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## MINIMIZING THE AMOUNT OF CONSTRUCTION WASTE

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### THE CITY OF TURKU

Turku is an old coastal city with some 165 000 inhabitants, located in southwestern Finland. About 5 per cent of citizens are working in the construction branch. Point of view is of municipal office (employer is Environmental Office in the City of Turku).

### CONSTRUCTION WASTE IN TURKU

In the beginning of 1990's we had an economical recession in Finland. The recession could also be observed well by the amount of building waste taken to dumping places. We are now again in the upward tendency in economy, which reflects as an increasing amount of intaken construction waste to the landfill. The amount of building waste to our landfill, Topinoja, totaled 8 400 tons in 1996. Almost as much found its way to recycling companies (7 500 t). This year (-97) is going to be again a recordyear; intaken amount of building waste will be estimated up to 12 000 tons.

Building waste compones about 10 per cent of total waste amount in Turku.

Turku has an Incineration plant for household waste since 1976, but construction waste can not be treated there, because of the size and the quality of waste.

The share of building waste of total waste amount is relatively high (10 %). It also includes plenty of fractions, which can be recycled instead of placing permanently to the landfill. These are the reasons why we have taken action in minimizing the amount of construction waste and encouraging to separation of recyclable fractions.

## **LEGISLATION**

### **Local waste rules**

Local waste management rules in the City of Turku (1996) are based on source separation of recyclable wastes and these instructions are including construction waste as well. Separation is demanded for metal, wood, soil, (mineral aggregates:) concrete, stones, asphalt and bricks and also other materials, which can be recycled - such as paper, board, gypsumboard and so on.

### **National waste rules**

Finnish Government has given a decision of Construction Waste, 1. June 1997, including rules for separation of Construction Waste. The content of national legislation is mainly the same as our municipal rules in Turku.

With help of legislation it is possible to get recyclable waste-fractions separation under control. Our office has informed sites a lot, although building companies are supposed to know the rules and the law. A good carrot for minimizing waste quantity is money. It is economically most beneficial for companies. Now it is even proved during this project:

## **THE PROJECT TO MINIMIZE THE AMOUNT OF CONSTRUCTION WASTE**

Environmental Office in the City of Turku started together with cooperating partners this project, which is one part of Environmental technology in construction 1994-1999-programme and was financed partly by Tekes (Technology development centre) and partly by the other participating companies.

Project named Development of Waste Management in Construction Site 1995-1997.

Other parties of the project are

- Skanska, owner of the project. Skanska is one of the biggest construction companies in Finland and one of the most advanced companies in construction waste management
- some Skanska's suppliers and sub-contractors
- VTT, Building Technology (Technical Research Centre of Finland), paper works

Summary will be written during autumn -97 by VTT, Building Technology.

## **MINIMIZING THE PRODUCTION OF WASTE ON SITE AND HANDLING OF THE PRODUCED WASTE**

Skanska has made a lot of work in investigating possibilities to minimize Waste disposal costs on site. They also have carefully analysed some construction projects implemented in Turku during 1995-1996 and found out that it is possible to decrease waste quantity from present average 6 kilos/building cubic meter to 2-3 kilos. The result shows that the type of the building project (building on-site or using pre-fabrical elements) has less influence on amount of waste than good logistics planning plus waste handling skills of workers.

The main means to reduct waste on site are minimizing material losses, optimizing packages and eliminating defects in quality.

The building project was divided into phases: Each of which were carefully analysed from waste generation point of view. They identified the following essential activities in reduction and handling of site waste:

### **1. Production planning**

(Storage points, positions of waste containers and their haulage routes will be shown in the site-layout; Lifting and transportation equipment should be considered, when waste haulage is planned; The lift should be used as help during the interior works; Haulage routes should be kept clear.)

### **2. Control of materials procurement**

(Size and delivery date of lots should be preplanned; The right amount of materials should be ordered to the site; Use of precut materials; Packing methods are optimized, use of recyclable packing materials where possible)

### **3. Contract Conditions**

(Cleaning and separating obligations should be part of contracts; Subcontractor's materials procurement should be controlled for minimization of waste generation point of view; Subcontractors are responsible for their problem wastes)

### **4. Selection of waste management method**

(The amount of waste generated on site is estimated and timed; Determinating of waste, which will be used as backfill and which will be separated; Treatment and separation of wastes is to be planned by work phases)

### **5. Use of waste collection equipment**

(Source separation and wheeled containers that accompany work teams should use; Waste collection point is to be located close to the point of work; Take-out and Bring-in -principle; Waste collection should be centralized)

## **6. Collection and haulage of waste**

(The expertise of the waste management company is to be utilized; Waste containers should be dimensioned according to amount of waste; Joint collection from several sites should be used when possible.)

## **7. Motivation and Guidance of employees**

(It should be ensured, that waste handling procedures are clear; Someone should be in charge of waste management and cleaning; Task- and material-specific separation instructions should be presented to work teams; The site's waste containers should be marked clearly by waste types)

Minimizing the waste has been economically beneficial for the companies. As one representative from Skanska told: "Separation of building waste is no business but minimizing the amount of it is." Waste quantity is a good indicator of logistics operations on site.

Part of our work in Environmental Office is to inform builders about waste matters. The information gathered during the project will be published as a set of instructions for builders. Instructions will emphasize the minimizing of waste on sites. One essential part of instructions is a informative list of companies interested in recyclable items. We have collected a good contact information for recyclable waste.

The leading construction companies in Finland have been or are still working with ISO -standards. One part of certification is to evaluate and develop means to minimize amount of waste. Time is ready for a new trends in waste management on sites in Finland.