Volunteer

Professional

Volunteer + Professional

Soil Builder

Image Source: U.S. Fish and Wildlife Service, "Coreopsis close-up." 09 June 2012 via Flickr, CC BY 2.0.

DEC working with lots

A FIELD GUIDE

HELLO

MY NAME IS

Soil Builder

The Soil Builder offers an inexpensive, hands-on approach to improving the soils on your lot. The Soil Builder is an environmentally-friendly alternative to chemical-based fertilizers, pesticides, and fungicides.

This fertilizer is not harmful to insects, wildlife, plants, soil, or humans and can be used on vegetable gardens, flowers, trees, and lawns to provide extra nutritional boost! Two compost recipes are provided to suit the size of your planting area.

The Field Guide provides some suggestions for a groundcover; however, the primary intent of this design is to improve the soils for whatever you may choose to grow next on your lot.

For more information refer to DFC-lots.com

What is the lot design likely to cost?

The estimated cost of the Soil Builder is low ($50 – $1,000) and based on utilizing volunteer labor and the seed mix. The cost assumes that residents or volunteers have access to basic safety gear and garden tools.

How much upkeep will this lot design require?

The maintenance of the Soil Builder lot design is low as soil amendments are easy to make and add to your garden. The Soil Builder can be used as a soil amendment before installing a lot design or after to provide additional nutrients to your garden. You can apply soil amendments to your garden one time, weekly, or annually depending on your soil needs and maintenance preference.

Will the installation of this lot design require a professional?

The installation of this lot design should not require professional assistance if you, with the help and support of friends, family or neighbors would like to construct this lot design. Please refer to the Step-By-Step section for guidance. If you do not have the required support or feel unable to tackle this lot design, please seek professional assistance.

How long will it take to install this lot design?

While people tackle projects in different ways and at different speeds, the Field Guide estimates installation time of this lot design to be one day with the help of at least one or two adults or youth. The Field Guide assumes the lot is 'construction ready,' and all equipment and materials required for lot design have been acquired and are ready to go.

Cost	**$50 - 1,000**	$1,001 - 2,500	$2,501 - 5,500	$5,500 +
People	**Volunteer**	Professional	Volunteer + Professional	
Experience	**Beginner**	Intermediate	Advanced	
Upkeep	**Low**	Medium	High	
Stormwater	Good	**Better**	Best	
Location	**Clay Soil Lot With a Patient Lot-Tender in Sun or Shade**			

Soil Builder

Examples of Composting Materials


1 - Spray Bottle

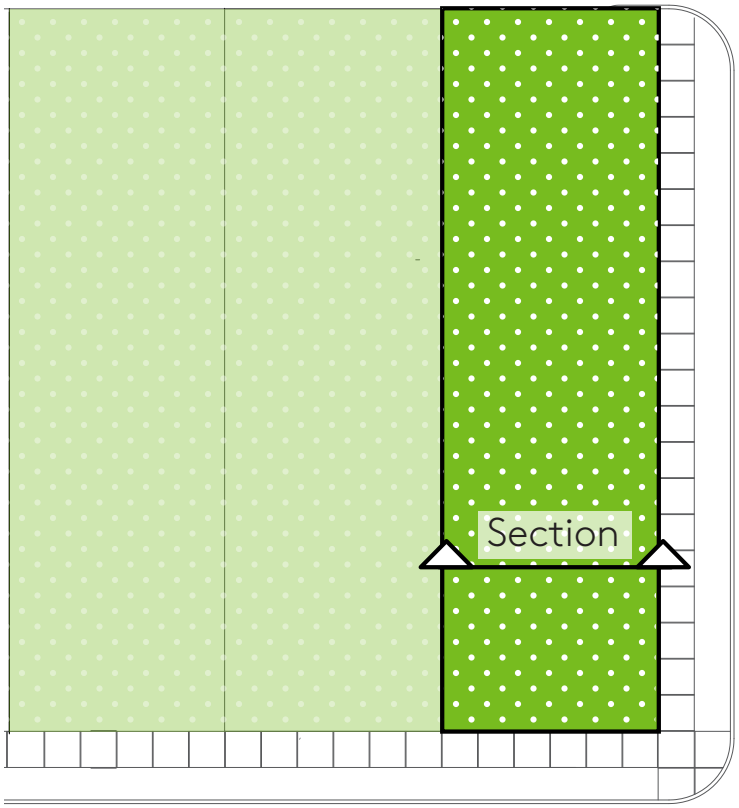

2 - Soil


3 - Soil Builder

Section

Lawn, Full Lot coverage

Where Do I Grow?



