7 Yard Treatments

Once you have sampled and analyzed a property's soil and determined that a lead hazard exists, the process of designing and implementing landscape treatments can begin. This chapter provides guidance on matching treatments to the hazards you've identified (Section 7.1), and describes specific low-cost treatment measures used by the EMPACT Lead-Safe Yard Project (Section 7.2). The chapter also covers the many "nuts and bolts" issues involved in the treatment process, including:

- Developing a budget for each yard treatment (Section 7.3).
- Meeting with the homeowner to explain the sampling results and areas of concern and to develop/review the treatment plan (Section 7.4).
- Contracting with a landscaper to complete all design and landscaping work on the property (Section 7.5).
- Establishing guidelines to ensure landscaper health and safety (Section 7.6).
- Securing the homeowner's approval and signoff on completed work (Section 7.7).
- Reviewing and approving landscaping work prior to final contractor payment (also in Section 7.7).

If you are a homeowner interested in learning about low-cost landscaping measures for reducing children's exposure to lead in soil, you can focus on Sections 7.1, 7.2, and 7.6. (**Section 7.6, Health and Safety for Landscapers, is essential reading for anyone who intends to do landscaping work in a lead-contaminated yard.**) You should also read Chapter 8, which covers the development of a maintenance plan for the finished yard—a critical part of the treatment process.

Sections 7.3, 7.4, 7.5, and 7.7 present detailed information for those responsible for implementing a lead-safe yard program.

7.1 Matching Treatments to Hazards

There are many ways of protecting children and other people from the hazards of lead-contaminated yard soil. Possible methods include removing and disposing of the contaminated soil, covering it with a permanent barrier such as asphalt, covering it with a non-permanent barrier such as mulch or grass, or changing the way people use their yard to reduce exposures.

To select the best method or methods for a particular property, you need to consider a number of factors, including the level of lead contamination, the frequency and extent of potential exposures, the homeowner's esthetic preferences, the cost of the protective measure, the amount of maintenance it will require, and its likely effectiveness. Protective measures can vary greatly both in the level of protection they provide and in their associated costs. Soil removal, for example, can completely eliminate a soil hazard, whereas use of a non-permanent barrier such as grass cannot. However, soil removal can be prohibitively expensive for many people due to the high cost of soil excavation, transportation, and disposal.

The EMPACT LSYP was created to develop low-cost landscape measures that protect children against exposure to high lead levels in yard soil. The landscape measures described in this handbook were selected for four main reasons:

- They are relatively inexpensive.
- They can be implemented by the homeowner or a program partner with a minimum of tools and experience.
- They are attractive and enhance the value of the yard.
- They are effective in reducing lead concentrations at the yard surface, and they therefore effectively reduce the potential for children's exposures.

All of the measures presented here could be characterized as interim controls. None provide the sort of permanent protection you could achieve through soil abatement (that is, by removing or paving contaminated soil), nor are they meant as a substitute for abatement. In fact, in circumstances where soil-lead levels are greatly elevated (i.e., above 2,000 ppm) and the possibility of children's exposure is high (i.e., in residential settings), federal regulations recommend or require abatement of the soil hazard (see Section 3.4.3).

The EMPACT LSYP encourages homeowners to follow all federal and state requirements and guidance for soil abatement that apply to them. But the project also recognizes that there will be many situations where homeowners and community organizations cannot afford the cost of abatement measures. In such situations, these landscape measures can provide some degree of long-term, effective protection so long as they are properly applied and well maintained. The key is selecting the right measures based on the existing lead hazards.

7.1.1 Combining Treatment Measures

So how do you choose among the treatment measures presented in this handbook? Your goal in developing a treatment plan is to achieve a delicate balance between the safe use of the yard and the existing lead levels. To do this, you should combine two main approaches:

- **Altering the surface cover.** Select landscape measures that provide a sufficient barrier, based on the soil-lead levels and the types of yard use.
- **Altering the yard use patterns.** Encourage safe yard uses, and discourage certain activities (e.g., gardening, children's play) in the areas of highest contamination. These activities may need to be relocated to a safer part of the yard.

In many cases, you will need to design different treatments for each of the yard areas evaluated during the sampling process: the house dripline, areas of bare soil, areas of unique use such as children's play areas and picnic and gardening areas, and other areas. The illustration on page 86, Characteristics of a Lead-Safe Yard, shows how a number of treatment measures can be combined to create a yard that is safe and attractive and meets the needs of the homeowner and/or residents. In other cases, you may only have to address a single yard area, such as the dripline (where soil-lead levels are usually found to be highest).

The table on page 85 presents a list of treatment measures used by the EMPACT LSYP at specific soil-lead levels. Each measure is described in greater detail in Section 7.2. However, before incorporating these measures into your own program, you should refer to Section 3.4.3 for a discussion of how the EMPACT treatment approach compares with the approach recommended under the

EMPACT LSYP TREATMENT MEASURES

Soil-Lead Level (parts per million)	EMPACT LSYP Treatment Measures
> 5,000 (very high)	If soil removal or permanent barriers are not possible: • Install semi-permanent barrier, such as a wood-framed dripbox filled with gravel or mulch. • Relocate gardens—unsafe for all types of gardening.
2,000–5,000 (high)	• Relocate gardens—unsafe for all types of gardening. • Relocate children's play area, pet area, and picnic area, if possible. If not, install wood platform or wood-framed raised play and picnic area filled with woodchips. • Install path of walking stones for high-traffic areas. • Seed and fertilize grassy areas, or cover with mulch or woodchips if not suitable for grass.
400–2,000 (moderately high)	• Install raised-bed garden and supplement with clean topsoil. • Install wood-framed raised play and picnic area filled with woodchips. • Install path of walking stones for high-traffic areas. • Seed and fertilize grassy areas, or cover with mulch or woodchips if not suitable for grass.
< 400 (urban background)	• No treatment necessary.

Characteristics of a Lead-Safe Yard

Signs of a Healthy Yard:

Signs of a Toxic Yard:

pending TSCA Section 403 rule (information about the rule can be found at http://www.epa.gov/lead/leadhaz.htm). Also keep in mind that decisions on specific landscape measures (e.g., choosing between mulch or grass, or between types of grass) must be made on a yard-by-yard basis to account for variables such as regional climate, yard topography, the amount of available sunlight, and the homeowner's esthetic preferences. These factors will often play a major role in shaping the final treatment plan for a property.

7.2 Treatment Options and Detailed Specifications

This section presents the specific landscape treatments used by the EMPACT LSYP. The treatment measures described here represent a suite of tools that the landscaper can use to address elevated soil-lead levels in specific yard areas: drip zones, grassed areas, parking areas, walkways, recreation and children's play areas, gardens, pet areas, and porches. As mentioned in Chapter 6, these are the high-risk and high-use yard areas where children are most likely to experience dangerous exposures to soil lead. For most of these yard areas, the EMPACT LSYP has developed two or more treatment options, giving the landscape designer some flexibility in selecting treatments that match both the homeowner's esthetic preferences and other variables such as yard topography and the amount of available sunlight.

It is important to keep in mind that not all treatments will be appropriate and/or effective at all locations. The treatments described here were selected by the EMPACT LSYP because they address the conditions found at a majority of sites in the project's target neighborhoods in Boston: high to very high soil-lead levels; inner-city homes that are typically wooden and covered with lead paint; high rates of yard use by children and families; and many areas of bare and partially bare soil. These landscaping measures also work well given Boston's variable climate, with its cold, wet winters and relatively hot, humid summers.

As you develop your own lead-safe yard program, you will no doubt want to pick and choose among the treatments presented here, rejecting some, revising others to fit your specific needs, and devising some entirely new treatments. The work you have done to get to know your target community (see Section 4.4) will help you in this process. In addition, you may want to consult local garden centers, nurseries, landscapers, and arborists for help selecting plants and grasses that will thrive in your area. If you live in an arid or semi-arid climate, for example, you may find yourself using plants that are very different from those used in the Northeast.

