Guide to Residential Landscape Development for Logan, Utah

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GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT
FOR LOGAN, UTAH

by

Michael Douglas Fotheringham

A thesis submitted in partial fulfillment
of the requirements for the degree
of
MASTER OF LANDSCAPE ARCHITECTURE

UTAH STATE UNIVERSITY
Logan, Utah
1978
ACKNOWLEDGMENTS

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Finally - to my wife, Patricia Fotheringham who gave so much to allow me to realize this project - thank you.

[Signature]
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ABSTRACT

Guide to Residential Landscape Development
for the City of Logan, Utah
by
Michael Douglas Fotheringham
Master of Landscape Architecture
Utah State University, 1978

Major Professor: Jerry W. Fuhriman
Department: Landscape Architecture and Environmental Planning

The "Guide to Residential Landscape Development" has been written for the Logan City Planning Department as a supplement to the "City of Logan Guidelines for Development", a comprehensive planning tool adopted in 1976. The Guide is primarily intended to motivate Logan homeowners in designing, constructing and maintaining their residential properties by pointing out methods of design and construction that:

- reduce costs of electricity, oil and natural gas by reducing energy needs
- increase property values
- maximize effective use of the property
- improve the aesthetic qualities of the homesite

The Guide also serves as a prototype of the kind of consumer advocacy tool needed in many cities to help inform private citizens of the vital role they can play in conserving energy and improving the natural and cultural environment in which they live.

(160 pages)
A Residential Landscape Design Guide for the Citizens of Logan, Utah

Whichever is yours today, and whatever your dreams for its future, know-how can help you make those dreams come true. Not even money can substitute entirely for an understanding of the process of residential and landscape design. You can buy professional advice, but if you yourself understand the process, you are more likely to be satisfied with the end results, no matter who does the work.
ABOUT THE PUBLISHERS

City of Logan, Utah
Planning Department
61 West 100 North
Logan, Utah 84321

LOGAN is busting at the seams. The intended population of 25,000 for which Logan was initially designed has been exceeded. Where are future families going to live? How large can we grow?

In 1976, Logan City adopted an updated Master Plan and a set of general development guidelines that provide direction and timing for its inevitable growth and expansion. The attitude of establishing a well-designed community has been demonstrated by these actions.

This Guide to Residential Landscape Development contains information designed to inform Logan homeowners of their roles in building well-designed homes, properties, and neighborhoods. Logan residents can help city officials in maintaining the quality environment we have by using these design and construction pointers on their own properties.

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Published under the direction of the Logan City Planning Department

City Planner: Mark Brenchley
Assistant Planner: Michael Fotheringham

Special consultants for the "Guide to Residential Landscape Development" include: Jerry W. Fuhriman, Associate Professor and Craig W. Johnson, Professor in the Department of Landscape Architecture and Environmental Planning at Utah State University; E. Arlo Richardson, Utah State Department of Agriculture Climatologist, providing input on content, organization and layouts; Lois M. Cox, consulting science writer and Joan Shaw, consulting editor providing critical review and editing of the text.

Special acknowledgment is given to the Fall term, 1976 Senior Class in the Department of Landscape Architecture and Environmental Planning at Utah State University for providing research and background material.

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Volume 1
OVERVIEW

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INTRODUCTION

This publication can give you the information you need to make intelligent decisions about where and how you and your family are to live. For example, it will tell you how to identify your family's house and yard usage patterns, how to avoid possible legal hangups, how landscaping techniques can lessen your gas and electric bills, and ways to achieve maintenance-free, usable yard areas. Preplanning can cut costs whether you are starting from scratch or renovating an established house and yard. And it can also optimize a family's chances of truly enjoying the outside (as well as the inside) of their home. When residential structures harmonize with the environment, the overall effect is pleasing to anyone “passing through” and relaxing to the residents.

The Logan City Planning Department is providing this guide as an aid to anyone (private homeowner and developer alike) who wants to optimize the functionality and aesthetic values of residential properties. Towards that end, it describes potential design and construction problems and goals, then combines suggestions for alternate solutions and routes to achievement with methods of evaluating what best fits your situation.

