UF UNIVERSITY of FLORIDA
IFAS Extension

ENH 1150

Sustainable Landscape Construction:

Materials and Products — Metals[1]

Gail Hansen[2]

THE DURABILITY and recycling potential of metal makes it a very sustainable exterior material. Metal structures will last several decades, which helps to offset some of the environmental impacts caused by the mining, manufacture, and production of this material. Metals can be recycled many times without compromising performance by adding them to the melt in furnaces, where they are fully restored to a new metal. The use of recycled metal scrap substantially reduces energy use, pollution, and mining impacts. Although metals weather well, some conditions do corrode them. These include acidic rain (from vehicular emissions), seawater contact, airborne salt, and industrial and urban pollution. Stainless steel is the most corrosion-resistant and aesthetically appealing metal for outdoors. It requires no surface treatment and can last 50 years or more. Marine-grade aluminum is a good choice for corrosion resistance in coastal environments. Copper will weather with a patina that protects the metal from corrosion.

Design and construction techniques with metals include:

DESIGN STRATEGIES:

- **Design to expose surfaces.** This way, rain will wash away surface contaminants. Use the highest grade of metal on surfaces that will not be cleaned by rain. Stainless steel, a common metal for outdoor kitchens, can be cleaned with soap and water.
- **Specify materials with a high recycling potential.** These include stainless steel, copper, and aluminum. Cor-Ten steel, which is often used in landscapes, is 95% recycled content.
- **Design structures to make disassembly and reuse easier.** For example, use mechanical fasteners rather than welding. Salvage and re-use whole metal members to reduce smelting, forming and finishing of the recycled metals.
- **Design to protect the metal.** Minimize rough surface finishes and crevices from joints and prefabrication that tend to trap corrosives. If you use a surface finish, orient the grain vertically to shed water.

CONSTRUCTION TECHNIQUES:

- **Prevent galvanic corrosion.** Use coatings or plastic or rubber gaskets. These will prevent galvanic corrosion between two metals.
- **Use a protective finish.** With the exception of stainless steel and weathering steel, all steels should be finished by galvanizing, powder coating, painting, or another finish to prolong life. Choose powder coating over solvent-based coating. Powders adhere through an electrostatic process and contain no solvents that will release VOCs (volatile organic compounds).
- **Consider a mechanical finish.** Buffing, polishing, and blasting are better than chemical finishes that release toxic wastes.
- **Prevent erosion and rust.** Avoid exposed fasteners, rivets, and right angle joints, which can collect water and pollutants. Instead, use simple joints. Create holes or gaps for drainage, and prevent bimetallic erosion by using fasteners that have equal or greater corrosion resistance but are compatible.

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.

[1] This document is ENH 1150, one of a series of the Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date, October 2009. Visit the EDIS Web Site at http://edis.ifas.ufl.edu.

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