Once you have assembled a suite of treatment options that will work in your program area, you should develop detailed specifications that define exactly how the landscaping work should be done and what

PHYTOEXTRACTION: AN EXPERIMENTAL APPROACH

All of the treatment measures used by the EMPACT LSYP focus on employing grass, plants, and other materials as a barrier to reduce children's exposure to lead-contaminated soil. None of these treatments, however, remove the lead from the soil. Today, researchers are experimenting with another approach for using plants to actually extract lead and other contaminants from soil: phytoextraction.

As a technology, phytoextraction is still in its infancy. Researchers are still struggling with a number of questions, such as which plants best absorb certain contaminants, and how to make the technology affordable. The EMPACT LSYP does not use phytoextraction at this point, but may consider it in the future, as more information becomes available about its applicability in residential settings. See Appendix C for a detailed discussion about this promising technology.

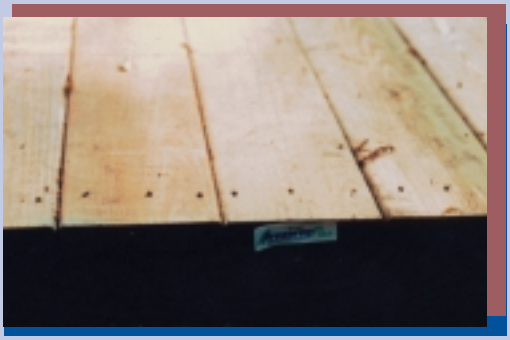
A perimeter mulch bed covering the drip zone.

materials should be used. These specifications should be provided to the landscaper and included with the landscaping contract (see Section 7.5.1) if you intend to engage a contractor. A set of sample specifications, developed by Lead Safe Boston and used by the EMPACT LSYP, is provided on pages 99 to 100.

7.2.1 Drip Zones

The drip zone is the narrow 3-foot strip around the foundation of the house. There, soil-lead levels are usually highest, because lead-based paint on the outside of older homes weathers over time and falls into the top layer of soil adjacent to the foundation, contaminating it. Play areas, picnic areas, and vegetable gardens must be located away from the drip zone. In addition, covering the zone with a permanent or semi-permanent barrier provides long-term protection from the contaminated soil.

The EMPACT LSYP uses raised perimeter boxes that not only cover the contaminated soil in the drip zone, but also prevent erosion and offsite transport of the soil and allow for continued weathering



Wood platform built with ACQ lumber.

LESSONS LEARNED: USING ACQ PRESSURE-TREATED LUMBER FOR ADDED SAFETY

Over the past 30 years, pressure-treated lumber has become standard for outdoor construction because it deters rot, decay, and termite destruction. The EMPACT Lead-Safe Yard Project used pressure-treated wood for these reasons during its first two years of yard treatments. Recently, however, there has been a growing awareness of the dangers posed by chemicals used in the traditional wood-treatment process. There is some evidence that these chemicals, which include the EPA-listed hazardous compounds arsenic and chromium, can leach out of pressure-treated wood and into the environment.

During its third phase of yard treatments, the EMPACT LSYP began using a relatively new type of pressure-treated lumber: ACQ Preserve. ACQ-treated lumber contains no EPA-listed hazardous compounds and is guaranteed to protect against rot, decay, and termites. In other words, it offers all of the values of traditional pressure-treated lumber with fewer hazards. This is especially important when you use wood in and around gardens and children's play areas, as the EMPACT LSYP does. Costs of ACQ-treated wood vary, though the EMPACT LSYP has found these costs comparable to the costs of traditional pressure-treated wood. For an information sheet on ACQ-treated wood, go to http://www.conradwp.com/acq.htm.

Left: Before—bare soil in drip zone (1,660 ppm).
Right: After—mulched planting bed covering soil.

of the exterior. Built from 2" by 6" ACQ (Alkaline Copper Quaternary) pressure-treated lumber, the boxes are lined with a filter-fabric weed barrier and then filled with either gravel or mulch and plantings, depending on the homeowner's preference. Plantings, such as evergreen shrubs, azaleas, boxwoods, holly, or thorny bushes, help keep children and pets away from the drip zone. Plantings used by the EMPACT LSYP are listed in the sample specifications on page 99. Consult a local garden center, nursery, or arborist to select plantings appropriate for your area.

7.2.2 Grassed Areas

Maintaining a healthy lawn is one of the best ways to reduce exposure to lead-contaminated soils. A healthy lawn acts as a natural barrier between people and contaminated soils, and provides a safe outdoor space for play and relaxation. Lawns require routine maintenance with water and fertilizer, and should be protected from foot traffic for the first 3 to 4 weeks after seeding. Consult a local garden center or lawn care professional to select grasses that will grow in the soil and climate conditions found in your region. In areas of heavy foot traffic or low light where grass won't grow well, install a stone path or raised mulch bed to cover all bare soil.

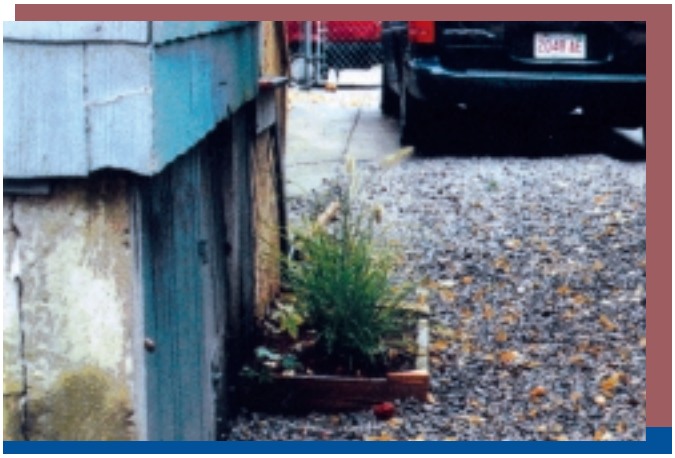
- **Existing lawn improvement.** Improvement of an existing lawn can be accomplished quite inexpensively. Rake bare areas to loosen the soil, apply seed mix at the rate specified by the manufacturer, then apply ¼" of top soil over new seed. Water thoroughly.

Two months post treatment. Lawn growth over previously bare, contaminated soil (1,770 ppm).

- **New lawn installation (at existing grade).** Where little or no grass exists on a lawn, the entire lawn area should be rototilled and reseeded (apply water to contain dust during rototilling). Spread ¼" of loam (soil composed of sand, clay, silt, and other organic matter) on top of the seed, then water thoroughly.
- **New lawn installation (raised bed).** For sloped yards, the EMPACT LSYP sometimes uses raised grass beds to create a terraced effect and limit runoff and erosion. A raised grass bed can also be installed in areas where roots or rocky soil prevent grass from growing. In a perimeter box made of 2" by 6" ACQ pressure-treated lumber, install 6" of loam over filter fabric weed barrier. Apply seed mix, then spread ¼" of loam on top of seed and water thoroughly.
- **Raised mulch bed (with or without plantings).** Raised mulch beds can be used to cover areas of bare soil where grass won't grow well. The beds can serve as children's play areas, or can be filled with various plantings to form an attractive garden area. Install a perimeter box made of 2" by 6" ACQ pressure-treated lumber to completely cover bare soil area. Install 4" of loam and 2" of pine bark mulch over filter fabric weed barrier. Select plantings that are appropriate for the area (e.g., shade, partial shade, full sun; arid or semi-arid soil). Provide recessed egress stepping-stones from the bed to an existing walkway.

