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Abbreviations

AA: Authorized Agency

C&D Waste: Construction and Demolition Waste

DA: Development Authority

EPR: Extended Producer Responsibility

IEC: Information, Education and Communication

IWSF: Intermediate Waste Storage Facility

LA: Local Authority

SCC: Secondary Collection Centre

ULB: Urban Local Body

WMP: Waste Management Plan

WUP: Waste Utilisation Plan

Definitions

Authorized agency: means an agency authorised by the local authority either for collection or transportation or both of construction and demolition waste.

Construction and Demolition (C&D) waste: means the waste generated due to construction, demolition, remodelling, renovation, repair and maintenance activities and comprises of soil, sand and gravel, bricks and masonry, concrete, metal, wood, plastic, ceramic and such other items.

Collection points: means a designated places in the jurisdiction of the local authority where waste generators, other than producers are required to deposit their construction and demolition waste to facilitate its management in an environmentally sound manner. (hereafter termed as Secondary Collection Centre (SCC) in this document).

Development Authority: means an agency that implements town planning schemes, area development plans, building laws and responsible for development of an urban area, regulates incidental civil operations like construction, engineering, demolition including utility services and amenities.

Intermediate Waste Storage Facility (IWSF): means a place in the jurisdiction of the local authority operated by the authority or an authorised operator where construction and demolition waste can be stored to facilitate its management in an environmentally sound manner.

Local Authority: means an agency entrusted to discharge functions related to sanitation, covering management of construction & demolition waste and includes a municipality, panchayat, cantonment board and notified area committee.

Orphan/legacy C&D waste: means the orphan and untreated construction and demolition waste lying in the jurisdiction of the local authority on the date of commencement of these rules.

Processing facility: means a designated establishment equipped with the requisite infrastructure to process construction and demolition waste operated by the recycler, to carry out processes of reception, storage, segregation, treatment or manufacturing of value-added articles or materials out of construction and demolition waste.

Producer: means a waste generator who is occupier or in charge of a building or building complex project having a built-up area of 20,000 square meters and above.

Recycler: means an entity registered on the portal and engaged in the recovery of reusable material from construction and demolition waste through on-site or offsite processing for manufacturing of value-added products or otherwise.

Urban Local Body (ULB): means a Municipal Corporation, Municipal Council, Nagar Panchayat, Cantonment Board, or any other authority entrusted with municipal functions in an urban area and responsible for implementing the provisions of these Rules within its jurisdiction.

Waste Generator: means an occupier of the project having full control over the construction or reconstruction or demolition or renovation or remodeling activity resulting in the generation of waste

Waste Management Plan (WMP): means a document prepared by producers, duly approved by local authority, for the management of construction and demolition waste to meet extended producer responsibility targets under First Schedule I.

Waste Utilisation Plan (WUP): means a document prepared by occupiers of construction and re-construction projects, duly approved by the local authority, for the utilisation of processed construction and demolition waste to meet waste utilisation targets under the Second Schedule or the Third Schedule.

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Chapter 1: Introduction And Stakeholder Framework For C&D Waste Management

1.1 Background

The construction sector is a major consumer of natural resources and raw materials used in building activities and a significant generator of Construction and Demolition (C&D) waste. To strengthen resource efficiency and promote sustainable management of this waste stream, the Government of India notified the Environment (Construction and Demolition) Waste Management Rules, 2025, superseding the Construction and Demolition Waste Management Rules, 2016. While the 2016 Rules primarily focused on collection, transportation, processing and disposal of C&D waste, the 2025 Rules adopt an integrated circular economy approach by promoting recycling, utilisation and recovery of construction materials.

Key provisions introduced under the Environment (Construction and Demolition) Waste Management Rules, 2025include the introduction of Extended Producer Responsibility (EPR),Waste utilisation frameworks, mandatory Waste Management Plans (WMPs) and Waste Utilisation Plans (WUPs), prescribed EPR and utilisation targets and a centralized online reporting and monitoring system. The online portal is intended to improve transparency, enable tracking of waste generation and recycling, facilitate monitoring of compliance obligations, and support data-driven planning of C&D waste management infrastructure.

A significant feature of the Rules is the introduction of the Extended Producer Responsibility (EPR) framework, which extends responsibility for C&D waste management to specified producers of construction materials and products. Under the Rules, a producer includes a waste generator who is the occupier or person in charge of a building or building complex project with a built-up area of 20,000 square metres or more. Obligated producers are required to achieve the prescribed EPR targets specified in the First Schedule and prepare a Waste Management Plan (WMP) outlining the collection, channelization and management of C&D waste. They are also required to prepare a Waste Utilisation Plan (WUP) detailing the utilisation of processed C&D waste to meet the applicable waste utilisation targets prescribed under the Second Schedule of Environment (Construction and Demolition) Waste Management Rules, 2025. Separately, the Third Schedule of the rules prescribes waste utilisation targets for road construction activities. or the Third Schedule.

1.2 Duties of the Stakeholders

The stakeholder ecosystem covered under the Rules broadly comprises the following categories

Table 1 Duties of stakeholders

Stakeholder	Primary Responsibility
Waste Generator	• Segregation of waste at source into appropriate categories. • Safe storage of waste within project premises. • Prevention of littering, illegal dumping and dust dispersion. • Handover of waste only to authorized collectors, transporters or processing facilities. • Payment of applicable user charges and waste management fees. • Compliance with directions issued by local authorities.
Producer	• Online registration on the CPCB portal and maintenance of records and submission of periodic reports. • Preparation and implementation of Waste Management Plans (WMPs) and Waste Utilisation Plan (WUP) and seeking approval from ULBs • Engaging authorized recyclers and service providers. • Achievement of prescribed recycling and recovery targets. • Fulfilment of Extended Producer Responsibility (EPR) obligations. • Ensuring utilization of recycled materials wherever technically feasible.
Contractor	• Collection and segregation of waste during construction and demolition activities. • Dust control and housekeeping measures. • Transportation of waste through authorized channels. • Compliance with storage, transportation and safety requirements. • Record keeping related to waste movement and disposal. • Supporting producers and project proponents in regulatory compliance.
Recycler	• Recyclers operating processing facilities, whether dry, wet, hybrid, or mobile, must register on the CPCB portal, as applicable under Environment (Construction and Demolition) Waste Management Rules, 2025. • Environmentally sound processing of C&D waste.Production of recycled materials and products that meet the applicable quality standards and specifications prescribed under Environment (Construction and Demolition) Waste Management Rules, 2025 • •Environmentally sound disposal of non-recyclable fractions in accordance with applicable regulations. • •Maintenance of operational records and submission of required reports through the prescribed reporting systems. • •Compliance with applicable environmental standards, consent requirements, and authorisations. • Generation, issuance, and management of EPR certificates in accordance with Environment (Construction and Demolition) Waste Management Rules, 2025.
LA/DA/Urban Local Body (ULB	• Review and Approval of the WMP and WUP as shared by producers • Establishment of SCCs/IWSFs as per requirement (A detailed SOP on establishment of SCCs is available at sop-for-sccs-for-cd-waste.pdf)

Stakeholder	Primary Responsibility
	• Ensure that designated collection points (SCCs)and Intermediate Waste Storage Facilities (IWSFs) are registered on the CPCB online portal, in accordance with the applicable requirements of Environment (Construction and Demolition) Waste Management Rules, 2025. • Facilitation of processing and recycling infrastructure. • Ensure that recyclers operating processing facilities, whether dry, wet, hybrid, or mobile, must register on the CPCB portal, as applicable under Environment (Construction and Demolition) Waste Management Rules, 2025. • Identification and prevention of illegal dumping hotspots. • Levy and collection of user charges and penalties. • Monitoring compliance by waste generators and service providers. • Promotion of recycled C&D products through municipal projects. • Conducting awareness and capacity-building programmes.
Government Agencies	• Integrating C&D waste management requirements into infrastructure projects. • Adoption of recycled C&D products in public works. • Inclusion of recycled material specifications in tender documents. • Demonstration of best practices through government projects. • Supporting market creation for recycled products. • Inclusion of processed waste articles and materials in the specific “schedule of rates”.
Regulators	• Registration and monitoring of regulated entities. • Verification of EPR compliance. • Review of annual reports and compliance submissions. • Conducting inspections and audits. • Levy of environmental compensation for non-compliance. • Development of guidelines, standards and monitoring systems.

1.3 Purpose of the Advisory

Construction and Demolition (C&D) waste is one of the largest waste streams generated in urban areas and is expected to increase substantially with rapid urbanisation, infrastructure development, redevelopment of existing built-up areas and growing construction activities across the country. Effective implementation of the Environment (Construction and Demolition) Waste Management Rules, 2025 is critical to ensuring that C&D waste is managed in an environmentally sound manner and diverted from open dumping and landfills towards recycling, recovery and beneficial utilization.

