

ENVIRONMENTAL ASSESSMENT OF UK SEWER SYSTEMS

A major UK study has confirmed that concrete is an environmentally sound product for pipeline systems.

“This research demonstrates the importance of evaluating the environmental effects of the materials and processes we use. I therefore welcome the publication of this brochure..... and hope that it will provide a useful guide to those within the industry who will be responsible for designing and building safe and sustainable sewerage systems for the 21st century”.

John Hobson - Director,
Construction Industry Directorate – Department of Trade and Industry

LCA (Life Cycle Assessment) analyses the environmental inputs and outputs in the life cycle of a product that can be assessed according to their environmental impact. The research was undertaken using the methodology detailed in the ISO 14040 series to ensure its credibility.

This research was completed in 2001 and involved the partnership of a number of well-known professional organisations. It was commissioned by the Concrete Pipe Association, supported by the British Cement Association, undertaken by a leading Dutch consultancy INTRON, critically audited by BRE and sponsored by the DTI.

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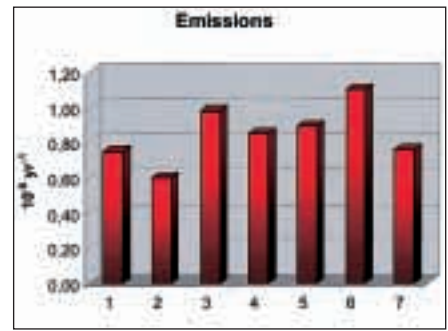
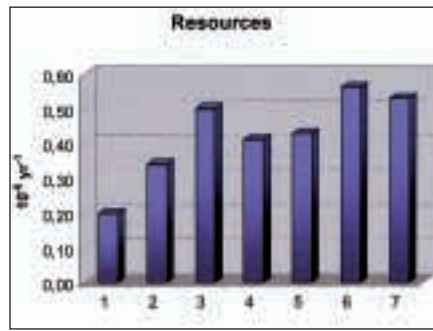
Which material is best for the environment? – This major UK study confirms that concrete is an environmentally sound product for pipeline systems.

The 13 environmental measures considered can be combined into resources, energy, emissions and waste. Concrete comes out the best overall, as illustrated here.

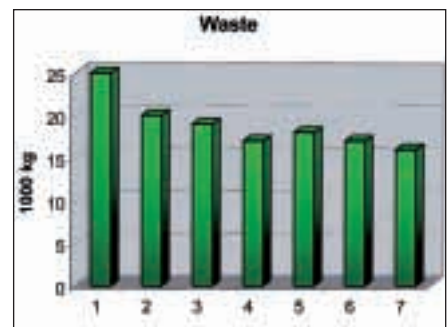
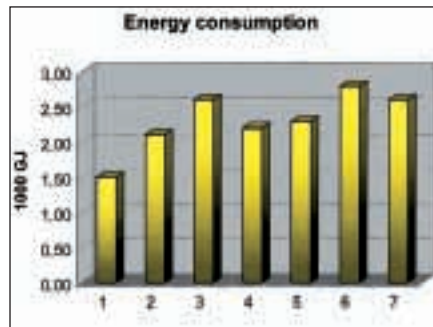
Groundbreaking UK Research? INTRON and BRE's world-leading expertise in environmental research combine to make this one of the most important research studies in recent years.

Scope of research – what was included? It was important to have a realistic comparison of the most widely used materials, therefore, a standard functional unit was defined which was independent of the materials studied. Comparison was between concrete, clay and five various types of plastic sewer pipelines and a separate product system was defined for each, based on publicly available information from producers and relevant British Standards.

Life cycle stages – from cradle to grave This in-depth study, the first complete environmental assessment of UK sewer systems, considered all raw materials, the manufacturing process, transport, construction on site, use and maintenance over 50 years and the ultimate decommissioning and disposal of the system.



Key= 1 Concrete, 2 Clay, 3 Solid wall PVC, 4 Twin wall PVC, 5 Ultrarib PVC, 6 Twin wall PP, 7 Spirally wound HDPE



How valid was the analysis?

Data for the research was provided by raw material suppliers, concrete pipeline system manufacturers, pipeline contractors and water companies. For other materials product information from the producers and publicly available data was obtained by INTRON, who checked the validity of the various pieces of data by using sensitivity analysis. The research was then independently audited by BRE to ensure its quality and validity.

What were the conclusions?

The above graphs show that concrete is the best choice for the environment. The more

detailed analysis in the research showed concrete performing best in seven and second best in three of the thirteen categories studied.

Any more evidence? –

Other evidence can be found in the LCA work undertaken in many European Countries, demands from the European Parliament and Commission for tougher measures on PVC, the long-term durability of concrete and the use of trenchless installation techniques.

When reviewing all the work that has been undertaken, it becomes apparent that concrete pipes have a very good environmental pedigree when compared with other materials.