7.2.3 Parking Areas

Cars parked on yards destroy grassed areas, turning them into dusty areas of bare contaminated soil. Cars should be confined to designated parking areas covered with gravel or asphalt. Heavy landscape timbers can be sunk at the perimeter of the parking area to define the edge and prevent stones from spreading into grass areas. All lots, whether gravel or asphalt, should have at least a 2-percent pitch across the surface to ensure that water will not puddle. Detailed specifications for creating a gravel or asphalt parking area are included on page 99.



A stone driveway.

7.2.4 Walkways

Worn dirt paths create dust. By installing stepping stones in areas where people regularly walk, you keep contaminated soil from being tracked into the house. Alternatives include concrete walks, cement stepping stones, gravel over filter fabric, recycled concrete, and brick paths.

Install stepping stones to prevent contaminated soil from being tracked into the house.

7.2.5 Recreation and Children's Play Areas

If possible, swing sets, sand boxes, and other children's play areas should be relocated away from the drip zone and other areas of highly contaminated soil. The same is true for picnic, barbecue, and other family recreation areas that receive heavy use. If relocation is not possible, the EMPACT LSYP uses one of two options:

- **Wood Platform**. A wood deck, made from ACQ pressure-treated 2" by 6" stock, can serve as a site for picnics, cook-outs, and children's play, and provides long-term protection from contaminated soil. Decking should be installed with a ¼" pitch to drain rainwater off the surface.
- **Raised bed filled with mulch or woodchips.** Raised beds can be used to cover areas of bare and/or highly contaminated soil. The beds provide an effective barrier and a safe, attractive place for children's play and family gatherings. Install a perimeter box made of 2" by 6" ACQ pressure-treated lumber, then install 4" of loam and 2" of pine bark mulch or woodchips over filter fabric weed barrier.

7.2.6 Gardens

Homeowners and residents should take precautions when gardening in or around lead-contaminated soil. Though plants generally do not accumulate lead, it is possible for a plant to absorb some lead in settings where soil-lead levels are very high. In addition, lead-contaminated dust can settle on the surface of garden plants.

Basic precautions include washing all vegetables with a vinegar-water solution, locating gardens away from roads and highly contaminated yard areas, and planting crops that are less likely to absorb or accumulate lead. In general, this means planting fruiting crops (e.g., corn, beans, squash, peppers, cucumbers, tomatoes, strawberries, apples) and avoiding root crops and leafy vegetables (e.g., carrots, radishes, lettuce, collard greens, spinach) since they are more likely to absorb lead from soils or become coated with lead-contaminated dust. Two excellent resources on lead in gardens are:

Lead in the Home Garden and Urban Soil Environment,
by Carl J. Rosen and Robert C. Munter
http://www.extension.umn.edu/distribution/horticulture/DG2543.html

Lead Contamination in the Garden, a fact sheet by Terry Logan
http://ohioline.ag.ohio-state.edu/hyg-fact/1000/1149.html

The EMPACT LSYP recommends relocating gardens away from the drip zone and other areas of highly contaminated soil. The EMPACT LSYP treatment approach recommends using raised beds in areas of moderate contamination (400 to 2,000 ppm). (Please refer to Section 3.4.3 for a discussion of how the EMPACT treatment approach compares with the approach recommended under the pending TSCA Section 403 rule.) Beds should be framed with 2" by 8" ACQ pressure-treated wood, lined with a filter-fabric weed barrier, then filled with 6" of loam that has been tested for lead levels (levels over 400 ppm are unacceptable). Gardening is considered safe in yard areas where lead levels are below 400 ppm.

7.2.7 Porches

The soil found underneath porches is often contaminated with lead from paint chips and with other chemicals that leach from pressure-treated wood used in outdoor construction. Because it receives

little sunlight, this soil is also naturally bare. The EMPACT LSYP has developed two strategies to discourage children from playing in contaminated soil beneath porches:

- **Lattice and Trim Barricade.** All exposed soil under porches is to be barricaded by ACQ wood framing, lattice, and pine trim. Prep, prime, and paint pine trim or apply two coats of wood sealant. Install a framed access door of like material. If loose soil is likely to be blown out from under porches, a covering of gravel or pea stone over bare soil would be appropriate.
- **Raised bed filled with mulch or gravel.** Install a wood box made from 2" by 6" ACQ pressure-treated lumber along footprint of porch. Line the box with filter-fabric weed barrier, then fill with either 2" of loam and 3" of pine bark mulch or 3" of loam and 2" of crushed stone.

Left: Before—bare soil under porch deck.
Right: After—area barricaded with lattice and trim.

7.2.8 Pet Areas

By tracking lead-contaminated soil and dust indoors, dogs and other pets can be a major source of lead exposure for humans. Pets that play regularly in certain parts of the yard can also create dusty areas of bare contaminated soil. If possible, pet areas should be located away from areas of highly contaminated soil. If not, install a wood box made from 2" by 6" ACQ pressure-treated lumber to completely cover the bare soil area. Line the box with a filter-fabric weed barrier, then fill it with 4" of loam and 2" of pine bark mulch or woodchips.

7.3 Developing a Budget for Each Yard Treatment

Once you have selected a suite of treatment measures for your program, you may want to develop a standard budget that can be used to guide each yard treatment. This budget will represent the maximum amount that the landscaper is authorized to expend in designing and implementing a treatment plan for each home.

Three main factors will drive the budget development process: the amount of funding available to your program, the number of yards you hope to treat, and the actual costs of materials and labor

SOURCES OF FREE MATERIALS

Parks departments

Recycling centers

Tree services

Corporate sponsors

Local nurseries

needed to create a lead-safe yard. Some yards will obviously cost more than others to treat. Your goal is to establish a reasonable budget for an average yard, with the possibility of authorized cost overruns at certain yards where treatments turn out to be unusually expensive.

A sample budget developed by the EMPACT Lead-Safe Yard Project is shown on page 101. The budget was developed in two steps. First, the project team calculated an allowance for each individual treatment measure by estimating the total cost of labor and materials. There are a number of reference books that can help with this process. The RSMeans Company, for example, offers several such books, including *Means Site Work & Landscape Cost Data 2000* (ISBN 0-87629-547-2) and *Landscape Estimating, 3rd Edition* by Sylvia H. Chattin (ISBN 0-87629-534-0). These books can be found in some libraries and bookstores or ordered online (http://www.rsmeans.com). Keep in mind that labor and material costs vary by region. You may want to consult a local landscaper as you develop allowances for each measure.

Second, the project team identified ways in which the individual measures might be cost-effectively combined to create a lead-safe yard. The goal was to make the yard lead safe by addressing as many areas as possible within a set budget (in this case, $3,000), while giving homeowners some freedom to choose the types of landscape measures they prefer. Note that the budget includes a standardized construction management allowance of $500, which allows the landscaper to cover costs such as landscape design, permits and fees, a workmanship and materials warranty, insurance, construction oversight, and the development of a maintenance manual for the completed yard.

Remember that the standard budget you develop represents the maximum amount that the landscaper is authorized to expend for each yard. Some yard treatments will cost less than the maximum. For this reason, you should consider developing a standard cost estimate sheet that the landscape coordinator can complete for each yard. A sample cost estimate sheet is shown on page 102.

LESSONS LEARNED: ESTIMATING TREATMENT COSTS

The experience of the EMPACT Lead-Safe Yard Project illustrates the importance of accurately estimating the per-yard costs of materials and labor. At the inception of the project, the project team set a target of treating 70 yards over the first two years, with a goal of expending about $750 per yard in landscape labor and materials that would be offered free to the participating homeowners. However, the project quickly found that treatment costs were running much higher than expected, partly because the project had chosen to employ a landscape team of city youths who were learning on the job (see also Section 4.2, "Selecting Program Partners"). The average cost per yard was roughly $2,100, with $300 going toward materials and $1,800 toward labor. Project management and indirect costs amounted to another $900 per yard. Because of these unexpected costs, the project was forced to scale back its objectives, though it still managed to treat 42 yards over the two-year period.

