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Basic Design Concepts for Sustainable Landscapes

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A sustainable landscape is more than the conscious arrangement of outdoor space for human enjoyment and satisfaction. It is a landscape that uses minimal water, fertilizers, pesticides, labor, and building materials. Creating a sustainable landscape means working toward a thoughtful balance between resources used—both in construction and maintenance—and results gained.

Sustainable landscapes require as much, if not more, planning as traditional landscapes. However, many traditional landscapes already contain some components of sustainability. The checklist on page 3 can help you evaluate your landscape's sustainability.

As you plan your landscape, think about your entire property and what you want to achieve. During each step in the process, think about ways to incorporate sustainability into your design (e.g., by selecting plants wisely, using recycled building materials, and limiting your use of plants with high fertilizer, water, or maintenance requirements).

The most common steps in developing a landscape include:

- ❁ Drawing a scale map (plot plan) of the property
- ❁ Completing a site analysis and assessing family needs
- ❁ Determining use areas
- ❁ Brainstorming alternative layouts and design ideas
- ❁ Creating a scaled drawing of the design (landscape plan)
- ❁ Selecting plants

A master plan is essential to ensure that all work done on the property will blend into the desired final outcome. Keep in mind that landscape development can be a long-term process. There is no need to develop your entire lot at once; completing the landscape over a 5-year period might be more feasible. This time frame allows you to evaluate plants as they grow and mature and generally is more financially manageable.



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Drawing a scale map of the property

Prepare a scale map of your property (Figure 1). Use graph paper and let one square equal a certain number of feet. Or use a ruler or engineer's scale as follows:

| Suggested scale | Small lot | Large lot |
|-----------------|----------------|----------------|
| Engineer | 1 inch = 10 ft | 1 inch = 20 ft |
| Ruler | 1 inch = 8 ft | 1 inch = 16 ft |

The map should include:

- ❖ Property lines
- ❖ North arrow
- ❖ Scale used
- ❖ Contour of the land (Use an arrow to show direction of surface water flow.)
- ❖ Location of existing landscape features: house, garage, buildings, trees, walks, and driveways

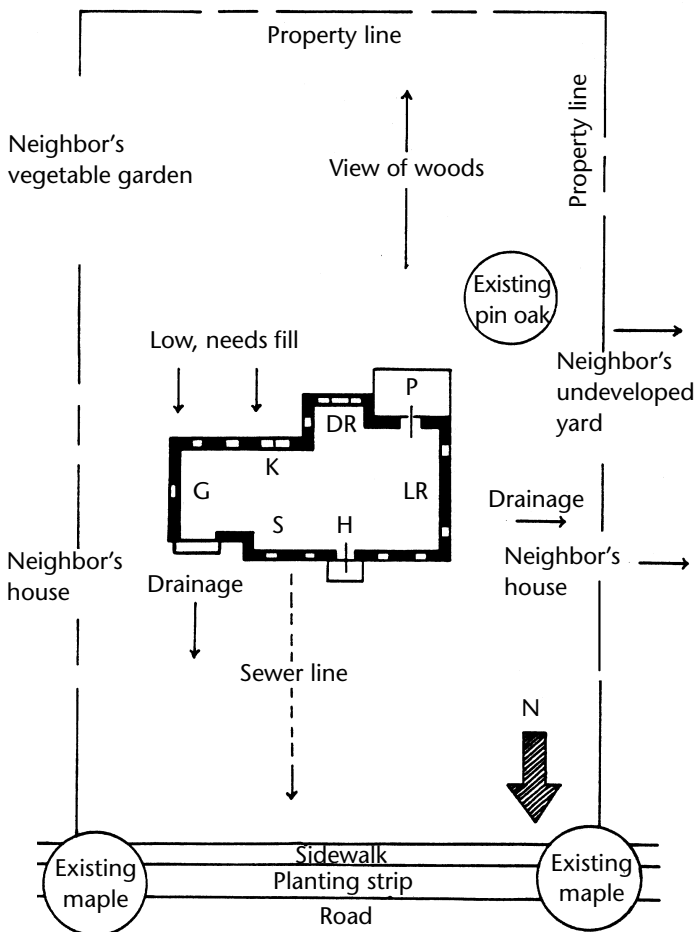


Figure 1.—Property map.

