



 Background
 Holistic Measures to Reduce Construction Waste

 Planning & Design Stage
 Construction Stage
 Demolition Stage

 Enabling Systems to achieve results
 Performance Indicators & Way Forward



















- Conscious use of lean, durable and affordable finishes
- Minimizes wastage during construction and induces fewer burdens in future maintenance and repair.



## Planning & Design Stage Life Cycle Assessment & Life Cycle Costing

Make cost and environmental comparisons on new or alternative materials









#### **Construction Stage**

BI

Since
2006

 BIM is again employed to optimize construction activities, facilitate coordination amongst work trades, detect and avoid clashes of utilities and building services with building structures, hence minimise abortive work on site.





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#### Construction Stage Use of Recycled Materials

- Cement-stabilised marine mud recycled for backfilling and making masonry blocks, pavers and roof tiles since 2013.
- Paving Blocks with **Recycled Glass & Aggregates** since 2010.
- Use bore-logs as planter kerbs.
- Use **GGBS** to partially replace cement in precast concrete construction since 2011.
- Recycled excavated rock materials for construction of 'footing'
  of site hoarding and for constructing Gabion structures



### Construction Stage Prolonged Service Life

... the service life of our residential building structures completed after 1992 is at least

## 100 years.

- Through incremental enhancement of design and construction control.
- Defers the need for demolition of buildings.

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#### Enabling Systems

## Performance-based Selection Mechanism of Contractors

To secure competent and reliable business partners to undertake our works contracts, in gist as follows-

• List Management;



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- PASS
- Selective tendering procedure; and
- Apply performance scores, corporate scores and price scores in tender assessment.

# Enabling **Systems** to Achieve Results

- Performance-based Selection Mechanism of Contractors
- ISO 14001 Certification
- Green-ready Specifications

#### Enabling Systems ISO 14001 Certification

- HA achieved ISO 14001:2004 certification in June 2009.
- HA's listed contractors also to be ISO 14001 certified.
- We initiate to implement ISO 14001 requirement for manufacturers of **major building materials**.
- ISO 14001 specifies the use of processes, practices, material or products that avoid, reduce or control pollution to minimize its impact on the environment.



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#### Enabling Systems Green-ready Specifications • WMP since 2000 EMP since 2002 IPSEHS since 2003 water recycling facilities since 2005 hard paved construction since 2005 weighbridge since 2005 Environmental Manager and Environmental Supervisor since 2012.

# Performance Indicators

- 30% less C&D wastes
- 41-51% less costly
- 80% less accident rates

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