The EMPACT LSYP is currently investigating alternative models for organizing a lead-safe yard program that could reduce current average costs, in particular costs for labor, management, and overhead. For example, the EMPACT LSYP is investigating a model based on the principles developed by Habitat for Humanity, in which the work involved in achieving a lead-safe yard is carried out with the help of the homeowner by using volunteer labor and donated materials. See Appendix B for more information on this and other proposed models.

7.4 Homeowner Design Session

The EMPACT LSYP has found that it is critical to include the homeowner in designing landscape treatments for his or her yard. Why? First, the homeowner is the person who can best verify that the selected treatments provide enough actual protection from the lead-contaminated soil, based on the way the yard is used. Second, the homeowner is there to ensure that the selected landscape treatments meet his or her approval in terms of their esthetic value. A homeowner who is unhappy with the appearance or layout of his or her yard is unlikely to commit the money and effort needed to maintain the landscape treatments year after year.

Chapter 5 of this handbook described the necessity of creating a permission form to document the homeowner's participation in your lead-safe yard program. That permission form should also specify the homeowner's role in choosing treatment options, should soil-lead levels on his or her property turn out to be elevated. The homeowner design session is where these choices are made.

The EMPACT LSYP has tried using both the outreach worker and the landscape coordinator for the design session. The landscape coordinator is the better option. However, the outreach worker should facilitate a smooth transition for the homeowner from the outreach/sampling phase to the design phase. For example, the outreach worker should convey names, numbers, and any linguistic barriers to the landscape coordinator soon after the soil sampling is complete. The outreach worker may also want to attend the initial meeting between the landscape coordinator and homeowner to maintain a sense of familiarity, trust, and continuity for the homeowner. During the design session, the landscape coordinator will do three things:

1) **Communicate with the homeowner about the testing results.** Using the color-coded map developed during the data-collection phase, the landscape coordinator should describe the testing results, the areas of concern, and the need for changes.

2) **Ask follow-up questions about yard uses**. During their initial meeting, the outreach worker should have interviewed the homeowner about the activities that take place in the yard and the ages and numbers of people who use the yard. Yard uses should have been mapped on a plot plan using colored markers or crayons (see Section 5.3). During the design session, the landscape coordinator should review the yard uses with the homeowner and ask any follow-up questions.

3) **Work with the homeowner to select appropriate treatments based on the lead levels, the yard uses, and the homeowner's esthetic preferences.** The selected treatments should be mapped on the plot plan showing yard uses, and this treatment plan should be used by the landscaper as a blueprint for work to be done. A sample treatment plan is shown on page 103. See Section 7.1 above for guidance on matching treatments to hazards.

You may wish to develop a legally binding form that the homeowner can sign at the conclusion of the design session, stating that he or she understands and approves of the final treatment plan. A sample homeowner's approval form is included on page 104.

7.5 Contracting With a Landscaper

Early in the development of your lead-safe yard program, you will want to identify a program partner for the design and landscape components of your project (see Section 4.2, "Selecting Program Partners"). This could be a non-profit landscaping company, a private landscaping company, or even a team of youth volunteers who have been trained in landscaping techniques. Another option, currently being tested by the EMPACT LSYP, is to develop a pool of landscaping contractors trained

at designing and implementing landscape treatments that can reduce exposure to lead-contaminated soil. Why create a contractor pool? By training and partnering with multiple contractors, you create competition—a market—for the work you have to offer, and you also build "capacity" within your community for this type of work. This is an important goal of your program: to increase your community's base of knowledge about soil-lead hazards and strategies for yard treatment.

No matter who you use for the design and landscape components of your project, you will need to develop a contract for the work. If you have chosen to use only a single landscaper, this process will be relatively straightforward: you will simply negotiate an agreement for the property or properties requiring treatment, and then capture the agreement in the form of a contract. Guidance on developing a contract is provided below.

If you have succeeded in creating a contractor pool, you will need to develop a system for choosing which contractor to use at a particular property. Here are two possible ways of doing this:

- **Group the properties geographically, then assign several to each contractor.** Under this scenario, each contractor is given a budget for each property he or she is assigned, and is asked to develop and implement a treatment plan within the budget. This method is relatively noncompetitive, in that contractors are not asked to bid against one another. However, over time, you can determine which contractors do the best and most cost-effective work, and then increase their workload.
- **Solicit bids for the property (or properties) requiring treatment.** This works best if you (or a professional landscape designer) have already developed a treatment plan for each property, identifying which landscape measures will be used. Each contractor is then given a copy of the treatment plan(s), along with detailed specifications for the work to be done, and is asked to submit a bid. The work goes to the lowest bidder. The disadvantage of this method is that the landscape contractor is not included in the development of the treatment plan.

Whatever method you use, you should consider assigning or awarding several properties at a time to each contractor, rather than one at a time. This allows contractors to benefit from the economies of scale when buying materials and planning their work.

7.5.1 Developing a Contract

To simplify the contracting process, you should develop a standardized contract for use at every property. This contract should define the scope of services the contractor will perform, the timeframe for the work, the contractor's legal responsibilities, and the details of compensation. The sample contract on pages 105 to 108 shows some of the details that should be incorporated into a standardized contract, including:

- **Warranty**—Contractors should provide a warranty guaranteeing their work from defects in workmanship and materials for a specified period. The EMPACT LSYP requires a one-year warranty from its contractors.
- **Draws**—The term "draws" refers to the timing of compensation. Many contractors will want one-third of their compensation up front, one-third at the halfway point, and the final third upon completion of the project. You should attempt to negotiate a payment schedule that is mutually acceptable, though you should keep in mind that draws are typically market-driven.

LEAD-SAFE YARD PROGRAM HEALTH AND SAFETY

I. Primary route of entry of lead into the body is ingestion:

- **A. Lead can enter the body through normal hand-to-mouth activities.**
- **B. Small amounts of lead left on hands or clothing can impact blood lead levels.**
- **C. Lead-contaminated soil can be transferred to the interior of dwelling (by pets, shoes, clothing).**

II. Preventive measures:

- **A. Avoid dust-generating activities.**
- **B. Dampen soil to minimize dust generation.**
- **C. Keep children and pets away from area where work is being done.**
- **D. Wear leather or comparable work gloves to minimize hand contamination.**
- **E. Do not smoke* or eat while in work area.**
- **F. Wash face and hands before smoking* or eating.**
- **G. Remove shoes/boots before entering a dwelling to limit contaminated soil transfer.**
- **H. Wash work clothing separately from other clothing.**

*** Do not smoke at all.**

- **Insurance**—Each contractor should be required to maintain general liability and workman's compensation insurance to protect against claims due to bodily injury or property damage and claims under state workman's compensation acts.
- **Pollution insurance**—Most general liability insurance policies do not cover injury or illness caused by pollution (for example, illness caused by lead exposure). You should look into the costs and the potential necessity of pollution insurance in your state and consider encouraging contractors to purchase such insurance.

7.6 Health and Safety for Landscapers

Before any field work begins, your program should develop safety guidelines that protect your soil sampling team and landscape workers from the risks associated with working with lead-contaminated soil. All field workers should be educated about lead hazards, health effects, safe work practices, and any federal or state regulations that apply to their work.

OSHA regulation 1926.62, the "lead in construction standard," applies to all private sector workers, no matter how few are employed. Although it does not apply to workers in the public sector, it is nevertheless a useful reference on responsible practices. The regulation, available online at http://www.osha-slc.gov/OshStd_data/1926_0062.html, requires a written description of the work to be done, an estimate of the anticipated exposure to lead, and a statement detailing the precautions to be taken. If the anticipated exposure to lead reaches the "action level"—30 micrograms per cubic centimeter of air, averaged over an 8-hour day—extensive guidelines come into play to protect workers.