- ❖ Doors, windows, porches, and rooms of the house
- ❖ Septic tank, sewer lines, and underground power lines
- ❖ Views (Point arrows in the direction of each good view.)
- ❖ Undesirable features of your own or adjoining property

Completing a site analysis and assessing family needs

A thorough site analysis can help you enhance or maintain your property's sustainability, as it tells you what you have to work with on the site. A site analysis also can shed new light on an existing landscape before you begin a renovation project. A comprehensive understanding of your site conditions is important, because in a sustainable landscape both native and introduced plants must be well suited to existing light, moisture, and soil conditions. Part I of the "Landscape design planning questionnaire" on pages 10–12 includes several questions to help with your site analysis.

Parts II and III of the questionnaire address the needs and preferences of the people who will use the landscape. Age of family members, types of pets, and personal plant preferences are important, as is determining whether there is a need for lighting or areas for entertaining or storage. You might want to add additional questions pertinent to your own situation.

Determining use areas

A landscape is composed of areas that are used for different purposes. Examples include the public use area, usually in the front of the house; the private use or family area, often in the back of the house; and the service area, generally in the back or side yard (Figure 2). It is important to design each area so that it meets the family's needs, contributes to an attractive overall landscape, and capitalizes on sustainability concepts.

Public area

This is the area that is visible from the street. The house should be the focal point of the public

area design. The landscape should be simple and uncluttered and create a sense of spaciousness. Keep the lawn or groundcover open and place shrubs to the sides of the house and in beds next to the house, not in isolated beds surrounded by turf or groundcover. Placing tall trees in the backyard and medium-size ones on the sides and in front will highlight the house.

When selecting shrubs to frame the front door, consider their texture, color, size at maturity, and shape. They should enhance the total visual effect and should not block doors or windows.

Private area or family area

The private area, often called the outdoor living room, is an important part of the American home. To maximize use of this area, it should be easily accessible from the house and should be designed to meet the family's needs. Often a patio or deck is part of this area, as well as a grouping of outdoor furniture or a cooking space. The size of the area depends on how it will be used. A 10' x 10' area holds four chairs and is about the minimum size for comfortably accommodating four people.

Consider using recycled materials or products made from renewable resources for the patio or deck. (See publication EC 1535 for more information.) Features such as motion sensor lights will increase the area's usefulness. Other issues to consider include privacy, year-round interest, climate control, and a children's play area.

Privacy

Properly grouped shrubs and trees create a sense of enclosure and screen the area from public view and nearby neighbors. For a small area, tall container plantings or a trellis or fence covered with vines can create a sense of privacy.

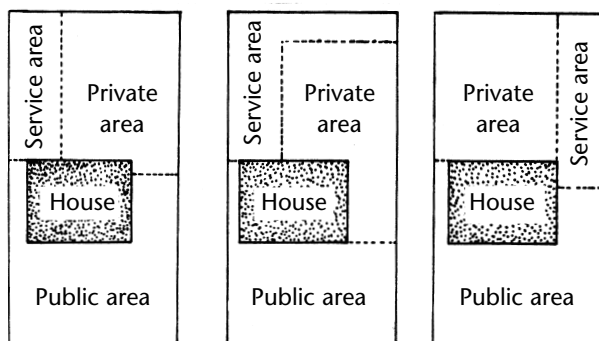
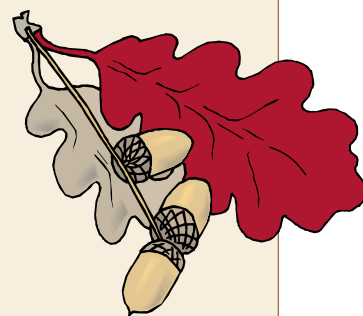


Figure 2.—Use areas in a landscape.

Evaluating landscape sustainability

Many home landscapes already contain some aspects of sustainability. However, most can benefit from a critical review and some improvement. Use the following checklist as a guide to determine how sustainable your landscape is.

- 🍃 What are the environmental benefits of the landscape?
- 🍃 Are mulches used to maintain soil fertility and earthworm activity?
- 🍃 Were plants selected properly to reduce the need for pruning, spraying, and fertilizing?
- 🍃 Are plants placed in ideal growing conditions (e.g., correct light and drainage)?
- 🍃 Were plants sited properly so that, when mature, they complement rather than compete with each other?
- 🍃 Have drainage problems been corrected to provide adequate water penetration?
- 🍃 Was the landscape planned to help prevent erosion?
- 🍃 Has water runoff been handled properly?
- 🍃 Has the landscape been developed to reduce the need for high-nitrogen fertilizers?
- 🍃 Does plant selection take into consideration the effect of sunlight on the household's summer cooling and winter heating needs?
- 🍃 Has the landscape created a better environment for people?
- 🍃 Does the landscape attract beneficial wildlife?



