

Low-Impact Development at Aikido in Fredericksburg

Designed in harmony with nature



For more information about Aikido in Fredericksburg, our facilities, and programs, go to www.familyaikido.org or phone us at 1.540.582.9600.

"Those who practice the Art of Peace must protect the domain of Mother Nature, the divine reflection of creation, and keep it lovely and fresh".

—O'Sensei, the founder of Aikido

Designed in Harmony with Nature



The program at Aikido in Fredericksburg is modeled after the Iwama Dojo in Japan, which emphasizes environmental stewardship, appreciation of the outdoors, and connection with the natural world, in addition to martial arts training. Therefore, the dojo facility was designed using Low-impact Development, which minimizes negative impacts on the environment and provides opportunities to observe and interact with our natural surroundings.



What is Low-Impact Development?

Low-Impact Development (LID) is an approach to environmentally friendly land use planning. This approach uses nature as a model, emphasizing native plants and minimizing manmade disturbances such as lawns and pavement. Instead of digging a large pond to hold stormwater runoff from rooftops, paved surfaces, and surrounding land, small, cost-effective landscape features are used to mimic a watershed's natural hydrology. These features work like their counterparts in nature

to decrease and slow runoff, minimize pollution and erosion, and lessen damage to streams, rivers, and coastal waters. LID can be applied to new development or retrofits.

Some common benefits of LID include: decreased costs of stormwater management, easier maintenance, more groundwater recharge, cleaner streams and rivers, increased tree cover, reduced heat islands, better air quality, reduced thermal stream pollution, and preservation or creation of wildlife habitat, and they are more aesthetically pleasing.

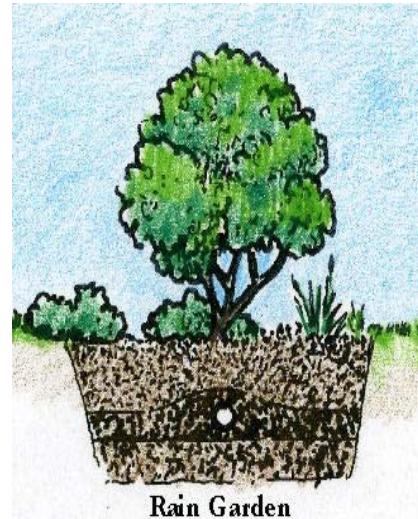
Elements of LID

Around the site you'll see several LID elements.

Grassed swales are used in place of curb and gutter systems. These open, shallow channels slow runoff, filter it, and promote infiltration into the ground; as a result, runoff volumes and peak discharge rates are lower, and the runoff is cleaner.

Infiltration trenches store water in the open space between crushed stone, allowing the water to slowly percolate into the subsoil. The trenches work in conjunction with raingardens, which provide an overflow outlet for runoff, when large storms cannot be fully contained by the trench.

Raingardens, or biofilters, are shallow depressions filled with porous soil, topped with a thick layer of mulch, and planted with drought- and water-tolerant vegetation. The soil, plants, and microbes provide natural treatment of stormwater, which flows into the raingarden and slowly percolates into the groundwater. Some of the water is also taken up by the plants. Raingardens remove pollutants better than conventional infiltration structures: as much as 75% of phosphorus and nitrogen; 95% of metals; and 90% of organics, bacteria, and total suspended solids.



When raingardens are used, water that enters our rivers and streams is cleaner, and so is the water that eventually recharges the groundwater that fills our wells. Not only do they look nicer than conventional stormwater ponds, raingardens provide windbreaks, absorb noise, provide wildlife habitat, and reduce the urban heat island effect. In many cases, they also cost less to install and maintain.

The small **Reforestation Area** is a planting of native trees and shrubs to replace pre-existing lawn. Trees and shrubs absorb nutrients and pollutants before they can enter groundwater or local streams. Infiltration rates of forests are 10 to 15 times higher than those of grass turf areas. Deep-rooted trees and shrubs also anchor valuable soil to prevent erosion and provide food and shelter for wildlife.

Our **Wildlife Meadow** is an area of native warm-season grasses mixed with wildflowers. It provides cover and nesting sites for birds and well as food for birds, insects, and mammals. The area is mowed only once a year, (compare that to your lawn!) so as not to disturb nesting animals, and does not require the application of any chemicals that make their way to our waters.

