Groundskeeping Training Module Companion Guide

Green Schools: A green school creates a healthy environment that is conducive to learning while saving energy, resources and money.

Groundskeeping: Groundskeeping can negatively impact the environment from the use of fertilizers, snow removal practices, maintenance equipment, pest control efforts, and more. Greening your groundskeeping program will aid in reducing these harmful effects.

Groundskeeping Practice	Negative Environmental Impacts
Maintenance Equipment	Noise, emissions, soil compaction
Plants	Non-native or invasive plants can affect the local ecology
Pest Control	Use of toxic chemicals poses a risk to plants, animals and humans
Landscape Waste	Adds unnecessary volume to landfills
Irrigation Management	Excessive water use for irrigation burdens the water supply, as well as treatment and delivery systems
Fertilizer Use	Contamination of groundwater; degradation of lake, river, and stream ecology
Snow Removal	Snow-melting chemicals can be harmful to vegetation and animals and can pollute water bodies
Cleaning of Building Exterior	Cleaning compounds can harm vegetation and pollute groundwater
Paints and Sealants	Many paints and sealants contain VOCs, which can be harmful to maintenance staff as well as others who come in contact with the products

The goals of a green groundskeeping program are to:

- Reduce chemical use
- Conserve energy
- Curtail water waste
- Eliminate pollution and contamination through runoff

Recommended Assessments

Gathering the answers to the preliminary assessment questions below can help you determine how far along your school or district is in implementing a green groundskeeping plan. This is not an exhaustive list, but it does provide a good starting point.

Groundskeeping

- What kind of exterior pest management practices are used?
- Are parents, faculty or staff notified if pesticides or fertilizers will be used?
- What kind of lawn-care services are used? Is the equipment gasoline, battery or electric powered?
- How is landscape waste disposed?
- Are buses or parents' cars allowed to idle?
- Is stormwater managed onsite or does it go into a municipal sewer?
- What kind of snow-removal practices are employed? Chemical?
- What kinds of paints are used on the building exterior?

Components of a Green Groundskeeping Program

Exterior Management Plan

- Exterior Cleaning and Grounds Maintenance
- Snow and Ice Removal
- Exterior Paints, Sealants and Caulks

Integrated Pest Management (IPM) Plan

- Outdoor Integrated Pest Management

Erosion and Sedimentation Control (ESC) Plan

- Erosion and Sedimentation
- Ongoing Landscape Operations
- Future Construction

Equipment and Product Selection

- Sustainable Purchasing Policy
- Equipment and Product Disposal Plan

Waste Management: Landscape Debris

- Composting

Landscape Design and Irrigation

- Landscape Design
- Drip Irrigation
- Rainwater

Managing Stormwater

- Stormwater Strategies
- Stormwater Strategies - Quality Control

Exterior Management Plan
Many traditional exterior cleaning strategies and products are water intensive or have toxic chemicals that can runoff into the sewer system. A green groundskeeping program requires the use of low-impact and biodegradable cleaning products whenever possible. Most types of grounds maintenance equipment use fossil fuels that have high emissions and are noisy. Use them only as needed and consider replacing with lower impact alternatives.

Regarding snow and ice removal programs, focus on prevention. Require the use of small amounts of deicer before snow storms. Use products with less toxic chemicals, like magnesium chloride, potassium acetate, or potassium chloride. Test small areas to determine the appropriate amount of deicer to use.

Many paints, caulks, and sealants contain Volatile Organic Compounds (VOCs) which contribute to poor air quality and are toxic to humans. Use adhesives and sealants that comply with the South Coast Air Quality Management District (SCAQMD) Rule 1168, and paints and coatings that comply with Green Seal GS-11. This will help ensure proper air quality for the students, installers, and the environment.

Integrated Pest Management (IPM) Plan
An IPM plan is an effective, environmentally sensitive approach that manages pest control through the most economical means, and with the least possible hazard to people, property, and the environment. Indoor and outdoor IPM strategies should be coordinated. As with all IPM policies, chemical use should be a last resort and applied only in the area of infestation. A school-wide notification should be given prior to application of any pesticides, except in emergencies.