This Advisory has been prepared specifically to support Urban Local Bodies (ULBs) in planning, developing, operating and monitoring C&D waste management systems in compliance with the Environment (Construction and Demolition) Waste Management Rules, 2025. It provides practical guidance to enable ULBs to fulfil their responsibilities

across the C&D waste value chain, including planning and assessment of waste generation, establishment of collection and transportation systems, development of processing infrastructure, adoption of appropriate procurement models, implementation of dust mitigation measures, and promotion of the reuse and utilization of recycled C&D materials and products. The Advisory also outlines the regulatory framework and stakeholder roles under the Rules, providing ULBs with a structured approach for implementing efficient, sustainable and resource-efficient C&D waste management systems while advancing circular economy principles and reducing dependence on freshly mined construction materials.

Chapter 2: Understanding Construction And Demolition Waste: Characteristics, Composition And Estimation

2.1 What is Construction and Demolition Waste?

Construction and Demolition (C&D) waste refers to waste generated from construction, renovation, remodelling, repair, maintenance and demolition activities associated with buildings and infrastructure. It comprises predominantly inert and non-biodegradable materials such as concrete, bricks, masonry, soil, sand, stone, metals, wood, glass, plastics and other construction materials. The quantity and composition of C&D waste varies depending on the type of project, construction practices, age of structures, materials used and demolition methods employed.

Unlike municipal solid waste, C&D waste is generally bulky, heavy and heterogeneous in nature. While a significant proportion of the waste stream consists of recyclable and reusable materials, improper handling often results in valuable resources being lost through dumping or disposal. Understanding the nature, sources and composition of C&D waste is therefore a critical prerequisite for planning collection systems, designing processing facilities, identifying recycling opportunities and promoting the utilisation of recovered materials.

2.2 Sources of C&D Waste Generation

C&D waste is generated throughout the lifecycle of built infrastructure and originates from a variety of activities, including:

- New construction of residential, commercial, industrial and institutional buildings.
- Public infrastructure projects such as roads, bridges, flyovers, airports, railways, ports and utility networks.
- Repair, renovation and remodelling activities.
- Demolition and redevelopment of existing structures.
- Disaster-related demolition and reconstruction activities.
- Illegal dumping and accumulation of orphan C&D waste from unidentified generators.

The quantity and characteristics of waste generated differ significantly across these activities. For example, new construction predominantly generates excavation spoil, concrete, bricks, packaging material and surplus construction materials, while demolition projects produce large quantities of concrete, masonry, steel, wood and mixed debris.

2.3 Composition of C&D Waste

The composition of C&D waste plays a critical role in determining appropriate collection, segregation, processing and utilisation pathways. Effective recycling and resource recovery depend upon understanding the proportion and characteristics of different material streams present within the waste.

Major constituents of C&D waste include:

i. Concrete and reinforced concrete

ii. Bricks and masonry
iii. Soil, earth and excavation material
iv. Sand and stone
v. Metals including steel and aluminium
vi. Wood and timber
vii. Glass
viii. Plastics
ix. Bituminous materials
x. Tiles and ceramics
xi. Gypsum and plaster-based materials

The composition of C&D waste varies across cities and project types depending on local construction practices, building typologies and material usage patterns. However, concrete, masonry and soil typically constitute the largest share of the waste stream and therefore represent the greatest opportunity for recycling and resource recovery.



Figure 1. Typical Components of C&D Waste

2.4 Importance of C&D Waste Management

C&D waste management is essential for sustainable urban development, environmental protection and resource conservation. Rapid urbanisation and infrastructure growth are generating increasing quantities of construction and demolition waste which if not managed scientifically can lead to environmental degradation, public health risks and loss of valuable resources.

a. **Preventing Illegal Dumping and Conserving Landfill Space**; Improper disposal of C&D waste on roadsides, vacant land, drains and water bodies degrades public spaces, obstructs drainage systems and consumes valuable land resources. Scientific collection, transportation, processing and reuse reduce the quantity requiring disposal and help preserve landfill capacity.
b. **Improper handling of C&D waste:** Contributes significantly to fugitive dust emissions and particulate pollution in urban areas. Effective collection, transportation, storage and processing systems therefore play an important role in urban air-quality management in addition to improving resource recovery and waste management outcomes.

c. **Conserving Natural Resources and Promoting Circular Economy**: C&D waste contains recoverable materials such as concrete, bricks, aggregates, soil, metals, and glass that can be reused or recycled. Resource recovery reduces dependence on mined materials and supports a circular economy by returning materials to productive use.
d. **Improving Public Health, Safety and Urban Liveability**: Poorly managed C&D waste can create safety hazards, obstruct drains, roads and footpaths and affect the quality of urban environments. Effective management helps maintain cleaner, safer and more liveable cities while supporting sustainable infrastructure development.

2.5 Challenges in managing C&D waste

The effective management of C&D waste remains challenging due to rapid urbanization, increasing construction activity and limitations in existing waste-management systems. Key challenges include:

a. **Waste Quantification and Data Gaps**: Reliable estimation of C&D waste generation remains difficult due to the absence of consistent reporting mechanisms, limited monitoring systems and unorganized development demolition activities.
b. Land Availability Constraints: Establishing collection centres, intermediate storage facilities and processing plants requires significant land which is often difficult for ULBs to procure because of competing land-use demands and high urban land values and public resistance.
c. **Source Segregation and Handling:** The bulky and heterogeneous nature of C&D waste makes segregation challenging. Limited space at construction sites and inadequate storage arrangements often result in mixing of recyclable and non-recyclable materials.
d. **Logistics and Transportation Costs**: Collection and transportation of C&D waste require specialised vehicles and heavy machinery for loading, unloading and handling, increasing operational costs and complexity.
e. **Institutional Capacity and Market Development**: Limited stakeholder awareness, weak inter-agency coordination, inadequate technical capacity and low market acceptance of recycled C&D products continue to constrain effective implementation and resource recovery.
f. **Informal Sector Dominance and Regulatory Enforcement**: A significant share of demolition activities is undertaken by unorganized operators, making monitoring, compliance enforcement and prevention of unauthorized dumping difficult.
g. **Limited acceptance of recycled C&D products:** Among Contractors, consultants and end users regard recycled C&D products as of low quality which continues to affect market development despite the availability of technical specifications and quality standards.

2.6 Estimation of C&D Waste Generation

Reliable estimation of C&D waste generation is essential for planning collection systems, transportation networks, storage facilities, processing capacity and utilization pathways. The choice of methodology depends on the availability of data, resources and the level of complaince required. Commonly used approaches are presented below.

2.6.1 Direct Measurement Methods

a) Site Visit and Direct Weighing Method

This method involves measuring C&D waste generated at construction and demolition sites through direct weighing, supported by site surveys and stakeholder interactions. It provides reliable estimates for individual projects but is resource-intensive and generally suited for sample-based assessments rather than city-wide quantification.

b) Estimation Surveys for Cities and Towns

City-level surveys involve collecting information on building stock, construction and demolition activities, material usage and waste management practices. Data collected from representative samples are analysed and extrapolated to estimate overall C&D waste generation and composition across the city.

c) Real Time Monitoring of C&D Waste

Waste quantities received at collection, storage or processing facilities can be measured using weighbridges or other appropriate systems. This approach provides accurate data on waste handled within the formal system and can support continuous monitoring of C&D waste generation and management.

2.6.2 Thumb Rule Method

Where detailed assessments are not feasible, ULBs may use standard estimation factors to obtain indicative estimates of C&D waste generation. The Technology Information, Forecasting and Assessment Council (TIFAC), developed a thumb-rule method to estimate construction and demolition (C&D) waste generation based on the type of building activity and its built-up area

2.6.2.1 TIFAC Methodology

The TIFAC methodology estimates waste generation based on the built-up area and type of activity. Indicative generation factors are:

a. New construction: 40-60 kg/m²
b. Renovation: 40-50 kg/m²
c. Demolition: 300-500 kg/m²

These factors can be applied to approved built-up areas to estimate city-level C&D waste generation.

2.6.2.2 MSW-Based Estimation Method

In the absence of primary data, C&D waste may be estimated as a proportion of Municipal Solid Waste (MSW) generation. C&D waste is generally estimated to constitute 5-25% of total MSW generated in urban areas and may be used as an indicative benchmark for infrastructure planning. This does not include C&D waste from works involving public utilities and public infrastructure.

2.6.3 Recommended Estimation Approach

C&D waste estimation should use the method that best suits the purpose and the data available. For planning and capacity assessment, more than one method should be used and the estimate should be checked against actual waste quantities wherever such data are available.

