

Aggregate Industries

Recycling of incinerator bottom ash hit the headlines last year but an Environment Agency report has confirmed its safety, adding weight to recent research by Aggregate Industries.

IBA gets the all clear

Reusing waste materials as secondary aggregates sits well with modern sustainable thinking and Incinerator Bottom Ash (IBA) has been successfully reused in construction for many years. But in July 2001, BBC2's Newsnight programme reported that IBA could pose a significant risk to public health and put continuation of this sustainable practice in jeopardy.

Asphalt producer Aggregate Industries was confident that the material was safe if processed correctly – a view that has been proven by an Environment Agency (EA) report published in July this year. Nonetheless, the Newsnight report put a damper on a successful IBA surface course trial which Aggregate Industries was working on at the time for Staffordshire County Council (SCC).

Aggregate Industries developed ASHphalt – a bituminous bound binder course material formed using up to 30% IBA – in the mid 1990s and wanted to investigate the material's potential as a surface course. The company teamed up with SCC to design a new ASHphalt mix and trial it on an access road to

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a household waste disposal site at Bemersley in Staffordshire.

“Bemersley is an ideal test site because it is well trafficked. Our only concern with developing ASHphalt as a surface course was its skid resistance, but vehicle speeds at Bemersley are low so safety was not a major issue,” says Aggregate Industries Technical & Development Director Paul Phillips. “During the trial we carried out skid resistance tests which showed ASHphalt to have a skid resistance value (SRV) which was much higher and more consistent than expected.”

Early trials showed excessive fines in the IBA material adversely affected ASHphalt's durability and the final mix used IBA with a grading of between 5mm to 20mm. The final mix was laid at the site in July 2001, just before the broadcast of the Newsnight report. According to Newsnight, IBA was being mixed with fly ash (see box) at an incinerator in Edmonton and was then used in road construction and the manufacture of building blocks. Newsnight claimed that IBA from Edmonton contained high levels of dioxins and posed a significant risk to human health. As a result, IBA and dioxins hit the national headlines.

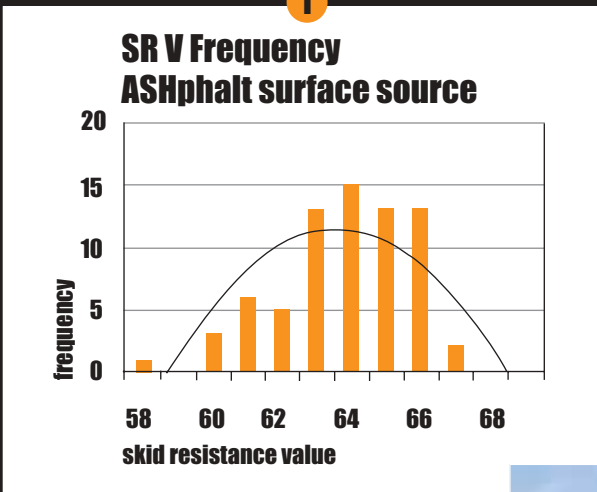
Although only one incinerator supplying the construction industry was believed to have mixed the two ash streams, the revelation exposed other UK incinerators to scrutiny. The EA immediately launched an inquiry to investigate operational practices at UK incinerators and to trace where the potentially contaminated IBA had been sent and for what purpose it had been used.

“We have used IBA to produce ASHphalt for a number of years and part of our continued development work included environmental analysis and leachability tests,” says Phillips. “The dioxin levels recorded in all the samples were equal or lower than those which exist in urban soils, indicating that IBA presents no extra risk to human health.”

According to the study by the EA, IBA contains very low levels of dioxins and present no risk to health. The EA report states that mixing of IBA and fly ash ceased at Edmonton in July 2000 and Aggregate



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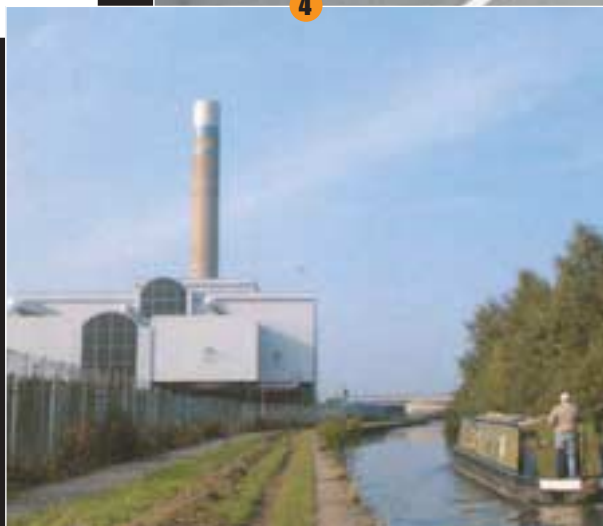
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1: Testing at Bemersley showed skid resistance of the ASHphalt surface course to be much higher and more consistent than expected.

2: The final ASHphalt mix was laid at the the Bemmersley household waste site in July 2001 and has performed well.

3: IBA often contains remains of ceramics and glass waste which initially gave Aggregate Industries concerns about skid resistance.

4: The UK's 14 municipal incinerators burn around 10% of the 29Mt of household waste produced in this country each year and IBA is a waste product of the process.



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Industries' records confirm that it has never used mixed ash from that source.

EA research also shows that the presence of dioxins in building blocks is unlikely to impact on overall human exposure to the chemicals, even if home owners are exposed to the material through DIY activities. With the dioxin risk resolved, Phillips now hopes that Ashphalt can be used more widely as a surface course.

Bemersley's ASHphalt surface course has now been trafficked for over a year and SCC is pleased with the result: "Visually the material is performing well," says SCC Project Manager Steve Holsgrove. "I hope that in future we could extend the use of such recycled materials to residential roads and footways in the county."

email hotline: info@modernasphalts.com

How does a waste incinerator work?

There are 14 municipal waste incinerators in the UK and these are used to burn around 10% of the 29Mt of household waste produced in this country each year. Design of each plant varies but the principal processes are the same.

Incoming waste is fed into a combustion chamber heated to 850°C. Fans force air through the waste to ensure instant ignition. Hot gases and ash are produced by the burning material which is carried on a moving grate. The ash which falls through the grate into a quenching pool below is known as Incinerator Bottom Ash (IBA) and is either sent to landfill or processed for use as a secondary aggregate.

The hot gases, which also contain fine particles of ash, pass upwards into the boiler where the heat is used to generate electricity. These combustion

gasses are usually acidic and contain a high concentration of fine ash particles plus the slow cooling often allows dioxins to form, so cleaning is essential. Lime is used to neutralise excess acid while finely divided carbon is added to remove dioxins and heavy metals from the gas.

The added carbon and lime along with the fine particles, known as Fly Ash, is removed from the gas by highly efficient filters and is disposed of at special landfill sites. This waste material is known as air pollution control residues. The cleansed exhaust gases are reheated to prevent a steam plume forming and aid dispersion from the stack.

"Most dioxins are created from the incineration of plastic material in the waste," says Phillips. "Creating new uses for recycled plastic and removing this material from waste streams is key to reducing dioxin levels created during incineration."