Year-round interest

Year-round interest is important throughout the landscape, but especially so in the private use area, particularly if the area is visible from the house. Evergreen trees, shrubs, and vines; plants with colorful bark or fruit; and perennials that keep their foliage or flowers through the winter are good selections. Small plantings of annuals and bulbs can provide additional color during the growing season. Pools, stone steps, paving, walls, bird feeders and baths, and other architectural features can provide additional interest.

Climate control

Weather control extends the outdoor living area's usefulness. Evergreen trees provide year-round screening and shade. Well-placed deciduous trees can screen the area from hot summer sun, while allowing maximum winter sun for solar heat. An awning or a trellis covered with plants can protect against inclement weather. If space allows, a pool or fountain can convey a sense of coolness during summer, with the added benefit of attracting wildlife.

Children's play area

The play area can be part of the outdoor living area or separate from it. Consider your children's ages and activities to determine the size and surface of the play area. For very young children, a small area enclosed by a fence near the kitchen or patio/deck is desirable. As children grow up, you will need to adjust the design to meet changing recreational needs.

Service and work areas

An area screened from major views is needed for service and work area(s). Examples include space for compost piles, garbage

cans, tool and wood storage, plant propagating structures, and dog runs. A dense planting of shrubs, a vine on a trellis, or a fence can obscure this area from the rest of the landscape.

Brainstorming alternative layouts and design ideas

Determine which use areas are appropriate for your design. Lay a piece of tracing paper over your plot plan and draw "bubble diagrams" to represent the different use areas (Figure 3). Fit them together

