



THE BRIEF:

LOW-IMPACT GARDENS

Pre-Registered SGD Member **Rachel Bailey** looks at ways to design more sustainable gardens with less waste and resources and a lower carbon footprint

Apart from reducing waste, when designing and building gardens to have as low an environmental impact as possible, we need to design using a systems approach and consider the whole lifecycle of the design and the garden. This includes the materials on-site that we can reuse, which might normally go in a skip; the new materials we bring in; and the end of life of the material or product. It also includes the amount of planting included in the design and what we are planting.

We need to design for longevity, using good-quality products that are well crafted or built and ideally can be easily fixed or replaced at the end of an individual component's life. Items should be designed with dismantling in mind, not demolishing. Flexibility is key too – can the design be adapted to accommodate different needs in the future? This would save the garden from having to be ripped out and started again from scratch.

ABOVE On a challenging coastal garden project, Bailey used gravel mulch to retain water in this exposed location and suppress weeds, to help create an attractive but lower maintenance garden
OPPOSITE For this new build garden, concrete pavers laid by the developer were lifted and turned into wildlife habitats





SIMPLE STEPS

Easy ways to make your practice more sustainable

- Communicate clearly with clients about a sustainable approach from the start of a project
- Design gardens with less paving
- Choose materials with lower embodied carbon
- Use a carbon calculator (eg Pathfinder) designed for the landscape industry to carbon audit your practice and designs (climatepositivedesign.com)
- Use more plants in your schemes
- Aim for the highest sustainability performance standards in your designs and practice
- Reduce and limit the power tools and energy used in garden aftercare and maintenance



ABOVE For the coastal garden, Bailey used the existing builders' rubble-filled soil as a low fertility planting substrate. Large boulders and smaller rocks were used to add height and interest, and the whole life cycle of materials such as timber were considered

Existing materials

When approaching a new design, take note of materials on-site during the site survey and ask the following questions. Could these be re-used as they are elsewhere in the design? Could they be used as a low fertility substrate, or a sub-base material? Could they go to a local reclamation yard? Do they need to be replaced at all?

In a recent garden I designed and built, we lifted the new concrete pavers that had been laid by the housing developer, and created seats that were also wildlife habitats. I also used them for paving utility areas, such as for the bins, which are normally tucked out of site. On another project, which had dreadful access, we re-used existing stone onsite. The uplifted stone was combined with concrete from an old in-situ concrete path that was far too narrow, and

where the sub-base had sunk on one side, making it very uncomfortable to walk down. By lifting, cutting and relaying the concrete combined with the stone, we created a Japanese-inspired path.

On a different garden build, we produced very little waste. Most of the ground was builders' rubble from a house extension that was demolished and buried in the garden, with a thin (max. 50mm) topsoil on top. We worked with this. I selected plants that would thrive in the low fertility substrate – I did not remediate the 'soil' at all. When additional 'soil' was needed for planting, I used a combination of horticultural sand and seed compost, which is of low fertility.

New materials

When choosing new materials for the garden, consider the embodied carbon

of what you choose, opting for those that sequester carbon, such as timber, or have a low embodied carbon content where possible. What will happen to the material at the end of its life? Could you use a reclaimed or recycled product, which would have a much lower carbon footprint? One example would be using a recycled-plastic gravel stabiliser rather than virgin plastic.

For big projects where large quantities are needed, recycled aggregate for mulch or paths and crusher-run for sub-bases can be bought directly from quarries where they process these materials. I am investigating where we can get smaller quantities of recycled aggregate and crusher-run for smaller projects because of the lower environmental impact these products will have over Type 1 hardcore and newly excavated gravel.

Paving has a high embodied carbon, but it can last a long time, so the lifetime embodied carbon could even out. However, we need to be mindful of houses and gardens changing hands, and people

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wanting to change the garden. Therefore, designing with flexibility and longevity in mind is best, including ease of dismantling. How is the paving fixed? Would it be possible to lift the paving so it can be reused elsewhere in the garden or passed on to a reclamation yard? We need to balance the longevity of the paving staying put and it being easy to lift, clean up and re-lay. Consider moving towards using truly sustainable materials, such as PEFC/FSC certified timber and timber products as part of a biotic circular economy.