Since the lead to which landscapers in the EMPACT LSYP are exposed falls below the action level, compliance with the lead in construction standard has not been difficult. However, to be on the safe side, the project has adopted an important contract requirement that goes beyond what OSHA stipulates for enterprises whose employees are exposed to lead below the action level. This requirement is health and safety training for landscapers. One of the main points conveyed in the training is that lead enters the body chiefly through ingestion, which happens as a result of routine hand-to-mouth activities such as eating, drinking, and smoking. An information sheet used in the training is shown in the box, "Lead-Safe Yard Program Health and Safety."

Even small amounts of lead on the hands can affect blood lead levels. Also, lead on clothing is easily transferred to the hands, and then from the hands to the mouth. Another danger is that lead will be brought into the home on landscapers' clothing, especially their boots or shoes.

A key precaution is to avoid activities that generate dust. When the ground must be disturbed, as is often the case in landscaping, it should be dampened to minimize the dust that may be generated.

Leather or comparable work gloves should be worn to cut down on hand contamination, and landscapers should not eat, drink, or smoke in the work area. After they leave, they should wash their face and hands before doing any of these activities. They should remove their boots or shoes at the door of their home to keep from tracking in contaminated soil, and they should wash their work clothing separately from their other clothing.

Blood lead tests are advisable to make sure such measures are effective, and in fact are mandated by OSHA for employees exposed to lead at or above the action level. Almost any doctor at almost any clinic can perform this service, but an occupational health physician and an occupational health clinic are recommended, primarily for skillful interpretation of test results.

Landscapers should have their lead levels taken before doing any work and then every two months for the next six months. If levels are still less than 40 µg/dL, the time between tests can increase to six months. If levels are between 40 and 50 µg/dL, testing should continue every two months. Levels above 50 µg/dL should trigger monthly testing, and if they don't decrease, the landscaper should be removed from the work area. However, this step may well be avoided. As soon as blood lead levels rise, employers should try to find out why and remedy the situation. Often the cause is some break in the accepted work practices, which can be handled by re-educating the employee.

The EMPACT LSYP has not seen any elevated blood lead levels among its team members as a result of exposure to lead in soil during landscaping work.

7.7 Approval and Signoff on Work Complete

After all landscape work and construction is complete, both you and the homeowner should inspect the property. You should look for the following things:

- That all landscape treatments have been successfully implemented as per the scope of work agreed to during the design session.
- That, for each treatment measure, the landscaper has followed the detailed specifications defining exactly how the work should be done and what materials should be used.
- That the property has been left in a clean state. The homeowner must approve any material remaining on site after completion of the landscape work.

This process of approving the completed work can be as formal or informal as you want to make it. During Phases 1 and 2, the EMPACT LSYP approved each yard treatment during an informal visit between the outreach worker and the homeowner (the outreach worker also used these visits to reinforce the lead hazard education delivered during previous visits). On the other hand, Lead Safe Boston, a spinoff of the EMPACT LSYP run by the City of Boston, has developed a legally binding project completion certificate (see page 109) to be signed by the homeowner and the landscape contractor after the property has been inspected and all work approved. The certificate also serves as a lien waiver, in which both the

A finished project.

homeowner and contractor discharge Lead Safe Boston from any legal claims that may arise in connection with the work performed under the program.

Lead Safe Boston has also created an additional form (see page 110) for the contractor to sign upon receipt of final payment. The form certifies that the contractor:

- Has paid all debts associated with the work done on the property.
- Discharges the program and the homeowner from any claims made by subcontractors, material suppliers, or workers, in connection with the work performed under the program.
- Has completed all work on the property according to the terms of the contract.
- Warrants the completed work against workmanship and material defects for the period stipulated in the contract.
- Has been paid in full for all work complete.

7.8 Handing Over the Case File

At the conclusion of the yard treatment process, after all landscape work has been inspected and approved, you should present the homeowner with the case file that has been developed for his or her property. This file should be a binder containing all information related to the property, including copies of application and permission forms, testing results, treatments plans, and approval forms. The binder should also contain a copy of the maintenance manual that the landscape coordinator develops for the property (see Chapter 8). Keep a copy of each case file for your program's records.

7.9 For More Information

For information on U.S. EPA's proposed standards (TSCA 403) for lead-based paint hazards (including lead-contaminated residential soils), visit the Office of Pollution Prevention and Toxics at http://www.epa.gov/lead/leadhaz.htm.

The Department of Housing and Urban Development's Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance (24 CAR Part 35) can be found online at http://www.hud.gov/lea/.

For an information sheet on ACQ pressure-treated lumber, go to http://www.conradwp.com/acq.htm.

Two excellent resources on lead in gardens are:

Lead in the Home Garden and Urban Soil Environment, by Carl J. Rosen and Robert C. Munter, http://www.extension.umn.edu/distribution/horticulture/DG2543.html

Lead Contamination in the Garden, a fact sheet by Terry Logan, http://ohioline.ag.ohio-state.edu/hyg-fact/1000/1149.html

The RSMeans Company publishes two reference books that can help with the process of estimating landscaping costs. The books, *Means Site Work & Landscape Cost Data 2000* (ISBN 0-87629-547-2) and *Landscape Estimating, 3rd Edition* by Sylvia H. Chattin (ISBN 0-87629-534-0), can be ordered online at http://www.rsmeans.com.

Information on OSHA's "lead in construction standard" (OSHA Regulation 1926.62) can be found online at http://www.osha-slc.gov/OshStd_data/1926_0062.html.

Sample Specifications for Yard Treatments

Suggested Plantings

Azalea evergreen hybrid (2 gallon)
Torch azalea (2 gallon)
Japanese boxwood (1 gallon)
Common boxwood (2 gallon)
American holly (2'-3')
Regal privet (18"-24")
Columbine (1 gallon)
Chrysanthemum (1 gallon)
Foxglove (1 gallon)
Day lily (1 gallon)
Black-eyed susan (1 gallon)
Hosta (1 gallon)

Drip Zone

Raised perimeter box filled with gravel (no plantings). Install 2" x 6" ACQ pressure-treated wood box 3' from foundation wall. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground to a minimum depth of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 3" of loam and 2" of ¾" crushed stone over filter fabric weed barrier.

Raised perimeter box filled with mulch and plantings. Install 2" x 6" ACQ pressure-treated wood box 3' from foundation wall. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground to a minimum depth of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 4" of loam and 3" of pine bark mulch over filter fabric weed barrier. Install a minimum of ten perennials per the list of plantings or approved equal.

Grassed Areas

Existing lawn improvement. Rake bare areas to loosen soil. Apply rye, fescue, and bluegrass seed mix at the rate specified by manufacturer. Apply ¼"of top soil over new seed and water thoroughly.

New lawn installation (at existing grade). Rototill existing lawn bed 6" deep. Apply water to contain dust during rototilling. Apply rye, fescue, and blue grass seed mixture at the rate specified by manufacturer. Spread ¼" loam on top of seed. Water thoroughly.

New lawn installation (raised bed). Install 2" x 6" ACQ pressure-treated wood box at owner-approved location. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 6" of loam over filter fabric weed barrier. Apply rye, fescue, and blue grass seed mixture at the rate specified by manufacturer. Spread ¼" loam on top of seed. Water thoroughly.

Raised mulch bed (with plantings). Install 2" x 6" ACQ pressure-treated wood box to completely cover bare soil area. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 4" of loam and 2" of pine bark mulch over filter fabric weed barrier. Install a minimum of ten perennials per the list of plantings or approved equal. Provide recessed egress stepping-stones from bed to walkway.