The Soil Builder can be implemented on single or multiple lots and is suitable for any property.

Soil Builder Area

Image Source: 1) Theornamentalist, "Water in spray bottle." 19 March 2013 via Wikimedia, CC BY-SA 3.0; 2) Holger Casselmann, "Home made terra preta." 31 March 2012 via Wikimedia, CC BY-SA 3.0; 3) SuSanA Secretariat, "Compost as faeces covering material in UDDT." 10 December 2006 via Wikimedia, CC BY 2.0;

Before You Start

'Construction Ready'

This lot design assumes that you have prepared the lot to a 'construction ready' state.

'Construction Ready' refers to a lot that is clean and clear of trash, hazardous objects, unwanted trees, brush and vegetation, fences, and other unwanted structures.

It may be necessary to remove grass in preparation for your lot design. Refer to the Remove Your Grass box located on the right hand side of this page for more information.

Is there an available water source near your lot? Consider how and where you will access water during and after construction to ensure that your plants can establish.

If your lot is not ready for construction, refer to the Clean + Green lot design.

You can find the lot design at DFC-lots.com.

Call Before You Dig

Locate underground utilities before beginning your lot design. MISS DIG provides a free service to Michigan residents by locating and marking utilities on requested properties. Call (800) 482-7171 or 811 at least three days before you plan to start digging on your lot.

Test Your Soil

Harmful pollutants have made their way into many urban soils. To proceed with awareness, consider having your soil tested before construction. Two great options are available:

Soil testing is free to members of Keep Growing Detroit's Garden Resource Program. Call (313) 757 – 2635 for more information or visit detroitagriculture.net.

If you are not yet a member, you can work directly with Michigan State University's (MSU) Extension Program. They have a Home Lawn and Garden Soil Test Mailer for $25. For more information call (888) 678 – 3464 or visit msusoiltest.com.

If you are concerned about the presence of lead or other contaminants in your soil, call the Michigan Department of Health and Human Services at (866) 691 – 5323 or (800) 424 – LEAD.

Remove Your Grass

Need to remove grass in areas where you are constructing your lot design?

There are many ways to remove unwanted grass. The first is to remove the grass and its root system by digging up the grass. Another option is to cover your lot with cardboard or a plastic tarp to smother your grass in darkness. It will take several weeks, but after being covered, the dead grass will be easier to remove.

Till Safely

Before you till, inspect your lot for signs of buried concrete or rubble that was not removed during the cleanup stage. Large debris can ruin tiller blades.

When tilling, wear appropriate safety gear, such as covered boots with socks, long pants, safety glasses, dust mask, and ear protection. Make sure you understand the safe operating procedures of your tiller. Refer to the user's manual.

What You Need: Shopping List

Shopping List

The shopping list provides a breakdown of potential materials, tools, and resources required to undertake this lot design.

This shopping list is designed for a single lot (30 by 100 feet).

Materials Defined

- **Airstone and Air Pump**: A system used to improve water and air circulation within aquariums. Available to purchase at most pet stores.
- **Backpack Sprayer**: A plastic container with an attached sprayer that can be strapped to your back. The plastic container will hold the Soil Builder and is an easy way to handle heavy liquids instead of carrying in a plastic watering can. Available to purchase at local retail or garden stores.
- **Cheese Cloth:** A loose-woven gauze-like cotton cloth. The cloth is used as a 'tight' strainer as it only allows liquid through.
- **Compost**: A mixture of organic material used as a plant fertilizer. Available to purchase at local retail or garden stores.
- **Fish Seaweed Fertilizer**: Ground-up fish in the form of a liquid. You can buy a pint of fish seaweed at local retail or garden stores.
- **Humic Acid:** Aged, dead plant matter, such as soil, peat, and coal, that can be purchased in liquid or granular form. Available to purchase at local retail or garden stores.
- **Inoculant:** Agricultural amendments to promote plant health. You can buy Garden Combination Inoculant at agricultural or garden stores or make your own. Inoculants have an annual expiration date and should be used soon after purchase.
- **Nylon Stocking or Meshed Bag**: Thin, cloth-like material that allows air or water to pass through easily. You can use a womens' nylon stocking or small mesh bag similar to a tea bag. Both items can be purchased at local retail stores.
- **Unsulphured Molasses**: A by-product of beating sugarcane, grapes, or sugar beets. Available to purchase at local retail or garden stores.

