

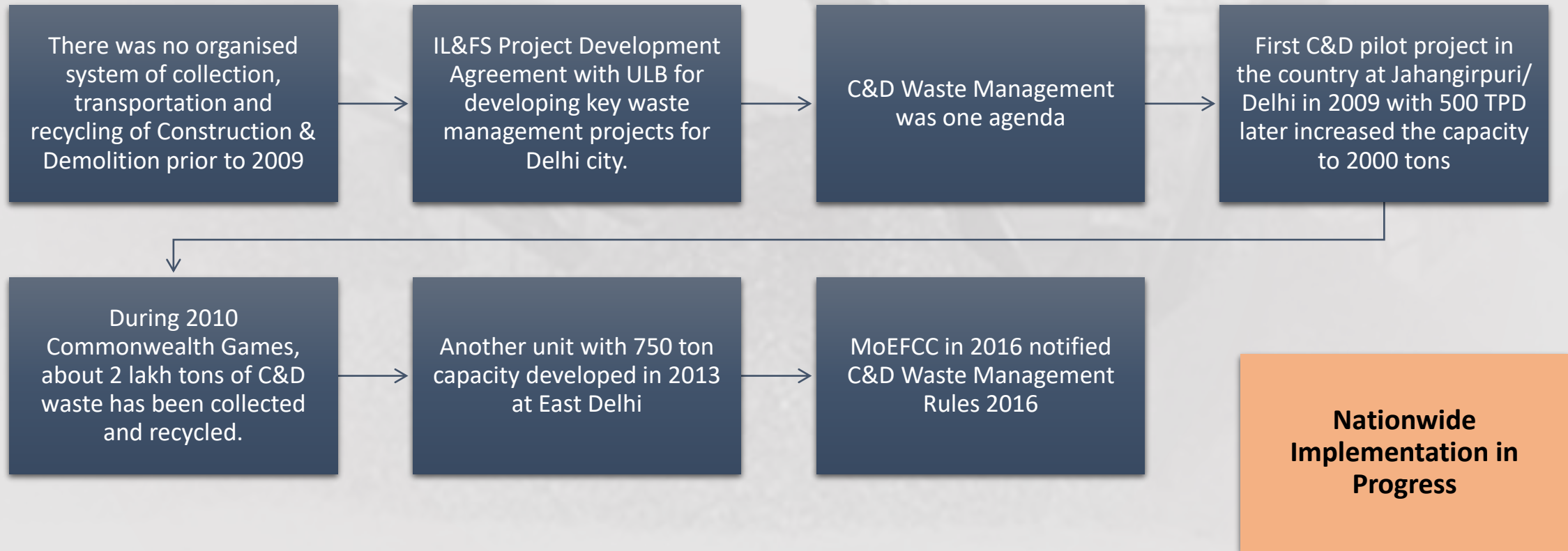


Construction & Demolition Waste Management: Take Aways from India

Leju Valsan

Enviro Enablers India Private Limited

Evolution of Construction & Demolition Waste Management in India



Composition of C&D Waste

C&D Waste consists mostly of inert and non-biodegradable material having high density

Major Components

- *Cement Concrete (Demolished)*
- *Broken Bricks*
- *Broken Cement Plaster*
- *Steel*
- *Rubble*
- *Broken Stone*
- *Broken Timber & Wood*
- *Soil & Sand*
- *Gravel*

About 50 % of C&D waste comprises of mixed sand and soil



Scheme of Action

Waste Collection

- Collection of Construction & Demolition Waste from designated locations

Transportation

- Transportation of C&D waste from the designated Collection Points to the processing site

Processing

- Weighment of C&D Waste
- Segregation of C&D Waste
- Wet and Dry Processing

Recovery & Reuse

- Recovery of aggregates
- Aggregates are converted to products like Kerb stone, Paver blocks
- Brick Dust & Granular Sub-base is sold as building material

Material Recovered from C&D Waste



Mixed Waste



Concrete Waste

Recycled Aggregate (RA)

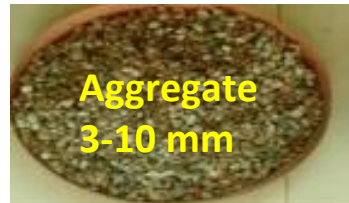
Recycled Concrete Aggregate (RCA)



