LANDSCAPE DESIGN

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WHAT IS LANDSCAPE DESIGN?

The purpose of this chapter is to introduce the broader context of landscape design processes and strategies, within which planting design, selection, installation, and management occur.
Landscape design is encompassed under the broader field of landscape architecture. The American Society of Landscape Architects defines landscape architecture as:

> "the profession which applies artistic and scientific principles to the research, planning, design and management of both natural and built environments. Practitioners of this profession apply creative and technical skills and scientific, cultural and political knowledge in the planned arrangement of natural and constructed elements on the land with a concern for the stewardship and conservation of natural, constructed and human resources. The resulting environments shall serve useful, aesthetic, safe and enjoyable purposes."

In practice, landscape design can be thought of as envisioning and creating outdoor places in space over time through combining skills and knowledge in art and science. This process involves understanding site conditions (see Chapter 2), applying design principles to develop a written and/or drawn plan, and managing construction and maintenance of designs. Project sites vary in size, for example, a street boulevard to a business' grounds to a regional park and trail or bike system. Project clients range from an individual to a team of public organizations.

Landscape Design-Related Professions

Landscape designer is a general title that encompasses someone who shapes and makes decisions about the forms and functions of outdoor spaces. A landscape designer most often works on site-scale projects to be constructed in the relatively short-term, rather than planning-scale projects that consider longer timeframes. Site-scale project clients range from residential, commercial, to public. Or, a landscape designer may be contracted by another company to work on the landscape-related portion of a larger site design project, like a new commercial center or street design. Landscape designers also focus on specialized planting design.

Landscape architect is a legal title reserved for someone practicing with a license, which are awarded at the state level. Each state has different requirements for licensing, but generally involves a post-secondary education, passing a series of national exams, and completing a work hours with a licensed professional. Often, public or large commercial landscape design services requires a licensed landscape architect. As a profession, landscape architecture covers a wider breadth of project types and scales, including planning and more specialized projects, such as stream restoration.

Landscape contractor, also referred to as landscape construction, landscape maintenance or management, and landscaping company, is a title that refers to someone or the business that installs, constructs, or maintains a landscape design. Design-build companies provide both design and installation services.

Other related professions that landscape designers commonly work with include irrigation specialists, plant biologists, ecologists, planners, civil and structural engineers, and architects.

LANDSCAPE DESIGN PROCESS

The practice of landscape design generally follows a series of steps, with associated work tasks (see Figure 2-1).

Although the process is described sequentially, in reality the process is iterative. Because each landscape design project is site specific, the tasks should be adjusted depending on the goals and budget.

Figure 2-1. Landscape design process stages

Project Goals & Programming

The initial stages of the design process are meant to build an understanding what is going on. The designer(s) and client(s) work as a team to clearly define the project scope and design services, and the client's "wish list" of physical design elements or site uses, referred to as *programming*.

Site Inventory & Analysis

Researching and observing historic and current conditions of the project site and its surrounding context is called *site inventory*. Then in *site analysis* the designer assesses these conditions for constraints and opportunities, which should inform design choices. (see Chapter 2).

Schematic Design

The next stage in the process is called *schematic design*, which during multiple design ideas or drafts are explored. It is common to develop 2-3 alternative designs that are shown to a client or stakeholders for feedback before creating the final design. Landscape designs are described through a series of drawings, illustrations, maps, lists or tables, written specification, and example photographs of previous projects.

Design Development

The process of creating the final landscape design documents is called *design development*. This is when a design's detail is decided, like plant selection and quantities, hardscape quantities, furnishing manufacturers, and construction bids. This step includes design "take-offs," which is the process of identifying exact material quantities, sources, and itemized costs. If the client is a public agency or large company, the final design will also need to go through *construction documentation*. This involves producing technical, digitally-drafted drawings that are legally bound before the project is built.

Construction

Once the landscape design is being installed, the designer's role is not finished. The designer, or project manager, should be very engaged during the *construction* process to ensure design integrity and approve adjustments when needed. Inevitably, construction will reveal unknown conditions, costs, and material substitutions, and designers need to remain creative to make choices that maintain the design's original goals and functions. At the end of installation, designers complete a project "punch-list," or check-list, to confirm that all materials where completed per the contract and design before final billing. Including the client(s) during a final walk-around is helpful to review work and gather feedback.

