

At a Glance

The main offices of Westmeath County Council (WCC) are situated in Mullingar town, with other offices in Athlone, Kilbeggan and Castlepollard.

The services of the Council include Planning, Housing, Water Services, Transportation, Motor Tax, Fire and Environment, Building Control, Arts/Culture, Heritage/Conservation, Community and Enterprise.

This project consists of the construction of a civic amenity facility on the outskirts of Mullingar, where the public can, for a small fee, bring their recyclables to the facility. The facility has been constructed using recycled crushed concrete in the sub-base and capping layers. Recycled asphalt planings have also been used in the surfacing layer. In terms of renewable energy resources, a wind turbine system has been erected at the southeast corner of the site to provide power to the electrical sockets and lights in the administration building. Also, a solar thermal heating system has been fitted to the roof of the administration building, which provides hot water to the administration building. Furthermore, the binder course of the tarmacadam contains recycled asphalt planings and the landscaped areas contain crumb rubber.



Civic Amenity Site Signage

CGPP2004/19

The use of recycled/reusable materials in the construction of environmental infrastructure in the Midlands



Westmeath County Council,
County Building, Mount Street,
Mullingar, Co. Westmeath

The main offices of Westmeath County Council (WCC) are situated in Mullingar town, with other offices in Athlone, Kilbeggan and Castlepollard. There are currently 649 people employed by WCC. The Council is divided into four separate areas, namely:

1. Economic Development and Planning
2. Environment, Housing, Social and Cultural Development
3. Transportation and Infrastructure
4. Community & Enterprise

The services of the Council include Planning, Housing, Water Services, Transportation, Motor Tax, Fire and Environment, Building Control, Arts / Culture, Heritage / Conservation, Community and Enterprise.

Aim of this Project

The aim of the project was to replace, where applicable, the traditionally used quarried/virgin aggregates in unbound materials with recycled materials such as crushed concrete. In bituminous bound materials, it was proposed to use a percentage of recycled asphalt planings in place of virgin aggregates. Also, it was proposed to use crumb rubber on all landscaped areas. The main disadvantage of incorporating the recycled materials is more costly than using traditionally quarried materials, mainly due to the fact that there would be increased transport costs on account of the limited facilities for production of these materials in the country at present.

However, there would be an overall benefit, not only in terms of the environment, but also in increasing public awareness.

Project Description

Mullingar Civic Amenity Centre was a new-build. The main activities undertaken were:

- Earthworks
- Installing services e.g. telecom, ESB, storm and foul sewers, watermain
- Construction of administration and garage buildings
- Installing wind turbine and solar panel systems
- Laying tarmacadam
- Fencing
- Internal Electrics
- Construction of a modular block retaining wall
- Landscaping

Recycled crushed concrete was used as a substitute for Clause 6F2 material in the capping layer and it was used in place of Clause 804 material in the sub-base layer. Also, it was used as backfill in the construction of the modular block wall and the drainage system.

Recycled asphalt planings were used as part of the binder course in the tarmacadam.

Achievements

Environmental Impact – Resource consumption has been reduced in the following ways:

- Approximately 4,200m³ of recycled crushed concrete has been incorporated into the construction of the project as oppose to using the traditional quarried aggregates
- Approximately 24m³ of recycled asphalt planings were incorporated into the tarmacadam binder course
- Approximately 24 tons of crumb rubber was used as part of the landscaping

Economic Impact – The decrease in the consumption of electricity on site due to use of the wind turbine and the solar panels will result in a positive economic impact from the project. The use of the recycled materials will also have a saving on the energy required and the associated carbon emissions, in extracting the raw material from the earth (stone and oil), which would otherwise be required. Plus saving resources with regard to the limited primary materials available.

Other Benefits – Raising awareness of the use of more sustainable material in the construction industry and promoting greener energy usage among the public through the inclusion of these practices in the civic amenity centre.



Wind Turbine at the Civic Amenity Site

Observations

Strategy to identify prevention opportunities – As recycled crushed concrete was used in place of the traditional quarried aggregates, this provided a greener alternative to the use of the aggregates. Also, the use of recycled asphalt planings in place of virgin aggregates in the bituminous bound materials provided a more environmentally friendly alternative to the virgin aggregates.

Knowledge of company operations – Westmeath County Council has gained knowledge of where to source the recycled crushed concrete, recycled asphalt planings and crumb rubber which were used in the construction of Mullingar Civic Amenity Centre. The Council also have information on the average cost of each of the recycled materials.

The contractor experienced a great deal of difficulty in attempting to source a supplier of recycled glass pavours and a decision was made to exclude this particular recycled material from the construction of the Civic Amenity Centre.

Monitoring of the performance of the recycled crushed concrete is ongoing. UCD Civil Engineering Department has developed an acceptable programme for monitoring the different materials performances over the duration of the service life. A control section was added in the Civic Amenity Centre made from traditional materials, with monitoring gauges for stress strain placed here and in the recycled materials sections for analysis and comparison of performance.

Lessons

If repeating the project again, recycled crushed concrete would be used again in both the capping and sub-base layers, as would crumb rubber in the landscaped areas and recycled asphalt planings in the binder course of the tarmacadam. Glass pavours would be incorporated into the construction if a supplier could be sourced. The wind turbine and the solar panels would also be used again. None of the materials gave any real problems in using

them save for the glass pavours where a supplier could not be found.

Care needs to be taken when using recycled construction materials that there are no contaminants in the material from its previous use. Contaminants such as pieces of reinforcing bars and small pieces of timber in the recycled crushed concrete were found. These contaminants were removed by hand as the material was placed and rolled and did not effect the quality of the material.



Solar Panels at the Site Office



Recycled material used as sub base

More Information

For more information on this project please contact:

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Cleaner Greener Production Programme

The Cleaner Greener Production Programme (CGPP) of the EPA was funded under the National Development Plan 2000 – 2006. The CGPP was launched in 2001 as a grant scheme to Irish organisations to implement cleaner greener practices while achieving significant cost savings.

Cleaner Greener Production is the application of integrated preventive environmental strategies to processes, products and services to increase overall efficiency and reduce risks to humans and the environment.

- Production processes: conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes
- Products: reducing negative impacts along the life cycle of a product, from raw materials extraction to its ultimate disposal.
- Services: incorporating environmental concerns into designing and delivering services.

The programme aims are focussed on avoiding and preventing adverse environmental impact rather than treating or cleaning up afterwards. This approach brings better economic and environmental efficiency.

Under Phase 2 of CGPP, 22 organisations were funded from a variety of sectors (e.g. chemicals, food, metals, electronics, service). The total achievements from the projects for the participating organisations included annual reductions of 250,000 tonnes in input/output streams (water/waste water), 660 MWh energy reduction and €1.6m cost savings.

The programme will continue to be funded by the EPA in the NDP 2007-2013.

This case study report is one of the reports available from the companies that participated in the second phase of the Cleaner Greener Production Programme. A summary of all the projects and CD containing all the reports are also available.

More information on the programme is available from the EPA:

Ms. Lisa Sheils or Dr Brian Donlon,
Environmental Protection Agency,
Richview, Clonskeagh Rd., Dublin 14, Ireland.
www.epa.ie/researchandeducation/research/

Programme Managers...

The Clean Technology Centre (CTC) at Cork Institute of Technology was appointed to manage the programme. Established in 1991, the CTC is now nationally and internationally regarded as a centre of excellence in cleaner production, environmental management and eco-innovation across a range of industrial sectors.