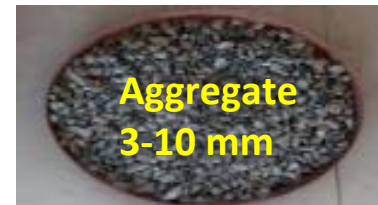
**Sand Substitute
Aggregate -3mm**



**Aggregate
10-20 mm**



**Aggregate
3-10 mm**

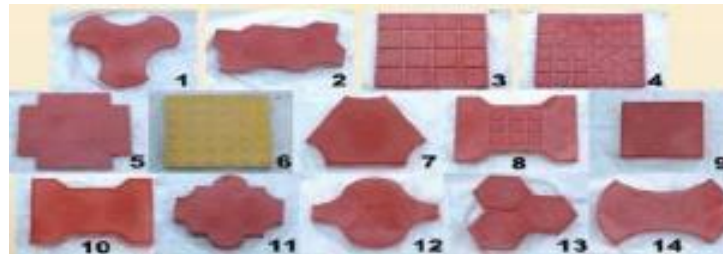


**Aggregate
3-10 mm**



**Aggregate
10-20 mm**

Recycled Concrete Aggregate Products



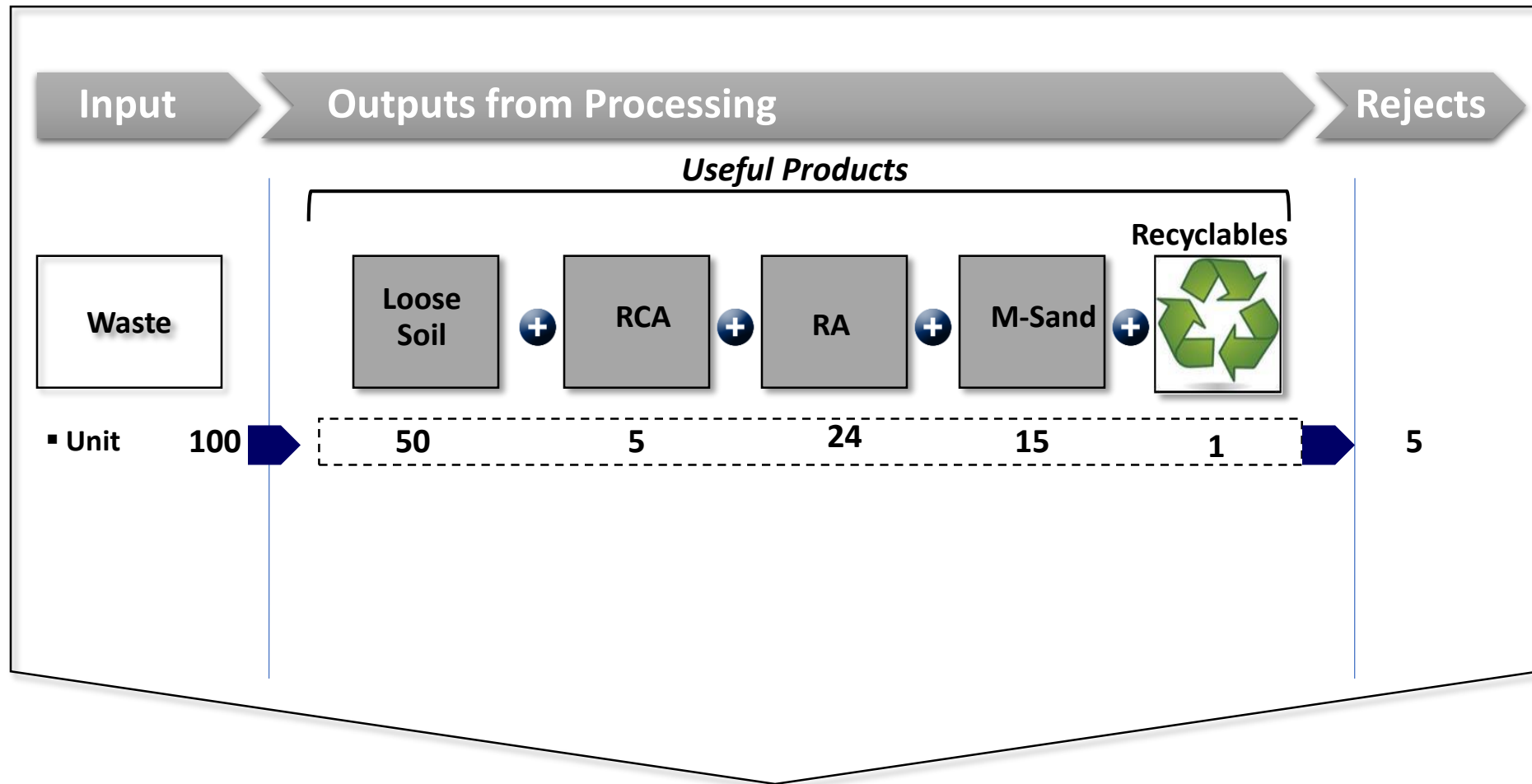
Recycled concrete aggregate (RCA) consists of aggregates produced by crushing concrete separated from C&D waste. This Aggregate is used for making value added products like pavement block, kerb stone, drain covers, and other non load bearing pre-cast products.