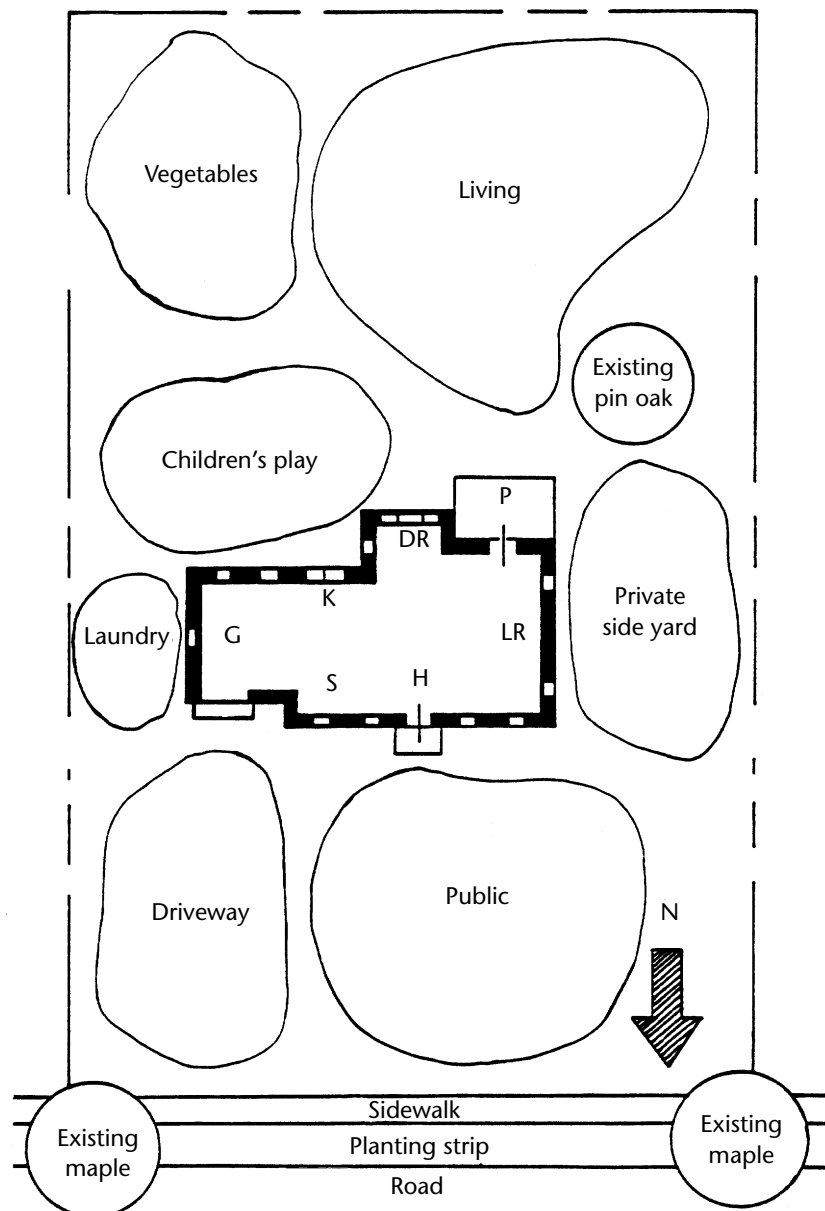


Figure 3.—Placing use areas on a map.



Figure 4.—Lack of simplicity (left) and simplicity (right). Although there are more elements in the landscape on the right, they are grouped to create a simpler design.

considering traffic flow and how the space will be used. How will people move from one area to another? How will people move from the house into the landscape?

Try different combinations in relation to rooms of the house, surrounding areas, and potential views. This brainstorming process will help you visualize various layouts and is an important step in exploring possible design options.

Because each landscape is unique, there are no hard and fast rules for design. However, certain design principles will help you create an aesthetically pleasing and sustainable landscape. These guidelines will help beginners create a functional landscape. The extent to which you follow them is up to you and your artistic style.

Standard landscape design principles include:

- ❁ Simplicity
- ❁ Rhythm and line
- ❁ Balance
- ❁ Proportion
- ❁ Focal point

Simplicity

Simplicity in a landscape can be physical, visual, or both. Physical simplicity refers to a design that consists of simple bed lines—either straight or gently curved—with no complex geometric shapes or patterns. Visual simplicity is achieved when plants are arranged to appear as a single unit. For example, you can group three or more plants of the same species to create one visual mass (Figure 4).



Figure 5.—Rhythm and line. The eye is directed toward the house by the plantings.

Landscapes that lack simplicity can look chaotic and do not create a sense of peace.

Rhythm and line

Continuity and integration of different elements into a landscape affect rhythm and line. Effective use of repetition can direct the eye or a person through the landscape and create a sense of unity among different spaces (Figure 5).

Balance

The two common types of balance in landscapes are symmetrical and asymmetrical. *Symmetrical* balance is most common in formal landscapes. These landscapes have an obvious central axis, and everything on one side is duplicated or mirrored on the other side. *Asymmetrical* balance uses different objects on each side of a discrete axis, but the end result still is a similar visual mass on both sides (Figure 6, page 6). Asymmetrical designs are well suited for home landscapes.



Figure 6.—Symmetrical balance (left) and asymmetrical balance (right).

Proportion

This principle refers to the size relationship between elements within a landscape. The major relationships to consider are plants to buildings, plants to other plants, and plants to people. Proportion changes over time as plants grow. To achieve correct proportion, always design your landscape based on the mature height and spread of the plants. Although plants might be a little out of scale when they are young, they will grow into proportion with other objects in the landscape.

Resist the temptation to overplant. Otherwise, you will have to remove many of the plants to prevent overcrowding.

Focal point

Focal points give the eye a place to rest when viewing the landscape as a whole. A focal point might be a plant specimen, garden accessory, or water feature. The front door is an example of a focal point in the public area.

Both the public and private use areas should have a focal point. If the area is large and divided into a number of smaller spaces, multiple focal points are needed.

Creating a scaled drawing of the design

Landscape designs generally are drawn in “plan view.” This means they are two-dimensional and drawn from a bird’s-eye view of the site. As you move into the final step of the design process, begin drawing landscape symbols (Figure 7) on the tracing paper to represent identifiable landscape elements. Don’t worry about selecting specific plants yet; a label of “deciduous tree” or a mass

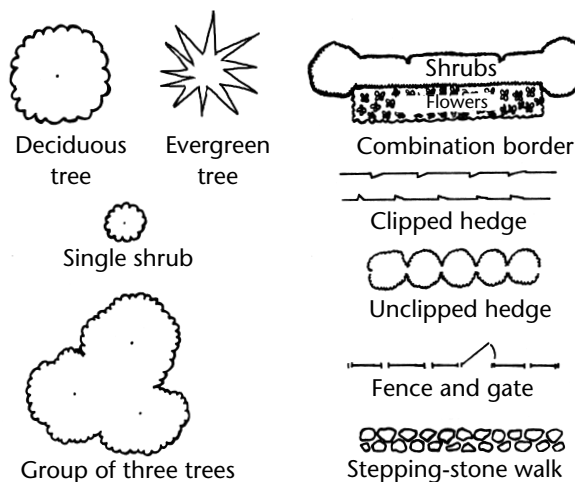


Figure 7.—Landscape symbols.

representing “perennials” is sufficient. You will select the specific plants in the final step.

