

Press Information

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Boxing clever

Harnessing excess in constrained space is one of the design challenges of today's streetscene

Michael Miles, director of Jones of Oswestry, explains.

Water deluges caused by intensifying rainstorms, litter overload from on-street recycling, root invasion from urban tree planting: modern factors affecting landscape design are creating distinct problems for specifiers.

But how do you manage these urban landscape excesses effectively, especially in street refurbishment where space is already cramped by existing underground services and built structures?

With some creative thinking underground, landscaping metalwork is offering a number of ways to 'box off' these problems, quite literally.

Surface drainage

Where surface drainage is concerned, solutions need to provide effective management of increasing volumes of stormwater runoff from hard landscaping.

According to climate change forecasts by UKWIR (2004), rainfall could increase by 40 per cent, with a 40 per cent increase in surface runoff and a 100 per cent increase in flood volumes.

C635 'Designing for exceedance in urban drainage – good practice' (CIRIA 2006) advises that, in almost all circumstances, the capacity of the gully grating will not be the cause of restricted inflow to the gully pot.

The guidance states: "It is more probable that the actual limit on inlet flow will occur at the connection to the underground pipe system."

Designers must find ways of attenuating surface water from extreme events using SUDS, to slow its release to our ageing and adequate sewer system. This might be in the form of surface storage, using culverts, for example. Or it might be solved using a gully system with integral capacity to store and manage excessive stormwater volumes without overwhelming the sewer.

Super-sized gully

The use of a proprietary super-sized gully may certainly be the most feasible option for developed sites, where the retrofitting of surface flood channels around existing infrastructure can be difficult.

It can also provide a cost-effective, space-efficient solution for new developments where aesthetics, and again space limitations, preclude the diversion and attenuation of exceedance waters at surface level.

This was the case in providing drainage to the Grand Stairs at LA4b Discovery Axis, part of the Paradise Project, Grosvenor's £1 billion regeneration of the heart of Liverpool.

The Paradise Project is creating Liverpool One, six interlinked districts over 42 acres, master-planned by Grosvenor and BDP. Another 25 firms of architects have designed individual buildings, while Laing O'Rourke, Balfour Beatty and Kier are main contractors. Grosvenor was selected by Liverpool City Council (LCC) as developer for the Paradise Street Development Area (PSDA) project in March 2000.

BDP specified curved-on-plan drainage grating systems from Jones of Oswestry, incorporating Supradrain large capacity gullies, to provide drainage at different levels of the feature circular staircase which emerges in Chavasse Park.

Controlled release

Supradrain super-gullies incorporate an extra large capacity box channel designed to handle the increased volumes and speed of precipitation characteristic of modern day rainstorms. As well as extra storage capacity, the channels give controlled release of water to the sewer via a special connection. This prevents the overload which can cause backing up and flooding.

For Discovery Axis, the Supradrain was specially designed to fit limited construction depth while meeting hydraulic performance criteria set by the drainage engineers, Capita Symonds, based on a storm return period of a 1:30 year event.

Colin Harrison, Senior Engineer at Capita Symonds, said: "Due to the large underground car park structure, we did not have the height, from finished pedestrian pavement levels to the top of the underground concrete slab, to fit a conventional 'off the shelf' drainage system.

“With our client's agreement, we proposed a bespoke drainage system with shallow channel by Jones of Oswestry that provided the same flow capacity as a standard system. The drainage solution also utilised an offset slot system to sit aesthetically with the above ground paving patterns, providing a better, high quality visual finish.”

Four curved drainage assemblies, totalling 135m in length, were designed for the staircase. A further two linear drainage runs were designed for adjacent retail areas, also reduced in depth to suit shallow slab.

On top, they incorporate a continuous drainage slot, interspersed with Aquaslot recessed gratings giving access to catchpits or sumps below. This presents minimalist lines of metalwork while allowing maximum paviour coverage, to reduce the risks of slips and trips and easing passage across for wheelchairs in response to the DDA.

Below, the gratings are teamed with Supradrain channels, reduced in depth to 100mm for installation in the shallow construction concrete slab. To compensate, they are 300mm wide to provide generous water holding capacity.

Street trees

Bringing many qualities to the streetscape, tree planting remains integral to urban regeneration. But for designers, tree establishment comes with some concerns.

Among them, is the risk of clay heave resulting from trees taking up moisture, and the potential impact of root systems on underground services and existing buildings. In fact, the Association of British Insurers claims that as high as 70% of subsidence claims are due to trees.

Tree grids, used to protect and anchor trees, can be adapted to meet these concerns.

Jones of Oswestry's Arborslot recessed tree surrounds with integral root retention boxes have been installed as part of Phase 1 of the Victor Road Environmental Improvement scheme in Bradford.

The improvements are creating a link between Lister's Mill and Lister Park, via Victor Road. Now redeveloped into stylish apartments, the vast mill and former silk warehouse lies within a conservation area north-west of the City, and has a 250 foot high chimney that still dominates Bradford's skyline.

Leafy avenue

Saira Ali, the project designer for the Landscape Design Unit at the City of Bradford Metropolitan District Council, said: ““One of the key objectives of the Victor Road environmental improvement scheme was to form a key axis between the new public space planned at the base of the mill chimney and the Park. This would be achieved by

improving the quality of the public realm and visual environment of the street and houses on Victor Road to create a calm, leafy avenue.”

