



Tight squeeze: central London sites suffer from traffic restrictions and lack of space

CONSTRUCTION & DEMOLITION

# Building sites unfazed by a lack of space

Advances in plant and technology make post-segregation a viable alternative to on-site sorting of construction wastes, writes **TARA DONAGHY**

Pre-segregation of construction and demolition (C&D) wastes is, of course, not a new concept. Some form of sorting has been carried out on building sites to remove scrap for resale since metal was first used for architectural purposes in the 18th century.

After the second world war, the development of plant to crush hard materials created a market for recycled aggregates, which encouraged the reclamation of concrete and hardcore on demolition sites. Most other waste materials such as glass, wood and plastics would typically be removed and landfilled.

By and large, that remained the status quo until the 1990s when the need to introduce environmental sustainability into the construction sector was put centre stage in a series of legislative changes which have altered the cultural landscape in which C&D wastes are managed.

Perhaps the most fundamental of these was the introduction of landfill tax in 1996. While its initial rate of £2 per tonne seems negligible compared with the current tariff of £82.60 per tonne, its legacy caused a paradigm shift in

thinking across most industries – no more so than in construction, which accounts for 25-30% of the total waste generated in the UK.

After 1996 there was a commercial driver to encourage quantity surveyors to investigate ways of minimising the amount of ‘other wastes’ generated at construction sites that would be removed to landfill, and this led to greater pre-segregation on the ground.

The requirement of contractors to document the types, quantities and destinations of wastes were contained in the Site Waste Management Plan (SWMP) Regulations, which came into force in 2008 and further promoted the concept of pre-sorting.

The commercial benefits cannot now be ignored. On one hand, the ‘stick’ has become heavier, with year-on-year hikes in landfill tax making it virtually unviable to dispose of anything other than hazardous C&D waste. On the other, the burgeoning markets for recycled materials, fuelled mainly by the phenomenal rise in Chinese and Asian development, have transformed many waste materials into a commodity that can offset the costs of disposal.

This has translated into a variance in tipping rates which has created higher value for pre-sorted material streams. While rates fluctuate over time and from region to region, a contractor can expect to pay on average 25-30% less for discharging uncontaminated pre-segregated waste streams compared with mixed construction waste, although the costs of sorting on-site do need to be fully accounted for when carrying out a true cost comparison.

Pre-segregation of construction wastes has therefore become a prevailing orthodoxy in the industry, and there is little debate that it will contribute to the EU target of 70% recycling of C&D waste by 2020 by reducing processing, creating a source of feedstock for the manufacture of new materials and creating buy-in from all those involved in the industry.

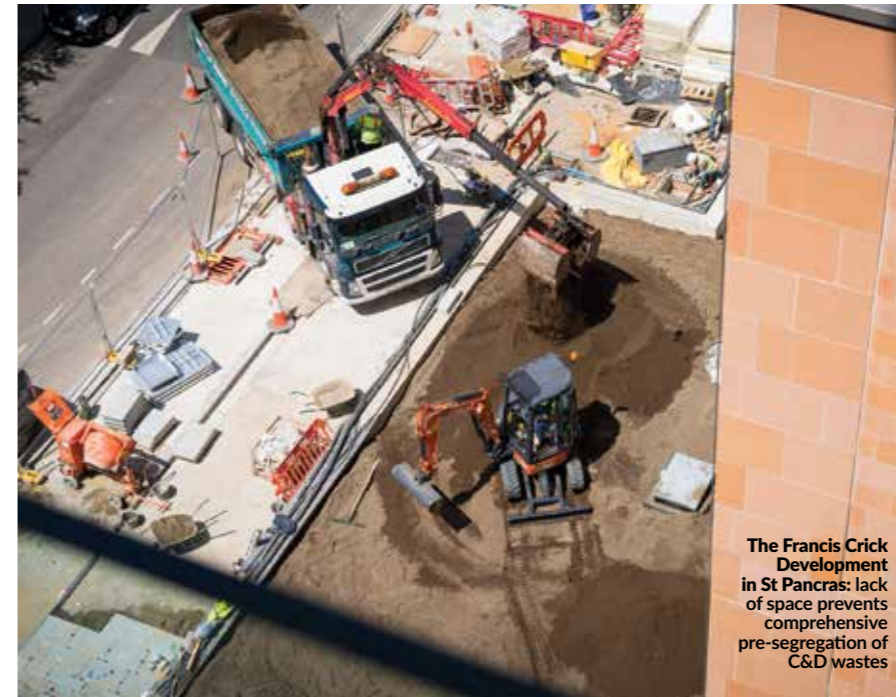
But there are circumstances when pre-sorting is not operationally feasible. Some materials streams, particularly on demolition sites, can be so cross-contaminated that effective segregation becomes too time consuming and expensive. Implementing a consistent sorting process can be a challenge when using a mix of nationalities on-site whose first language is not English. And if the site is located in a particularly busy traffic area, for example in city centres, there may be restrictions on vehicle movements to and from the site which compromises the ideal waste collection process.

By far the most common hindrance to site separation is space – or the lack of it. A typical demolition project may generate up to a dozen waste streams and, if the site is closely bounded



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The Francis Crick Development in St Pancras: lack of space prevents comprehensive pre-segregation of C&D wastes

by transport links or other buildings, there may not be sufficient footprint within the site boundary to locate skips for each material type or an area for the sorting to take place.

Again, these restrictions typically exist in city centre locations where space is at a premium. As a contractor that operates extensively in central London, McGrath Group often encounters this issue. The current site of a development of biomedical research facility the Francis Crick Centre is a classic example.

Bordered by main roads on two sides and the British Library and St Pancras station on the other, logistics provider Select Plant Hire has insufficient space to locate skips for each material stream. Instead it has opted to segregate metals and plasterboard and collate the rest as mixed waste, which is collected twice daily and tipped at McGrath's MRF in Hackney.

Similarly, building contractor Lakehouse is typically given permission by local authorities to locate just one skip in residential streets for collecting wastes generated by programmes

of social housing refurbishment in inner London. So McGrath arranges regular, on-demand collections of mixed wastes from its sites throughout the capital.

As a consequence, more than 80% of the C&D material McGrath handles is collected or tipped as mixed wastes. Fortunately, advances in technology have enabled sophisticated post-segregation systems to be developed.

A number of operators have developed integrated systems into their MRFs which combine mechanical, magnetic and manual techniques to process heterogeneous consignments of C&D materials into their constituent materials. McGrath has invested heavily to introduce bespoke plant to allow its MRFs in Hackney and Barking to cater for any type of non-hazardous construction materials.

Loads pass through an initial pre-sort stage where operatives extract oversized materials such as large timber, metal or plastic items using grab plant. These are removed to individual material bays.

The rest of the items are placed on to a feeding belt and pass through a trommel, which separates materials by size. The larger items retained in the trommel are passed via a conveyor into a 22-station picking cabin for manual sorting. Here, materials are identified visually by type, removed by hand, and dropped through chutes into material bays or containers. Plastics, packaging, small timber items and non-ferrous metals will be extracted and sent to a specialist facility for recycling.

The small items which have fallen through

the trommel screen are sorted by size and weight using a flip-flop screen and suction plant, which segregates them into non-mineral and mineral items.

Small mineral items are assimilated into homogenous loads of concrete, hardcore, masonry, track ballast, glass and stone. These are crushed and pass through washing plant to remove silt and clay residues. The washed material then passes through a screener which separates it into different sizes of recycled aggregate: 40mm, 20mm and 10mm shingle, sharp and fine sand.

Small non-mineral residues such as pieces of paper, textiles and plastic are packaged using purpose-built baling/wrapping plant which creates durable bales for transport to an energy-from-waste plant.

Overband magnets located strategically throughout the system remove ferrous metals while non-ferrous materials such as zinc, aluminium and tin are removed manually and separated at the picking station.

This integrated post-segregation system is very efficient. More than 95% of the mixed construction wastes will be segregated into individual material streams which, in the case of rubber, timber and mineral items, are recycled on-site or removed and sent to specialist reprocessing facilities where they are converted into feedstock for manufacturing processes. Only the remaining non-mineral residues are packaged and sent for energy recovery.

Moreover, detailed analysis of clients' waste can be provided to help them demonstrate good practice. While the SWMP Regulations have now been revoked, some contractors still require plans to be produced and many continue to use them to apply discipline to their resource efficiency procedures.

Data from the MRF about the post-segregation, as well as reprocessing methods used to recycle the material streams, can be provided on a regular basis or for an entire project to help the contractor demonstrate that best practice – adhering to the waste hierarchy – has been applied and evidence for sustainability schemes such as BREEAM and CEEQUAL.

It has taken a number of legislative and commercial inducements to create a climate where site segregation is now seen as de rigueur for processing C&D wastes and, should conditions be conducive, it makes financial and environmental sense to pre-sort. However, advances in post-segregation technology mean that lack of space need not be a barrier to demonstrating best practice and for companies to discharge their environmental responsibilities.

● Tara Donaghy is business director of the McGrath Group