After you have developed the final draft of your design, take a few minutes to answer the following questions to make sure you’ve covered everything. It is a lot easier to make changes at the design stage than when you are digging holes for plants or excavating for a patio!

- ❁ Is the driveway design pleasing, useful, and safe? Is the entrance easily accessible? Is there a turnaround? guest parking?
- ❁ Are walkways convenient? Are guests directed to the front door?
- ❁ Will the landscape be attractive from the living room? picture window? porch? dining room? Will it be attractive all year?
- ❁ Is there a private living area? Is it screened from neighbors? from the service area? from other buildings?
- ❁ Are the gas meter, power meter, and oil tank easily accessible and, if necessary, screened from public view?

- ❁ Will tree and shrub planting locations interfere with the septic tank, sewer lines, or drainage fields? Will excavating for a patio interfere with these elements?
- ❁ Do all parts of the landscape fit together into a unified plan?

When you have completed this step, your design should be fairly well defined and look something like Figure 8.

Selecting plants

When you begin drawing the final plan, you will select specific plants and represent them with landscape symbols. These symbols should be drawn to scale and should represent the mature spread of the plant. For example, assume you are using a ruler and a scale of 1"=16'. You want to draw a maple tree with a mature spread of 20'. You will need to draw a circle with a diameter of 1¼".

Although plant selection can be daunting, it also is enjoyable. There are many reference books to help you. Many not only describe each plant's height, spread, leaf and flower color, but also highlight water, fertilizer, maintenance, and adaptability characteristics. Below are some basic guidelines to consider before you consult a reference book.

See publication EC 1534 for more information on selecting plants for sustainable landscapes.

Aesthetic considerations

Consider each plant's texture, seasonal foliage color, flowers, fruit, and bark. When possible, select plants that provide year-round interest. For example, choose a tree, such as a river birch, that has attractive spring flowers, beautiful fall or midsummer color, and exfoliating (shedding) bark for winter interest.

By selecting plants that bloom at different times, you can have color throughout the year. Flowering trees provide pastels in spring; beds of perennials and annuals furnish vivid hues

in summer; trees and shrubs whose leaves turn yellow, orange, or crimson brighten gray autumn days; and the bark and fruit of some species are attractive throughout the winter. Strongly contrasting textures also can create interesting year-round effects.

Mature size

Consider the mature size of plants you select for your landscape. A common mistake is to select plants that soon become too large for their location—for example, large junipers planted under picture windows. These plants require regular and drastic pruning in order to preserve the view from the window. The resulting maintenance costs and