The recessed design of the Arbor-Slot grid allows paving to be carried close to the tree bole. This provides a pleasing visual harmony with surrounding paving design and continuity of the tone, quality and treatment of predominant paving materials.

“We wanted a tree grille surround that would tie into the surrounding area and bring the whole thing together, as continuity was important,” comments Saira Ali. “Due to the proximity of services, we also needed some form of root retention and a sympathetically designed tree guard to protect against impact. Arborslot, with its root-box and tree guard additions, met these needs.”

The root retention box prevents root spread that could affect underground services and structures, and has an integrated aeration/irrigation system to ensure healthy tree growth.

Slots provided in the tree grid will allow it to be mechanically lifted when planting of the chosen tree species - Tilia Cordata “Streetwise” and Prunus Avium “Plena” - takes place this autumn.

On-street recycling

LA ‘Recycle on the Go’ initiatives in towns and cities are driving demand for products to encourage effective on-street recycling of litter.

The new Ecochute recycling bin system from Jones of Oswestry provides segregated collection of recyclable litter – typically glass, plastic, card and cans/metal. Like systems successfully used on the continent, it has the added advantage of providing substantial underground storage capacity. This reduces the frequency of collections as well as minimising the potential for unsightly litter overflow and associated health risks from vermin.

Versions typically seen on the continent require proprietary equipment on specialized vehicles to lift and empty the integral litter receptacle. In contrast, Ecochute eliminates this need, by using standard wheelie bins and incorporating an integral winch for removal and emptying within manual handling requirements. This offers much greater flexibility, convenience and cost-savings in the servicing of installations to encourage the uptake of recycling schemes in the UK market.

Standard installations offer the choice of one, two or four recycling chutes, with signage and aperture configurations designed to reduce the problem of cross-contamination.

Aimed at encouraging on-street recycling, Recycle on the Go was created by DEFRA (Department for Environment, Food and Rural Affairs) with the help of environmental charity Encams.

With one of the lowest recycling rates in Europe, the UK needs to reduce the amount of waste going to landfill by nearly two thirds by 2020 to meet EU targets.

Costs

The main costs associated with on-street recycling are typically collection, MRF (materials recycling facilities) charges for sorting, and bin maintenance. Ecochute is designed to reduce the onus of all three of these costs.

Firstly, the use of wheelie bins with generous capacity reduces the frequency of collection, and means that waste can be directly and quickly removed from the Ecochute, aided by the mechanical hoist, with minimum fuss.

Secondly, materials are already segregated into the robust, transportable structure of the wheelie bin.

And thirdly, the integrated chute and recessed cover are hinged into a rigidly anchored frame, providing a highly resilient, anti-vandal structure while affording lockable protection of the storage chamber below.

Jones of Oswestry is currently establishing trial sites for Ecochute with public and private sector organisations.

ENDS

Jones of Oswestry is a leading designer and manufacturer of steel lintels and landscaping products including access covers, drainage gratings, tree surrounds and disability access ramps.

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Photos:

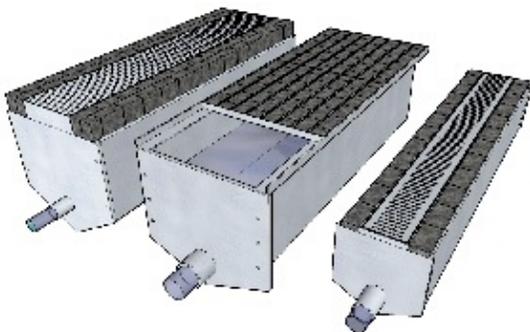


Image ref: 27020

Super-size, slow release drainage gullies are one answer to surface water flooding, increasing water holding capacity underground while controlling release to the sewer.



Paradise Project photos (L to R refs: 4321, 4172, 4181, 4347)

Slotted drainage with extra capacity Supradrain channels by Jones of Oswestry at Liverpool's Paradise Project. Four curved drainage assemblies, totalling 135m in length, were designed for the Grand Stairs at LA4b Discovery Axis, reduced in depth to suit the shallow slab construction over an underground carpark. A further two linear drainage runs were designed for adjacent retail areas.



Photo ref: Victor Road 3456

Jones of Oswestry's Arborslot recessed tree surrounds with integral root retention boxes have been installed as part of Phase 1 of the Victor Road Environmental Improvement scheme in Bradford.



Photo ref: Victor Road 3.7.08.011
Photo courtesy of City of Bradford Metropolitan District Council.
 Arborslot tree surrounds, with sympathetically designed tree guards to protect against impact, ready for tree planting at Victor Road, Bradford.



Photo ref: Bristol 5075
 Softening urban landscaping with tree planting – recessed tree grids allow maximum paviour coverage, reducing the risks of slips and trips and easing passage across for wheelchairs in response to the DDA.



Photo ref: Ecochute 4852

LA 'Recycle on the Go' initiatives in towns and cities are driving demand for products which encourage effective on-street recycling of litter.



Photo ref: Ecochute 4509

Like systems successfully used on the continent, Ecochute has the added advantage of providing substantial underground storage capacity, but uses standard wheelie bins to appeal to the UK market.