Table 2 Recommended estimation method

Situation	Preferred estimation approach
ULB without reliable data	TIFAC factors + an MSW-based benchmark as a preliminary estimate only.
ULB preparing a DPR	Primary survey + historical building/activity data + TIFAC cross-check.
Existing formal C&D waste management system	Actual weighbridge, collection, processing and portal data.
Final processing-capacity planning	Triangulate multiple methods and validate the estimate against actual collected and processed quantities.

The estimation of C&D waste generation provides the quantitative basis for planning an efficient and sustainable C&D waste management system. Information on the quantity, composition and spatial distribution of waste generated within a ULB jurisdiction helps determine the infrastructure, resources and institutional arrangements required for its management. These estimates support informed decision-making on collection mechanisms, transportation requirements, storage facilities, processing capacities and utilisation opportunities. The subsequent chapter builds on these estimates to present a framework for planning and implementation of C&D waste management systems by Urban Local Bodies.

Chapter 3: Planning And Local Body Implementation Framework

Before establishing a C&D waste management system, ULBs should undertake a comprehensive assessment covering waste generation, infrastructure requirements, financial viability and market demand for recycled products. Key considerations include:

3.1 Planning Approach

Planning of a C&D waste management system should be undertaken in a systematic manner to ensure that collection, storage, transportation, processing and utilization infrastructure are aligned with the quantity and characteristics of waste generated within the ULB jurisdiction. The planning process should consider both current waste generation and future growth arising from urban expansion, redevelopment activities and infrastructure projects.

The following key aspects should be considered by ULBs while developing a C&D waste management system:

i. **Assessing C&D Waste Generation:** Estimate current and future C&D waste generation using suitable methodologies such as direct measurement, thumb-rule approaches and MSW-based estimations. The assessment should account for ongoing construction activities, redevelopment trends, population growth and future development plans.

ii. **Developing a Collection Strategy:** Assess the need for collection infrastructure based on waste generation patterns and sources. ULBs need to establish Secondary Collection Centres (SCCs) for receiving and temporarily storing waste from small and dispersed generators and provide on-call collection services through helplines, mobile applications or similar mechanisms. Bulk waste generators/Producers to transport segregated waste directly to authorized processing facilities or Intermediate Waste Storage Facilities (IWSFs).

iii. **Planning Collection Infrastructure:** SCCs, IWSFs and collection systems should be planned based on waste generation hotspots, service coverage requirements, accessibility and transportation distances. SCCs should preferably be located near major construction zones, redevelopment areas and transport corridors to facilitate efficient waste collection and transfer. A detailed SOP on establishment of SCCs is available at sop-for-sccs-for-cd-waste.pdf.

iv. **Identifying Suitable Sites:** Appropriate locations should be identified for processing facilities, IWSFs and SCCs considering land availability, accessibility, environmental safeguards, operational requirements and future expansion needs.

The following aspects can be considered while finalizing the location:-

a. Located for convenient access by waste generators and collection vehicles, with all-weather road connectivity.
b. Situated away from schools, hospitals, water bodies, flood-prone/low-lying areas, and predominantly residential zones.
c. Avoid locations on or near congested roads to minimize traffic disruptions.
d. Ensure proper drainage and avoid waterlogging-prone sites unless drainage can be developed
e. Prefer vacant municipal land, industrial areas, urban fringes, and other sites with adequate space and road access.
f. Consider locations along major arterial roads, transport/logistics zones, and permitted public utility land.
g. Give priority to sites near major C&D waste generation areas such as redevelopment zones, housing projects, demolition clusters, and infrastructure corridors.
h. Prefer locations near municipal waste facilities or C&D recycling/processing plants to reduce transportation distances.
i. Temporary or semi-permanent SCCs may be established in areas with concentrated short-term C&D waste generation.
j. State/ULB shall earmark space for C&D waste management in their future development plans.

v. **Selecting Appropriate Processing Technology:** Technology selection should be based on waste quantities, composition of waste, local conditions, availability of land and utilities, market demand and intended use of recycled products. ULBs may consider dry, wet, hybrid or mobile processing systems depending on local requirements.

vi. **Assess Financial and Implementation Options:** ULBs should evaluate capital and operating costs, revenue opportunities and institutional capacities while selecting an implementation model. Appropriate arrangements may include municipal operation, EPC contracts, public-private partnerships (PPP), hire private operators or hybrid approaches.

vii. **Promote Utilisation and Market Development:** Demand for recycled aggregates, manufactured sand, paver blocks and other recycled products should be assessed at the planning stage itself. ULBs should identify potential users, facilitate offtake arrangements and integrate recycled products into procurement frameworks and municipal works wherever feasible.

3.2 Processing Approaches

The choice of C&D waste processing method depends on waste quantity, land availability, transportation distance, project scale and local conditions. Broadly, three processing approaches may be adopted:

3.2.1 Dry Processing

i. Dry processing is the most widely adopted approach for recycling C&D waste and is suitable where waste is relatively clean and contains limited soil, clay or other contaminants.

ii. The process primarily relies on mechanical operations such as segregation, crushing, screening and metal recovery without significant water consumption. Incoming waste is first inspected and segregated to remove undesirable materials such as plastics, wood and hazardous waste. The remaining inert fraction is then processed through crushers and screening systems to produce various grades of recycled aggregates and manufactured sand.

iii. Dry processing facilities are comparatively simple to establish and operate, require lower capital investment and operating expenditure, and do not require wastewater treatment systems. The absence of water-intensive operations also eliminates sludge generation, reducing handling and disposal requirements. These characteristics make dry processing particularly suitable for small and medium-sized ULBs, decentralized processing facilities, and regions facing water scarcity.

iv. The principal outputs from dry processing include recycled coarse aggregates, recycled sand, road sub-base material and recovered metals. These materials can be utilized in road construction, paving works, embankment filling, backfilling, non-structural concrete applications and other construction activities, depending on local demand and applicable quality standards. Dry processing is most effective where source segregation and separate collection of C&D waste are practiced, as cleaner waste streams improve material recovery and product quality.



Figure 2 Dry processing of C&D waste

3.2.2 Wet Processing

i. Wet processing is adopted where C&D waste contains significant quantities of soil, clay, silt, dust or adhered contaminants that cannot be effectively removed through conventional dry processing. In addition to crushing and screening, the process incorporates washing systems and fines recovery units to improve the quality of recycled materials.

ii. During wet processing, the waste undergoes multiple stages of washing and classification. Fine particles and contaminants are separated using hydrocyclones,

classifiers and washing equipment, while water treatment and recovery systems enable reuse of process water within the facility. The resulting recycled aggregates and sand are cleaner and more suitable for applications requiring higher-quality materials.

iii. Although wet processing produces superior quality recycled products, it requires higher capital investment, greater operational expertise and reliable water availability. Facilities must also incorporate systems for sludge management and process water recycling. This is a more environment friendly processing system.

iv. Consequently, wet processing is generally more suitable for large ULBs and metropolitan cities generating substantial quantities of C&D waste, particularly where waste streams contain higher levels of fines and contaminants. The technology is best suited for centralized processing facilities serving large catchment areas, where economies of scale can justify the additional infrastructure and operational requirements. This can also be adopted in hilly areas.

v. The principal outputs from wet processing include high-quality recycled aggregates, recycled sand, recovered fines and metals. These materials can be utilized in concrete products, paving blocks, road construction, precast applications and other construction works where improved material quality is required.



Figure 3 Wet processing of C&D waste

3.2.3 Mobile Processing

i. Mobile processing involves the deployment of portable crushing and screening equipment directly at construction sites, demolition sites, redevelopment projects or temporary storage areas. Unlike conventional fixed recycling facilities, mobile units are transported to locations where substantial quantities of C&D waste are generated and process the material near its point of origin.

ii. The approach significantly reduces transportation requirements and associated costs by enabling immediate treatment and reuse of materials at or near the project site. Recycled aggregates generated through mobile processing may be utilized directly for backfilling, road sub-base construction, site development works, landscaping applications or other project requirements. Mobile processing is particularly valuable for large infrastructure projects, urban redevelopment projects,

industrial demolition activities and locations situated far from centralized processing facilities.

iii. In addition to cost savings, mobile processing facilitates faster site clearance, reduces vehicle movements, lowers transportation-related emissions and promotes the circular use of materials within the same project. The technology is especially relevant for bulk waste generators producing substantial quantities of concrete, masonry, asphalt and inert debris at a single location.

vi. Mobile processing can also be adopted through a cluster-based approach, wherein a mobile unit serves multiple construction, demolition or redevelopment sites located within a defined geographical area. Under this model, waste generated from a cluster of projects is processed sequentially or at a common temporary location, allowing ULBs to extend recycling services to areas where individual waste quantities may not justify a dedicated facility. This approach can be particularly beneficial for medium-sized cities, urban redevelopment zones and peri-urban areas, enabling efficient resource utilization while reducing transportation distances and infrastructure costs. This can also be adopted in hilly areas.