In a circular economy, the product or material would go back to the manufacturers to reuse the components, rather than just go to generic 'recycling'. As designers, we need to be asking suppliers if they will take the material back either for restoration and reusing or repurposing. For

example, Ecodeck take back any offcuts and the composite decking at the end of its life to be reprocessed into new planks. This information needs to be communicated clearly to the client in written form, so that the information can be passed on to new owners with the house and garden if the client moves.

Concrete conundrum

We need to minimise the amount of concrete used onsite and also find alternatives. Keep concrete foundations to where they are absolutely needed. Going back to longevity, consider elements that are normally embedded in concrete, such as pergola and deck posts. The timber could need replacing in time, so use post-bases or feet so the timber can be removed without need to dig up the concrete. This approach

also has the added advantage of increasing the life of the timber.

For decks and bases for timber structures like summerhouses and sheds, you could use ground screws. These do not require concrete at all and can be removed and reused as needed. They can also be used to create a level base on sloping ground.

Sloping sites

When faced with a sloping garden, do not immediately think that it needs to be levelled. Consider working with the slopes to minimise big excavations, which disturbs the soil and releases carbon, and can result in vast quantities of soil going to landfill. By working with the slope, we can reduce the number of walls that are required, and therefore concrete foundations, which all reduce the embodied carbon associated with the garden. Working with slopes also can create an interesting garden and greater opportunities for habitats.

Where some 'walls' are required, look at alternative methods of soil retention, such as Geogrids and Envirolok-type

ABOVE The informal naturalistic design was created to link the house and garden to the wider natural landscape. Bailey produced very little waste on the build and chose plants that could manage the existing conditions and would not require many additional resources

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ABOVE Bailey lifted a range of existing paving materials on this project and reused them to make a new bicycle access path at the back of the property

products, which offer the opportunity for a softer, planted finish. These do not require concrete foundations, though advice should be sought from companies that sell these products. Similarly, as with any terracing with multiple walls and earth retention, structural engineering advice should also be sought. Consider reusing any soil that does come from excavations within the garden to create an interesting landscape – of course, this goes for all gardens, not just the sloping ones.

I am currently designing a garden on a huge slope – a 10m difference from the house to the top of garden. We are not building a single wall, but using Geogrids and Envirolok bags (a bit like sandbags), which will be back-filled with soil from site to help retain the slopes. The slopes will all be heavily planted. The Geogrids used

nearer the house will offer the opportunity to create a kind of green-wall effect, but without the irrigation and feeding, and will be more attractive than the en masse planting needed with the Envirolok bags.

We are bringing in paving for a terrace, but this will not be a solid terrace, which would have a huge carbon footprint. Instead, it will be combined with gravel and planting to reduce the quantity of stone required, and in turn lower the embodied carbon. Planting will include low, mat-forming plants, such as *Pratia pedunculata*, *Trifolium*, *Ajuga reptans* or *Sesleria caerulea*. Combining low groundcover plants with mound-forming plants, such as *Carex divulsa*, that are suitable to the location will circumvent the need for cutting a lawn, but offer that open green space to allow the garden to breathe.

“CONSIDER REUSING ANY SOIL THAT DOES COME FROM EXCAVATIONS WITHIN THE GARDEN TO CREATE AN INTERESTING LANDSCAPE”

Planting picks

Evergreens are important in planting design, but schemes should include lots of deciduous trees and shrubs, because they sequester more carbon than the equivalent-sized evergreen counterpart. Layer planting to include as much diversity as possible, which will help protect the soil from erosion, bind it with roots, sequester carbon and create a beautiful, natural place to be.

I always incorporate as many of the existing mature trees and shrubs within a new design as possible. They also add to the design rather than take away from it, and with a little judicious pruning, they can often add character you cannot buy. ○

There are several recent free webinars by experts in their field on sustainable design solutions for the landscape industry, organised by Rachel Bailey and Becca Duncan, available to view online now. Go to YouTube and search for ‘Rachel Bailey Garden Design’ to find the channel.