

# Waste Management for Highways Maintenance - Pg1

## Case Record



**Location** Area 8,  
Northamptonshire

**Client** Highways Agency

**Main Contractor** Carillion Highways Maintenance

Carillion plc has the contract for the maintenance of trunk roads and motorways in Highways Agency Area 8. The area is based on Northamptonshire and also covers parts of the surrounding counties.

### Environmental Initiatives

**Waste Management** Utilisation of asphalt planings

Reduction in the use of virgin drainage material

Reduction in waste of gully arisings and debris

Various types of waste materials are produced by the work and Carillion is keen to reduce waste in the following areas:

- higher utilisation of asphalt planings in the works
- reduction in the use of virgin drainage filter material
- reduction in waste of gully arisings and debris

In April 1997 Carillion plc won the contract for the maintenance of trunk roads and motorways in Highways Agency 8, centred upon Northamptonshire. This comprised contracts up to £100 000. The total carriageway length is 1200 miles.

- inclusion in basecourse or road base being laid in Area 8
- aggregate in lower pavement layers or footpaths
- track construction on agricultural land
- use, with an emulsion polymer, as car park surfacing

Carillion managed the work, which was undertaken by a number of sub-contractors.

The major aspects of the work were the maintenance of:

- road pavement
- footpaths
- drainage works
- barriers
- signs

Also included were the control of litter and debris, and the reconstruction of road surfaces.

#### Waste produced

Various waste materials were generated from the work. Predominant among these were asphalt planings resulting from resurfacing operations, litter and debris swept up from the roads, road gully arisings and roadside drainage filter media. There was also waste produced by replacement of damaged crash barriers and the replacement of road signs.

#### Waste minimisation initiatives

##### Asphalt planings

Prior to the laying of new wearing course, basecourse or overlay, the existing asphalt surface has to be planed off. The depth of planing depends upon the condition of the pavement. It is typically some 40mm, but may be significantly more. Some 5000 tonnes were produced in the year up to July 2000. This material was all reused in the following four major ways.

- inclusion in basecourse or road base being laid in Area 8
- aggregate in lower pavement layers or footpaths
- track construction on agricultural land
- use, with an emulsion polymer, as car park surfacing

# Waste Management for Highways Maintenance - Pg2

## Case Record



<b>Location</b>	Area 8, Northamptonshire
<b>Client</b>	Highways Agency
<b>Main Contractor</b>	Carillion Highways Maintenance

### Environmental Initiatives

<b>Waste Management</b>	Utilisation of asphalt planings
	Reduction in the use of virgin drainage material
	Reduction in waste of gully arisings and debris

All of these uses reduced the need for the end user to procure material from elsewhere, and were thus legitimate waste minimisation initiatives.

Carillion considers that a higher proportion of planings could be used in the new pavement. This would be beneficial in increasing the recovered value of the material, as the planings would replace a proportion currently filled with material made with virgin aggregate. One problem was that planings could not be stock piled at the existing depot sites, because of their potential for contaminating salt stockpiles. Another problem was that the planing sub-co-ordinators were at liberty to dispose of the planings as they saw fit.

An amendment to contractual arrangements would have assisted in improving the situation. Being able to store planings for recycling back into the structure of the pavement as a high-grade feedstock would also assist. This is restricted by the Waste Management Licensing Regulations 1994, which allows up to 50 000 tonnes to be stored for up to three months. This is not considered long enough to allow workable stockpiles to be maintained.

### Road gully arisings

This material is predominantly silty in nature. Approximately 1000 tonnes per year is collected. At present this is disposed of to landfill.

A chemical analysis was carried out on a sample from the M1. This sample was found to contain safe levels of all contaminants assessed, with the exception of copper and zinc. These were found to be only high enough to restrict plant growth, and were not otherwise hazardous.

There is currently no obvious use or market for the material, and it is therefore sent to landfill in the absence of any alternatives. This is because of both the perceived risk of contamination and the difficulty of selling small volumes.

If the material could be stored until a more saleable quantity was available, it might be possible to find a better disposal route than landfill. However Schedule 3 of the 1994 Waste Management Licensing Regulations do not grant an exemption for the storage of this material.

### Litter and debris

Approximately 2000 tonnes of sweepings are collected each year, of which some 40 to 50 per cent are silt. At present the majority of this goes directly to landfill, though some basic segregation is carried out by the sub-contractor to extract rubber and metal. These are then sold. The problem of disposing of the silt, even if segregated, is similar to that of gully arisings.

It is estimated that some 30 per cent of the waste disposal cost could be saved by more rigorous segregation of the waste.

### Roadside drainage filter media

The granular filter media in the roadside drains became clogged with fine material and require cleaning or replacement

Approximately 12000 tonnes were treated in the year up to July 2000 of which 35 per cent was removed and replaced with virgin material. The clogged material was crushed to form 6f1 material, and used primarily as fill. The remaining 65 per cent was treated by a contractor who cleaned it, and replaced it, where possible.

# Waste Management for Highways Maintenance - Pg3

## Case Record



<b>Location</b>	Area 8, Northamptonshire
<b>Client</b>	Highways Agency
<b>Main Contractor</b>	Carillion Highways Maintenance

This was done using dry screening, off site at his depot. It was not always possible, as the process is not effective if the material is too wet or too dirty. However some 80 per cent of this material was reused in this manner.

Under the present arrangement the amount this would save would be dependant upon the price charged by the planing contractor, the cost of a storage facility for the planings, and the haulage cost of the planings to the batching plant. These vary for each contract.

### Environmental Initiatives

<b>Waste Management</b>	Utilisation of asphalt planings
	Reduction in the use of virgin drainage material
	Reduction in waste of gully arisings and debris

It was estimated that the cost saving in cleaning and reuse was up to 20 per cent compared to replacement. The fact that some filter media was cleaned and some was replaced reflected the cost of new material, which was governed by its haulage cost.

Projects such as this term maintenance contract demonstrate the effect upon cost considerations of the relative locations of depots, storage areas, processors and suppliers in terms of the cost of waste minimisation. This covers both the direct economic costs and the environmental cost of transporting material.

Consideration has been given to the use of shredded vehicle tyres as a replacement for stone aggregate. In order to avoid the danger of vehicles sinking into the softer lighter rubber material, it is preferable for the top 150-200 mm to be bitumen-bound. This bound layer was costed in 1996 as being of the order of £20 per m<sup>2</sup>. At present, the cost of cleaning aggregate to a depth of 200mm is of the order of £5 per m<sup>2</sup> - significantly cheaper.

#### Asphalt planings

None of the asphalt planings resulting from the maintenance operations is currently being wasted. However it was considered by Carillion that more could be reused in the basecourse - saving a higher value primary material.

This action would reduce the quantity of new aggregate and bitumen required in the basecourse.

#### Road gully arisings

Because of the comparatively small quantities involved, the likely need for a waste licence for storage and the requirement for chemical analysis, the costs of disposal other than to landfill would be significant if a buyer for the material could be found. For the material to be used elsewhere the Highways Agency would need to incur this cost.

#### Litter and debris

The financial savings of greater segregation of litter are estimated to be £20 000 per annum. The problems of the disposal of the grit fraction are as for the gully arisings.

#### Drainage filter media

Had all the filter media been cleaned during the last year, the saving might have been of the order of £25 000. This figure is based on a 20 per cent saving on the cost for the 35 per cent of drainage media that was removed and replaced. However this figure varies greatly from contract to contract, as haulage is a significant component of the cost comparisons.