Tools + Resources

Suggested Tools

- **Safety Gear:** Gloves, heavy work boots, tall socks, pants, long sleeve shirts, dust masks, and protective eye wear

Field Guide Resources

Resources are available on the Field Guide's web site.

- **Clean + Green**
- **Bulb Planting Detail**

Materials

A Lot of Soil Builder

- **5 Gallon Bucket**, 2 buckets
- **Humic Acid,** 1 tablespoon
- **Water,** 5 gallons of bottled water or non-chlorinated water
- **Airstone and Air Pump**
- **Inoculant,** 1 cup of worm castings or aerobic compost, such as decaying organic matter from existing compost bin
- **Food Mix,** ¼ cup of unsulphured molasses, Fish Seaweed Fertilizer
- **Nylon Stocking or Meshed Bag**
- **Cheese Cloth or Strainer**
- **Watering can or backpack sprayer**

A Little Soil Builder

- **5 Gallon Bucket**, 2 buckets
- **Non-Chlorinated Water,** 5 gallons
- **Compost,** ⅓ of 5 gallon bucket
- **Cheese Cloth or Strainer**
- **Watering can or backpack sprayer**

Groundcover (Optional)

- **Low-Maintenance Fescue Mix**, 15 pounds of seed
- **Germination Blanket**, 4 rolls (8 by 112.5 feet)

Soil Builder Step-By-Step

Let's Start

Want to create the Soil Builder but don't want to hire a professional? Here are a few guiding principles to help you construct your lot design.

☑ Check off tasks as you go along.

Lot Design Steps

Volunteer:

- ◯ **Prepare Your Lot**
- ◯ **Make A Lot of Soil Builder**
- ◯ **Make A Little Soil Builder**
- ◯ **Sow Lot + Maintain**
- ◯ **Sow Low-Maintenance Fescue Mix**

Bioremediation

In the simplest terms, bioremediation is the process of breaking down harmful chemicals that exist in the soil. Aerobic bacteria, nematodes, fungi, and protozoa are very tiny organisms that make the bioremediation process happen.

Materials Defined

Don't know what 'inoculant' is? Refer to page 5 for the definitions of key materials found in these recipes.

◯ Prepare Your Lot

Soil Builder is an environmentally-friendly alternative to chemical-based fertilizer, pesticides, and fungicides.

Soil Builder can be used on existing lawns and gardens or used as a soil supplement before constructing another Field Guide lot design. If you prefer to remove your existing vegetation and sow a groundcover, refer to Remove Your Grass on page 4. If you are not interested in a groundcover, refer to the Field Guide web site for variety of lot designs you could install on your lot.

This lot design offers two types of Soil Builder: A Lot of Soil Builder and A Little Soil Builder.

A Lot of Soil Builder is a recipe designed to provide oxygen-rich, culture-containing aerobic bacteria, nematodes, fungi, and protozoa. This combination of beneficial microorganisms provide bioremediation properties and help improve the overall quality of the soil.

A Little Soil Builder is a simpler compost recipe than A Lot of Soil Builder but has the same beneficial fungi and microorganisms to help improve overall quality of soil. A Little Soil Builder can be used on individual plants, vegetables, flowers, and trees.

◯ Make A Lot of Soil Builder

A Lot of Soil Builder Recipe is based on a recipe found in Earth Repair by Leila Darwish, a great resource for organic ways to heal the soil and earth.

This recipe is for 5 gallons of Soil Builder. It is likely to require a few batches to cover the full lot. It is best applied over several applications and seasons.

To make A Lot of Soil Builder, preheat over the stove 1 cup of inoculant, allowing it to mix together but being careful not to let it burn. Preheating will increase its fungal power.

Soil Builder Step-By-Step

Remove from the stove and add one tablespoon of humic acid. Humic acid is produced by biodegradation of dead organic matter. You can purchase humic acid and other ingredients listed in recipe at garden stores, including Detroit Farm and Garden.

