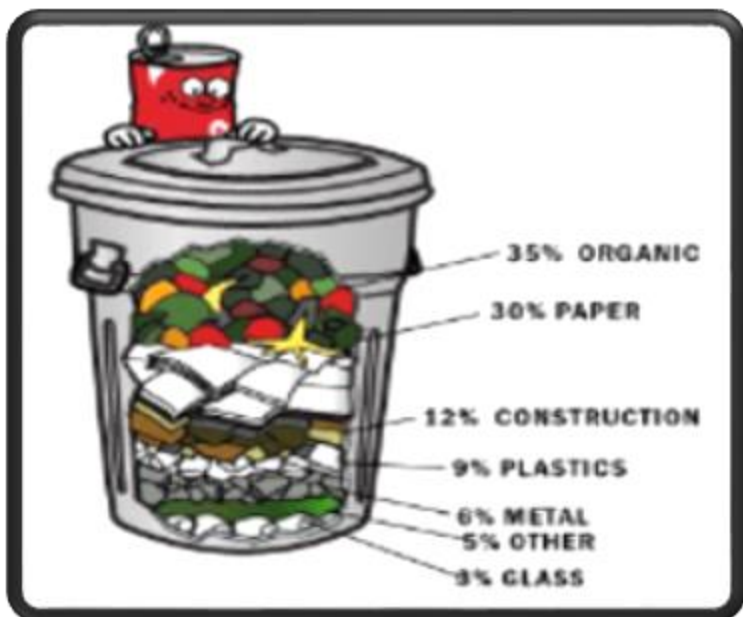
GROUTS



Tiles Adhesive

Separation of Construction /Household Waste

To ensure segregation of waste at source into types such as dry, wet, organic etc. for its proper disposal and treatment.



Organic Waste Management, Post Occupancy



On-site waste treatment system to treat and convert the waste into manure or generating power.

Thank You

