



Kim Wilkie's earthwork at Great Fosters in Surrey helps block sound from the nearby motorway

Photo: Clive Nichols

EARTH-MOVING DESIGNS

In the first of a new series, [Annie Guilfoyle](#) looks into what you need to know to create landforms and earthworks

To most designers the word 'landform' will conjure up images of the extraordinary Garden of Cosmic Speculation created by Charles Jencks, or the exquisitely sculpted landscapes of Kim Wilkie. However, I want to find out if landforms work in a more modest setting, and how designers should approach this type of project.

Study the native landscape – it is full of lumps and bumps. Then delve deeper into history, and you will discover that man has always played a large part in contouring the countryside. Landforms were created to be places of meeting and worship, burial grounds or to create a lookout in order to spot rampaging

rebels. Building a monumental hillock was what you did if you lived in Neolithic times. Long barrows, round barrows and henges are all early evidence of man-made landforms. Possibly the finest example of this is the magnificent Silbury Hill in Wiltshire, the largest man-made mound in Europe.

Man continued to mould and mound the earth in later history to express wealth and status rather than to conceal or cremate. Dartington Hall in Devon boasts the most splendid tiltyard: a series of steep, grass steps created in the 14th century to view jousting competitions.

Possibly one of the most intriguing Elizabethan landforms was Lyveden New Bield, created by the recusant Thomas Tresham; he concealed his Catholic beliefs by shaping the land into representational forms, containing secret biblical references. At Claremont in Surrey, Charles Bridgeman's 18th-century amphitheatre looks as innovative today as it did back then. And I cannot write about earth moving without a nod to the much-slated Mr Brown and his formulaic landforms that swept the 18th-century countryside, sometimes eradicating the formal gardens that went before. Throughout history, landforms have been created not only for practical or symbolic reasons, but also for aesthetics. Nothing much has really changed.

Projects for inspiration

Jim Buckland, gardens manager at West Dean in Sussex, told me how 15 years ago, as part of the refurbishment of the gardens, it was necessary to screen the garden from the road. A large amount of concrete spoil had been excavated from the old farmyards; it would have been costly to remove this from site. →

In order to elevate the perimeter planting, concrete spoil was laid in a long undulating bund approximately 70cm to 1m in height; the bund varied in depth from between 3-5m from front to back. Topsoil was scraped off the adjacent fields (in order to prepare them for wildflower meadow planting) and was heaped onto the concrete bund. Tree saplings were then planted into the topsoil and now there is an established woodland landform that offers ample screening as well as filtering road noise.

At RHS Garden Hyde Hall in Essex, Matthew Wilson and landscape architect Chris Carter carried out a similar project on an area about the size of a tennis court. It was covered with roughly 100 tons of crushed rubble, concrete and brick, which was destined for landfill. Huge gabbro boulders were used to hold the substrate and topsoil in place (creating an impression of a Mediterranean hillside). The placement of the rocks was crucial to ensure that the landform looked natural. Over the substrate they graded 400mm of native topsoil, which accentuated the shape of the bund. This was mixed with a high proportion of grit to aid drainage, as the local soil is clay based. It was planted with drought-tolerant plants in the spring of 2001, and has not been watered since.

At Easton Walled Garden in Rutland, Lady Ursula Cholmeley built a meandering grass bund, approximately 1m high, which effectively screens off the composting and bonfire area from the rest of the garden. The sloping sides are easy to mow and the top can be safely trimmed.

Planning & design

Before designing, it's always best to check if planning permission is required, so I contacted Martin Goodall LRTPI, consultant solicitor and planning specialist. He explained that planning permission for landforms or earthworks in a domestic garden falls into a 'grey area' that does not seem to require any planning consent, unless the earthworks require extensive building and/or engineering.

When planning the work, it is also essential to consider how this style of landform will be maintained. Can it be cut by hand or machine? Will it be firm enough to walk on? Will it support the weight of a mower?

If designing a landform with sloping sides, it is important that you identify your soil type in order to establish the 'angle of repose'. This is the maximum angle that your soil will remain stable, before it fails or subsides. Each soil type has a maximum angle of repose – however, this can be influenced by other factors such as moisture content, land stability or vegetation.