The meadow's deep-rooted grasses anchor soil and prevent erosion, while the plants absorb water. This decreases runoff to the tributary of the Ni River located at the far north end of the property. Just half an acre of meadow replaced the need for one stormwater detention pond.



Rain Barrel

Rain barrels provide free, soft water for such uses as watering plants, irrigation, and car washing. Property owners save money on their water bills and public water systems experience lower peak water demand. Rainbarrel water can even be used during outdoor watering bans.

Protecting the Chesapeake Bay

The Chesapeake Bay is the largest estuary in the U.S. It is a complex ecosystem that includes important habitats and food webs. The Bay is downstream from the runoff from 64,000 square miles in six states and Washington, DC. This runoff degrades the bay by adding unwanted pollutants and nutrients. This is called non-point source pollution (NPS). NPS comes from every parcel in the region and is now recognized as the primary threat to water quality in the United States.



Everyone in the watershed lives just a few minutes from one of the more than 100,000 streams and rivers that drain into the

A Rainbarrel is commonly a plastic 50-gallon barrel. It collects rainwater during periods of drought or to reduce overall water consumption from municipal supplies. Widespread use of rain barrels reduces the amount of rainwater reaching the ground and draining into streams and storm drains. It therefore reduces erosion, sedimentation and pollution and prevents stormwater drainage systems from being overwhelmed.

Bay. Each of these tributaries can be considered a pipeline from communities into the Bay and its rivers. Everything we do on the land – including the use of automobiles, fertilizers, pesticides, toilets, water, and electricity – affects the streams, the rivers, and the Bay.

To help restore the Bay, you can be careful about what you do in your own community, home, and backyard. If you have the opportunity, choose LID over conventional development techniques, like we did here.

What can you do?

Lawn mowers, blowers, and other powered lawn maintenance equipment pollute, while extensive tracts of grass are contributing to a shift in soil ecology and animal populations. They are also increasing lawn-loving pests. Excessive use of chemicals (fertilizers and pesticides) used to keep lawns green and lush are affecting water systems, animal (including human) health, and climate.



Consider replacing a portion of your lawn with native trees, shrubs, grasses, and flowers. Even just keeping your lawn taller (~3") provides benefits such as a healthier root system which results in more water absorption and less runoff.

With sprawling development, there has been a significant loss of natural areas. By providing wildlife habitat on your property you are

helping to offset the losses, while providing a place to view the wonders of nature up close.

Use nature as a model.

Introduce a variety of native plants and include some that produce flowers, nuts, berries, or seeds. Provide water by putting in a pond, fountain or birdbath, if you don't have natural water bodies nearby. Mosquitoes won't be a problem in a backyard pond, if fish are added. Birdbaths should be emptied and refilled daily, and cleaned weekly to keep birds healthy and prevent mosquitoes.

A variety of evergreen and deciduous trees can provide nesting places, as can thickets and brush piles, fallen logs and even dead tree snags. Artificial homes can be created to further attract birds, butterflies, bats and toads.

LID Resources

Ask questions and take advantage of the many local and regional agencies and organizations that can provide assistance with LID and habitat enhancement projects. Following are contacts that were helpful in Aikido in Fredericksburg's efforts to improve our community:

- Virginia Department of Conservation and Recreation www.dcr.state.va.us
- Chesapeake Bay Program www.deq.virginia.gov/bay
- Virginia Cooperative Extension www.ext.vt.edu
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- United States Department of Agriculture www.usda.gov
- Tri County/City Soil and Water Conservation District www.tccswcd.vaswcd.org
- Virginia Native Plant Society www.vnps.org

Consider this...

- In rough figures, approximately 97% of the Earth's water is in oceans—it is not drinkable.
- Approximately 2% of the fresh water is frozen in glaciers and ice caps.
- Less than 1% of Earth's water is found in lakes, rivers, and streams and many of these are polluted.
- Every drop is precious!

AIKIDO in Fredericksburg is a 501(c)3 nonprofit educational corporation. Donations that support our educational mission are welcome.

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