Figure 4 Mobile processing of C&D waste

3.2.4 Suitable Applications of Different C&D Waste Processing Technologies

Table 3 Suitable applications of different C&D processing technologies

Processing Technology	Suitable Applications
Dry Processing	Small and medium ULBs; decentralized processing facilities; areas with relatively clean and segregated C&D waste streams; water-scarce regions
Wet Processing	Large ULBs and metropolitan cities; centralized processing facilities; areas with mixed waste streams containing higher levels of soil, silt and fines; locations requiring high-quality recycled products
Mobile Processing	Large construction and demolition projects; infrastructure and redevelopment projects; clusters of construction sites; hilly and remote areas; locations distant from fixed processing facilities

Chapter 4: Procurement Models

4.1 Financial Planning for C&D Waste Management

Financial planning for a C&D waste processing facility should evaluate capital investment, operating expenditure, transportation costs, revenue streams, market demand for recycled products and long-term sustainability. ULBs may adopt either an Engineering, Procurement and Construction (EPC) model or a Public-Private Partnership (PPP) model based on local requirements and financial capacity.

Table 4 Comparison of Implementation Models

Parameter	EPC Model	PPP Model
Capital Investment	Primarily by ULB/Government	Primarily by Private Partner
Ownership	ULB/Government	As per concession agreement
Design & Construction	EPC Contractor	Private Concessionaire
Operation & Maintenance	ULB or separately appointed operator	Private Concessionaire
Revenue Risk	Primarily with ULB	Shared or largely borne by private partner
Suitable For	Small and medium-sized generators	Medium and large-scale generators

4.1.1 EPC Model

Under the EPC model, the ULB finances and owns the facility while a contractor is engaged to design, procure, construct and commission the project within an agreed timeframe and cost.

The ULB is responsible for:

- Land identification and provision.
- Waste generation assessment and capacity planning.
- Project funding through municipal resources, grants, loans or government schemes.
- Appointment of contractors through a competitive bidding process.

Following commissioning, the facility may be operated directly by the ULB or through a separately appointed operator. Revenue may be generated through processing fees, collection charges/tipping fees, sale of recycled products and sale of recovered materials.

The EPC model offers greater public control over assets and operations but requires higher upfront capital investment from the ULB.

4.1.2 PPP Model

A Public-Private Partnership (PPP) involves a long-term contractual arrangement under which a private partner develops and operates the facility while sharing project risks and responsibilities with the ULB.

Typically, the ULB provides land and facilitates waste supply while the concessionaire is responsible for:

- Design, construction, financing, operation and maintenance of the facility.
- Collection, transportation, processing and recycling of C&D waste as applicable.
- Production and marketing of recycled products.
- Compliance with environmental regulations, reporting requirements and performance standards.
- Revenue streams under PPP projects may include:
  - Processing and or tipping fees.
  - User and collection charges.
  - Sale of recycled products and recovered materials.
  - Performance-linked payments from the ULB where applicable.
  - PPP projects should incorporate provisions for capacity expansion, digital monitoring systems, performance standards, and transparent reporting mechanisms.:

4.2 Financial Viability Considerations

To ensure the long-term sustainability of C&D waste management systems, ULBs should consider the following factors while planning collection, storage, processing and utilization infrastructure:

- Monitoring of waste flows and product utilisation to improve operational efficiency and support informed decision-making.
- Linkage of processing capacity with actual waste generation and utilisation potential to avoid underutilisation of facilities.
- Development of Intermediate Waste Storage Facilities (IWSFs)/Secondary Collection Centres (SCCs) to aggregate waste from multiple generators, improve collection efficiency and reduce transportation costs.
- Levy of user charges for collection, transportation, storage and processing of C&D waste to support recovery of operational costs.
- Efficient transportation and logistics planning to minimize waste handling and transportation costs.
- Promotion of utilisation by government agencies, development authorities, infrastructure projects and private construction activities to strengthen market demand.

- Inclusion of recycled products in procurement frameworks to create a predictable market for recycled aggregates, manufactured sand and other recycled materials.

A combination of adequate waste inflow, efficient collection and transportation systems, appropriate user charges and sustained demand for recycled products is critical for the technical and financial viability of C&D waste management facilities.

Chapter 5: Dust Mitigation Measures For C&D Waste Management

Construction, demolition and material handling activities are significant contributors to urban particulate pollution. Project proponents should implement adequate dust suppression measures including site barricading, green netting, covering of stockpiles, water sprinkling systems, covered transportation of materials and debris, and proper housekeeping practices. For large construction and demolition projects, use of surveillance systems and periodic inspections may be considered to strengthen compliance.

Table 5 Dust mitigation measures

Stage of Value Chain	Potential Sources of Dust	Recommended Mitigation Measures	Responsible Stakeholder
Generation of C&D waste during construction, renovation & demolition	Demolition activities, excavation, cutting, material handling, exposed debris and stockpiles construction and repair activities	Pre-wetting of structures; water sprinkling/misting; dust screens or green nets; covering of stockpiles; controlled demolition practices; Installation of wind barriers / breakers along the project boundary, immediate collection of debris, cleanup after work	Waste Generator / Project Proponent
Collection & Loading	Loading of waste into vehicles, repeated handling of debris, movement of equipment	Minimize handling; reduce drop heights; mechanical loading where feasible; periodic water sprinkling in loading areas	Waste Generator / Collection Agency
Secondary Collection Centers (SCCs)	Waste unloading, temporary storage, vehicle movement, loading for onward transport	Paved surfaces; regular water sprinkling; covered storage of fine materials; speed restrictions; housekeeping; green buffers; loading operations under covers	ULB/LA/DA SCC Operator
Intermediate Waste Storage Facilities (IWSFs)	Bulk storage, loading and unloading activities, vehicle movement	Paved storage areas; stockpile management; water spraying systems; covered storage for fines; green buffer zones; regular maintenance and sweeping	ULB ULB/LA/DA/ ISF Operator
Transportation	Open vehicle loads, material spillage, road dust, vehicle movement	Use covered vehicles or containers; avoid overloading; prompt removal of spillages; wheel washing to avoid dust suspension; speed control; regular road cleaning	Transporter / Waste Generator
Dry Processing Facilities	Crushing, screening, conveyor transfer points, stockpiles, material handling waste reciepts	Enclose crushers and screens; water spray or fogging systems; cover conveyors where feasible; dust extraction systems for larger plants; paved roads; covered stockpiles and a wheel washing system.	Facility Operator
Wet Processing Facilities	Waste receipt, crushing and screening operations, material storage, waste	Water sprays at processing points; covered transfer systems; proper management of fines and sludge; maintenance of water recirculation	Facility Operator

Stage of Value Chain	Potential Sources of Dust	Recommended Mitigation Measures	Responsible Stakeholder
	receipts; conveyor transport points	systems; stockpile moisture control and a wheel washing system.	
Mobile Processing Units	On-site crushing, screening, material transfer, stockpiling	Water spraying at crushers and screens; temporary dust barriers; covered storage of processed materials; processing during suitable weather conditions; site housekeeping	Project Proponent / Mobile Processor
Storage of Recycled Products	Stockpiles of recycled aggregates and sand, loading operations	Covered or stabilized stockpiles; water sprinkling as required; designated storage areas; minimize multiple handling	Facility Operator / End User
Utilization of Recycled Products	Material handling, unloading, site usage activities	Covered transportation; controlled unloading; water sprinkling during handling; good housekeeping practices at utilization sites	Contractor / End User
Monitoring & Compliance	Failure of dust control systems, poor operational practices	Periodic inspections; maintenance of dust suppression systems; record keeping; complaint redressal; corrective actions for non-compliance	ULB/LA/DA / SPCB/Facility Operators/ Project Proponents
Construction Site Management	Cutting, grinding, excavation, exposed materials	Green netting, site barricading, CCTV monitoring, periodic water sprinkling, enclosure of cutting areas, covered storage of fine materials	Project Proponent

5.1 Classification of Dust-control Measures

Dust-control measures should be clearly distinguished between measures that are generally necessary for environmental compliance, recommended good practices and project-specific measures. The classification should be applied according to the scale and nature of the activity and the applicable environmental requirements.