Concrete – the case is proven

“With the energy that is saved by using concrete DN450 pipes instead of solid wall pvc pipes, a truck loaded with concrete pipes could circle the world 1.5 times for every kilometre of sewer system”

INTRON

Further information can be found in the publication “Environmental Assessment of UK Sewer Systems – Groundbreaking Research” which can be obtained by:

- Downloading the document from the CPA Web site – www.concretepipes.co.uk
- Phoning the CPA on 0116 253 6161 for a copy.

Introducing a stormwater attenuation system

Hepworth Concrete has introduced a stormwater attenuation system to cope with under-capacity in local sewers and watercourses. This often arises when new developments are built with substantial areas of water-impermeable surfaces.

The Hepstorm™ system provides a complete solution using tried-and-tested stormwater storage techniques. It includes concrete pipes up to DN 2400 allowing storage capacity to be specified to match both anticipated flow rates and site conditions.

These are complemented by concrete end caps with cast inlet pipes and cast-in sump and vortex flow controls. Inlet pipes are available in a range of diameters and positions for multiple connections.

Hepstorm™ can be used in both load-bearing and non-load-bearing applications and can be designed to suit most structural and hydraulic criteria. It allows rapid construction using standard joints and without the need for on-site fabrication. The system is fully adoptable by water companies and offers a 120-year design life.



LARGER ACCESS

To accommodate the larger, more powerful jacking/boring equipment employed in today's trenchless technology, Milton Pipes Ltd has extended its Milshaft range to include a 4m diameter precast concrete caisson. The larger units allow contractors to construct 4m diameter vertical shafts for jacking and reception pits or may be adapted as manholes in open cut construction.

Concrete in aggressive ground

The Building Research Establishment has recently published a new guidance document on the protection of concrete from aggressive chemicals in the ground.

This document is titled BRE Special Digest 1 'Concrete in aggressive ground' and replaces BRE Digest 363: 1996, whilst also building on the work of the Thaumaside Expert Group. It is a longer and more complex document than previous Digests and runs to four Parts. Contained in Parts 1, 2 and 3 are methods of assessing the chemical environment, recommendations for specifying concrete and design guides for common applications such as foundations.

The fourth of these Parts is a design guide for specific precast products, which includes concrete pipelines, and the Concrete Pipe Association was closely consulted during its development. From this involvement, the manufacturers of precast concrete pipeline systems are able to assure users of these products that the requirements of the new BRE Special Digest can be met for the range of ground conditions, including aggressive grounds, which may be encountered in the UK. CPA member companies are happy to offer advice and to discuss individual situations





A giant success

CPA member Stanton Bonna has extended its existing DN 300 to DN 1800 pipe range. New larger sizes, DN 2000, DN 2200 and DN 2400 introduced during 2001 have been a success.

Well over 1km of these new concrete 'giants' have been supplied to one scheme at Hatfield. The major development by Arlington Properties includes office blocks, warehousing and a new campus for the University of Hertfordshire.

The large diameter pipework will carry surface water to a pumping station. Jackson Civil Engineering installed the pipes for main contractor Carillion.

Lady Chatterley's Lover ... Now Read On

The spoil heap and the D.H. Lawrence book 'Lady Chatterley's Lover' were the only reminders of those days when the Ollerton colliery provided income for the Chatterley family.

Today, the colliery site is a scene of activity and ingenious development. Tesco is investing in a new major supermarket and the adjacent site is to be developed as the Sherwood Energy Village, to benefit the local economy.

Because of the prevailing wet ground conditions and potential of flooding, special precautions have been taken on the supermarket site. This is where Hughes Concrete was able to help specialist subcontractors F. G. Construction of Nottingham.

Twenty-five DN 3000 in-line soakaways have been constructed to prevent future waterlogging. These utilise Hughes DN 3000 perforated rings, each 1m deep with DN 3000 heavy-duty cover slabs.

The 66 perforated units were supplied via heavyside drainage merchants, UGS Ltd of Kirkby in Ashfield to a carefully planned schedule for on-site installation.

As these interesting projects develop, the residents of Ollerton and district can look forward to benefiting from new and exceptional facilities, with Hughes Concrete soakaways quietly and reliably safeguarding the site – while Lady Chatterley now merely provides an interesting read!



CPA Members

- CV Buchan
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Tel: 01952 727338
- Hanson Concrete Products
Tel: 0117 981 2791
- Hepworth Concrete
Tel: 01530 240024
- Hughes Concrete Ltd
Tel: 01538 380500
- Johnston Pipes Ltd
Tel: 01952 630300
- Milton Pipes Ltd
Tel: 01795 425191
- RMC Concrete Products
Tel: 01931 716444
- Stanton Bonna Concrete Ltd
Tel: 0115 944 1448

CPA member companies represent almost 100% of the concrete drainage industry.

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