Management of Construction & Demolition Waste

[1]Kamlesh Madavi, [2]Prof. Dr. Ramesh Dod

[1]Student, [2]Professor of Civil Engineering & Guide
M.tech (Construction & Management Engineering),
School of Civil Engineering, MITWPU, Pune, INDIA

Abstract: The construction sector is increasing fast due to boost in infrastructure development in last 5 to 10 years. This includes construction of public infrastructure, housing projects, smart city development and many others. All of these things are creating huge amount of construction and demolition waste. Smart city projects are promoting the redevelopment projects. The redevelopment includes demolition of existing structure and constructing it again with new facilities and larger FSI. All the activities of any structure (construction, repair, demolition) create construction and demolition waste. There is need of strict disciplinary action for management of construction and demolition waste and proper framework for its correct utilization. The paper focuses on the quantity of construction and demolition waste in all over world and India. The paper also discusses the existing scenario of management of construction waste in different cities of India and the Govt. Regulations. The composition and material of construction and demolition waste is also given in this paper.

***Keyword*: Construction and Demolition waste, management, current scenario.**

I. INTRODUCTION

Infrastructure development has got huge importance in 12th five year plan. The different sectors of construction have given a lot of money for construction or development. Therefore in upcoming years there will be a lot of construction all over the India. Such developments raise the standard of village to town or town to city. The increasing developments attracts the population towards it will ultimately raises the demand of housing projects. To satisfy this demand there is a need of new construction or development of old one. The cycle of this continues for years. But all these actions raise the load of construction and demolition waste system.

This 21st century is a new era of construction. Nowadays the buildings are tall and slender. The old system of constructing huge and bulky building has gone. The Govt. audit of every building after certain years is compulsory and the repair of it as per regulations. If structural audit members declare the building as dangerous then its owner has to redevelop it. This redeveloping old building with new style and raised FSI trend is also increasing the construction and demolition waste day by day.

An investigation show that the total construction and demolition waste from Indian construction industry is around 12 -15 million tons per year. Therefore the management of construction and demolition waste is attracting the people. The construction and demolition waste is an inert material contains different materials like concrete, bricks, tiles, etc. The waste also has some dangerous substances for environment and public health like phosphorus. Construction & Demolition waste includes Fill material, Pipes and metals, Glass, plastics, Wood, Land clearance debris, Concrete, Tiles and ceramics, etc.

II. LITERATURE REVIEW

Hongping Yuan, (2011) the research by Yuan et al. (2009) presents a comprehensive examination of the research papers ublished in academic journals in the field of C&D waste management. With the assistance of the Qualitative Social Research software package NVivo, Yuan et al. (2009) introduced a rigorous and logic method for identifying the C&D waste management papers.

Issam M. Srour, (2012) In this paper authors have made a framework for managing construction demolition waste. Construction and demolition waste encompasses a wide variety of materials resulting from various activities including soil, rocks and vegetation resulting fromnexcavation, land levelling, civil works and site clearance.

Markandeya Raju Ponnada (2015) the authors have conducted in small scale preliminary study in order to evaluate feasibility of different construction and demolition strategies. The objective of the study is to compile the relevant literature which will give an insight in demolition waste management strategies of different developing countries.

III. ANALYSIS OF STUDY

1. India:

India has several metropolitan cities. These cities are mainly contributing in increase in construction and demolition waste. The various authorities have conducted survey on construction and demolition waste. The result is given below:

Table No.1: Annual Estimate of C&D by Govt Authorities

Year	Authority	Annual Estimate in million tons
2000	Ministry of Urban development	10-12
2001	TIFAC	12-15
2010	Ministry of Environment & Forest	10-12
2014	Ministry of Urban development	No estimate