Place mixture on shallow tray (to cool evenly) and let sit for three days. **On day three, fill a five gallon bucket with bottled water or other non-chlorinated water.** The water temperature should be between 55 and 80°F. **Put the airstone in the bottom of the five gallon bucket, attach the air pump, and let the mixture start churning or coming to a rolling boil.** The mixture needs oxygen - if it is not bubbling or churning, you will need to use a stronger air pump.

Place inoculant and food mix (¼ cup of unsulphured molasses and Fish Seaweed Fertilizer) in a nylon stocking or mesh bag, tie the end, and suspend it in the water. Let the mixture sit for approximately 24 hours. **Do not let the mixture sit for more than 36 hours.** If the mixture smells sharply, do not use; the mixture has either received insufficient oxygen or too much food. The Soil Builder should smell earthy and sweet. A soil biology test is recommended on your first few batches to make sure microbes are being produced. You can purchase this at most retail or garden stores.

Place cheese cloth or strainer over the second five gallon bucket, then pour mixture through a strainer to remove large debris. This step is important to ensure your sprayer or watering can does not clog.

Place mixture in watering can or backpack strayer. Water or spray mixture evenly over your lot. It is likely to require a few batches to cover a full lot.

You can use this mixture through the spring, summer, and fall. The more you spray your lot, the healthier it will become! Creating a compost pile will provide you with a source of inoculant. Wash bucket, pump, and spray with non-toxic, environmentally-friendly, biodegradable cleaner once you finish spraying.

◯ Make A Little Soil Builder

This recipe is based on a recipe found on Home Composting Made Easy. A Little Soil Builder is a simple compost recipe best used on individual plants or small planting beds, such as vegetables, flowers, and trees.

Fill a five gallon bucket ⅓ full of compost, then add bottled water or other non-chlorinated water to the top of the bucket.

Mix and let the mixture brew for approximately three to four days, stirring it occasionally.

Place cheese cloth or strainer over the second five gallon bucket, then pour the mixture through strainer to remove large debris. This step is important to ensure your sprayer or watering can does not clog.

Place mixture in a watering can or backpack sprayer. Use mixture immediately for maximum benefit around root systems of hardy shrubs, trees, and established plants. For delicate or potted plants, the Field Guide recommends diluting the mixture further. When diluted, the Soil Builder should be light brown or the color of a light cup of tea.

Wash bucket, pump, and spray with non-toxic, environmentally-friendly, biodegradable cleaner once you finish spraying.

Soil Builder Step-By-Step

◯ Sow Lot + Maintain

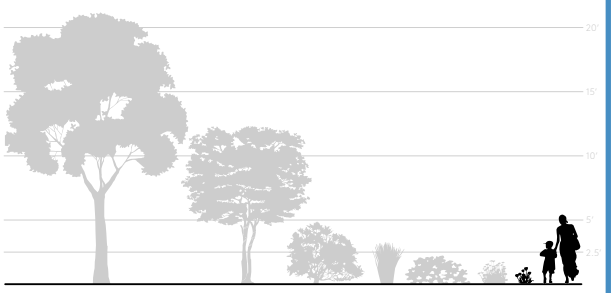
If your lot is bald or you plan on sowing a different groundcover than the one currently growing on your lot, the Field Guide recommends a low-maintenance fescue mix. **Refer to box on right for guidance on sowing low-maintenance fescue mix or page 9 for alternative groundcover options.**

Looking for more than a groundcover for your lot? Check out the Field Guide web site for lot designs.

The Soil Builder does not require maintenance; however, any groundcover or lot design you may decide to construct will. Refer to individual lot designs for more information.

! Visit the Resources page on the Field Guide's web site (DFC-lots.com) to discover other vendors and places to purchase plants.

Average Height of Plants



Groundcover

◯ Sow Low-Maintenance Fescue Mix

If you are seeking a lower-maintenance alternative to traditional lawn, the Field Guide recommends a fescue seed mix. **If you follow the Soil Builder lot design you will need approximately 15 pounds of fescue seed mix for the remaining lot and four 8 by 112.5 foot rolls of single net germination blankets.**

This family of floppy grasses is drought-resistant and requires one cutting (in August or September) per year. Fescue can be established in full sun to shade and should be seeded in spring (mid-March to mid-May) or fall (August to September).

Soil should be prepared for seeding by scarifying, raking, or tilling the soil four to six inches deep to loosen any compaction, allowing for easier seed germination and better water infiltration. Apply seed mix to a damp lot.

