

A Study on Analysis of Korea's Construction Wastes Disposal Condition and a plan for Recycle Improvements of Recycled Aggregate through on-site Research

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ABSTRACT: This study is intended to calculate the actual recycling ratio of construction waste and recycled aggregate generated on site of the final disposal company. It is also analyzed the construction waste of the final disposal company, as well as aiming to ultimately analyze the actual disposal state of Korea's construction waste. According to on-site research on the middle disposal company, the average recycling ratio, reclamation, and incineration of brought in waste were 95.6%, 4.2%, and 0.01%. As the result of on-site research on the middle disposal company, disposing ratio of construction waste was shown at 4.2% lower in recycling percentage when compared to statistic data of Ministry of Environment, Republic of Korea (year 2005, in metropolitan area) and 4.0% and 0.01% higher in reclamation and incineration compared to the data. These differences seem to be because export data of waste in simple construction fields were only applied in the process of the current statistic data calculation. Actual results of construction waste's final disposal company did not reflect. Also recycle method of recycled aggregate needs to be used as a high value. Therefore, in order to improve efficiency of the government's construction waste-related policy, it is judged there needs to be improvements in current disposal methods.

Keywords: Construction Wastes, Recycling Ratio, Recycled Aggregate

1. INTRODUCTION

1.1 Background of Study

Increasing Construction wastes is bringing environmental problems as like exhaustion natural resources and saturation reclaimed land so importance of effective

management policy by government is emphasizing nowadays.

In order to lead effective result from the policy the statistics establish which reflect situation of Korean construction wastes are needed.

1.2 Purpose of Study

This study calculate actual construction wastes ratio in Korean capital area with reflected analysis result from the construction site and disposal company

Also this study indicates detail plans for improve the alternative resources

2. MANAGEMENT SITUATION OF CONSTRUCTION WASTES

2.1 Report and Statistics System

Construction waste report system has changed in December 2005. The old report system was paper work but new system CWMS (Construction Wastes Information Management system) reports by internet.

CWMS standards amount of wastes discharge and disposal in construction site but it do not reflect the last disposal amount by subject. It makes difference between statistical data and actual disposal ratio.

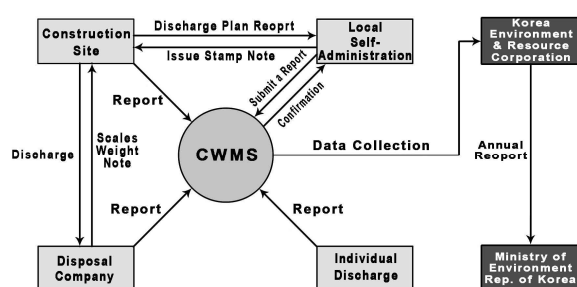


Figure 1: Report System in Korea

2.2 Discharging and Disposal Situation

Construction wastes are steadily increasing by annually about 11.3%. The amount of wastes are very focused on the capital area such as Seoul (24.6%) and Kyung gi-do (16.7%)

Korean construction wastes average recycling ratio from 2001 to 2005 is 89.1%, reclamation and incineration ratio are 9.2% and 1.7%. At the same period in Seoul ratio shows different result. Average recycling ratio is 76.1% and reclamation and incineration ratio are 22.9% and 1.0% in Seoul.

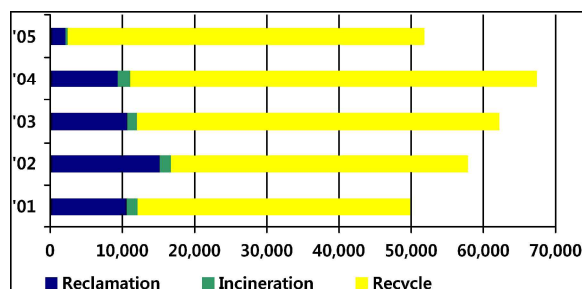


Figure 2: Disposal Situation in Capital Area(2001~2005)

3. RESULTS OF DISPOSAL COMPANY'S AND CONSTRUCTION SITE'S ANALYSIS

This study investigates two different disposal companies and construction site.

Also in order to get more data, we had a research with 13 companies.

3.1 Types of Construction Wastes at Disposal Company(taken in 83,434Ton)

Company 'A' has taken 38,434 Ton of construction wastes during 3 months (Sep ~ Nov in 2007). Concrete was 60,105 Ton(72.0%), soil and sand were 17,268 Ton(20.7%), Asphalt concrete was 3,080Ton(3.69%), mixed wastes were 2,695(3.23%) and rest of the wastes were 284 Ton(0.34%).

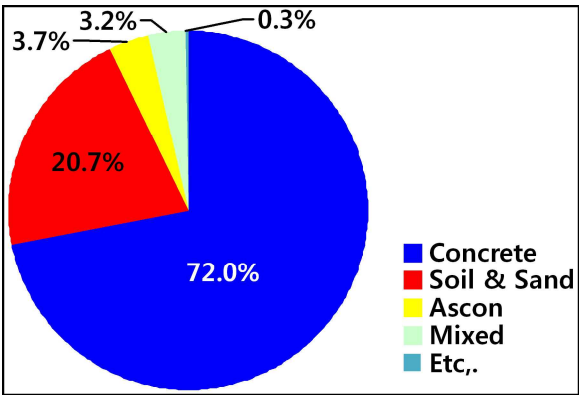


Figure 3: Amount of Taken(by type)
Amount of Disposal by Types(on site)

Recycling ratio of taken amount was 95.6%, reclamation and incineration were 4.2% and 0.01%. Also the other wastes as like metal was 0.6% and rest of them (0.2%) were piled up in the company field.