Erosion and Sedimentation Control (ESC) Plan
Erosion and sedimentation control can be a problem on many schools. Erosion and the resulting soil loss adds sediment to stormwater systems and local bodies of water. Proper drainage is essential to preventing erosion, and ongoing maintenance practices can mitigate and identify potential problems. Landscape operations should include: identifying existing problems; checking site infrastructure, including gutters, drains, and downspouts; maintaining ground cover continuously; cleaning sedimentation sources; and reviewing the grounds for loose slopes, sedimentations, and erosion. If your school has construction on site, take additional ESC measures, such as stabilizing soil to prevent loss through temporary or permanent seeding and diverting landscape maintenance waste from the landfill through mulching or composting.

Equipment and Product Selection
As part of the groundskeeping program, include a sustainable purchasing policy. This policy will set parameters and identify the most environmentally friendly products and equipment. The policy should address toxicity, energy use, water use, noise pollution, emissions, and disposal. The EPA has developed the Environmentally Preferable Purchasing (EPP) program for landscape-related items.

One of the items addressed in a sustainable purchasing policy is product and equipment disposal to ensure that when these items are discarded, the environment is not negatively impacted. Make sure you know what products or equipment have government disposal regulations, and follow instructions accordingly. Disposal of equipment may include selling, donating, or recycling when

they reach the end of their lives or are replaced with new equipment. Having a plan in place will help your school minimize the amount of waste it adds to the landfill.

Waste Management: Landscape Debris
Landscape maintenance creates waste that can be diverted from the landfill through composting. Grass clippings, leaves, brush and other debris can be composted or grinded into mulch and used on your school's grounds. Exterior composting efforts can be coupled with food composting to maximize waste diversion.

Landscape Design and Irrigation
Proper landscape design and plant selection can help your school reduce and/or eliminate the need for permanent irrigation systems. The use of native or adaptive plants can help minimize the need for irrigation. If your school's landscape requires irrigation, consider installing drip irrigation. This strategy minimizes the use of water and fertilizer by allowing water to drip slowly to the roots, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, or tubing.

Also consider capturing rainwater and storing it in cisterns for site irrigation. This water can be used as the makeup water for a permanent irrigation systems or be pumped for "as needed" irrigation. Captured rainwater can also be used to flush toilets or as makeup water for cooling towers.

Managing Stormwater
If rainwater is not captured, employ strategies to minimize and treat your site's runoff. Because stormwater and sewers are often combined, reducing runoff can both minimize flooding and reduce exposure to sewage and the amount of effluent reaching the rivers and other bodies of water. Many strategies can minimize runoff, such as smaller building footprints (to maximize the site area that can naturally absorb the stormwater), use of green roofs, smaller paved areas, and permeable and open-grid pavers.

Bioswales and rain gardens are two landscape features that are multifunctional. They help control and reduce runoff by allowing water to slowly percolate into the ground and filter the water as it infiltrates the soil. Swales and rain gardens can be a cost-effective way for your school to address stormwater.

Depending on the size of your building and local building codes, your school may have stormwater treatment requirements. Natural filtration such as bioswales and rain gardens work well, but you can also install detention vaults with sand filters to remove solids and effluent from stormwater prior to entering the system.

Glossary

Biodegradable Product: Biodegradable cleaning products use organic material such as plant and animal matter and other substances originating from living organisms. These products break down through natural processes.

ENERGY STAR: ENERGY STAR is the government-backed symbol for energy efficiency. The label was established to make it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.

Environmentally Preferable Product:
Environmentally preferable products are certified by a third-party environmental label, such as Green Seal or EcoLogo. The label indicates that the product and its packaging were developed based on a consideration of human health and safety, ecological toxicity, environmental impacts, and resource conservation.

Low-emitting Materials: Low-emitting materials are products that do not release significant pollutants into the indoor environment. These products contain zero- and low-volatile organic compounds (VOCs).

Volatile Organic Compounds (VOCs): VOCs are carbon-based chemicals that easily evaporate at room temperature. Breathing low levels of VOCs for long periods of time may increase some people's risk of health problems. Common symptoms of exposure to VOCs include eye, nose and throat irritation; headaches; nausea; dizziness; and worsening of asthma symptoms.