Management

Following installation, on-going *landscape management* is essential to the design's growth and health. Landscape designers may be contracted to provide on-going maintenance or write management plans for larger projects. A more contemporary approach to landscape maintenance is called adaptive management, where tasks are flexible and change over time as site uses and plants evolve within dynamic systems.

DESIGN GOALS AND APPROACHES

Landscape design provides solutions for a range of environmental, social, and economic challenges. For example, a homeowner wants to reduce water use for irrigation and would like a place for outdoor entertainment. Or, a business needs to meet stormwater management requirements for development ordinances and would like to use native plants in their landscaped areas. Or, a public agency is designing a bike path next to a river that also needs revegetation to stabilize eroding banks. The goals that drive a project are unique to its geographic location, client desires and programming needs, site constrains, and design or architectural styles. Early in the design process, the designer and the client(s) should collaboratively develop goals to inform best approaches and strategies. Design goals typically encompass items such as landscape functions (to filter, to diversify, to shade), forms (to mound, to alley, to gather), or other performance benefits (to reduce sediment runoff, to increase physical exercise, to source 100% re-used brick from a demolished building).

Sustainable Landscape Design

Many recent approaches to landscape design strive to revitalize connection between the built environment and the ecological services that we rely on, such as climate regulation, air and water cleansing, water supply retention, hazard mitigation, pollination, habitat functions, waste decomposition, food and renewable non-food products, and cultural and human health benefits. Sustainable landscape design utilizes strategies to provide lasting ecological, social, economic, and aesthetic benefits, and sees landscape as a medium to address complex environmental-social problems. The sustainable SITES initiative is a project certification program that is administered by U.S. Green Building Council, specifically focused on landscape projects rather than buildings. The Landscape Performance program of the Landscape Architecture Foundation promotes the importance of quantifying and qualifying the impacts of sustainable landscape designs, as opposed to conventional approaches. Both these programs have databases with excellent examples of built projects that utilize a sustainable landscape design approach (see References). Other related approaches include low-impact development, green infrastructure design, biophilic design, rewilding, and ecological landscape design.

Drought-Resilient Design

Xeriscaping, or drought-tolerant design, prioritizes strategies that need little to no irrigation, especially the use of potable, utility-treated water. U.S. communities in the west and southwest continue to face water quantity problems, and many have developed economic incentives for installing xeriscaping. Selected plants should be drought-tolerant or require little to no additional water beyond local precipitation and establishment. Xeriscaping has often been characterized by large swaths of rock mulch or stones to reduce materials that require water. However, more contemporary designs use drought-tolerant vegetated ground covers to promote the full range of plant benefits that hardscape materials do not offer. Where irrigation is used for periodic watering, strategies should employ more efficient drip emitters or sprayers, adjusting irrigation schedules to reduce water loss from evapotranspiration, or using smart technology like rain sensors or soils moisture monitors that turn off irrigation when plants do not need additional water. Hydrozones are a strategy to design planting beds with plants that have similar water needs, to better align irrigation zone settings rather than uniform watering.

Other Design Inspirations

Numerous other design approaches exist. For example, landscape designs may be inspired by numerous garden themes or forms, such as a Japanese, English, permaculture, therapeutic, or memorial garden. Other regional approaches include firewise and design for sea-level rise. In firewise landscape design, planting zones to reduce risk of fire spread and home destruction should gradually increase the density, height, and diversity of species away from the home. In contemporary landscape design projects, rarely are designers given money for simply “making something pretty.” Landscape designs should be performative in multiple ways, and create quality places where people want to live, work, play, and learn, known as placemaking. Plants and landscape design should reflect and enhance a place’s uniqueness, creating a strong sense of place. Designed spaces should be multi-functional throughout the year, to provide cost-effective uses of space with increasing pressures from the built environment.

Importance of Beauty

In any approach, landscape design emphasizes the value of beauty and aesthetics. Many contemporary design

approaches embrace more plant species that inherently do not display characteristics that people expect in ornamental, more manicured settings, such as vibrant flowers, uniformity, tidy or upright stems, or fast growth. Many native and native cultivars also exhibit more muted colors and tones of brown, characteristic of natural systems through seasonal changes. Research has shown that people view these characteristics as messy, disorderly, and not well maintained. For these reasons, landscape designs should incorporate elements that demonstrate beauty and human care, even while using native plants. Strategies include fencing, other visible lines from mowing or paving, signage, pops of color at different times of the year, and elements of design structure (see section 4. *Design Language*).