Although the emphasis in this Guide is on Logan's natural and cultural settings, the principles presented are virtually universal. And the list of relevant literature found throughout can be used by anyone seeking more detailed information.
HISTORY OF PLANNING IN LOGAN

The settling of the arid Great Basin in the mid 1800’s was a significant planning success. Each of the nuclear communities conformed to a specific plan conceived by Joseph Smith and implemented primarily by Brigham Young. This plan (called the plan for the City of Zion) guided Logan’s birth and development.

Logan was officially incorporated in 1866, but it had its beginnings in 1861. In accord with Smith’s concept, the city was laid out in a grid pattern with wide streets that intersected at right angles, creating ten-acre blocks. The city was designed for an ultimate population of 20,000 to 25,000. These people were to center their lives around a strong community center and quiet neighborhoods with their agricultural land forming a green belt at the periphery.

Today, Logan, more than most substantial Great Basin communities, still expresses the City of Zion concept. The current population (27,720 in 1977), however, exceeds the 25,000 population figure for which Logan was planned. People-associated problems need to be addressed today, if a well-planned community is to be perpetuated. This guide has been designed to help forestall potential difficulties in the areas of home and neighborhood development.

Many of the houses constructed during Logan’s early development (before the advent of electric or natural-gas heating and cooling) were oriented and designed to work with the climate and use the sun as a heat source. For instance:

- Spacious covered front porches were built to face south or southwest, thus providing shade during the summer and heat traps during the winter as they collected the sun’s energy and reflected it into the house.

- Large windows were located on the south and east sides of the house to capture the much-wanted winter sun. Windows on the north walls (if any) were kept small to limit heat loss during the winter. West walls were also kept free of windows because of the intense afternoon summer sun.

- The characteristically high ceilings allowed summer heat to rise, thus cooling the room, but posed a problem for winter heating.

As central heating and cooling became available to the average homeowner, these practical design ideas were discarded. Today’s fuel-costs and fuel-shortage realities, however, are bringing such “working-with-nature” concepts back into the public consciousness.

HOW THIS GUIDE WORKS

This Overview and the series of 12 chapters are arranged to conform with the phases you will be going through in designing your landscape. Chapters 1-12 are best used in numerical sequence, with numbers 1-4 presenting the design phase and numbers 5-12 presenting the construction phase in a logical order. You can just ignore the topics that don’t apply to your specific needs. For more details about any topic, browse among the references suggested at the back of this Overview and each chapter.

2
Analyze your homesite...

HOW TO BEGIN

In this Overview you are introduced to the process of designing a residential landscape. The other 12 chapters add more technical descriptions of steps in the design process. Any or all may be useful as you try to reduce energy costs, give your family additional “living” room, increase your property’s value, and/or create an attractive but easily maintained home landscape.

This process divides naturally into two phases. In the first phase you plan and design on paper. The end product is a detailed drawing of your intent. This can be completed by you or by a professional landscape architect. In phase two, you transfer the design to your property. Again, you and your family may do the work or you can hire some or all of the work done.

Your residential landscape design effort can proceed in four steps:

1. Analyze your homesite — What positive and negative characteristics may affect your future use and enjoyment of the property? (Read Chapter One — Legal Considerations and Site Analysis)

2. Define your personalized goals and objectives for the landscape — What activities do your family members want to include around the home? (Read Chapter Two — Homeowner’s Goals)

3. Read Chapter Three — Landscape Design Principles — and Chapter Four — Solar Energy and the Residence — How can Logan homes and landscapes be helped to harmonize with the local environment and simultaneously enhance family life?

4. Use the other chapters as needed (Chapters 5 - 12) — How can you construct and maintain your personalized house and yard design?
Design outdoor living areas...

Construct...
Maintain...
Enjoy the results
Design Phase

The Guide to Residential Landscape Development consists of three volumes: (1) the Overview, (2) The Design Phase (Chapters 1-4) and (3) The Construction Phase (Chapters 5-12). The following summaries of each chapter's contents can help you select the ones applicable to your immediate situation.