Virgin Vs Recycled

S. No.	Products	UoM	Price of Virgin Material (INR)	Price of Recycled Aggregates
1.	Recycled Concrete Aggregates (10 / 20 / 30 / 40 mm)	MT	1050	900
2.	Manufactured Sand	MT	1100	850
3.	Soil	MT	350	200
4.	CC Blocks	Piece	30	27
5.	Kerb Stones	Piece	75	59
6.	Tiles (Dumble, Chequered, Milano etc)	Piece	10-16	8-14

Products from C& D Waste Recycling



Processing can reduce waste to landfill by 95 %, thereby reducing pressure on scarce land . . .

Success Stories



Construction of New Supreme Court Building

18.6 Lakh M 10 grade Concrete Cement blocks of size 400x200x100, supplied for the new building and extension of the Prestigious, Supreme Court Building



4 Kms Expressway Bakkarwala Road by DDA

Provided 2.6 Lakh MT of Recycled material of required grade passing through IS sieve 150 mm and retaining on 26.5/4.75 mm sieve for back filling of 4 km long and 100 m highway



Construction of New MP Flats

M 10 Grade Cement Concrete blocks of size 400 x 200 x 100, supplied for the prestigious MP Housing Project



Biodiversity Park at Okhla under DDA

More than 5 lakh CC Blocks supplied to Boundary Wall works at Okhla Biodiversity Park



Delhi Technological University by PWD

More than 28 Lacs numbers of CC Bricks Supplied to Delhi Technological University Project of PWD. Paver Blocks & Kerb Stones used in Delhi Technological University Project of PWD

Early Day Challenges

- Offtake of recycled aggregates was a major road-block for the recycling units.
- The Sector struggled for many years to stabilize and slowly the awareness also build up and the recycled products has become familiar in the industry.



Enablers

- Indian Standard (IS) code 383: 2016

C&D waste BIS IS; 383	Plain Concrete	Reinforced Concrete	Lean Concrete (< M15 grade)	Extent of utilization
Recycled Concrete Aggregate (RCA)	25%	20% (only upto M25 grade)	100%	as Coarse Aggregate
Recycled Aggregate (RA)	Nil	Nil	100%	as Coarse Aggregate
Recycled Concrete Aggregate (RCA)	25%	20% (only upto M25 grade)	100%	as Fine Aggregate

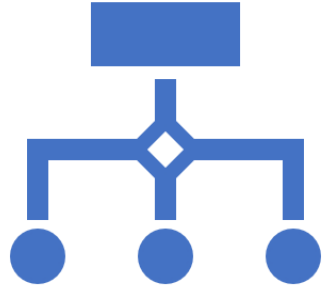
Enablers



State Government come out with various enabling orders to promote the use of recycled aggregates.

- A minimum of 2% of C&D Recycled Products shall be used for building works.
- 10% of C&D Products shall be used for Road works.
- Urban Local Bodies (ULBs) in Delhi shall mandate 5% use of C&D recycled products for nonstructural application by all, including private individuals.
- Compliance of these conditions shall be verified and certified by the concerned Executive Engineer before verifying and certifying the bills for payments in any such contract.
- Intimation of the action taken/compliance report.

Enablers



MoUHA has asked Various state-run agencies such as NHAI, MCD, DDA, CPWD, PWD, DSIIDC, I&FC, NBCC, NDMC etc. asked to mandatory use recycled aggregates.

As per the latest information; The following Quantities of C&D Waste is recycled and reused in Delhi

YEAR	C&D Waste Processed by 5 Delhi Facilities	Total C&D Recycled Products Utilized
FY 22-23	11.2 Lakh Tons	10 Lakh Tons
	9 Million Tons Cumulative	

PPP Opportunities

- Highly Scalable
- Recycled products are mainly catering to construction industry
- More resourceful and remunerative
- Project break even can be achieved in 5 years



Thankyou