LANDSCAPE DESIGN LANGUAGE

Materials or Medium

Landscape materials are chosen for various reasons, and material selection should be considered on a project-by-project basis and based on a thorough site analysis (see Chapter 2). Proper materials selection along with on-going and correct maintenance ensure a design's longevity and sustainability.

Landform

Landform, or topographic patterns and shapes, is one design material quickly overlooked. Landform design and earthwork are typically referred to as site engineering, site development, or grading and drainage plans. Considerations for landform may be aesthetic, perceptual, spatial, or environmental. Aesthetic strategies for landform include sculptural, architectonic, or naturalistic themes. Perceptual and spatial considerations include slope requirements for drainage or ADA accessibility, enhancement, enclosure, or separation. For example, the design of landforms can be done in a way to create emphasis through a vista, repetition through multiple undulations, or separation of site functions through terracing or berms. Finally, environmental reasons include stormwater management, stream and habitat restoration, and microclimate creation. As an overarching tenant, earthwork should only occur within reason, to minimize the negative impacts associated with manipulating topography like erosion, loss of vegetative cover, changes in natural drainage patters, and costs of removing and replacing soil.

In addition, landform also refers to the dirt itself. Designing "from the ground up" is certainly an important design strategy to ensure appropriate soil or growing media properties for supporting vegetation, furnishing or structure foundations, or other materials. Working with existing soil resources whenever possible is advised for reducing costs and environmental impacts. However, when soil needs to be supplemented, replaced, reclaimed, or improved, the process and protocol for how this should happen is the designer's responsibility.

Vegetation

Plant layout and species selection is an entire design process in and of itself, and vegetation is a key component to all landscape design projects. Plant selection factors are covered in-depth in Chapter 2. Planting lists are often categorized into the following groups: deciduous trees (shade vs. ornamental), coniferous trees, shrubs, perennials, grasses, bulbs, and annuals. In general, woody plants provide horizontal or vertical structure and "bones" for a planting design, and tree canopies create enclosure or an outdoor room "ceiling." Evergreen plants, especially in climates with multiple seasons, provide year-round structure and interest that is difficult to achieve with other plant types. Ornamental grasses and perennial flower or seed heads can also help with fall-spring interest, and should not be pruned until early spring. Planting design may also consider grouping plant species to mimic or represent a native plant community, or archetype.

Water

People are strongly connected to the sensory experience of water in the landscape, and often interactive water features become a gathering spot or point of emphasis. Water as a design material includes natural surface waters like streams and rivers, rainwater runoff, irrigation water and design, and design features that incorporate water like fountains or play areas. Today, designers need to thoughtfully consider how a project site relates to watershed-scale water quantity and quality, and create designs that contribute to healthy water resources for the future. Employing

strategies where possible that reduce, recycle, or reusing water in the landscape is advised. Design of irrigation systems may be developed by the landscape designer or an irrigation consultant.

Hardscape and Furnishings

Hardscape materials include those for the finished surface type as well as the underlying materials needed for its support and construction. Common hardscapes include pathways, sidewalks, parking areas, patios and plazas, recreational courts, and walls. Some common hardscape materials are concrete, asphalt, unit pavers, permeable paving, stone, tile, and steel, and other piping for drainage. Construction detailing and management when building these hardscapes is an important to ensure accuracy. Landscape furnishings encompass seating, tables, drinking fountain, play structures, trash and recycling receptacles, signs, and even things like dog waste stations, bollards, and storage structures. Furnishings are typically specified from a manufacturer, but can also be custom designed and built. Placement of furnishings should relate to surrounding site functions, like entrances and intersection. The size, quantity, and style of furnishings should complement the overall design concept.

Design Elements

Creating a landscape composition using the materials described above is guided by a set of design elements and principles to make beautiful, unified spaces. Overall, design unity is an umbrella goal that occurs when all design features are successfully integrated together to create order and support the design as a whole.

Line

An actual or implied mark, path, mass, or edge where length is dominant. For example, sidewalks or trails, property lines, planting bed lines, or water courses. Lines are important for developing circulation patterns and directing visual and physical movement.

Form

The mass of shapes, both horizontally and vertically across the project site. For example, forms in a residential design may be created for an entryway planting, raised bed garden area, patio, shaded grove, and a play area. Creating order and structure of forms can be accomplished using spatial themes including, rectilinear (straight, right angles, square), angular (points, acute, triangles, hexagons), curvilinear (circles, semi-circles, arcs, tangents, naturalistic), and combined themes.