CHAPTER 1 – Legal Considerations And Site Analysis — Legal constraints can force abandonment of a family's plans to develop property in a certain way. Heartaches such as that can be avoided by recognizing possible legal roadblocks before investing. This chapter describes a logical, sequence you can follow.

Then, as you look at properties, think about which way the runoff will go, what condition the soil is in, how the house is (or could be) oriented relative to the sun, and how much usable outdoor space you'll have.

Before you buy, notice the unique characteristics of the property in question, and decide which ones will promote or detract from the family goals you established in the Family Inventory Checklist. In this chapter you find information about how to select a site and then how to record and map such relevant components as:

- soils and drainage patterns
- meso- or general climate
- microclimates around buildings
- existing vegetation and structures
- natural features and their characteristics
- anticipated new structures
- walkways and driveways

CHAPTER 2 – Homeowner's Goals — Preplanning, matching your budget to yard-use priorities and a realistic time schedule, and involving the entire family in defining those priorities can give your family life a new dimension. By taking the steps outlined in this chapter, you will be able to identify your family's goals for and attitudes toward the land around your home. Or if house-hunting, you might modify your decision about what house or building lot to buy.

CHAPTER 3 – Landscape Design Principles — The next step is to evaluate your ideas in terms of design principles that help you organize and arrange activities, forms, spaces, and materials. For example, it is important to separate family entertaining space from gardening and storage areas. Trees and shrubs can provide such separation, but only if they are planted with attention to how much sunlight, water, and nutrients each one needs. This chapter graphically presents design ideas along with checklists that can help you create the environment that will best fit your family. Specifics about choosing and arranging plant materials are covered in Chapter 12.

CHAPTER 4 – Solar Energy And The Residence — This chapter emphasizes the role that the sun plays in heating homes. By increasing our use of solar energy we can decrease our reliance on fossil fuels (natural gas, coal, and oil). The suggestions offered include how to best orient your house and ways to make overhangs and plant materials contribute to your comfort all year long.

By the time you have worked your way through Chapter Four you will have one or more drawings that show your property as it is - and as you want it to be. Then comes the translation from drawing to reality.
CHAPTER 5 — Site Grading, Soil Quality, Drainage and Irrigation — The topography or surface features of land are routinely manipulated to meet construction requirements. Grading not only helps determine drainage routes, it also theoretically prepares your topsoil for planting. And grading can be the first step in creating any retaining walls your property may need. These are crucial factors in later use of the home and grounds.

Irrigation equals any artificial introduction of water into the plant’s root zone. Methods of irrigation include automatic sprinkling systems and drip and flood irrigation. The time required to keep a landscape beautiful is defined to a large extent by its irrigation needs. This chapter gives you clues on evaluating your alternatives.

CHAPTER 6 — Driveways and Walkways — Access to automobile storage and parking, as well as to all activities or spaces in and around the residential landscape should be easily maintained, durable, and convenient. This chapter points out efficient ways to preplan toward that end.

CHAPTER 7 — Overhead Structures, Patios and Decks — Trellises, arbors, or various overhead coverings can be designed to provide shade, to enclose an activity area, or protect an area from wind or precipitation. Partially-enclosed courtyards or outdoor living areas can extend your home’s interior living space to the outdoors. In this chapter you’ll find suggestions for ways to evaluate and build such structures.

CHAPTER 8 — Greenhouses, Utility, And Storage Areas — Every home needs space in which maintenance equipment, tools, building materials, firewood, and garbage can be kept out of sight, and yet convenient to points of usage. Ideas for locating and organizing such an area are given in this chapter. The uses of greenhouses are also provided.

CHAPTER 9 — Fences and Walls — You may want to build fences or walls to subdivide and define space for activities, or to provide raised planting beds. Possible materials and designs are described in Chapter Nine.

CHAPTER 10 — Play Areas — This chapter is concerned with areas for recreational activities for all members of the family, not just the youngsters.

CHAPTER 11 — Water Features, Lighting, Meters, Mailboxes, Dog Runs, and Residential Graphics — There are many small items that must be considered for maximizing the comforts of the residential landscape.