Table 6 Category wise dust control measures

Category	Examples
Generally necessary	Covered transport, control of exposed fine material, housekeeping, appropriate storage and dust suppression where required.
Recommended good practice	CCTV, automated sprinkling, wheel cleaning, additional enclosure and routine inspection.
Project-specific	Additional air-quality monitoring, traffic management, enhanced enclosures and other measures based on site conditions.

Chapter 6: Reuse Of Recycled Material

6.1 Reuse and Utilisation of Recycled C&D Materials

The long-term sustainability of C&D waste management systems depends not only on collection and processing but also on the effective utilisation of recycled materials and products. Recycled C&D waste can be processed into a range of construction materials, including recycled aggregates, recycled concrete aggregates (RCA), manufactured sand, screened soil, road sub-base material, paver blocks, kerbs, tiles, bricks and precast products. Utilisation of these materials reduces dependence on freshly mined resources, conserves natural aggregates and supports circular economy objectives.

For effective market adoption, recycled materials should conform to applicable standards, specifications and quality requirements prescribed by BIS and other relevant agencies. ULBs should encourage the use of certified recycled products in infrastructure projects, public works and construction activities within their jurisdiction.

6.2 Role of ULBs in Promoting Utilisation of Recycled Products

Urban Local Bodies (ULBs) play a key role in creating demand for recycled C&D materials and ensuring that processed waste is effectively utilized in construction activities. To promote utilisation of recycled products, ULBs may consider the following measures:

- Promote the use of recycled products such as recycled aggregates, recycled concrete aggregates (RCA), manufactured sand, road sub-base material, paver blocks, kerbs, tiles and other approved recycled products in municipal works.
- ULBs may mandate and incentivise the use of recycled C&D waste materials in new buildings and infrastructure projects. Tender conditions may require a minimum utilisation of recycled C&D products for suitable non-structural applications, wherever technically feasible. This will help create market demand for recycled materials and promote circular construction practices.
- Incorporate recycled products in municipal procurement frameworks, including Schedule of Rates (SoR), standard specifications, bid documents and tender conditions, wherever technically feasible.
- Utilize recycled materials in municipal infrastructure projects such as roads, pavements, drains, embankments, parks, landscaping works and public buildings.
- Encourage adoption through development approvals, redevelopment permissions and large construction project approvals, in accordance with the provisions of the Environment (Construction and Demolition) Waste Management Rules, 2025.
- Facilitate institutional offtake by coordinating with Development Authorities, Public Works Departments (PWDs), road agencies, government departments, public

sector undertakings and other public infrastructure agencies operating within the ULB jurisdiction.

- Promote awareness and confidence in recycled products through demonstration projects, outreach programmes and dissemination of successful applications.
- Encourage compliance with applicable standards and specifications to ensure quality, performance and market acceptance of recycled materials.
- Review Waste Utilisation Plans (WUPs) submitted by obligated entities and verify that the proposed utilisation strategy, quantities, end-use applications and procurement arrangements are aligned with the applicable utilisation targets prescribed under the Rules.
- Monitor implementation of approved WUPs to assess whether the proposed quantities of recycled products are being utilized in practice and maintain records to support compliance monitoring.
- Assess local demand and utilisation opportunities before planning processing capacity, so that recycling infrastructure is linked with realistic and sustainable end-use markets.

The successful utilisation of recycled C&D materials depends on the combined efforts of ULBs, government agencies, developers and other stakeholders in creating consistent demand and integrating recycled products into construction activities. Across India, several cities and agencies have demonstrated practical approaches for promoting the use of recycled C&D materials through supportive policies, procurement practices, infrastructure projects and institutional partnerships.

The case studies given in the next chapter highlight successful examples of recycled material utilisation and provide insights into strategies that can be replicated by ULBs to strengthen circular economy outcomes and enhance the sustainability of C&D waste management systems. In addition, selected international practices have been compiled in Annexure I to provide a broader perspective on global approaches, innovative applications and policy mechanisms that have supported the large-scale utilisation of recycled C&D materials.

Chapter 7: Lessons From Case Studies

The experiences of Surat, Ahmedabad, Navi Mumbai, Delhi, Chandigarh and Hyderabad demonstrate that successful C&D waste management requires a combination of policy support, collection infrastructure, processing capacity, market development and institutional oversight and enforcement.

7.1 Collection and Transportation

- Dedicated collection systems are critical to prevent illegal dumping and improve waste recovery.
- Successful cities have established multiple collection centres, on-call collection services and GPS-enabled transportation systems.
- User charges for collection and transportation help recover operational costs, particularly from bulk waste generators.
- Integration of collection centres with processing facilities improves operational efficiency and traceability of waste flows.

7.2 Processing Technologies

- Both wet and dry processing technologies are being successfully implemented in Indian cities.
- Wet processing is preferred where higher-quality recycled aggregates are required or where waste contains significant soil and fine contaminants.
- Dry processing offers lower water consumption and lower operational complexity.
- Technology selection should be based on waste characteristics, local conditions, water availability and market requirements.

7.3 Institutional and Implementation Models

- PPP-based projects have demonstrated success in large cities by leveraging private-sector investment and expertise.
- ULB-led projects can also be effective where waste quantities are lower and adequate financial and operational capacity exists.
- Long-term concession arrangements, clear contractual obligations and performance-based monitoring contribute to project sustainability.
-

7.4 Market Development and Offtake

- Diversifying recycled products and integrating land support with buy-back arrangements under PPP models can strengthen market demand and improve project viability.
- Assured utilisation of recycled products through mandatory procurement provisions, and their inclusion in Schedules of Rates (SORs) and public works specifications, can promote market acceptance and improve project viability.

- Digital waste exchange platforms can connect C&D waste processing facilities with potential buyers, facilitating the uptake of recycled materials in public works.

7.5 Monitoring and Enforcement

- Digital monitoring tools such as GPS tracking, CCTV surveillance, weighbridge integration, online reporting systems and mobile applications have emerged as effective mechanisms for improving accountability and reducing unauthorized dumping.User charges and penalties for illegal dumping help discourage non-compliance and improve collection efficiency.
- Regular monitoring of waste generation, transportation and processing is essential for effective implementation of the C&D Waste Management Rules, 2025.

7.6 Key Success Factors

The reviewed case studies indicate that the following factors are critical for successful C&D waste management:

- Reliable waste quantification and capacity planning.
- Adequate land availability for collection and processing infrastructure.
- Efficient collection and transportation systems.
- Appropriate technology selection based on local conditions.
- Sustainable financial and contractual arrangements.
- Assured market demand and procurement support for recycled products.
- Strong regulatory oversight, monitoring and enforcement.
- Public awareness and stakeholder participation.
- Integration of digital monitoring and reporting systems.
- Dedicated collection centres linked to processing facilities.
- Government-led market creation through procurement policies.
- Strong air-quality and dust-management measures.

7.7 Action Matrix

Table 7 Action matrix

Observed issue	Recommended action in ULB system
Waste is generated but not collected	Provide accessible on-call/scheduled collection and designated collection points.
Collected waste is diverted	Use authorised destinations and proof of delivery.
Plants are under-utilised	Review catchment, collection efficiency, waste supply and operational performance.
Recycled products remain unsold	Prepare offtake plans and integrate suitable products into public procurement/SoR.

Digital data exists in silos	Use a single traceable chain from generation to utilisation.
Illegal dumping persists	Map hotspots, strengthen enforcement and provide convenient legal disposal routes.
Small generators are underserved	Provide simple, affordable collection/drop-off services.
Legacy C&D waste remains unaddressed	Prepare an inventory and phased remediation plan.