Texture

Surface quality of elements (rough, smooth, etc.). The texture of a material may also relate to the touch and sensory experience of a landscape. For example, using course plant material in the background of a composition creates enclosure by shortening the perceived distance and view.

Color

Pigments and color mixing. Color and visual impacts in the landscape are especially thought of in terms of plant combinations, seasonality, hardscape materials, and coordination of colors with other built elements on a site. Often, color becomes an element for strong place making. Cool colors (greens, blues, purples) tend to recede, while warm colors (reds, oranges, yellows) tend to advance toward the eye.

Design Principles

Scale

The measurable distance between objects or forms (two dimensional or three dimensional). Forms, such as a patio or recreational field, and materials, like vegetation or furnishings, should be scaled appropriately and specifically for the project site size and design goals. For example, the scale of a plaza hardscape is drastically different for one restaurant space versus an urban farmer's market. Or, the scale of a walkway should be different along a river promenade versus an exploratory path through a secret garden.

Proportion
The relation of two things in size, number, amount, or degree.

Balance
A visual or feeling of equality of weight, attention, or attraction of the various elements within the composition. For example, a balance of evergreen species across a design can help create unity and year-round structure.

Repetition
*C*reation of a predictable pattern through repetition of identical or similar elements. Repeated plant species, plant combinations, form themes, or color may contribute to place making, site rhythm, or unity as one moves through a site. Meanwhile, too much repetition becomes predictable and monotonous. Central Park's bridges are an example of a repeating feature that creates park rhythm.

Rhythm
The act of repeating an element either regularly or irregularly. Rhythm, through repetition, creates site choreography and sequencing as people move through and experience a space. For example, a pop of bright yellow used in a bulb, perennial, a tree's fall color, seating, and the color of a shed, creates a movement through the seasons and between the built and natural site features.

Emphasis
The stress, often in form or scale, placed on a single area or feature of a design. In a large-scale project, emphasis may be a neighborhood landmark, such as a building, archway, or a landform feature like a summit. However, on a small-scale project emphasis may be created by a heritage tree, a fountain, or an entryway area. Typically, emphasis is characterized by singularity or unique significance.

Variety
Absence of uniformity. Variety creates interest and diversity. A variety of plant textures and scents keeps interest and movement in a therapeutic garden. A diversity of plant structure and species provides increased habitat features.

Economy
Using only what is needed to create the intended effect; eliminating any elements that might distract attention from the essence of an idea. Listed last, but may be the most important for sustainability. A project must employ economy not only for cost efficiencies in the initial installation, but for long-term management. Devolution to simpler design lines, forms, textures, etc. leads to a design with a clearer concept, which is advantageous for the end user to maintain. For example, over-complexity of curves in a pathway leads to pedestrians or bikes cutting corners, leading to more wear on plants or materials along the edges. Or, curves with very tight radii may be more expensive to design irrigation and difficult to design with efficient water use. All projects should embrace economy as an opportunity to develop a successful design, not as a limitation.

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Sustainable Sites Initiative: www.sustainablesites.org

Landscape Performance Series, Landscape Architecture Foundation: www.landscapeperformance.org

National Association of Landscape Professionals: www.landscapeprofessionals.org

City of Bozeman, Water Conservation Division, Water Smart Planting Guide: www.bozeman.net/Departments/Public-Works/Water-Conservation/Home

USDA, Natural Resources Conservation Service, PLANTS Database: plants.usda.gov

US EPA, WaterSense Program, Outdoors section: https://www.epa.gov/watersense/outdoors

Review

A. List three types of projects at different scales that a landscape designer may work on.

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B. How does a landscape designer differ from a landscape architect and landscape contractor?

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C. List three different stages of the design process and describe one task for each.

1._____

2._____

3._____

D. What are three ecosystem services that a sustainable landscape design approach may benefit?

1._____

2._____

3._____

E. What strategies could be utilized to create a drought-resilient design?

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F. Why is beauty important when designing naturalized landscapes that prioritize native plants?

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G. What are the four basic design elements? Define each and describe one consideration for design.

1._____

2._____

3._____

4._____

H. List and define three of the many design principles. Describe an example for how each may be achieved.

1._____

2._____

3._____