LEED for Existing Buildings: Operations & Maintenance Rating System
Credits Related to Groundskeeping

The LEED for Existing Buildings: Operations & Maintenance rating system credits that apply to groundskeeping fall under several LEED credit categories, including: Sustainable Sites (SS), Water Efficiency (WE) and Materials & Resources (MR).

Sustainable Sites

SS Credit 2 – Building Exterior and Hardscape Management Plan
Encourage environmentally sensitive building exterior and hardscape management practices that provide a clean, well-maintained and safe building exterior while supporting high-performance building operations.

SS Credit 3 – Integrated Pest Management, Erosion Control & Landscape Management Plan
Preserve ecological integrity, enhance natural diversity and protect wildlife while supporting high-performance building operations and integration into the surrounding landscape. Have an environmentally sensitive management plan in place for the site's natural components.
SS Credit 5 – Reduced Site Disturbance: Protect or Restore Open Space
Conserve existing natural site areas and restore damaged site areas to provide habitat and promote biodiversity.

SS Credit 6 – Stormwater Management
Limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, reducing or eliminating pollution from stormwater runoff and eliminating contaminants.

Water Efficiency

WE Credit 3 – Water Efficient Landscaping
Limit or eliminate the use of potable water, or other natural surface or subsurface resources available on or near the project site, for landscape irrigation. Rainwater harvesting, greywater recovery, installing native plants, or employing xeriscape strategies can help you create water efficient landscaping for your school.
Materials & Resources

MR Prerequisite 1 – Sustainable Purchasing Policy
Reduce the environmental impacts of materials acquired for use in the operations, maintenance and upgrades of buildings. Have in place an Environmentally Preferable Purchasing (EPP) policy that includes product purchasing policies for the building and site.

MR Credit 1 – Sustainable Purchasing: Ongoing Consumables
Develop and maintain a sustainable purchasing program covering materials with a low cost per unit that are regularly used and replaced through the course of business.

MR Credit 2 – Sustainable Purchasing: Durable Goods
Develop and maintain a sustainable purchasing program covering items available at a higher cost per unit and durable goods that are replaced infrequently and/or may require capital program outlays to purchase.

MR Credit 3 – Sustainable Purchasing: Facility Alterations and Additions
Develop and maintain a sustainable purchasing program covering materials for facility renovations, demolition, retrofits and new additions.

MR Credit 7 – Solid Waste Management: Ongoing Consumables (MRc7.1-7.2)
Develop and maintain a waste reduction, recycling, and/or composting program that addresses ongoing consumables.

MR Credit 8 – Solid Waste Management: Durable Goods
Develop and maintain a waste reduction, reuse, and recycling program that addresses durable goods.

MR Credit 9 – Solid Waste Management: Facility Alterations and Additions
Divert construction and demolition debris from disposal to landfills and incineration facilities. Redirect recyclable recovered resources back to the manufacturing process and reusable materials to appropriate sites.

Groundskeeping
References and Resources

The Center for Green Schools at USGBC
http://www.centerforgreenschools.org/

Erosion Control Technology Council
www.ectc.org

Green Building Certification Institute (GBCI)
http://www.gbci.org

Green Existing Schools Toolkit
www.centerforgreenschools.org/k12toolkit

Green Seal
www.greenseal.org

Green Shield Certified
www.greenshieldcertified.org

Plant Native
www.plantnative.org

South Coast Air Quality Management District
www.aqmd.gov

Stormwater Manager's Resource Center
www.stormwatercenter.net

Sustainable Purchasing Tracker – Indoor Environmental Quality
http://www.usgbc.org/ShowFile.aspx?DocumentID=6416

U.S. EPA Environmentally Preferable Purchasing (EPP) Landscaping
http://www.epa.gov/epp/pubs/products/landscaping.htm

U.S. EPA Integrated Pest Management in Schools
http://www.epa.gov/pesticides/ipm/index.htm

U.S. EPA Low-Impact Development
http://www.epa.gov/owow/nps/lid

U.S. EPA Pesticides
http://www.epa.gov/pesticides

U.S. EPA Wastes, Composting
www.epa.gov/wastes/conserve/rrr/composting

U.S. Green Building Council (USGBC)
http://www.usgbc.org