Source: IRJET, Volume2, Issue3, June2015

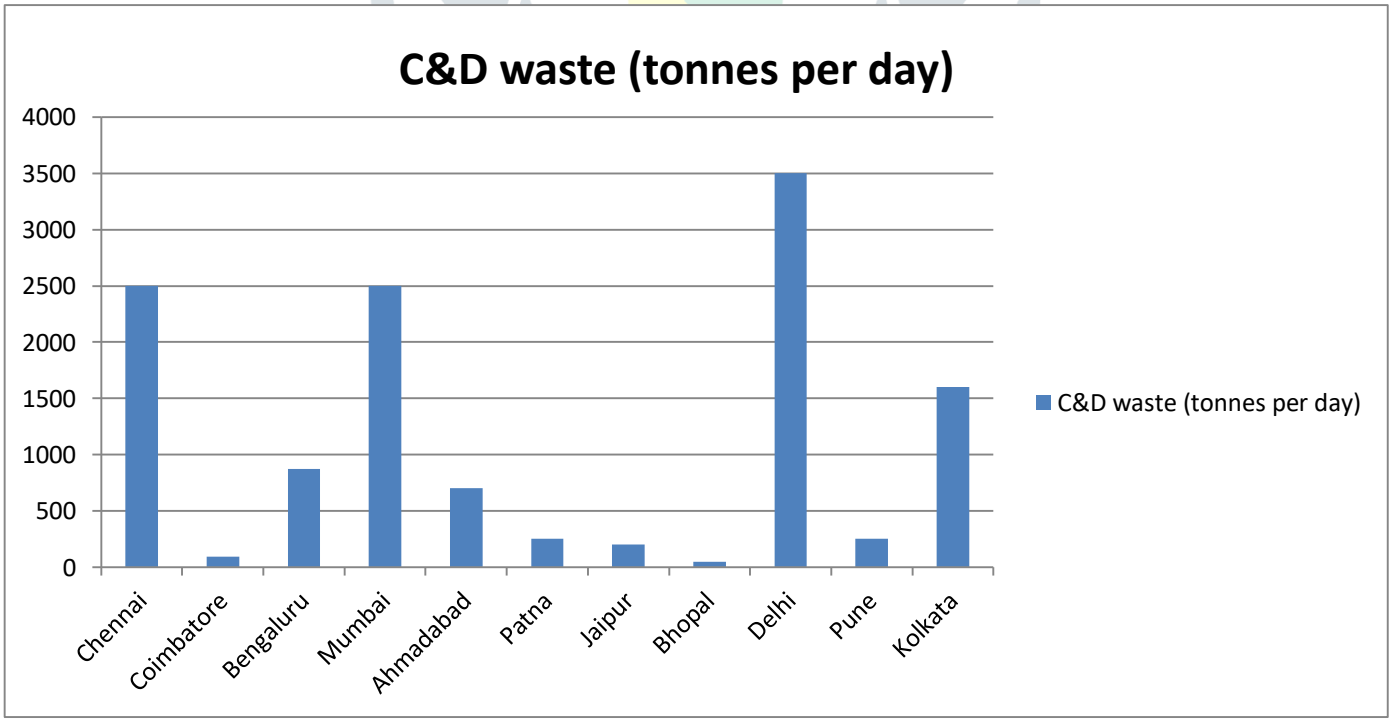
There are so many capital cities in India are mainly contributing in raising construction and demolition waste. The waste generated from each city is given below

Table No. 2: Area, Population, C&D waste generation in different cities

City	Area (km2)	Population	C&D waste (tons per day)
Chennai	1189	6500000	2500
Coimbatore	246.8	2618940	92
Bengaluru	709	8443675	875
Mumbai	4355	12442373	2500
Ahmadabad	464	6063047	700
Patna	9945	2514590	250
Jaipur	484.6	3471847	200
Bhopal	285.9	1917051	50
Delhi	1484	21800000	3500
Pune	331	3125000	250
Kolkata	205	4496694	1600

Source: Guidelines on Environmental Management of Construction & Demolition Waste.

Chart No.1: Waste generated in different cities



2. Current scenario of Construction & demolition waste management:

1. Chennai

For Chennai East area, there is 1 dumping yard for 15 zones of city. City has 2 large dumping yards at Peruguddi & Kodhungaiyur for dumping large amount of C&D waste. Corporation Charges Rs.2000/- fine for illegal dumping.

2. Coimbatore

Coimbatore City Municipal Corporation has proposed a processing plant of capacity 100 TPD.

3. Bengaluru

Bruhat Bengaluru mahanagar Palika has proposed a C&D waste processing facilities at Kannur, Mallasandra and Anjanapura, each with capacity of 750 TPD. The corporation will impose Rs 1000 fine for mixing C&D waste with wet waste.