CHAPTER 12 — Installation and Care of Plant Materials — You can give your home an individualized image and atmosphere by your choice and placement of trees, shrubs, groundcovers, lawn, and flowers. But to make that effect last, the plants have to be installed according to their individual needs (soil, nutrients, sun, water, and maintenance). By the time you’ve read through this chapter, you’ll have insights into the special stresses Logan’s climates and soils place upon plants — and how to compensate for them.
Begin Here

If you are interested in building any of the facilities or undertaking any of the tasks shown, refer to the appropriate Chapters in the Guide to Residential Landscape Development as indicated by the symbol.

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SUMMARY

Most of us must carefully budget time and money if we expect to cope with family realities. For homeowners, this can mean minimal attention to the home landscape, often because it is assumed that landscaping is exorbitantly expensive. A thoughtfully designed landscape, however, does not necessarily equate with large expenditures of time and money but it can:

- increase the enjoyment of family activities for all concerned
- enhance the value of your property
- decrease the cost of heating and cooling your home
- improve the overall quality of your neighborhood

If you want to experience the satisfaction inherent in do-it-yourself residential landscape design, the Guide to Residential Landscape Development is available at the Logan City offices. The attached glossary may help as you read this and other sources of information. The Logan City Planning Department welcomes any suggestions pertaining to the format and content of this Guide so that future reprints can be improved.
Glossary

acid soil — a soil which is acid (pH values less than 6.6) in the horizons penetrated by roots. These soils are typical of wet climates and provide the best medium for most ornamental plants. They are rare in Logan.

acre — a unit of measure of land area, equal to 160 square rods, 10 square chains or 43,560 square feet. A chain equals 66 feet; a rod equals 16.5 feet.

alkaline soil — a soil which is alkaline (pH values between 7.3 and 8.5) in the portions penetrated by plant roots. These soils are usually poorly drained and/or are not very productive unless amended with more fertile additives; they prevail around Logan.

annual — a plant that grows from seed to maturity in one year. They usually have to be replanted each year unless they are allowed to reseed. Many desirable and colorful garden flowers are annuals.

arbor — an open overhead structure usually consisting of a horizontal framework supported by columns and on which vines or other plants are grown.

architect — a person primarily concerned with construction and design of structures that enclose space for the purpose of providing a controllable climatic environment (shelter) for human activities.

architectural scale — a measuring device used to convert actual distances on the ground to drawing distances on the plan. These are available at most drafting and art supply stores.

available water — moisture in the soil that is accessible to a plant at a rate sufficient for its growth and health. Too much or too little can kill an average plant.
**base map** — a graphic drawing of the homeowner's property viewed as if from directly overhead. The location of the house, easements and right-of-ways, property line directions and lengths, utility meters, contours of landform changes and other existing features are recorded on a base map. After this map has been drawn, blue prints can be made. Site analysis data and the design are then drawn on separate prints to avoid confusion and/or a neglect of existing features.

**bedding plants** — annuals, perennials or shrubs that are planted in masses or beds for a strong visual effect.

**berm** — a mound of earth built up to provide screening from winds, sounds or views or to separate activities. Berms can be planted with shrubs to emphasize the mound or with lawn. Slopes on berms normally do not exceed 30%.

**biennial** — a plant requiring two years to mature from seed to death.

**blue print** — a reproduction of a base map or other drawing made by placing the map on top of a light-sensitive paper, exposing it to light and then fixing the unexposed patterns, thus duplicating the original map. Blue print is often used as a synonym for plan or design.

**buffer-strip** — usually refers to a berm, hedge, or fence that separates two activities or spaces.

**catch basin** — a small reservoir or sump in an artificial storm drainage system where surface water enters the underground portions of the system, either by pumping or gravity flow.

**chlorosis** — a paleness or yellowing of the leaves of plants due to a failure of the chlorophyll to develop properly. This usually is caused by a lack of iron. Chlorotic leaves range in color from light green through yellow to almost white. Iron can be added to soil immediately around the plant to correct the situation, but some soils around Logan bind such iron before the plants can utilize it. In these cases, foliage sprays are needed.

**climate moderation** — plants, berms, fences, and overhead structures can moderate extreme effects of wind, precipitation, and sun by screening them on certain occasions and capturing them on others. The idea is to extend comfortable human use of exterior spaces over a longer period of time.