Structural engineer Jane Wernick CBE FREng Hon FRIBA, director of engineersHRW, has some general advice for garden designers planning on earth moving. "Your initial considerations are what the landform is to be made of and what its foundation will be," she explains. "The landform will need to be stable, durable and safe to access, therefore ask yourself: Can it be made from materials available on the site? Does it have steep slopes? All soils have a maximum slope at which they are stable. If you want them to be at a greater slope you can use methods such →



Photo: Annie Guilfoyle



Photo: Jason Ingram/Hauser & Wirth



Photo: Annie Guilfoyle

"LANDFORMS WERE CREATED TO BE PLACES OF MEETING AND WORSHIP, BURIAL GROUNDS OR TO CREATE A LOOKOUT IN ORDER TO SPOT RAMPAGING REBELS"

CLOCKWISE FROM TOP LEFT Dramatic landforms in the Rolawn: Why? conceptual show garden by Tony Smith at RHS Hampton Court 2016; simple grassy mounds at Hauser & Wirth Somerset; a 13m-high viewing mount at Scampston Walled Garden in Yorkshire; 'Marchants' 'Mump' is the perfect place to view Graham Gough's garden

Photo: Andrea Jones

LANDSCAPER'S LANDFORM TIPS

Award-winning landscape contractor **Steve Swatton** shares his checklist of major considerations for designers embarking on a landform scheme.

1. Access for machinery: Unless the feature is relatively small, diggers and dumpers are the tools for the job. The amount of earth or material to be moved is usually balanced with the size of machine. Access and working space set the practical limitations and therefore size of plant you can use effectively.

2. Soil stability: A sandy soil can erode quickly if used on steep banks and heavy clay is often hard to grade depending on ground/weather conditions. Landscape matting can reduce erosion and give a stable base for planting.

3. Slope angle: If it's greater than 45 degrees, it ultimately becomes more difficult to stabilise the soil. As the angle increases you may have to consider additional methods of soil stabilisation.

4. Soil depth: When using rubble or spoil as a sub-base make sure that it is compacted in layers, in the same way as the soil. Allow for adequate soil depth for growing grass, plants or trees.

5. Communicating your scheme: Sections are the best form of understanding and calculating existing ground. A model is also useful to communicate forms to your contractor. Spirals and domes are difficult to show in plan without studying lots of existing and proposed levels.

6. Calculations: Working out material quantity build up or use can be complicated in a 3D design, so if you're inexperienced, make it clear so the contractor is aware your calculations are only approximate and they should carry out their own to verify.



FURTHER READING

BOOKS

The Garden of Cosmic Speculation

by Charles Jencks
ISBN 978-0711222169

Led by the Land

by Kim Wilkie
ISBN 978-0711233256

The Universe in the Landscape: Landforms

by Charles Jencks
ISBN 978-0711232341

ONLINE

- planninglawblog.blogspot.co.uk
- www.ehrw.co.uk
- www.istructe.org/finding-a-structural-engineer
- www.engineers-hrw.co.uk
- www.swattonlandscape.com

A graduated spiral mount in the wildflower meadow at Highnam Court in Gloucestershire

Photo: John Campbell

as earth reinforcement, or stepped retaining walls. Rock can be much steeper – even vertical or overhanging. Soil and rocks are very heavy,” she continues, “so unless the ground below is very stiff, ie, is rock, gravel or sand, there will be settlements. These can be calculated once you have information about the ground. You then need to consider if settlements are a problem or not.”

Wernick also recommends checking if the ground on which the landform is to be built is flat or sloping. If the latter, it will be necessary to consider what would stop it from sliding. “Because the landforms are heavy they add what we call ‘surcharge’ to the ground they sit on. This is significant if the landform is on top of some soil that is being supported by a retaining wall, as the soil will then put a larger horizontal force onto the wall. So an engineer will need to check that the wall can take that extra load.”

Drainage is also important. Is the landform going to be permeable to water, and where will the surface water go? Lastly, she says durability needs to be carefully considered. “It is generally a good idea to seek the advice of a structural or civil engineer,” Wernick says. “They will be able to advise on whether you need to employ them on any landform project that you are about to undertake.” ○

Discover how Charles Jencks creates his land art on page 58

**“DELVE DEEPER INTO HISTORY,
AND YOU WILL DISCOVER THAT
MAN HAS ALWAYS PLAYED A
LARGE PART IN CONTOURING
THE COUNTRYSIDE”**