Parking Areas

Gravel parking areas. Install 6" of compacted gravel/crushed stone base to all areas designated as parking areas. Top of base shall be 2" to 3" below finish grade of surrounding area. Install a top layer of 1-1/2" to 2" of processed gravel or crushed stone (3/8" or ¾" size) over gravel/crushed stone base. Final grade is to have a minimum of 2% pitch across the surface to ensure that water will not puddle.

Asphalt parking areas. Level surface by preparing a 6" gravel base over a uniformly graded and compacted subgrade. Form, spread, and roll 2" of bituminous base coat and 1" topcoat to create a driveway 10' wide. Final grade is to have a minimum of 2% pitch across the surface to ensure that water will not puddle.

Walkways

Stone path. Install round or square red patio stepping stones at all egresses from front to rear yard. All stones shall protrude no more than ½" above the existing or new grade.

Recreation and Children's Play Areas

Raised play area. Install 2" x 6" ACQ pressure-treated wood box. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 4" of loam and 2" of pine bark mulch or woodchips over filter fabric weed barrier.

Wood platform. Install a 10' x 12' ACQ wood platform built from 2" x 6" stock, 16" on center with 5/4" x 6" radius edge decking. All decking and joints to be mechanically fastened with 3" galvanized screws. Platform shall be installed with a ¼" pitch to drain rainwater off of surface.

Garden Areas

Raised vegetable garden bed. Install 2" x 8" ACQ pressure-treated wood box at owner approved location. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 6" of loam over filter fabric weed barrier.

Pet Areas

Raised pet area filled with mulch or woodchips. Install 2" x 6" ACQ pressure-treated wood box to completely cover bare soil area. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 4" of loam and 2" of pine bark mulch or woodchips over filter fabric weed barrier.

Porches

Bare soil under porches (lattice and trim). All exposed soil under porches is to be barricaded by ACQ wood framing, lattice, and pine trim. Prep, prime, and paint pine trim or apply two coats of wood sealant. Install framed access door of like material. Include galvanized metal hasp and hinges.

Bare soil under porches (mulch bed). Install 2" x 6" ACQ pressure-treated wood box along footprint of porch. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 2" of loam and 3" of pine bark mulch over filter fabric weed barrier.

Bare soil under porches (gravel bed). Install 2" x 6" ACQ pressure-treated wood box along footprint of porch. All joints and corners shall be mechanically fastened with 3" galvanized wood screws to a 1-1/2" square stake driven into the ground a minimum of 12". All corners shall be braced with triangular exterior grade plywood keystones mechanically fastened directly to the wood box with 3" galvanized wood screws. Install 3" of loam and 2" of ¾" crushed stone over filter fabric weed barrier.

SAMPLE BUDGET FOR YARD TREATMENTS

	Allowance
House perimeter (drip zone) Each house receives approximately 150 l.f. of perimeter raised boxes installed 3' from foundation wall where feasible. (Exceptions to perimeter boxes are existing asphalt/concrete paving, bulkhead, under rear porches, etc.). Fill perimeter boxes with homeowner's choice of:	
Option #1: 6" of pine bark mulch, filter fabric, and ten 1-gallon plantings (i.e., common boxwoods, azaleas, holly, or equal). Plantings to include compost/top soil/manure.	$1060.00
Or Option #2: 4" of gravel, filter fabric (no plantings).	$1060.00
Bare soil area under rear porch area (all areas matching this criteriaon to receive treatment)	
Option #1: Barricade exposed soil by wood framing and lattice secured to porch framing/supports. Install access door of like material with hasp.	$350.00
Or Option #2: Area under porch to received raised perimeter boxes, filter fabric, and installation of 6" of pine bark mulch or 4" of gravel.	$ 350.00
Back yard (homeowner to choose one option)	
Option #1: Each house shall receive a 10' x 12' wood platform built from 2" x 6" ACQ stock, 16" o.c. with 5/4" x 6" radius edge decking.	$780.00
Each house shall also receive approximately 10' x 12' area of lawn. Treatment to include rototilling soil 6" deep, installing filter fabric, adding 6" of conditioned top soil to be spread by hand, perimeter edging to be constructed of 2" x 6" ACQ stock, and a 6# shade mix to be installed by push spreader.	$250.00
Or Option #2: Each house shall receive a 10' x 12' wood platform built from 2" x 6" ACQ stock, 16" o.c. with 5/4" x 6" radius edge decking.	$780.00
Each house shall also receive approximately 10' x 12' garden area. Treatment to include rototilling soil 6" deep, installing filter fabric, adding 6" of conditioned top soil to be spread by hand, perimeter edging to be constructed of 2" x 6" ACQ stock.	$250.00
Or Option #3: Each house shall receive approximately 20' x 24' area of woodchips. Treatment to include installation of filter fabric, adding 2" of topsoil spread by hand and covered with 6" of woodchips, and installation of perimeter edging to be constructed of 2" x 8" ACQ stock.	$905.00
Each house shall also receive misc. treatments to adjoin mulched area to egresses. Misc. treatments to include up to 30 additional 12" x 12" red patio stepping stones, misc. plantings, additional mulching, etc.	$125.00
Walkways	
Each house shall receive up to 30 red patio stepping stones, 12" x 12", to be used at major egresses.	$60.00
SUBTOTAL (house perimeter, rear porch, back yard, and walkways)	$2500.00
CONSTRUCTION MANAGEMENT ALLOWANCE (general requirements; landscape design and site development; construction oversight; homeowner education and maintenance manual development)	$500.00
TOTAL (APPROXIMATE) COST PER LOT	$3000.00

SAMPLE COST ESTIMATE SHEET

Property address: _____

_____

House perimeter (homeowner to choose one option)

Option #1 _____l.f.
Perimeter box with pine bark mulch, filter fabric, and plantings. $_____
Or Option #2 _____l.f.
Perimeter box with gravel, filter fabric; no plantings. $_____

Bare soil area under rear porch area (all areas matching this criteria to receive treatment)

Option #1
Wood framing, lattice, access door, stepping stones. $_____
Or Option #2
Raised perimeter boxes, filter fabric, and mulch or gravel. $_____

Back yard (homeowner to choose one option)

Option #1
Installed 10' x 12' x 6" ACQ wood platform. $_____
New 10' x 12' area of lawn with ACQ perimeter edging. $_____
Or Option #2
Installed 10' x 12' x 6" ACQ wood platform. $_____
New 10' x 12' x 6" garden area framed with ACQ wood. $_____
Or Option #3
New 20' x 24' x 8" area of woodchips framed with ACQ wood. $_____
Stepping stones, misc. plantings, additional mulching, etc. $_____

