

Sustainable Landscape Construction:

Materials and Products — Brick¹

Gail Hansen²

BRICKS ARE a commonly used material in landscapes because they are durable and low-maintenance, and they can be used in a variety of applications or recycled or re-claimed for use multiple times. Bricks are made from clay and pulverized shale, which is natural, non-toxic and abundant. The manufacture of bricks can often use recycled materials, such as clay from the by-products of mining operations, or bottom ash, a recycled material from coal-fired power plants. Although bricks use more energy than concrete in manufacturing, the energy source, natural gas, is cleaner than the coal used for concrete. On-site recycling of materials also minimizes waste material. It is not recommended, however, that salvaged historical building brick be used for patios, driveways, or terraces. Horizontal applications require stronger, denser, and more water-resistant brick pavers. Most of the environmental impact from bricks comes from their manufacture: bricks and mortar are inert and will not contaminate a site. Various design and construction techniques should be used to make the on-site environmental impact of bricks even lower, and to increase the lifespan of brick installations:

DESIGN STRATEGIES

- **Minimize cutting.** Design structures that use the whole brick in order to reduce cutting of bricks for less waste.
- **Use bricks to create pervious paving.** There are no porous clay bricks, but you can design brick pavements to allow water flow by laying the bricks in a pattern with voids (spaces between bricks) and filling the voids and joints with gravel or aggregate.
- **Use plastic spacers.** Plastic spacers between the bricks will interlock the bricks and make them more stable. Brick pavements with plastic spacers should only be used for pedestrian and light vehicle areas.

- **Choose sustainable mortars.** Avoid mortars with color pigments from metal oxides such as cadmium, zinc or lead chromate, and lithopone. These can be toxic.

CONSTRUCTION TECHNIQUES

- **Use sand for horizontal structures.** Setting brick pavers on sand allows for easy removal and replacement. (Use weep holes every 12 inches on a concrete slab if the pavers are laid on a sand base over the concrete.) Flexible, sand-laid brick pavement is more durable than rigid mortar-set pavement. Cracks in mortar are difficult to repair, and typically the entire installation needs to be replaced.
- **Construct joints carefully.** Most brick structures fail at the joints. Tool the mortar joint to shed water and compact the mortar. Use concave, V-shaped, or weathered joints and avoid weeping, struck, flush, raked, or extruded joints.
- **Design for good drainage.** Use wall caps with overhangs and flashing or drip kerfs under the caps. Use chamfered bricks below recessed bricks to shed water from joints.
- **Recycle damaged or mortar-spotted bricks.** Separating mortar from brick is not only labor intensive but it usually damages the bricks. Save these and crush them for reuse as a mulch or base material.

Adapted from:

Calkins, M. (2009). *Materials for sustainable sites: A complete guide to the evaluation, selection, and use of sustainable construction materials*. Hoboken, NJ: John Wiley & Sons, Inc.

Sovinski, R. (2009). *Materials and their applications in landscape design*. Hoboken, NJ: John Wiley & Sons, Inc.

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² Gail Hansen, assistant professor, Environmental Horticulture Department, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.