NETWORK RECY PROJECT

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Technological innovation for the environment

BET 2 - 0624
01.11.98–31.10.02

Use of recycled materials as aggregates in the construction industry

BRIEF DESCRIPTION:

Partners:

Antwerp Recycling Company, Belgium
Firma HENGL, Austria
Hochschule Bremen, Labor für Baustofftechnologie, Germany
Deutag remex Building Material Processing Co Ltd, Germany
Technische Hochschule Darmstadt, Germany
Danish Recycling in Cooperation, Denmark
Demex-Rådgivende Ingeniører A/S, Denmark
Universitat Politecnica de Catalunya, Spain
Recuperaciò d'Espais Naturals SA, Spain
Consejo Superior de Investigaciones Cientificas; Instituto di Ciencias de la Construccion "Eduardo Torroja", Spain
Technical Research Centre of Finland, Building Technology, Finland
Centre Experimental de Recherches et d'Etudes du Bâtiment et des Travaux Publics, Service Environment, France
GTM SA, France
University of Patras, Department of Civil Engineering, Greece
The Icelanding Building Research Institute, Iceland
University of Dublin-Trinity College, Ireland
Contento Trade Srl, Laboratorio Settore Ambiente, Italy
Civiel Technisch Centrum Uitvoering Research en Regelgeving, Netherlands
Technische Universiteit Delft, Netherlands
Norwegian Building Research Institute, Norway
Laboratorio Nacional de Engenharia Civil, Portugal
Swedish Cement and Concrete Research Institute, Sweden
Building Research Establishment Ltd., United Kingdom
DE RYCKE Gebroeders NV, Belgium
Rijkswaterstaat-Ministerie van Verkeer en Waterstaat, Netherlands
Readymix UK, Technical Centre, United Kingdom

Objectives:

The main objective is the utilization of C&D waste (building and demolition waste); so there is the need to develop plans of waste management.

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It includes:

A lot of advantages: in particular, the knowledge for the use of recycled materials, which are produced by C&D waste, for the treatment of waste of other industrial activities, as aggregates in building industry.

OBJECTIVES:

The environment protection is one of the main problems to be solved nowadays; in real terms a more rational use of the raw materials and energy and a more organized waste management have been increasing.

Because of the huge quantities of construction and demolition wastes (C&D wastes), the building industry is strongly implicated in the need of developing plans for the waste management. In 1995 the total amount of C&D wastes was estimated between 221 and 334 millions of tons.

To solve this problem some actions within the building sector have been undertaken to convert this high amount of wastes in reusable resources.

In a few years the building industry is more and more involved in the waste recycle coming from other sectors, especially as recycled aggregates.

In many European countries some initiatives to optimize the efficient recovery of wastes have been undertaken. The Thematic Network try to contribute to these actions and its main aims can be reassumed as follows:

- ✓ Contribute o the introduction at European level of standard and practical norms concerning the C&D waste recycling.
- ✓ Coordinating somehow the realized researches without the UE funding, regarding the reuse of C&D wastes coming from other industrial sectors.
- ✓ Organizing a recording service on the aggregate use, based on some coordinated research action and on report that show the results of the R&D correlated research projects.

Diffuse information concerning the above mentioned recording service on the recycled aggregates, using different means as publications, annual reports, strategic notes.

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STATE OF THE ART

The decreasing availability of raw materials and the high cost of the C&D waste disposal are enhancing their recycle in many EU countries. By one side, the demolition technology development is focused on some methods to sort the different waste fractions directly during the demolition process, that means a selective demolition, and on the realization of optimal demolition methods as concern the environmental impact and the workers safety. By the other side there was an increasing of the recycling plants for the separation and the treatment of the waste demolition, to obtain recycled products usable afterwards.

It's possible to distinguish between a low level processing and a high level one for the wastes. High level processing implies the crushing of uneven material, such as concrete, into a graded, higher values building product suitable for substitution of primary aggregates. Low level processing generally involves rough crushing and possibly screening to produce a material, which is suitable for on-site fill and landfill engineering.

Except for rather low-tech applications, such as road sub-bases and bases, the use of the recycled raw materials or aggregates is far from widespread, even in the more advanced countries. The rather low degree of utilization of these materials is amongst others determined by quality issues, imposed barriers, prices and psychological barriers:

- ✓ a major disincentive is the perception of lack of consistency in the quality of the recovered secondary material. A great use of these materials will only be realized if the user can rely on the products and materials as being of good quality. The absence of standards and specifications as well as an unclear legislation with respect to the definition of secondary raw materials make it difficult to guarantee quality.

- ✓ secondary raw materials are often subject to the same, often inappropriate, requirements as primary raw materials. These technical These technical specification are imposing barriers on the use of the recycled materials; the lack of appropriate specifications for secondary aggregates limit further investments in C&D waste processing technologies.

- ✓ the production of high quality secondary materials is technically feasible, but the cost tend to be higher than those for quarrying primary materials, especially in regions which are rich in natural construction materials. Only in low tech applications recovers products can compete with traditional

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construction materials. The strategic role of the government is therefore most important in influencing the building owners towards use of secondary products, by imposing taxes and fees, deposits and recycling schemes and the use of fiscal instruments.

- ✓ although the use of recycled aggregates in more high tech applications is in many cases possible and in some cases already allowed by standards, the end user is still found to be quite sceptical. The lack of a proven service record as well as the necessity to modify some parameters in the production process in which the recycled products are used are the main reasons for this scepticism.

MAIN INNOVATIONS

The intense European-wide collaborations realized within the Thematic Network enable participants to profit from the following advantages:

- ✓ the established network contacts would make it possible for participants to concentrate R&D efforts on a limited amount of topics taking into account the work being done by the network partners

- ✓ an unified evaluation of existing pilot projects and R&D results and the dissemination of the related information would help to establish the basis for a proven service record of recycled materials. This would surely simplify the drafting of national or European technical standards.

- ✓ the establishment of a consensus view with respect to the required technical characteristics in codes and standards is considered a priority, because most companies active in the recycling area are small size and are not in the position to spend effort to pull standardization initiatives

- ✓ less advances countries will profit from the experiences in the more advanced countries, because the network will enable them to have first hand information about the available recycling technologies, regulations and specifications.

- ✓ the knowledge developed for the use of recycled materials coming from C&D waste will be also useful for the recycling of other industrial waste production as aggregates in the construction industry

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- ✓ the last positive aspect of this network is related to the regulatory work in the different countries regarding the environmental requirements for secondary building materials. Most of the partners in the network are involved in such regulatory work and will profit from other countries experiences.

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