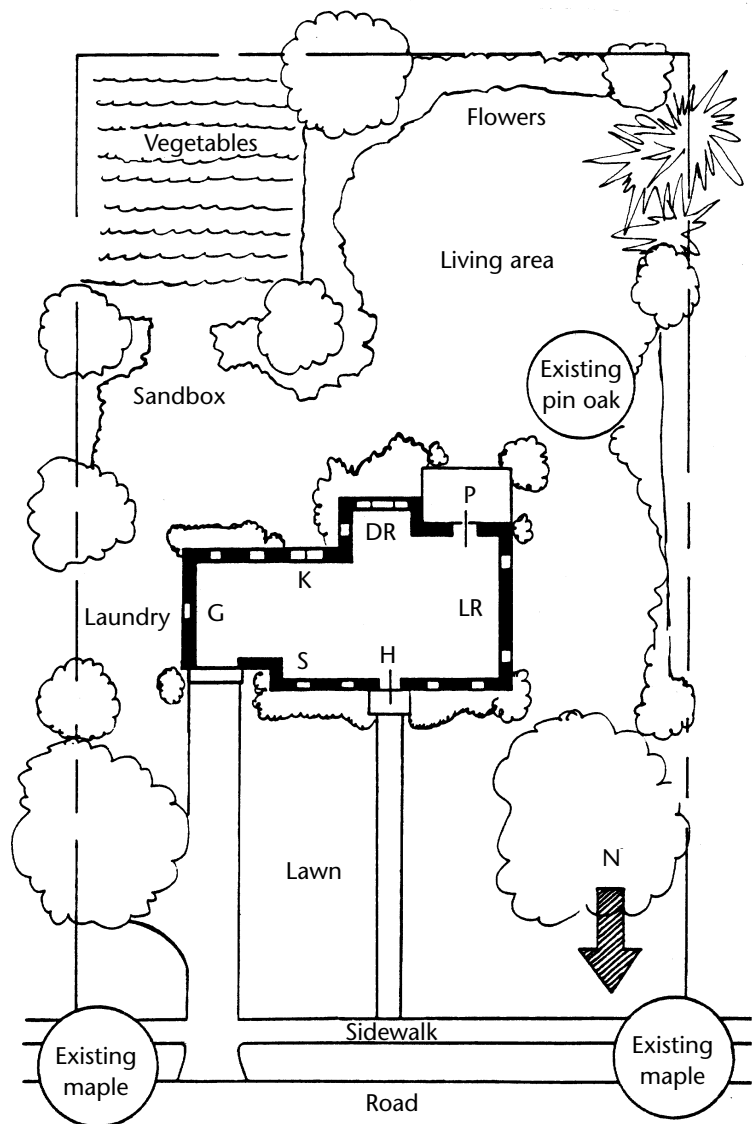


Figure 8.—Sample landscape plan.

excess green waste reduce the landscape's sustainability. Additionally, drastic pruning often reduces the specimen's natural grace and beauty. A better alternative is to plant a small shrub whose mature height will be below the window. This plant will require minimal, if any, pruning and will maintain its natural shape.

Plant form

Plants grow in many forms, or shapes. Incorporate a variety of forms into the landscape to create visual interest. Some common forms of shrubs and trees are shown in Figure 9.

Plant texture

A plant's texture depends on the size of its leaves and stems and their three-dimensional arrangement. Plants with large, widely spaced leaves and thick stems (e.g., bigleaf hydrangea) have a coarse texture. Plants with small, closely spaced leaves and thin stems (e.g., boxwood) have a fine texture. Although some variation in texture is needed to make a landscape interesting, avoid numerous combinations of plants with extremes in texture.

Because deciduous plants lose their leaves in the fall, be sure to consider their stem size and arrangement. Densely branched deciduous shrubs such as spirea and honeysuckle might work as a screen even after their leaves have dropped.

After you have selected the plants, the final step is to label them on your drawing and create a planting key (Figure 10). It is important to remember, however, that landscapes are a work in progress, and change often is necessary to enhance their beauty and usefulness.

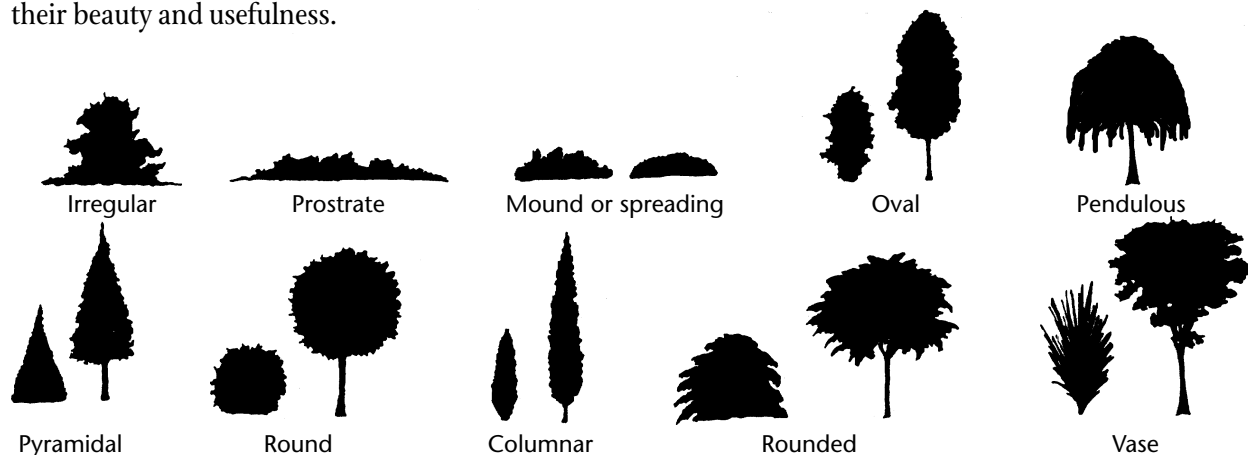


Figure 9.—Plant forms.