**compost** — a mixture of soil and decomposing vegetable matter used as a fertilizer or as a mulch. Almost all organic wastes can be converted into compost.

**coniferous** — synonymous with evergreen (see deciduous for comparison).

**contour** — a line on the surface of the earth, all points of which are at the same elevation above sea level. Such a line is invisible unless it has been marked by an engineer. The location of contour lines is frequently indicated on base maps as dotted lines.

**critical moisture (or wilting point)** — reached when soil moisture has decreased and can no longer extract sufficient water from the soil to meet its needs.

**cultural landscape** — human creations that have become part of the total landscape, all site features that cannot be considered natural or of a natural system.

**cut and fill** — grading that changes the natural relief of the earth's surface. Cut and fill operations are employed to form berms, swales and flat terraces for patios and other structures.

**deciduous** — describes plants that normally shed their leaves at a certain season (see coniferous for comparison).

**design** — a term used as a synonym for plan. Design can also refer to the "intent" of or the organization of a group of activities or objects, or to a conscious
effort to plan, using design principles as a
guide.

dormant — as applied to plants, this term
means resting or not growing. Most
plants are dormant when the temperature
drops below 43°F. (plant zero), or during
periods of drought. Deciduous plants lose
their leaves during dormant periods and
grow new leaves when dormancy ends.
Many plants spend seasons of dormancy
as seeds, root buds, or bulbs. In some
plants, chemical and biological changes
important to the survival of the plant
take place during dormant periods. These
changes may be triggered by cold, frost,
dryness, or shortened exposure to daylight.

drainage — the removal of water in the
form of rain, snow or irrigation from an
area by natural or artificial runoff. Almost
all of the changes which man makes in the
landscape—the altering of vegetation, earth
works, structures, etc.,—interfere with natural
drainage and require the construction of
artificial drainage systems to replace or
supplement natural drainage.

drought — an extended period of abnormally
dry weather of sufficient length to impair
agricultural production or domestic water
supplies.

easement — a right-of-way for public use
such as public utilities and walkways. The
fee title to land in the easement areas
remains tied to the adjacent land and the
easement rights are relinquished when the
public use ceases.

embankment — a structure of rocks or
earth arising above the normal surface of
the earth for purposes of protection,
retention or support of other structures.
An embankment is also known as a berm.

environment — highly variable living and
nonliving factors that define our immediate
habitats and extended worlds.

erosion — removal and transportation of
soil and rock materials by gravity, wind,
and/or running water. Can be accelerated
by the removal of natural or established

plant material.

evergreen (coniferous) — describes plants that
retain their foliage throughout the year.

excavation — an artificial, man-made gouge
in the earth's surface.

extentional landscape — area beyond the
property lines of the homsite.

frost action — can involve several changes.
First, the soil expands as water on the soil
freezes. Second, the soil contracts during a
period of thaw due to the melting of ice in
the soil. This may cause breaks in pavement,
foundations, and plant roots.

germination — the beginning of growth in a
dormant seed or spore. Germination is
initiated by conditions of temperature and
moisture and sometimes by fire, light, and
chemical reactions in the soil.

gradient — the angle of incline from the
horizontal. Gradients may be indicated
as a ratio—1:2—meaning one foot vertical to
two feet horizontal; or as a percentage
—10%—meaning 10 feet vertical to 100 feet
horizontal.

groundwater — the water that saturates the
soil below the water table. Usually the
source of wells and springs.

hardiness — measure of a plant’s ability to
withstand rigors of a climate, particularly
to the occurrence of freezing, moisture,
and extreme heat.

hedge — closely planted shrubs, used as a
barrier. The plants may be trimmed or
left to grow naturally.

herb garden — a garden (indoors or
outdoors) devoted to the cultivation of
herbs used for medicine, food, flavor, or
accent.

humus — decomposed or partly decomposed
organic matter in the soil, usually close to
the earth's surface. Humus gives topsoil a
dark color.
indigenous - native, or belonging to a region or area. In terms of plants, natives generally have a high degree of gradually evolved hardiness and are well adapted to their location.