Sow seed across the remaining lot by using a seed spreader or by hand. A seed rate of five pounds per 1,000 square feet is recommended. Gently water seedlings daily until they are four to six inches in height. Placing a thin layer of straw or a germination blanket over seeded areas will help ensure that your seed establishes by keeping seeds from blowing away and protecting them from birds. Germination blankets or straw can be purchased at most nurseries and garden stores.

When established, grass will not require supplemental watering except during unusually dry periods. Eco-Turf Low Maintenance Fescue Mix is one recommended seed mix and can be purchased through the Michigan Wildflower Farm.

Other Field Guide lot designs can be used as groundcovers. Check out the web site for additional options and ideas.

Next Level: If you would like to bring additional color to your grass, you can plant bluebells, crocuses and/or daffodils to create a decorative show in spring. Bulbs should be planted in the fall.

For more guidance on bulb planting refer to the Bulb Planting Detail.

Planting: Alternative Groundcover

For More Information

If you are seeking a more interesting groundcover than a low-maintenance fescue, try one of the alternative options listed on this page.

For more information on using any of the seed mixes on this page, refer to the lot designs below on the Field Guide web site:

Partially Shaded Area Roadside Seed Mix
Refer to Syrup Maker lot design

Native Grassland Meadow
Refer to Grassland Habitat Maker lot design

Butterfly Garden Mix
Refer to Native Butterfly Meadow lot design

Clay Mix
Refer to Clay Soil Mix lot design

These seed mixes, additional groundcovers, and lot designs can be found at DFC-lots.com.

Seed Mix for Part Sun to Shade

Partially Shaded Area Roadside Seed Mix

Mixing two pounds of Partially Shaded Area Roadside Seed Mix (ERNMX-140) with three pounds of Annual Cover Crop seed mix is recommended (oats or grain rye depending on sowing season) if selected for the lot design groundcover.

You can buy these seeds premixed at Ernst Conservation Seeds.

Seed Mix for Full Sun to Part Sun

Native Grassland Meadow

Mixing three pounds of Native Grassland Meadow seed mix (Eastern Native Habitat & CREP, ERNMX - 173) with three pounds of Annual Cover Crop seed mix is recommended if selected for the lot design groundcover.

You can buy these seeds premixed at Ernst Conservation Seeds.

Seed Mix for Full Sun to Part Sun

Butterfly Garden Mix

Mixing 15 ounces Butterfly Garden Mix seed mix with 24 ounces Annual Cover Crop seed mix is recommended if selected for the lot design groundcover.

You can buy these seeds premixed at Michigan Wildflower Farm.

Seed Mix for Full Sun to Part Sun

Clay Mix

Mixing 15 ounces Clay Mix seed mix with 24 ounces Annual Cover Crop seed mix is recommended if selected for the lot design groundcover.

You can buy these seeds premixed at Michigan Wildflower Farm.

Plant Sizes

Seeds: All plants can be purchased in seed form.

Did You Know?

Professionals Can Help!

The Field Guide to Working With Lots provides a Construction Package for each lot design. The Construction Package includes information and details required for a professional to construct this design. On the Field Guide web site, use the Construction Package link located near the top of this lot design page to download and print. Your selected professional will then be able to provide a cost estimate and schedule based on the condition of your lot and the design you select.

Want to Hire Locally?

DFC-lots.com has a growing list of Detroit-based professionals and suppliers of landscape materials and services.

Still unsure of where to start?

Call (313) 294-LOTS or email fieldguide@detroitfuturecity.com for assistance.

Helpful Facts

- Unfinished Soil Builder or old compost may be nutritionally deficient and should not be used on individual plants.
- A Little Soil Builder can be mixed and used within one hour as a mild fertilizer.
- Soil Builder is ready to use when the mixture smells "yeasty."

Planting Tips

- You can use Soil Builder as root drench, applying it directly to the soil around plants or as a foliar (leaf) spray.
- If using on individual plants, you can add ⅛ teaspoon vegetable oil or mild dishwashing liquid per gallon to help the mixture stick to the leaves.
- Annual Crop Cover seed mix is used to help establish initial seed mix. It does not need to be reseed annually.

Draw Your Lot

DETROIT FUTURE CITY | working with lots | A FIELD GUIDE

Visit DFC-lots.com
#DFClots

Image Source: Chhe, "A picture of Carex pensylvanica." 25 July 2009 via Wikimedia, Public Domain.