Case Study: Bakkarwala, New Delhi

Table 8 Case Study: Bakkarwala, New Delhi

1	State Name	New Delhi
2	ULB Name & No. Of Wards	Municipal Corporation of Delhi – 29 Wards
3	Total Estimated C&D waste Generation/Day in the ULB	950 MT
4	Quantity of C&D by Bulk waste generators	-
5	No. of Wards covered for C&D, in case whole city not covered	29
6	Ownership (ULB/PPP/Pvt. Operator)	PPP
7	Types of outputs - No. of recycled items made from C&DW (e.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Paver blocks, Bricks, Kerb stones, recycled sand, recycled aggregate, Concrete Blocks, Bio Soil etc.
8	Whether Established on Cluster approach	-
9	If no. 8 is Yes - Names of all ULBs serviced	-
10	Area of Plant (Land area)	5.01 Acres
11	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized (1000 TPD)
12	Current Status	Operational
13	Month/Year of Commencement of operation (MM/YY)	March 2020
14	Designed Capacity of Plant (TPD)	1000 TPD
15	Average Daily Waste Intake/Processing (FY 2019-20)	950 TPD
16	Mechanism for Collection & Transportation of C&D wastes	
	• ULB	Yes
	• Collection Centre	Yes
	• On call basis	Yes
	• Collection from state Agencies/ ULB itself	-
	• Bulk Generator Waste	-
17	Fee charged by ULB/Operator against Collection & Transportation, if any	
	• Private parties	Yes
	• ULB	-
	• Govt. Agencies	Yes
	• Bulk Generators	Yes
18	Types of Process - Wet/Dry	Both Dry and Wet
19	Indicative processing scheme/ Equipment in line	-

20	Percentage of Inert/ Processing Rejects going to Landfill	1%
21	Total Capital Expenditure	20 Cr
22	In case of PPP Projects, support to the project by	
	• VGF	-
	• Land	Yes
	• Buy back of products	Yes
	• Other support	-
23	Fee charged, if any, for processing (per ton)	Rs. 124/- Per MT for ULB and Rs. 275/- Per MT plus GST for other parties
24	Sales of products (FY 2019-20)	
	• To private parties	Yes
	• To ULB	Yes
	• To other Govt. Agencies	Yes
25	Any other information	
	• Amount collected for sanction of construction/demolition/cutting of roads etc. for C&D waste; penalty for dumping of C&D waste	-

Case Study: Shastri Park, New Delhi

Table 9 Case Study: Shastri Park, New Delhi

1	State Name	Delhi
2	ULB Name & No. Of Wards	Municipal Corporation of Delhi - 64 Wards
3	Total Estimated C&D waste Generation/Day in the ULB	700 TPD
4	Quantity of C&D by Bulk waste generators	300 TPD
5	No. of Wards covered for C&D, in case whole city not covered	64 wards (East Delhi)
6	Ownership (ULB/PPP/Pvt. Operator)	PPP
7	Types of outputs - No. of recycled items made from C&DW (e.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Recycled Aggregate, Recycled Sand, Soil, Concrete Blocks etc.
8	Whether Established on Cluster approach	No
9	If no. 8 is Yes - Names of all ULBs serviced	NA
10	Area of Plant (Land area)	2.5 Acres
11	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized (1000 TPD)
12	Current Status	Operational
13	Month/Year of Commencement of operation (MM/YY)	December 2015
14	Designed Capacity of Plant (TPD)	1000 TPD
15	Average Daily Waste Intake/Processing (FY 2019-20)	1000 TPD
16	Mechanism for Collection & Transportation of C&D wastes	
	• ULB/Private operator	Yes
	• Collection Centre	10 Designated sites
	• On call basis	Yes
	• Collection from state Agencies/ ULB itself	-
	• Bulk Generator Waste	Yes
17	Fee charged by ULB/Operator against Collection & Transportation, if any	
	• Private parties	Yes
	• ULB	Yes
	• Govt. Agencies	Yes
	• Bulk Generators	Yes
18	Types of Process - Wet/Dry	Integrated (Wet + Dry)
19	Indicative processing scheme/ Equipment in line	-
20	Percentage of Inert/ Processing Rejects going to Landfill	NIL
21	Total Capital Expenditure	21 Cr
22	In case of PPP Projects, support to the project by	
	• VGF	No
	• Land	Yes
	• Buy back of products	-
	• Other support	-
23	Fee charged, if any, for processing (per ton)	Rs 444 per MT

24	Sales of products (FY 2019-20)	
	• To private parties	Yes
	• To ULB	-
	• To other Govt. Agencies	-
25	Any other information	
	• Amount collected for sanction of construction/demolition/cutting of roads etc. for C&D waste; penalty for dumping of C&D waste	NIL

Case Study: Burari, New Delhi

Table 10 Case Study: Burari, New Delhi

1	State Name	Delhi
2	ULB Name & No. Of Wards	Municipal Corporation of Delhi
3	Total Estimated C&D waste Generation/Day in the ULB	300 TPD
4	Quantity of C&D by Bulk waste generators	1700 TPD
5	No. of Wards covered for C&D, in case whole city not covered	32 wards
6	Ownership (ULB/PPP/Pvt. Operator)	PPP
7	Types of outputs - No. of recycled items made from C&DW (e.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Recycled Aggregate, Recycled Sand, Soil, Concrete Blocks etc.
8	Whether Established on Cluster approach	No
9	If no. 8 is Yes - Names of all ULBs serviced	NA
10	Area of Plant (Land area)	7 Acres
11	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized (2000 TPD)
12	Current Status	Operational
13	Month/Year of Commencement of operation (MM/YY)	July, 2009
14	Designed Capacity of Plant (TPD)	2000 TPD
15	Average Daily Waste Intake/Processing (FY 2019-20)	1500-1700 TPD
16	Mechanism for Collection & Transportation of C&D wastes	
	• ULB/Private operator	Yes
	• Collection Centre	8 Designated sites
	• On call basis	Yes
	• Collection from state Agencies/ ULB itself	-
	• Bulk Generator Waste	Yes
17	Fee charged by ULB/Operator against Collection & Transportation, if any	
	• Private parties	Yes
	• ULB	Yes
	• Govt. Agencies	Yes
	• Bulk Generators	Yes
18	Types of Process - Wet/Dry	Integrated (Wet + Dry)
19	Indicative processing scheme/ Equipment in line	-
20	Percentage of Inert/ Processing Rejects going to Landfill	NIL
21	Total Capital Expenditure	45 Cr
22	In case of PPP Projects, support to the project by	
	• VGF	No
	• Land	Yes

	• Buy back of products	-
	• Other support	-
23	Fee charged, if any, for processing (per ton)	Rs 340 per MT
24	Sales of products (FY 2019-20)	
	• To private parties	Yes
	• To ULB	-
	• To other Govt. Agencies	-
25	Any other information	
	• Amount collected for sanction of construction/demolition/cutting of roads etc. for C&D waste; penalty for dumping of C&D waste	NIL

Case Study: Ranikhera, New Delhi

Table 11 Case Study: Ranikhera, New Delhi

1	State Name	Delhi
2	ULB Name & No. Of Wards	Municipal Corporation of Delhi
3	Total Estimated C&D waste Generation/Day in the ULB	400 TPD
4	Quantity of C&D by Bulk waste generators	600 TPD
5	No. of Wards covered for C&D, in case whole city not covered	32 wards
6	Ownership (ULB/PPP/Pvt. Operator)	PPP
7	Types of outputs - No. of recycled items made from C&DW (e.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Recycled Aggregate, Recycled Sand, Soil, Concrete Blocks, CC Bricks, Paver Blocks, Tiles, Kerb Stone etc.
8	Whether Established on Cluster approach	No
9	If no. 8 is Yes - Names of all ULBs serviced	NA
10	Area of Plant (Land area)	5 Acres
11	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized (1000 TPD)
12	Current Status	Operational
13	Month/Year of Commencement of operation (MM/YY)	January, 2020
14	Designed Capacity of Plant (TPD)	1000 TPD
15	Average Daily Waste Intake/Processing (FY 2019-20)	700 TPD
16	Mechanism for Collection & Transportation of C&D wastes	
	• ULB/Private operator	Yes
	• Collection Centre	10 Designated sites
	• On call basis	Yes
	• Collection from state Agencies/ ULB itself	-
	• Bulk Generator Waste	Yes
17	Fee charged by ULB/Operator against Collection & Transportation, if any	
	• Private parties	Yes
	• ULB	Yes
	• Govt. Agencies	Yes
	• Bulk Generators	Yes
18	Types of Process - Wet/Dry	Integrated (Wet + Dry)
19	Indicative processing scheme/ Equipment in line	-

20	Percentage of Inert/ Processing Rejects going to Landfill	NIL
21	Total Capital Expenditure	20 Cr
22	In case of PPP Projects, support to the project by	
	• VGF	No
	• Land	Yes
	• Buy back of products	-
	• Other support	-
23	Fee charged, if any, for processing (per ton)	Rs 237.40 per MT
24	Sales of products (FY 2019-20)	
	• To private parties	Yes
	• To ULB	-
	• To other Govt. Agencies	-
25	Any other information	
	• Amount collected for sanction of construction/demolition/cutting of roads etc. for C&D waste; penalty for dumping of C&D waste	NIL