Walkways

Egress stepping stones. $_____

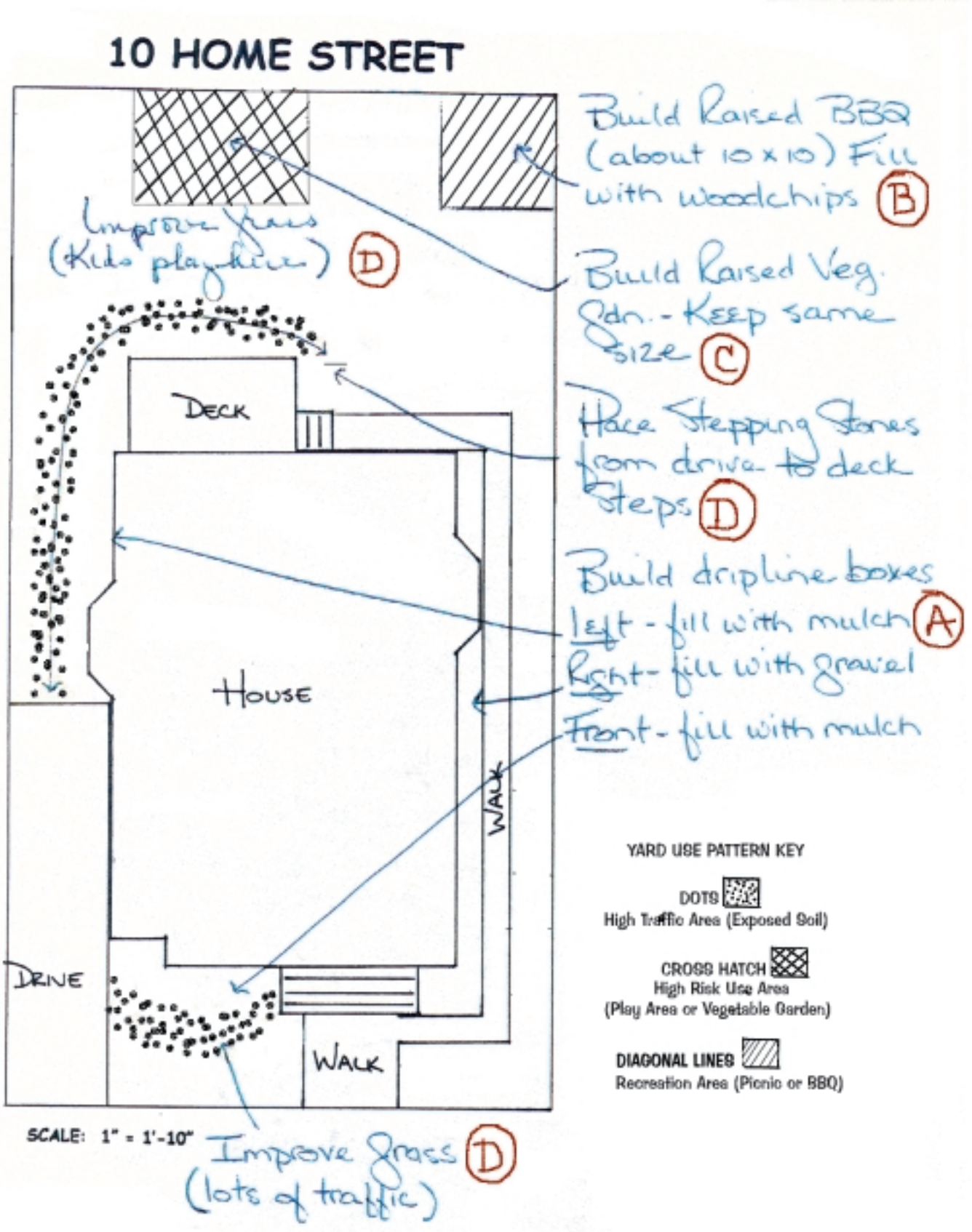
Misc. treatments:

Existing lawn improvement. $_____
Additional edging, material, plantings, etc. $_____

Total (Approximate) Cost $_____

Cost Estimate Submitted by: _____ Date: _____

Company name: _____



SAMPLE FORM:
HOMEOWNER'S APPROVAL OF TREATMENT PLAN

Date: _____

Property Owner: _____

Property Address: _____

_____

I/We have reviewed the construction documents (specifications, plans, drawings, etc.) for the proposed treatment of the soil around my/our property and attest that they are complete, accurate and conform to my/our wishes.

I/We authorize the program to proceed with my/our application using said construction documents fully aware that said documents may change. I/We understand that any changes to the documents will be reviewed by me/us and I/We shall approve such changes prior to commencement of the work by the landscaper. I/We also understand that [the lead-safe yard program coordinator] must approve all changes to the proposed scope of work before work begins.

Date of Specifications/Plans: _____

Date Landscaper can begin scope of work: _____

Number of days required to complete scope of work: _____ Calendar Days

_____	_____	_____	_____
Owner #1	Date	Landscaper	Date
_____	_____	_____	_____
Owner #2	Date	Program Coordinator	Date

CONSULTANT CONTRACT

THIS CONSULTANT CONTRACT (the "Contract") is made as of this ____ day of _____, 200__ between (Organization Name), with its principal office located at (Organization Street Address, City, State, Zip, hereinafter called "(Organization acronym)", and (Contractor Name), the principal place of business of which is located at (Contractor Street Address, City, State, Zip).

WHEREAS, the (Organization acronym) desires to engage the Consultant as an independent contractor, and the Consultant desires to accept such engagement on the terms and conditions set forth hereinafter;

NOW, THEREFORE, in consideration of the covenants and agreements herein contained, the (Organization acronym) and the Consultant agree with each other as follows:

1. **Scope of Services.**

- Obtain completed Homeowner Yard Use Interview and plot plan, developed by the Environmental Protection Agency, from (the organization acronym).
- Design and landscape (number of) properties recruited and enrolled from (Target Area). All landscaping designs shall include but not be limited to the attached Attachment A Lead Safe Boston/National Center for Lead Safe Housing Standard Plan for Low Level Lead Soil Treatment dated December 29, 1999.
- Meet with homeowner within ten business days after receipt of testing results and homeowner use questionnaire from (Organization acronym/name) to complete Landscaper Information Sheet and to discuss current and future use of yard.
- Generate landscape design within five business days from the date of meeting with the homeowner. Obtain (Organization acronym/name) approval of design; obtain homeowner approval of same. Provide (Organization acronym/name) with four copies.
- Generate property specific cost proposals and submit to (Organization acronym/name) for approval.
- Secure planting stock and materials required for specific project(s).
- Pay for and post all necessary fees/permits.
- Install landscapes as per owner and (Organization acronym) approved designs within thirty days from the date of landscape plan approval.
- Generate homeowner maintenance manual specific to each property. Provide (Organization name) with three copies and homeowner with one copy.
- Conduct 30-minute educational session with homeowner to review homeowner maintenance procedures and manual.
- Obtain homeowner and (Organization acronym) final approval of landscape work.
- Leave property in a clean state. Owner must approve any material remaining on site after completion of landscape installation.
- Provide a 1-year workmanship and materials warranty from date of final homeowner approval. This warranty is limited to defects in workmanship and materials attributable to the consultant only and does not cover losses caused by: acts of God, third parties or failure of the homeowner to comply with the maintenance procedures and manual.
- Coordinate with Lead Safe Boston representatives and/or other applicable agencies in the execution of this contract.
- Complete all work as per local, state and federal rules and regulations.

1. **Compensation.** The (Organization acronym/name) shall reimburse Consultant on a semimonthly basis for (Contractor name) services on receipt of itemized invoices as follows:

- $(Negotiated amount)/ea. On completion of initial visit with homeowner to discuss landscape design
- $(Negotiated amount)/ea. On completion and approval of landscape design and maintenance manual.
- Half of property specific cost proposal (less design fee) on commencement of landscape installation.
- Balance on completion and approval of installation and 30-minute educational session with homeowner to review homeowner maintenance procedures and manual.
- No one property shall exceed $3,000 including general conditions, design work and maintenance manual without prior approval from (Organization acronym/name).
- Invoices shall reflect actual costs per property and are to be submitted semimonthly to (Organization acronym/name) for processing and payment.

2. **Term.** The term of this Contract shall be from (Start Date) to (End Date). Either party on 30 days notice may terminate this contract. In the event of premature termination by the (Organization acronym/name), the Consultant shall be paid for all work completed prior to the termination as well as the reasonable value of all work partially completed and all materials obtained and stored on-site.

3. **Benefits.** The (Organization acronym/name) is not responsible for any insurance or other fringe benefits, including, but not limited to social security, worker's compensation, income tax withholdings, retirement or leave benefits, for Consultant or employees of Consultant. The Consultant assumes full responsibility for the provisions of all such insurances and fringe benefits for himself or herself and all Consultant's employees.