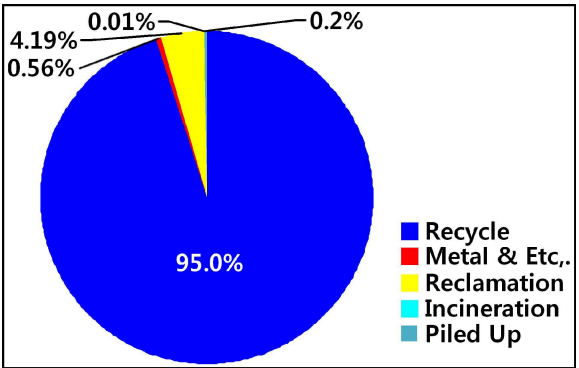


Figure 4: Disposal Ratio(Company 'A')

3.2 Amount of Disposal by Types(research)

In case of research of 13 disposal companies, average recycling ratio was 95.8%, reclamation and incineration were 4.1% and 0.1%. This result was nearly same as company 'A'.

Table I: Research (13 Companies)

Company	Ratio of Disposal(%)		
	Recycle	Reclamation	Incineration
C	94.0	5.0	1.0
D	98.6	1.4	0.01

E	91.2	8.8	0.01
F	98.9	1.1	0.03
G	87.5	12.5	0.1
H	98.0	1.8	0.01
I	98.2	2.1	0.03
J	99.7	0.3	0.01
K	98.0	1.9	0.1
L	94.3	5.7	0.0
M	93.7	6.0	0.2
N	95.6	4.3	0.1
O	97.2	2.5	0.3

3.3 Take out Situation by Recycled Aggregate Types

This study analyzed two companies. Company 'A' has not obtained recycled aggregates quality certification but company 'B' has obtained.

It analyzed that Company 'A' has average working ratio 39.4% so this can produce 1,261 Ton in a day and Company 'B' has average working ratio 63.1% so this can produce 757 Ton in a day. In the case of Company 'A', all of productions were taken out as a low value but company 'B' has different. High value and low value ratio in company 'B' were 1:6.5(5,948 and 38,821Ton)

4. CALCULATION ACTUAL RECYCLE RATIO OF CONSTRUCTION WASTES

In this part, we calculate actual recycling ratio with chapter 3's result and compare this result and statistic data of Ministry of Environment in Korea.

4.1 Analysis Scope and Method

Calculation is based on the data which is results from the disposal companies and the construction site in capital area in Korea. Also this calculation results being compared to statistical data.

The first standards of actual recycling ratio are data of company 'A' and research from 13 companies.

The second standard of actual recycling is based on the use of recycled aggregate both value and cost. And this result reflects the capital area's data from the Ministry of Environment.

Also disposal ratio of rest of types reflects data from the Ministry of Environment.

4.2 Results of Analysis

All the results are based on the amount of wastes that disposal company has taken from the construction site and this regards as recycling by 100%.

The photo as below indicates the results of calculation

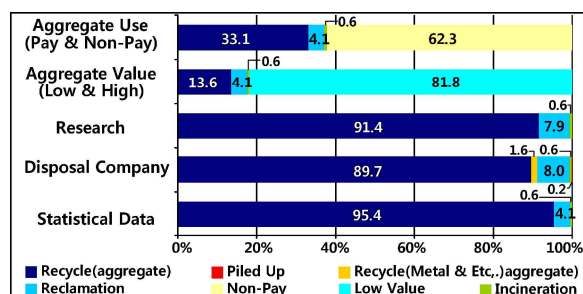


Figure 5: Result of Calculation

The actual recycling ratio compare to the data of the Ministry of Environment is presenting at Table as below.

Table II: Actual Ratio of Recycle.

Statistics	Ratio of Recycle	
	Company(Disposal)	Research
95.4%	91.2%	91.4%

Table III: Actual Ratio of Reclamation.

Statistics	Ratio of Reclamation	
	Company(Disposal)	Research
4.1%	8.0%	7.9%

Table IV: Actual Ratio of Incineration.

Statistics	Ratio of Incineration	
	Company(Disposal)	Research
0.6%	0.2%	0.6%

4.3 Plans for Recycle Improvements of Recycled Aggregate.

As a result of analysis not only calculation of actual ratio but also improvement plan is important. There are some plans for improve the recycle.

The first, it needs to expand the demand range because now that demand range is very limited.

The second, it needs to make an incentive plan for using recycled aggregates.

The third, it needs to develop the technique and confirm the good quality.

The forth, it needs to introduce compulsory use of recycled aggregate.

The fifth, it needs to convert a negative recognition about recycled aggregate.

5. CONCLUSION

All statistical data is based on the data by construction site's reports in Korea. However, in order to get more correct data it needs to calculate with the separate type of data from disposal company. This will be contribute to government for enhance the efficiency of construction wastes policy.

This study (especially the data) expects to being used as basic and important information so that it lead to maximization of construction wastes management efficiency.

ACKNOWLEDGEMENT

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