



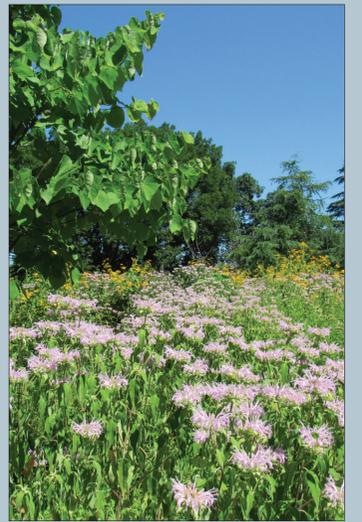
Once re-mediated, the soils were replaced and prepared for the installation of meadow seed and plugs. The native wildflower meadow greatly reduces the runoff from traditional lawn found in cemeteries.



Volunteer planting days offer unique social benefits to families of the deceased and community partners by providing a direct connection to the earth and the departed. As the burial plots are filled, they are planted with native perennial and shrub species, that improve stormwater infiltration, and reduce compaction, healing the disturbed soils and improving the ecological function of the site.



A rain garden was built in the site and was sized to capture not only the runoff from Nature's Sanctuary, but also captures runoff from the adjacent driveway. The design of the project manages not only the restored burial site but also runoff from the surrounding areas.



Nature's Sanctuary functions not only as a green burial area but provides valuable ecosystem services, while offering social and economic benefits.



Due to its historic use as a dump for the cemetery, the soil was removed and remediated on-site. This ensured the re-use of soils native to the site and reduced the carbon footprint of the soil remediation, by avoiding off-site hauling and importation of topsoil.

West Laurel Hill's Nature's Sanctuary is intended to be Revolutionary. The theory behind this cemetery design and the maintenance practices dictated by its design are intended to disrupt the status quo of cemetery design and maintenance that has become more dependent on fossil fuels, chemicals, and wasted resources over the past century. The project's design creates a model for perpetual care that will involve nature-based maintenance practices that parallel and harness natural ecological processes and cycles.

Over 5 years ago, West Laurel Hill Cemetery began a conscious effort to create a more sustainable business practice throughout the entire cemetery. Every aspect of the cemetery operation was reviewed for improvements to sustainability and the Triple Bottom Line. One of the major improvements that evolved out of the sustainability effort at West Laurel Hill was a green burial cemetery. The idea for the current Green Cemetery evolved from the original intent to have green burials in the West Laurel Hill cemetery portfolio, but the sustainability team quickly realized that they could push the envelope on the concept of green burials.

Following the USGBC SITES model for a collaborative communication and design process, the design involved every level of decision makers including the Board of Directors, administration, sales, landscape architects, engineers, contractors, funeral directors, grave diggers, maintenance personnel and the local government from concept to ribbon cutting. With this design team in place, the strategy of a design that would grow stronger and become more self-sustaining over time evolved. Stormwater was a major design element throughout the process. With a site perched above the Cynwyd Trail, controlling runoff to the trail below was only the beginning. Improved infiltration via natural meadow and woodland ecosystems is not a common occurrence over modern gravesites, pervious natural aggregate pavement and raingardens are also not common, but these elements were integral to the design. Every aspect of the final cemetery design was viewed through a lens of sustainability and ecological value, resulting in this unique model for sustainable cemetery design.

Burial sites have been a standard of humanity for thousands of years, but the modern cemetery

has evolved to a homogeneous and sterile environment that often neglects the care of stormwater. The current status quo for cemeteries involves pavement and lawn with sporadic canopy trees that suffer stress due to less than ideal tree-lawn growing conditions. Expanses of lawn lack well-developed, stratified soils. These lawn areas commonly suffer compaction from decades of mowing.

Nature's Sanctuary's theory of Assisted Ecological Succession utilizes the structure of existing cemetery maintenance staff to maintain, care for, and encourage natural succession processes in a cemetery environment. The design reintroduces stratified vegetation including groundcover, understory, subcanopy and canopy provides the opportunity to retain rainwater on expanded vegetative surface area. The cooling effects of evapotranspiration and shade offer natural amenities to cool stormwater before it flows to nearby streams.