4. **General Liability and Workman's Compensation.** The contractor shall purchase and maintain such insurance as will protect him/her from claims under the Workman's Compensation Acts (chapter 152 of the Massachusetts General Laws) and from claims for damages because of bodily injury, including death and all property damage including, without limitation to, damage to the buildings and adjoining the site of construction which might arise from and during operations under any Contract, whether such operations be by himself/herself or by any subcontractor or anyone directly or indirectly employed by either of them. The Contractor shall, without limiting the generality of the foregoing, conform to the provisions of the Section A of Chapter 149 of the Massachusetts General Laws, which Section is incorporated herein by reference and made a part hereof.

General Liability Insurance Minimum bodily injury limits of $100,000 per person and $300,000 per accident, and $300,000 aggregate during any twelve-month period, shall include the following:

a. Public Liability (bodily injury and property damage)

b. Independent Contractor's Protective Liability

c. All Risk Insurance - covering all contractor equipment with provisions of waiver of Subrogation against the Owner

d. Comprehensive All Risk Motor Vehicle Liability Insurance—minimum bodily injury limits of $100,000 per person, per accident, and property damage limit of $300,000 per accident

5. **Arbitration.** Any controversy or claim arising out of, or relating to, this Contract or the breach thereof, shall be settled by arbitration in accordance with the rules then obtaining of the American Arbitration Association. Judgement upon the award rendered may be entered in any Court having jurisdiction thereof. Any award rendered hereunder shall be final and binding on all parties thereto.

6. **Construction.** This Contract shall be construed, interpreted and applied under and in accordance with the laws of Massachusetts.

7. **Parties Bound.** The terms and provisions of this Contract shall be binding upon the parties hereto, their legal representatives, successors and assigns.

8. **Federal Requirements.** The Consultant's services may be reimbursed in part from funds under a contract funded directory or indirectly by the U.S. Department of Housing and Urban Development. Consultant is bound by the provisions of that contract.

9. Entire Agreement. This instrument contains the entire agreement between the parties. No statement, promises or inducements made by any party hereto, or agent of either party hereto, which is not contained in this written contract, shall be valid or binding; and this contract may not be enlarged, modified or altered except in writing and signed by the parties.

IN WITNESS WHEREOF, the parties have caused to be properly executed on their respective behalf, this Consultant Contract, effective for all intents and purposes as of
(Month, Day, Year).

(Organization Name)

By: _____

Title: _____

(Contractor's Name)

By:_____

Title:_____

ATTACHMENT A—Narrative
Lead Safe Boston/National Center for Lead-Safe Housing
Standard Plan for Low Level Lead Soil Treatment
December 29, 1999

Goals of the Low Level Soil Treatments
The goal of this project will be to improve the lead safety in homes by the reduction of exposure to high levels of lead in soil. All work will be based on soil assessments conducted by EPA. EPA will conduct all soil testing and provide to the vendor/contractor a plot plan indicating areas of concern.

Abatement strategies shall be designed to change the use of the yards while providing a lead safe area for children and families to enjoy.

Outreach and Enrollment
The outreach and enrollment component of the project will be undertaken by a contractor already in use by The National Center (Silver Linings). Outreach will focus on a pool of properties deleaded under Lead Safe Boston's Round 1 Evaluation project. These properties will be targeted primarily because of the extensive data collected to date.

Typical Yard
When the deleading of a home was complete, the single soil treatment conducted by Lead Safe Boston deleading contractors included a final cleanup of the soil by hand raking after abatement of the structure as per the Massachusetts Lead Law. The properties averaged 4000 s.f. and the footprint of the home averaged 1000 s.f. In addition, the yards are mostly flat, compacted soil with evidence of tree roots and shade. Most properties do not have driveways.

General Requirements
The General Requirements are to include but are not limited to: permits/fees, a 1 year workmanship and material warranty period, general liability and worker's compensation requirements (see attached).

Landscaping and Site Development
Landscaping and Site Development is to include generation of the initial Landscape design based on use and the plot plan provided by EPA. Also to be included is the generation of the maintenance manual for the homeowner education component.

Construction Oversight
The construction oversight allowance is to include construction monitoring, final inspection/sign off and homeowner final approval. The date of final homeowner approval will be the starting date of the 1 year warranty period.

Homeowner Education
The homeowner education allowance is to include two on-site meetings: initial meeting to obtain homeowner approval and a final meeting to review all site specific maintenance manuals and work completed by the vendor/contractor.

Design
The Consultant shall use this document as a guideline for all landscape design decisions.

SAMPLE PROJECT
COMPLETION CERTIFICATE

Date: _____ Building ID: _____

Property Owner: _____

Property Address: _____

_____

I/We have inspected my/our property and found that the work conducted to make our yard lead safe has been successfully completed according to the scope of work I/we approved dated _____. I/We have met with [Contractor name] and attended a 30-minute educational session to review the Lead Safe Yard Maintenance Procedure Manual. [Contractor Name] has provided me/us with a copy of this manual for my use.

In accordance with the scope of work and in connection with the final payment made to the contractor, I hereby agree to discharge, and hold [Your Program] harmless from any and all claims which arise against the Owner and/or his/her property, in connection with the work performed under this Program.

_____ _____ _____ _____

Homeowner Name Date Homeowner Name Date

Inspection has been made of the yard made lead safe through the [Your Program]. I have examined the work and found all the work to be completed in a satisfactory manner and in accordance with the scope of work dated _____.

_____ _____

Program Representative Date

_____

In accordance with the contract dated _____ and in connection of the final payment made thereunder, I hereby agree to discharge, and hold the Owner and [Your Program] harmless from, any and all claims (including all liens resulting therefrom) which arise against the Owner of his/her property the contractor as its assignee now has or ever had by virtue of, or in connection with the work performed under, said Agreement.

That also in consideration of said final payment I hereby agree to discharge, and hold the Owner harmless from, any and all claims (including all liens resulting therefrom) which may be brought within forty (40) days of the date hereof by all sub-contractors, all suppliers of materials and equipment, and performers of work, labor or services arising by virtue of, or in connection with the work performed under, said Agreement.

That I warrant same for one (1) year from the date hereof, against workmanship and materials defects. One-year warranty does not cover losses caused by: acts of God, third parties or failure of the homeowner to comply with the maintenance procedures and manual.

_____ _____

Contractor Name Date

SAMPLE FORM:
CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS, RELEASE OF CLAIMS, WARRANTY OF WORKMANSHIP AND RECEIPT OF PAYMENT

Property Address: _____

_____

Pursuant to the Agreement between [Contractor Name] and [Your Program], dated ____/____/, for the scope of work conducted at the above listed property, the undersigned, acting on behalf of the contractor, hereby certified and agrees as follows:

1) That he/she has paid in full, or has otherwise satisfied obligations for all materials and equipment provided, and for all work, labor, and services performed and for all known claims for all damages arising by virtue of, or in connection with the work performed under, said Agreement for which the owner of his/her property might in any way be held responsible.

2) That in accordance with said Agreement and in connection of the final payment made thereunder he/she hereby releases the Owner and [Your Program] of any lien, or claim or right to lien on said property resulting therefrom, which against the owner of his property the contractor or its assignee now has or ever had by virtue of, or in connection with the work performed under, said Agreement.

3) That also in consideration of said final payment he/she hereby agrees to discharge, and hold the Owner and [Your Program] harmless from, any and all claims (including all liens resulting therefrom) which may be brought within forty (40) days from the date hereof by all subcontractors, all suppliers of materials and equipment, and all performers of work, labor, or services arising by virtue of, or in connection with the work performed under, said Agreement.

4) That all work in connection with said Agreement has been performed in accordance with terms thereof.

5) That he warrants same for one (1) year from the date hereof, against workmanship and materials defects. The one-year warranty does not cover losses caused by: acts of God, third parties, or failure of the homeowner to comply with the maintenance procedures and manual.

6) That he/she has received from [Your Program] all sums of money payable to the contractor under said Agreement and any modifications or changes thereof.

By: _____ _____

Contractor Name **Date**