Bulletin of the *Transilvania* University of Braşov
CIBv 2014 • Vol. 7 (56) Special Issue No. 1 - 2014

THE IMPACT OF THE SITE ORGANIZATION ON THE ENVIRONMENT

V. IACOB[1]

Abstract: *The organizing a construction site asks each time solving issues related to creating the conditions for basic activities. Frequently these activities lead to environmental protection violations. To ensure sustainable development, laws are implemented based on the principles like: caution in making decisions, prevention of environmental risks and damage occurrence, biodiversity and ecosystems conservation, removing the pollutants that seriously affects human health. In this paper the authors will present the main factors of pollution from a construction site, and the measures who shall take for environmental protection.*

Key words: *construction site environment, pollution, construction site organization, biodiversity, ecosystems.*

1. Introduction

In the decade in which the cities face a chaotic urban development, by building residential houses and the demolition of the old buildings, the development of main streets, the construction and demolition waste are growing and must come up with a plan to reintegrate them.

Environment, built environment, natural environment are concepts that define the intervention to protect the environment on a global scale in construction and urban development.

2. Type and volume of waste deposited

In the Construction activity, the waste are divided into two categories: construction waste and demolition waste.

These wastes come from:

- materials resulting from construction and demolition of buildings - cement, bricks, tiles, ceramics, stone, plaster, plastic, metal, iron, wood, glass, scrap carpentry, building materials that are expired;
- materials resulting from maintenance and from construction of the access roads and associated structures, tar, sand, gravel, bitumen, tarred substances, substances with bituminous binders or hydraulic;
- material excavated during construction activities, decommissioning, dredging, remediation - soil, gravel, clay, sand, rocks, plant debris.

Also, waste resulting from natural disasters are considered construction and demolition waste. The objects or materials

[1] "Gheorghe Asachi" Technical University of Iasi, Faculty of Civil Engineering and Building Services

easily removed from a structure (furniture, electrical appliances and other equipment) are not considered construction and demolition waste.

The waste from construction sites can be divided into two other categories, like dangerous waste and very dangerous waste:

- hazardous material: asbestos, tar and paint, heavy metals (chromium, lead, mercury), varnishes, adhesives, polyvinyl chloride, solvents, polychlorinated biphenyl compounds, different types of resins used for conservation, fireproofing, waterproofing;
- non-hazardous materials that were contaminated by mixing with hazardous materials, such as building materials mixed with hazardous substances, mixed materials resulting from indiscriminate demolition work;
- soils and gravel contaminated with hazardous substances.

The Regional Waste Management Plan, construction and demolition waste, including excavated soil from contaminated land are composed of three individual components: construction waste, demolition waste and earth excavated from contaminated land.

Construction and demolition waste represent 25% of the total waste. These wastes come mostly from renovation or demolition of old buildings.

Currently only a small part of construction and demolition waste is reported, especially those that are coming from people seeking building permits for renovation, demolition and construction.

The largest quantities (waste concrete, brick, brick and mortar) are coming from the construction companies, which usually do not declare these quantities. These wastes are crushed and reused at road access to construction sites or at filling the holes in asphalt. Also, the waste may be stored in places authorized by the Environment Agency, but supported by local administrative authorities.

Regarding other components, such as the timber of replacement windows and door frames, doors, floors or floor coverings, repairs to roofs, it recovered to 95% by poor people, who use it as fuel.

The reinforcements of concrete are removed and taken to melting and reuse.

Glass is a component that is very brittle and often is eliminated with household waste when it come at the population or when mixed waste come from construction companies.

Construction and demolition waste, who coming the European Union countries, represent about 25% of waste. They include different materials, many of which can be recycled.

3. Environmental protection measures

On the whole period operation of a construction and demolition site, can be contaminated the environment element, like:

- air (fig. 1);
- water (direct or indirect);
- noise;
- soil (fig. 2).

Measures for protection against air pollution.

Demolition work are an uncontrolled source of particulate emissions in the atmosphere, both during the application of methods proposed for demolition, as well at handling the waste and the waste heaps. Since emissions are uncontrolled, can not establish a monitoring program.

Measures for protection against water pollution. The main categories of wastewater collected on the demolition site are the pluvial waters. Collected rainwater should not be discharged directly into the environment. If in the construction site or

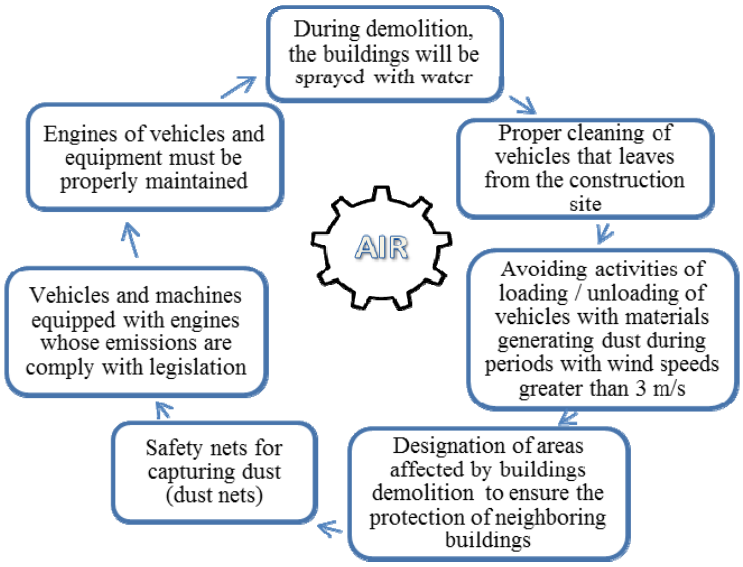

Fig. 1. *Measures for protection against air pollution*

in its vicinity there is a centralized sewer system, it will take over and will collect rainwater. Otherwise, ensure rainwater harvesting in a pool, these will be treated either on construction site or in a treatment plant. Water quality will be monitored as required by the regulatory authority in water management with order to track indicators: pH, conductivity, total dissolved substances, suspended matter, metals.