The ecological succession model will transform traditional cemetery planning into a conservancy model where land is preserved, restored and converted to permanently preserved woodland ecosystem environments. This will be a paradigm shift from the current cemetery model. This innovation will prove that developed and undeveloped areas of cemeteries should be maintained as low impact meadow or other natural conditions, rather than unwarranted expanses of unnecessary lawn and the associated stormwater runoffs and pollutants that are typically associated with lawns. The improved stormwater benefits, cooling effects, and human rejuvenation aspects of woodland ecosystems in rural and urban cemeteries will become the anticipated standard for cemetery maintenance and design.



From the project's inception the decision was made to select locally and site sourced materials. The stone utilized was all local to the site and the stabilized aggregate was brought in from New Jersey.

Leave a Perpetual Legacy In Nature's Sanctuary at West Laurel Hill

ASSISTED ECOLOGICAL SUCCESSION

As green burial properties are filled, they are transitioned from a maintained meadow state into a successional meadow. Old growth hardwood forests native to Eastern Pennsylvania are the result of land being left to heal and regenerate over time.

➔ **MEADOW**

The process begins with grasses, wildflowers and other plants in the form of a MEADOW, which restores the soil and prevents erosion after the disturbance event. **Native plants are used to sow the site.**

Over time, small, tough, fast growing trees and shrubs begin to grow among the grasses to create a SUCCESSIONAL OLD FIELD with high species diversity. **Maintenance is required to prevent invasive species from taking over.**

➔ **SUCCESSIONAL FOREST**

As the trees expand, they begin to create a new environment called a SUCCESSIONAL FOREST. Meadow plants are replaced with shade plants. **Continued monitoring for invasives is needed.**

➔ **SUCCESSIONAL FOREST**

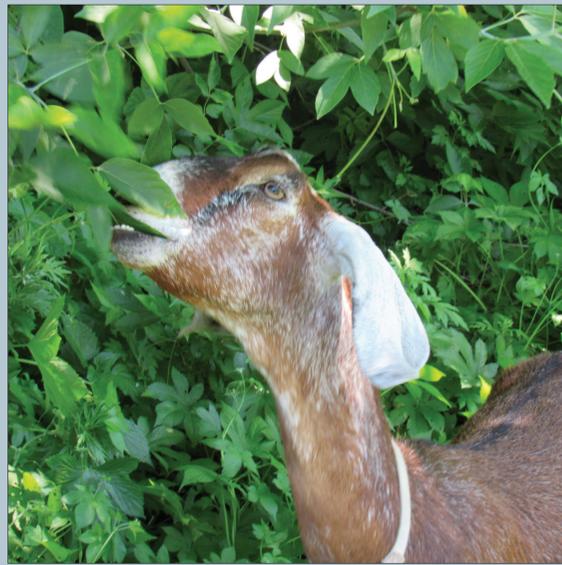
The trees grow large enough that their canopies create full shade. The site is now a CLIMAX FOREST where the trees can grow to their maximum size. **Minimal maintenance is required at this stage.**

➔ **CLIMAX FOREST**

Ecological succession is the natural process by which a forest site recovers from a disturbance that destroys or removes all its plant life, returning it to its climax forest state. Succession is broken down into a series of stages.



Directly Adjacent to Nature's Sanctuary is an apiary owned and operated by a local beekeeper. This use of the site not only functions as a profitable viable source of local honey, but the bees assist in the ecological function of Nature's sanctuary, pollinating the valuable native plant species within the area.



The deployment of goats on an annual basis has assisted in the remediation of invasive plant material on the site, and provides a unique public relations and education opportunity for West Laurel Hill. The hard-working goats are featured at West Laurel Hill's yearly Sustainability Fair.



Nature's Sanctuary's innovative design process led to SITES v2 Gold-Level certification. The project is the only cemetery in the world to attain this prestigious certification and on of the first 10 projects to achieve gold level. Utilizing the SITES v2 framework led to the implementation of many innovative practices during the planning, construction and ongoing maintenance of the site.

Nature's Sanctuary at West Laurel Hill