For more information

- Conserving Water in the Garden: Designing and Installing a New Landscape*, EC 1530 (2001). \$1.00
- Deer-resistant Ornamental Plants*, EC 1440 (1994). 75¢
- Gardening with Beneficial Insects*, PNW 550 (reprinted 2002). \$1.00
- Gardening with Fewer Pesticides: Integrated Pest Management*, EC 1532 (2001). \$2.00
- Hardscape Materials for Sustainable Landscapes: Patios, Decks, and Walkways*, EC 1535 (2001). \$1.00
- Plant Materials for Landscaping: A List of Plants for the Pacific Northwest*, PNW 500 (1999). \$2.50
- Plant Selection for Sustainable Landscapes*, EC 1534 (2001). \$1.50
- Selecting, Planting, and Caring for a New Tree*, EC 1438 (reprinted 1997). \$2.00
- Southwestern Oregon Tree Selection Guide for Coos, Curry, Douglas, Jackson, and Josephine Counties*, EC 1505 (1999). \$5.50
- Sustainable Gardening: The Oregon–Washington Master Gardener Handbook*, EM 8742 (reprinted 2002). \$22.00

To order copies of the above publications, send the complete title and series number, along with a check or money order for the amount listed (payable to Oregon State University), to: Publication Orders, Extension & Station Communications, Oregon State University, 422 Kerr Administration, Corvallis, OR 97331-2119 (Fax: 541-737-0817).

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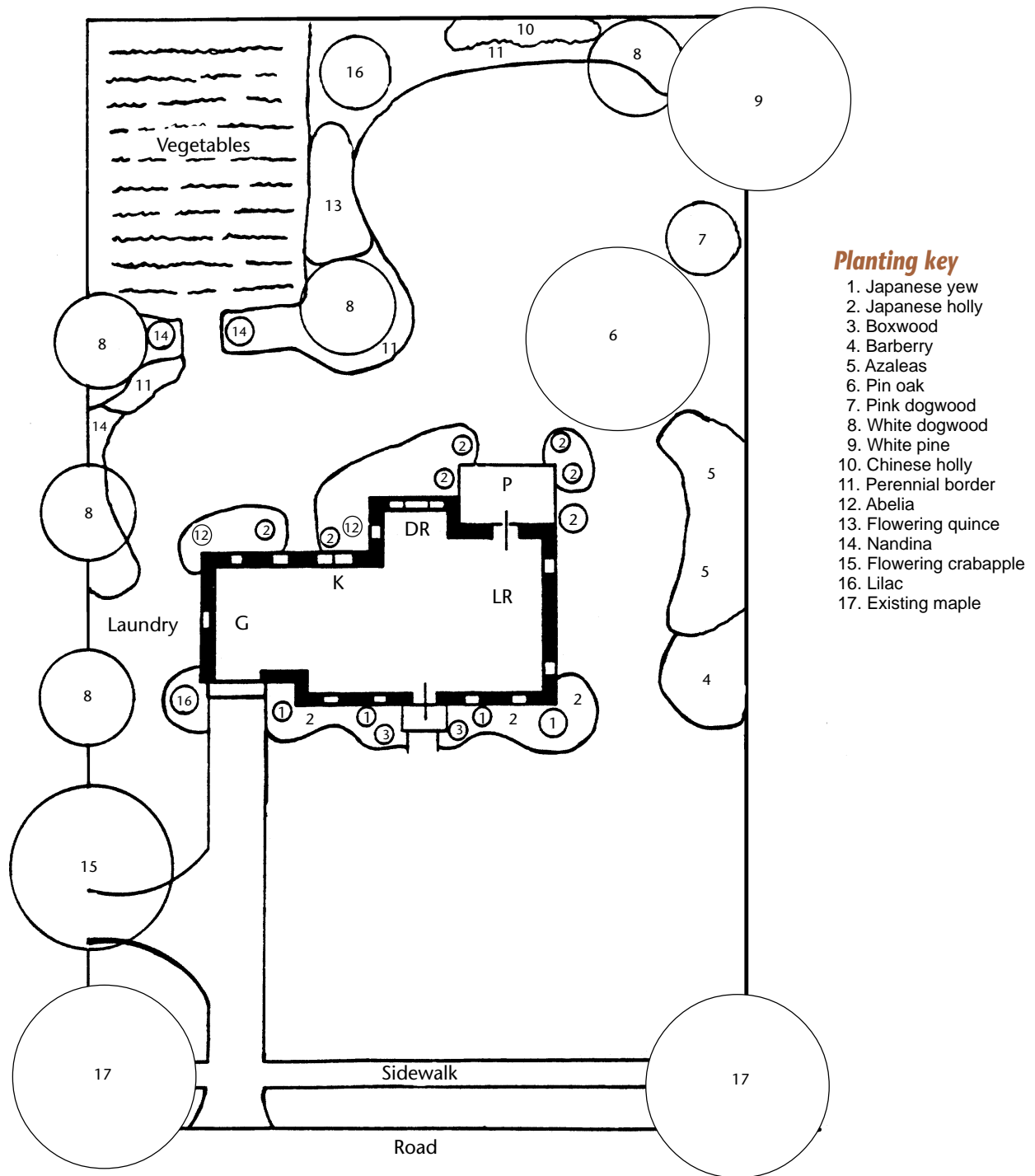