4. Mumbai

In 2005, Municipal Corporation of Greater Mumbai issued Demolition & Desilting waste guidelines but lack of enforcement, demolition debris still ended up dumping ground. CIDCO & YUVA established a recycling plant in Kharghar, but it closed in 2013. Corporation charges Rs.1000 for not delivering C&D in as per specified manner.

5. Ahmadabad

The Ahmadabad Municipal Corporation awarded 5 acres of land to DNP infrastructure Private ltd. for establishing recycling plant of 300 TPD. It is operational from Oct, 2013.

6. Patna

Patna Municipal Corporation has allotted a site at village Bairia of 80 acres for open dumping from last 2-4 years.

7. Jaipur

The state government proposes set up 29 C&D waste recycling plant in state. Jaipur recycling plant is one of them. A private company proposed a plant of 300 TPD on 6 acres near existing dumping ground.

8. Delhi

Municipal Corporation of Delhi has set up 3 C&D recycling plants at Burari, Kidwai Nagar & Shstri Nagar having capacity of operation 2000,150,500 TPD respectively. The plant prepares curbstons, paver blocks, blocks, etc. The plant is working on zero discharge. The bulk generators pay Rs.205 per tonne as transportation cost.

9. Pune

Pune Municipal Corporation has allotted 2 acres land for C&D waste recycling plant. The corporation has banned dumping C&D waste in open space, roads or water resource. PMC will charge fine of Rs.25000 for such illegal dumping.

10. Kolkata

C&D wastes recycled in road construction in Kolkata. The recycling process is best suited to roads with light traffic.

11. Hyderabad

Greater Hyderabad Municipal Corporation has proposed 4 sites for disposal of C&D waste. GHMC chargers Rs.360 per ton as fee.

12. Chandigarh

Municipal Corporation of Chandigarh has identified 18 low laying areas for dumping debris. MCC charges RS. 50 for up to 25 cu. ft. and Rs.2 per tons after that.

3. Sources of Construction & Demolition waste

Construction & Demolition waste is generated throughout the complete life span of the project which includes construction, renovation & demolition. Quantity of waste generation depends on phase of project. According to Danish Environmental Protection Agency (DEPA), 2003, 30% of the total waste generated was C&D waste. Of this 70-75% waste generated was from demolition activity, 20-25% from renovation and remaining 5-10% from new building developments.

Table No.3: C&D waste generation by different activities

Type of Activity	Estimated waste generation (kg/ sq.m.)
Construction	40-60
Renovation/ Repair	40-50
Demolition	300-500

Source: Guidelines on Environmental Management of Construction & Demolition Waste.

4. Components of Construction & Demolition waste:

The components of C&D waste varies with type of structure. Demolition waste is mainly the collection of all construction materials from a building after removal of salvageable components like doors and windows. Demolition wastes are much larger in volume than the construction wastes.

Major components	Minor components
1. Cement Concrete 2. Bricks 3. Cement Plaster 4. Steel from RCC 5. Door and windows 6. Rubble 7. Stones & Soil 8. Timber	1. GI pipes/Iron Pipes, Plastic Pipe 2. Electric Fixtures 3. Conduits 4. Glass 5. Asbestos and contaminated soil 6. Plastic bags, Cement bags. 7. Clothes

5. Construction & Demolition waste Disposal Strategy in Maharashtra:

State of Maharashtra has taken some steps for proper management of C&D. As discuss above, Mumbai has made its own guidelines. The state Govt. also suggested other big cities of Maharashtra to take action on C&D waste management.

IV. CONCLUSION

As studied above, the C&D waste contains different types of material which can be reuse and recycled. The proper management of C&D is becoming more important day by day. As discussed above, only 2 cities, Ahmadabad & Delhi have their own recycling plant. Other cities have come up with dumping system. Some of other, has proposed plants, but will take a lot of time. The small cities and satellite towns are also developing rapidly so they should plan proper management of construction & waste at early stage to reduce burden afterwards. The state of Chandigarh has taken smart actions towards this C&D waste management. Other states of India should also follow and make their own strategies at state level.

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