Case Study: Hyderabad, Telangana

Table 12 Case Study: Hyderabad, Telangana

1.	State Name	Telangana
2.	ULB Name & No. Of Wards	150
3.	Total Estimated C&D waste Generation/Day in the ULB	1800 to 2000
4.	Quantity of C&D by Bulk waste generators	1200 to 1400
5.	No. of Wards covered for C&D, in case whole city not covered	150 Wards
6.	Ownership (ULB/PPP/Pvt. Operator)	M/s SSREC C&D Management Authorized GHMC C&D Waste Concessionaire
7.	Types of outputs- No. of recycled items made from C&D Waste (E.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Recycled sand Zone ii & iii, Recycled Aggregate 20mm/10mm/6mm, CC Bricks, Paver blocks, kerb stones, chequered tiles, CSRA Blocks, Putty
8.	Whether Established on Cluster approach	NA
9.	If no. 10 is Yes- Names of all ULBs serviced	NA
10.	Area of Plant(Land area)	1. Satamrai / Shamshabad Plant M/s SSREC~5.0 to 6.0 Acres Thumkunta / Shamirpet Plant M/s SSREC~5.0 to 7.0 Acres
11.	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Both centralised and decentralised models available. Centralised Model 500 TPD to 2,000 TPD (Bulk Processing)
12.	Current Status	Both are operational
13.	Month/Year of Commencement of operation (MM/YY)	11November 2022
14.	Designed Capacity of Plant(TPD)	Shamshabad (SSREC))- 500TPD Thumkunta (SSREC)- 500TPD
15.	Average Daily Waste Intake/Processing (FY 2019-20)	NA (operational from January 204
16.	Mechanism for Collection & Transportation of C&D wastes	Bulk Generator Waste
	a) ULB/Private operator	Yes private trucks till SCTPs
	b) Collection Centre	Secondary collection and Transfer points (SCTPs) 2 are in operational
	c) On call basis	Yes
	d) Collection from state Agencies/ ULB itself	NA

	e) Bulk Generator Waste	NA
17.	Fee charged by ULB/ Operator against Collection & Transportation, if any	Bulk Generators
	a) Private parties	300/-per ton disposal At shamshabad/thumkunta recycling plant
	b) ULB	INR 463
	c) Govt. Agencies	INR 463
	d) Bulk Generators	INR 463
18.	Types of Process- Wet/Dry	Both wet & dry
19	Indicative processing scheme/ Equipment in line	Attached as Annexure I
20	Percentage of Inert/ Processing Rejects going to Landfill	~5% Processing Rejects
21.	Total Capital Expenditure	₹16 -18 Crore per facility
22.	In case of PPP Projects, support to the project by	Buy back of products
	a) VGF	NA
	b) Land	NA
	c) Buy back of products	CC Bricks, Paver blocks, kerb stones, chequered tiles, CSRA Blocks, Putty
	d) Other support	Clay
23.	Fee charged, if any, for processing (per ton)	
24.	Sales of products (FY 2019-20)	Annexure III (sale of recycled products)
	a) To private parties	
	b) To ULB	
	c) To other Govt. Agencies	
25.	Any other information	Annexure II (recent Govt Orders summary)
	(amount collected for sanction of construction/demolition/ cutting of roads etc. for C&D waste), penalty for dumping of C&D waste	

Case Study: Chandigarh

Table 13 Case Study: Chandigarh

1.	State Name	Chandigarh (UT)
2.	ULB Name & No. Of Wards	Municipal Corporation Chandigarh (MCC) – 35 wards
3.	Total Estimated C&D waste Generation/Day in the ULB	Approx. 80–100 TPD
4.	Quantity of C&D by Bulk waste generators	NIL
5.	No. of Wards covered for C&D, in case whole city not covered	Whole city covered.
6.	Ownership (ULB/PPP/Pvt. Operator)	ULB – Municipal Corporation Chandigarh (MCC)
7.	Types of outputs- No. of recycled items made from C&DW (E.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Washed sand, silt, Aggregates – 10 mm, 20 mm & 40 mm. PCC products – Paver blocks 60mm,80mm, Kerb stones/channels and tiles.
8.	Whether Established on Cluster approach	No
9.	If no. 10 is Yes- Names of all ULBs serviced	Not applicable
10.	Area of Plant (Land area)	2.13 Acres
11.	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized
12.	Current Status	Operational
13.	Month/Year of Commencement of operation (MM/YY)	05/2019
14.	Designed Capacity of Plant (TPD)	150 TPD
15.	Average Daily Waste Intake/Processing (FY 2019-20)	Intake 46.20 TPD Processed 48.68 TPD (Backlog of 2.48 TPD also processed)
16.	Mechanism for Collection & Transportation of C&D wastes	Collection through MCC vehicles- from collection centres and call based Lifting of C&D waste. Govt. Agencies itself dump C&D waste at processing facility. Direct delivery by Residents at processing facility.

	a) ULB/Private operator	ULB – Municipal Corporation Chandigarh
	b) Collection Centre	25 designated collection centres.
	c) On call basis	Call-based door-to-door collection service: Calling on the toll-free number 0172- 2787200 for collection of C&D waste.
	d) Collection from state Agencies/ ULB itself	
	e) Bulk Generator Waste	Limited
17.	Fee charged by ULB/ Operator against Collection & Transportation, if any	
	a) Private parties	Rs. 972.41/Trip upto 5 km from C&D plant and additional charges Rs. 60.78/Trip for distance beyond 5km.
	b) ULB	
	c) Govt. Agencies	
	d) Bulk Generators	
18.	Types of Process- Wet/Dry	Wet processing.
19	Indicative processing scheme/ Equipment in line	Receiving & weighing → Feeding in Crusher Hopper → 1st Vibratory Screen → Separation of Silt → Jaw Crusher → Granulator crusher→ screening & washing → separation of aggregates/sand/silt.
20	Percentage of Inert/ Processing Rejects going to Landfill.	NIL
21.	Total Capital Expenditure.	Approx. Rs. 2.50 crore
22.	In case of PPP Projects, support to the project by	
	a) VGF	NA
	b) Land	ULB-owned land
	c) Buy back of products	NA
	d) ther support	NA
23.	Fee charged, if any, for processing (per ton)	Rs. 280.78/ton + GST (as per C&D waste management policy 2022)
24.	Sales of products (FY 2019-20)	9325 MT
	a) To private parties	
	b) To ULB	
	c) To other Govt. Agencies	
25.	Any other information	
	(amount collected for sanction of construction/demolition/ cutting of roads etc. for C&D waste), penalty for dumping of C&D waste	Rs. 59,107/-

Case Study: Navi Mumbai, Maharashtra

Table 14 Case Study: Navi Mumbai, Maharashtra

1.	**State Name**	**Maharahtra**
2.	ULB Name & No. Of Wards	Navi Mumbai Municipal corporation
3.	Total Estimated C&D waste Generation/Day in the ULB	250 TPD
4.	Quantity of C&D by Bulk waste generators	Not Separately maintained
5.	No. of Wards covered for C&D, in case whole city not covered	8
6.	Ownership (ULB/PPP/Pvt. Operator)	ULB
7.	Types of outputs- No. of recycled items made from C&DW (E.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Recycled Sand Recycle Aggregate Paver block / Bricks
8.	Whether Established on Cluster approach	No
9.	If no. 10 is Yes- Names of all ULBs serviced	Not Applicable
10.	Area of Plant(Land area)	2.5 Acres
11.	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized
12.	Current Status	Operational
13.	Month/Year of Commencement of operation (MM/YY)	2019
14.	Designed Capacity of Plant(TPD)	150 TPD (Extended To 250 Tpd Currently)
15.	Average Daily Waste Intake/Processing (FY 2026-27)	240 Tons / 100%
16.	Mechanism for Collection & Transportation of C&D wastes	Centralised, Debris on call
	a) ULB/Private operator	ULB
	b) Collection Centre	8
	c) On call basis	Yes
	d) Collection from state Agencies/ ULB itself	8
	e) Bulk Generator Waste	Yes
17.	Fee charged by ULB/ Operator against Collection & Transportation, if any	
	a) Private parties	Yes

	b) ULB	Yes
	c) Govt. Agencies	Yes
	d) Bulk Generators	Yes
18.	Types of Process- Wet/Dry	Dry
19.	Indicative processing scheme/ Equipment in line	Dry & Wet Processing
20.	Percentage of Inert/ Processing Rejects going to Landfill	20%
21.	Total Capital Expenditure	7,37,10,681
22.	In case of PPP Projects, support to the project by	Not Applicable
	a) VGF	
	b) Land	
	c) Buy back of products	
	d) Other support	
23.	Fee charged, if any, for processing (per ton)	Rs. 571/- Plus GST
24.	Sales of products (FY 2026-27)	
	a) To private parties	Approx 100 Tons per Day
	b) To ULB	Nil
	c) To other Govt. Agencies	Nil
25.	Any other information	Nil
	(amount collected for sanction of construction/demolition/ cutting of roads etc. for C&D waste), penalty for dumping of C&D waste	1300000

Case Study: Surat, Gujarat

Table 15 Case Study: Surat, Gujarat

Sr. No.	Particulars	Details
1	State Name	Gujarat
2	ULB Name & No. Of Wards	Surat Municipal Corporation -30 Wards
3	Total Estimated C&D waste Generation/Day in the ULB	131.93
4	Quantity of C&D by Bulk waste generators	-
5	No. of Wards covered for C&D, in case whole city not covered	30
6	Ownership (ULB/PPP/Pvt. Operator)	PPP
7	Types of outputs- No. of recycled items made from C&DW (E.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Paver blocks, Bricks, Kerb stones, recycled sand, recycled aggregate ,Concrete Blocks , Bio Soil etc.
8	Whether Established on Cluster approach	-
9	If no. 10 is Yes- Names of all ULBs serviced	-
10	Area of Plant(Land area)	3 Acres.
11	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized (300 TPD)
12	Current Status	Opeational
13	Month/Year of Commencement of operation (MM/YY)	February 2019
14	Designed Capacity of Plant(TPD)	300 TPD
15	Average Daily Waste Intake/Processing (FY 2019-20)	242.5 TPD
16	Mechanism for Collection & Transportation of C&D wastes	
	○ ULB/Private operator	Yes
	○ Collection Centre	10
	○ On call basis	Yes [1800 212 2829]
	○ Collection from state Agencies/ ULB itself	-
	○ Bulk Generator Waste	-

17	Fee charged by ULB/ Operator against Collection & Transportation, if any	
	○ Private parties	Yes
	○ ULB	-
	○ Govt. Agencies	-
	○ Bulk Generators	Yes
18	Types of Process- Wet/Dry	Dry (C & D waste)
19	Indicative processing scheme/ Equipment in line	-
20	Percentage of Inert/ Processing Rejects going to Landfill	-
21	Total Capital Expenditure	19.52 Cr
22	In case of PPP Projects, support to the project by	-
	○ VGF	-
	○ Land	Yes
	○ Buy back of products	-
	○ Other support	-
23	Fee charged, if any, for processing (per ton)	333 Rs Per MT
24	Sales of products (FY 2019-20)	
	○ To private parties	Yes
	○ To ULB	-
	○ To other Govt. Agencies	-
25	Any other information	
	○ (amount collected for sanction of construction/demolition/ cutting of roads etc. for C&D waste), penalty for dumping of C&D waste	Rs. 10,000/- (Maximum charges) penalty for dumping of C&D waste

Case Study: Ahmedabad, Gujarat

Table 16 Case Study: Ahmedabad, Gujarat

Sr. No.	Particulars	Details
1	State Name	Gujarat
2	ULB Name & No. Of Wards	Ahmedabad 48 wards
3	Total Estimated C&D waste Generation/Day in the ULB	1000
4	Quantity of C&D by Bulk waste generators	1
5	No. of Wards covered for C&D, in case whole city not covered	48
6	Ownership (ULB/PPP/Pvt. Operator)	1 plant is on PPP model and one plant is owned by AMC
7	Types of outputs- No. of recycled items made from C&DW (E.g. Paver blocks, Bricks, Kerb stones, Tiles, recycled sand, recycled aggregate etc.)	Paver block, pre cast wall, road side curbing, agreegates, m sand, Bricks, Kerb stones
8	Whether Established on Cluster approach	-
9	If no. 10 is Yes- Names of all ULBs serviced	-
10	Area of Plant(Land area)	6 acres for both plants
11	Centralized/Decentralized (Decentralized upto 5 tonnes/day)	Centralized
12	Current Status	Operational
13	Month/Year of Commencement of operation (MM/YY)	1. March 2013 2. March 2026
14	Designed Capacity of Plant(TPD)	AMC has 2 operational plants and each plant is having 1000 TPD capacity
15	Average Daily Waste Intake/Processing (FY 2019-20)	998
16	Mechanism for Collection & Transportation of C&D wastes	
	○ ULB/Private operator	Yes

	○ Collection Centre	25 dedicated C and D collection centres
	○ On call basis	Yes
	○ Collection from state Agencies/ ULB itself	-
	○ Bulk Generator Waste	-
17	Fee charged by ULB/ Operator against Collection & Transportation, if any	
	○ Private parties	-
	○ ULB	-
	○ Govt. Agencies	-
	○ Bulk Generators	
18	Types of Process- Wet/Dry	Wet
19	Indicative processing scheme/ Equipment in line	-
20	Percentage of Inert/ Processing Rejects going to Landfill	-
21	Total Capital Expenditure	1 plant is on PPP Model 2nd plant is funded by AMC costing Rs. 25 Cr.
22	In case of PPP Projects, support to the project by	-
	○ VGF	-
	○ Land	Yes
	○ Buy back of products	Yes
	○ Other support	-
23	Fee charged, if any, for processing (per ton)	-
24	Sales of products (FY 2019-20)	-
	○ To private parties	Yes
	○ To ULB	Yes
	○ To other Govt. Agencies	-
25	Any other information	-
	○ (amount collected for sanction of construction/demolition/ cutting of roads etc. for C&D waste), penalty for dumping of C&D waste	Rs. 1,00,000/- (Maximum charges) penalty for dumping of C&D waste

Annexure 1: International Approaches to Construction & Demolition (C&D) Waste Management

This annexure provides a comparative reference to selected international approaches to C&D waste management. The practices are presented for reference and learning only and are not intended to imply direct adoption of country-specific legal provisions, targets or charges.

Table 17 International best practices

Management Stage	International Practice	Example Countries/Regions	Key Learning for ULBs
Planning	Integrate waste management into project planning and approvals.	UK, Singapore	Plan collection, processing and utilisation systems before waste generation occurs.
Before Demolition	Conduct pre-demolition assessments to identify reusable, recyclable and hazardous materials.	EU, Austria, UK	Assess materials before demolition to maximise recovery and minimise waste.
Demolition	Adopt selective demolition and deconstruction practices.	EU, Japan, Austria	Separate materials during demolition to improve recycling potential.
Source Segregation	Segregate major material streams such as concrete, bricks, metals and wood.	Japan, South Korea, EU	Segregation at source improves recovery rates and product quality.
Collection & Transportation	Use authorised collection systems and direct waste to designated facilities.	Singapore, Hong Kong	Improve traceability and reduce illegal dumping.
Processing & Recycling	Establish dedicated facilities for sorting, recycling and resource recovery.	Australia, South Korea, Singapore	Processing infrastructure should match waste availability and local demand.

Product Quality	Apply quality standards and testing for recycled products.	South Korea, UAE, EU	Quality assurance improves user confidence and market acceptance.
Reuse & Salvage	Reuse building components and materials wherever feasible before recycling.	USA, Netherlands, UK	Prioritise reuse before recycling to maximise resource value.
Market Development	Promote demand through procurement policies and construction specifications.	Australia, Netherlands, EU	Recycling infrastructure must be supported by stable end-use markets.
Financial Sustainability	Use a combination of service charges, disposal fees and product revenue.	Hong Kong, Australia	Financial models should not rely solely on sale of recycled products.
Monitoring & Digital Systems	Track waste generation, collection, processing and utilisation.	Singapore, EU	Digital systems improve accountability and performance monitoring.
Performance Measurement	Measure actual quantities collected, processed and utilised.	Singapore, Australia	Focus on operational performance rather than installed capacity.
Enforcement	Use approvals, inspections, documentation and penalties to ensure compliance.	Japan, Hong Kong, EU	Enforcement is critical for preventing illegal dumping and improving compliance.
Circular Economy	Promote reuse, recycling and use of secondary materials in construction.	Netherlands, EU	Treat C&D waste as a resource rather than a disposal problem.

Annexure 2: Indicative Price Comparison of Recycled C&D Products and Conventional Construction Materials in Delhi

Table 18 Indicative Price Comparison of Recycled C&D Products and Conventional Construction Materials in Delhi

Product	Recycled C&D Product	Approx. Market Price (₹)	Conventional/Fresh Material	Approx. Market Price (₹)	Applicable GST*
Coarse Aggregate	Recycled Aggregate (20 mm)	Lower than conventional aggregate	Natural Aggregate (20 mm)	Higher	5%
Fine Aggregate	Recycled Sand/Manufactured Sand from C&D Waste	Lower than river sand	River Sand	Higher	5%
Paver Blocks	Recycled C&D Paver Blocks	Competitive with conventional products	Conventional Concrete Paver Blocks	Comparable/Higher	18%
Kerb Stones	Recycled C&D Kerb Stones	Competitive	Conventional Concrete Kerb Stones	Comparable/Higher	18%
Hollow/Solid Blocks	Recycled Aggregate-Based Blocks	Lower to comparable	Conventional Concrete Blocks	Comparable	18%
Ready Mix Concrete (where recycled aggregates are used)	Recycled Content Concrete	Comparable	Conventional Concrete	Comparable/Higher	18%

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