Figure 10.—Landscape plan with planting key.

Landscape design planning questionnaire

This questionnaire will help you organize your thoughts when designing or renovating your landscape. It may bring to mind topics you have not considered and will give you a better idea of how to design a landscape to meet your needs.

Site information

First, gather information about your existing yard to see how it will affect your plan.

Color of house: _____

Architectural style: _____

Desirable views: _____

Undesirable views: _____

Overhead utilities: _____

Unique features: _____

Soil: Clay Decomposed granite Sandy Rocky Hardpan Rock shelf

Direction of winds: Summer _____ Winter _____

Are wind screens needed? Yes No Where? _____

Are sound buffers needed? Yes No Where? _____

Are there elevation differences? Minimal Moderate Severe slopes

Are retaining walls needed? Yes No Where? _____

Are there soggy areas (high water table)? Yes No Where? _____

Where will water drain? _____

Is a French drain required? Yes No

Sun exposure: _____

Where is your yard too hot in the summer? _____

Existing trees, shrubs, and surface roots _____

Existing site features and structures _____

Existing walks: Brick Cement Gravel Stone Bark

Is there a parking strip? Yes No Where? _____

Preferred level of maintenance: High Medium Low

continues on next page

Landscape design planning questionnaire (continued)

Design considerations

Now, consider how the landscape will be used.

Who will use your yard? Adults Children Elderly Pets

Preferred style: Formal Semiformal Informal

Theme (e.g., English, Oriental, or natural) _____

Preferred shapes (for lawns, walks, decks): Rectangular 45° angles Circles

Straight lines Curving/free-form Combination

Type of front entryway: Straight to the door Meandering Private courtyard

Outdoor structures/features: Patio roof Raised planters Children's play area _____

Satellite dish Dog pen/run Storage shed BBQ area Gazebo

Deck Fence Swimming pool Spa/hot tub Sculpture

Boulders Dry creek Mounds/berms Pond Bench Fountain _____

Waterfall and stream Greenhouse Other _____

What size patio/deck do you need? 2–4 people 4–8 people

8–12 people 12+ people

Do you want walkways connecting parts of your yard? Yes No

Do you want outdoor lighting? Landscape Security

What items need storage space? Garden equipment Garbage cans

Other _____

Do you need off-street parking for guests? Cars RVs Other _____

How will you water? Garden hose Sprinkler system Drip irrigation

Do you have photographs of your yard? Yes No

(Photos can help you visualize what you want.)

Other comments:

continues on next page

Landscape design planning questionnaire (continued)

Plants

Finally, think about the types of plants that will meet your needs.

What type of plants do you like?

Broadleaf evergreen trees and shrubs: Flowering Nonflowering

Deciduous trees and shrubs: Flowering Nonflowering

Conifer trees Fruit trees Shade trees Junipers Vines Roses

Annual flowers Perennial flowers Vegetables Herbs

Other _____

Do you like fragrant plants? Yes No

Favorite colors: _____

Least favorite colors: _____

How much lawn do you want? None Small Average Large

Where will the lawn be? _____

Is anyone in your family allergic to specific plants? Yes No

Is anyone in your family allergic to bees? Yes No

Are deer a problem? Yes No

What special garden areas do you want? Vegetables Annuals Roses

Perennials Herbs Wildlife/native Orchard Shade

Rock garden Cut flowers Fragrance Wheelchair-accessible

Other _____

Other comments: