imc fresh thinking

Case Study

'World First' for IMC and Imperial College

Imperial College has been one of the UK's leading educational establishments since 1907 and prides itself on its use of cutting edge equipment and solutions.

Background

IMC's solution to the diversion of caterers' food waste from landfill is founded on an extensive 3 year research programme that was concluded in 2006 by senior academics at London's Imperial College. The solution enables waste producers to recycle their food waste into a high quality compost on site and has already been recognised by numerous awards from both the catering and waste management industries.

Imperial College is renowned globally for the quality of its teaching with over 13,000 full time and 1,000 part time students enrolled at any one time and over 6,000 staff including academic, research and support personnel. Maintaining the highest academic standards also puts pressure on every service and support facility to achieve the utmost level of professionalism and to deliver the very best available, whether it be catering, human resources, health & safety or facilities management. In a climate of reducing funds, meeting this challenge is becoming increasingly difficult.

Following an extensive review in 2007, as a result of which a new Waste and Recycling Strategy was developed, the newly restructured Soft Services team, part of Facilities Management, embarked on an ambitious 3 year recycling development plan to raise Imperial College's approach to dealing with waste to a level that would represent the benchmark for the sector.

The Challenge

With around 90 different buildings across the Campuses, including research facilities at four London Teaching Hospitals, the task of introducing cost efficient, practical disposal solutions is rendered especially difficult, a fact confirmed by Waste & Recycling Manager, Nic Dent. Formerly a Manager in the NHS, Nic has introduced a series of initiatives during his two and a half year tenure at Imperial with the aim of increasing the College's recycling rate from around 19% in 2007/08 to 40% by the end of the 2010/11 academic year. "We generate around 50 different types of waste and our primary objective has been to streamline the collection and disposal of these across all our Campuses. These stretch across London and beyond so we have to co-ordinate our programmes with not one but several Local Authorities each of whom may work with different contractors and operate their own distinct set of initiatives, to their own schedule of goals and priorities. For example, our waste and recycling strategy at our main Campus on Exhibition Road is first discussed and agreed with Westminster Council prior to its implementation." In addressing the multiple waste streams, food has been recognised to be one of, if not *the*, most difficult to deal with and is the single largest waste stream at our main Campus in South Kensington which had not yet been tackled. In this instance, cost was not our foremost consideration as the College is able to benefit from subsidisation that is available to most UK educational establishments. As Nic explains: "During our cross-departmental discussions to identify the solutions available from which we intended to draw up our short-list, we discovered that our Department of Civil & Environmental Engineering had worked with IMC to develop a solution that appeared to meet all our criteria."

Despite the obvious provenance of IMC's system, and its endorsement by Sue Grimes, Professor of Waste Management in the Engineering Faculty, site visits were undertaken by the Facilities Management team to view a variety of systems in action including an alternative In Vessel Composter and a waste vacuum system. As Graham Watson, Head of Soft Services at Imperial College, comments: "The only benefit we perceived of the vacuum system was that of convenience to the waste producer by removing the waste as soon as it is produced; it does not remove the problem of the waste's environmentally friendly disposal and would, for us, have been prohibitively expensive to instal. With the other IVC, the requirement to mix green waste with an equal quantity of food waste was of no real value to us. However, our experiences at The O2 and the Army's new School of Catering at Worthy Down, where IMC's system has been adopted and where we were able to discuss the practicalities of the system with catering and facilities management staff, demonstrated to us unequivocally that this was the route we should go down. Even the Chief of Staff at Worthy Down was full of praise for the system and proud of their recycling and landfill diversion achievements as a result."

The College was also aware that the students' positive engagement in the scheme was important and that the chosen solution's green credentials should meet with their ethical approval.

The CompPod is delivered and craned into position requiring connection only to external mains services before being fully operational.

The Solution

IMC's pioneering system uses an IMC Food Waste Disposer to first macerate the food waste before extracting the solid fraction from the macerated waste by means of an IMC "WastePro" Dewaterer. The resultant dewatered waste is then mixed with a small quantity of compressed wood pellets and loaded into an In Vessel Composter (IVC) from which it emerges 6 to 8 weeks later as high quality compost that conforms with the Standards for Composted Materials BSI PAS100.

The CompPod's compact dimensions enable it to occupy only a small footprint. Over 1 tonne of food waste from multiple producers on site is composted here every week.

At Imperial College, food waste is produced from two main areas, the main refectory kitchen, that serves 3 dining halls, and two kitchens serving prestigious restaurants. There are also several cafes sited around the Campus. Around 1.1 tonnes of food waste are produced each week during term time. Working closely with IMC, the College has opted to address the disposal of food waste produced by the kitchen and dining halls at source, by equipping the kitchen with a Food Waste Disposer and Dewaterer which have been integrated into stainless steel tabling that also houses a spray hose reel. All food waste generated by the kitchen in the preparation and serving of the food, and by the dining halls from leftovers, is processed immediately and the dewatered waste kept in small, lidded 23 litre bins in readiness for composting. Food waste generated at the other restaurants on-campus is collected in marked bins for processing at a central location on site where the bins are emptied on to a sorting table, in order that any non-food items can be removed, prior to macerating and dewatering. The dewatered waste from both the central and outlying dining facilities is then loaded into the IVC in an operation that takes only a few minutes each day.

In a world first, the College has commissioned a self-contained, modular building in which to house the waste sorting table, with its own macerator and dewaterer, and the IVC. The building, referred to as the "CompPod", has been constructed and laid out in such a way as to aid compliance with the requirements of Animal By Products Regulations should the College choose to seek accreditation even though it is currently exempt. The CompPod therefore comprises all of the equipment recommended for best practice and housekeeping standards including even a radiator to keep the operator warm in the depths of Winter. Finishes to all the interior surfaces are easy to wash down and clean whilst the layout is designed to maximise operator efficiency by facilitating the smooth transition of the food from waste material to a high quality end product. Nick Roalfe, Director of Facilities Management, explains: "By going down the route of a self-contained, pre-fitted building we were able to avoid any structural changes and modifications to the College and significantly reduce the installation time. All services such as power, water and drainage, were brought to the location of the building

Food waste is first emptied from the waste collection bins on to the sorting table before being pushed into the hopper of the FWD. The captured dewatered waste is then loaded into the IVC. A utensil washer ensures the bins are kept clean.

Over 20,000 students and staff take advantage of the comprehensive catering facilities on campus at Imperial College.

in advance of its arrival; only final connections were then required on the day of installation."

Like his colleagues, Nick is keen to elevate the green status of the College and is confident that its current, rather lowly position in the Universities "Green League table" will be substantially revised the next time the League is refreshed. "We have also encouraged the buy-in of the students and have promoted the CompPod during the recent Green Week organised by the Students' Union. The very presence of the dedicated building helps convey the seriousness with which we have tackled this important issue. We are very proud of our 'world first' status and intend to enter into a number of Awards to not only help establish the College's credibility in this area but help generate awareness of the solution amongst the wider educational community."

The Results

With an all-inclusive investment of £140,000 in the CompPod and associated equipment to allow safe and eco-friendly disposal of food waste, Imperial College expects to make direct savings of around £104,000 in its first year of operation. As Nic Dent explains: "This solution deals with food waste before it is able to contaminate any other waste materials, some of which we are now able to recycle as well. We can now replace our skip compactors that were being used to collect general waste, including food, with our preferred, much cheaper and environmentally acceptable rotational compacting solution." These savings will only increase going forward meaning a worst case Return On Investment of around 16 months; furthermore, by dealing with the food waste at source, the College is no longer exposed to the vagaries and uncertainties that surround its disposal by other means. But, as Nic highlights, the benefits are much more than just financial: "The CompPod is a very visual and confident demonstration, especially to those staff and students who were initially sceptical of our total commitment to tackling waste disposal and its impact on our, and future generations', environment. As a compact, off-the-shelf solution that is scaleable according to the volume of waste that requires treatment and can be immediately operational upon installation, I would envisage our pioneering approach to be followed by many more establishments faced with this challenge."

Government approved

IMC's food waste recycling solutions, including the CompPod, have been approved by the Government procurement agency, buyingsolutions, and are available to all Public Sector establishments at preferential terms.

buying solutions

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