Noise emissions.

The noise from the demolition sites are caused by handling of heavy machinery, by the broken concrete with different cars, by demolition with controlled explosion, by the waste handling and transport.

Besides dust, the noise is one of the most important factors of environmental pollution from a demolition site. Noise emission monitoring shall be made annually near the construction site or demolition site.

Measures for protection against soil pollution (Fig. 2).

- control and daily cleaning of the work area;
- selective collection of waste;
- waste transport for recovery or disposal;
- final issuance of the construction site after demolition;
- greening the construction site after demolition;
- control and daily cleaning of the work area.

4. Ecological construction sites

A convenient way to waste reduction may be ecological construction sites experimenting. This demonstrated that economic balances and materials of construction site waste management can be positives for the following reasons:

- source reduction and sorting waste for recovery a materials can be benefical, both for waste management as well as for construction site productivity: less waste,

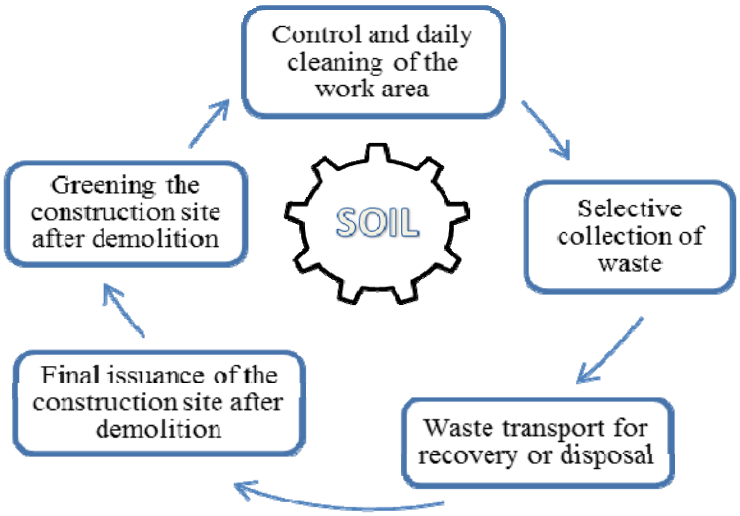

Fig. 2. Measures for protection against soil pollution

good training, staff informing, greater safety the workplace and reducing costs.

- knowledge the quantities and types of waste, real costs associated with them, allows companies to define new sources of savings and productivity;

- planning early for the organization sites is essential, despite the difficulty of estimating for the quantities and types of waste generated (underestimated in most experimental sites).

This may be easier, with the needed experience, especially as sorting and waste management will become a necessity. On the other hand, stands out the need to organize local branches waste, so sorted waste not to be transported long distances, resulting additional transport costs, additional costs related to environmental protection.

Conclusions of economic evaluation, qualitative and quantitative have proved that ecological sites are only one element of local politics and regional waste management.

- the waste evolution and profitability will depend to the local officials wishes that are responsible with the waste management;

- the plans for waste disposal by introducing them into the building sites are major elements that will help improve waste management;

- the business mobilizing is fundamental to creating and supporting the implementation of local branches for waste recovery.

Ecological construction site or traditional site - cost differences.

A comparative economic simulation between a traditional site and ecological site for a new building emphasize the following:

For a traditional construction site:

- volume of waste is higher, hence a greater number of tippers for transport;

- waste is not sorted or recovered;

- the waste is stored in class III sites, without sorting, in a way similar to household waste, not complying with european regulations in force;

For ecological construction site:

- reduction of waste at source by 20% and no extra cost, a higher loading factor

for dumpers and more dumpers for transportation;

- the ordinary industrial waste are recovered: 15% (wood, plastic, cardboard), 35% are exploited;
- 50% of waste is stored in class II sites, debris and embankments of the site.

The final conclusion is that for an ecological site the cost represent 66% of the cost of a traditional site.

The difference between costs is explained by:

- sorting iron and of remaining debris (with the opportunity to use debris at embankments to the nearby construction site) - 20%;
- reduce the volume of waste at source - 25%;
- other factors such as material recovery have a small influence (about 5%), because there is local recovery centers.

The data from the various studies - audit, the data from recovery center - have proved that the total cost of selective demolition is 2.5 times higher than the cost of a classical demolition. This difference is due to labor cost (2150 hours from 265 hours), but is explained by the experimental nature of this study. The selective demolition demonstrate economic attractiveness in particular the recovery of waste. Instead, remains comparable in terms of waste transport from the classical demolition.

We can say that transformation and recycling of construction sites waste remains an evolving process, because a market economy without waste is an ideal of human development.

5. Conclusions

The organizing a construction site involves some work phases and elaboration of lists of activities. These lists include processes that take place before project execution, during project execution and after project completion.

Thus, for good protection of ecological environment and prevent environmental risks, some measures are taken in the construction site, depending on the type of project to be executed, by its location, neighborhood, physical condition of the objective (if it's a demolition project), so the environmental factors like water, air, soil to be affected the least.

Apart from specific documentation for a project construction or demolition should be presented documentation on the types of materials, work methods used, the amount of waste, type of waste and their impact to the environment.

For demolition of a building should be data on:

- amount and type of waste;
- the main environmental factors that may be contaminated;
- methods of waste sorting and recovery;
- the place where the waste is transported and stored.

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