landscape architecture - the art of space utilization and organization in the landscape. Landscape architects are concerned with how to best use outdoor space, the creation of controlled environments within the space, the adaptation of organisms to natural and man-created environments and the conservation of the aesthetic values and resources of the landscape.

mesoclimatic - the climatic effect measured, recorded and interpreted on a large, regional scale. For the purposes of this Guide, the mesoclimatic is considered the climate that affects northern Utah.

microclimate - the climatic effects measured, recorded, and interpreted at a residential scale. The variations of climate defined by the local topography and buildings in and around the home landscape. Microclimate is always a variation in the mesoclimatic.

module - a unit of measure, expressing the proportions of a design or composition. A module may be determined by a characteristic of a material used, such as brick, or by the size of lumber and other building materials or by some other proportional system.

nature study area - a plot of land reserved for natural, native vegetation growth.

perennial - a plant that sustains itself for more than two years.

pollution - contamination of water, earth, or air with harmful or obnoxious substances.

precipitation - rain, snow, dew and hail. Precipitation is a major factor in any mesoclimatic.

run-off - water from precipitation or irrigation that flows over the land surface. It is not absorbed by soil and plants, and in urbanized areas is mostly directed into storm sewer systems.

scale - the relative size of things. The size of human beings, the human scale, is a standard reference for the size of all things in our culture.

seedling - a young plant produced by the germination of a seed.

setback - a common zoning-ordinance restriction specifying the distance a new house or structure must be set back from a road or the lot boundaries.

survey - the determination, by means of examination of land records and field measurements based on these records, of the exact boundaries and location of a property.

soil fertility - a measure of nutrients in the soil that are needed to meet the growth requirements of plants when other growth factors, such as light, moisture, temperature and the physical conditions of the soil are favorable. Vegetation, growing under proper conditions, with their death and decay, return to the soil all the nutrients which they have extracted from the soil.

soil moisture - water that is held or suspended in the soil.

solar energy - the energy from the sun received on the surface of the earth. Because this energy arrives diffused and at low temperatures, only a small amount is currently utilized by man. Most of the solar energy useful to man is that which evaporates water into the atmosphere, and the energy trapped by the photosynthetic processes in plants. The possibilities of more efficient use of solar energy at the residential scale are tremendous.

space - the three-dimensional working area within which the homeowner may design and construct structures and plant vegetation.
subgrade — the prepared ground level upon which a pavement is constructed or upon which topsoil is placed for plant materials.

temperature inversion — a natural phenomenon that occurs when a mass of warm air is above a layer of cooler air near the ground. This situation contributes to the accumulation of smog as dust, smoke, and gas fumes are trapped in the cooler surface layer.

topography — a term applied to the surface features or relief of the land surface, or to a graphic description of these features.

trellis — an open framework or lattice used as a support for growing vines or other plants.

utility garden — a food-growing garden.

water table — the top level of water held in the soil. In several locations in Logan, the water table is very close to the surface of the land, thus requiring special design of basements and footings.

weed — an undesirable or misplaced plant.

wild garden — a garden planted with the native plants of the region, or a garden designed and planted with native vegetation to resemble a natural landscape.

zoning — restricts usage that can be made of certain land areas, normally involves ordinances passed by governing bodies.
General References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

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635.9 Atk

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N485

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Or1

712
P871c

635
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R568


631.8
R611

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R72


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St32

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635.0978
Su74

635.9
T768


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W528


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632.94
Yep
A Residential Landscape Design Guide for the Citizens of Logan, Utah

Volume 2
DESIGN

After reading Volume One, the Overview, you probably realize that you and your family want and/or need to make improvements in certain aspects of your property, whether those improvements mean adding an outdoor lighting system or tearing up the old yard and starting again.

In Volumes Two and Three, we answer questions regarding how to go about these changes. This Volume introduces the homeowner or developer to the design phase of residential landscape design, suggesting that in order to successfully complete a design, the designer should first go through a planning stage prior to the execution stages of his residential landscape design process.

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Chapter 2 - HOMEOWNER'S GOALS

Chapter 3 - LANDSCAPE DESIGN PRINCIPLES

Chapter 4 - SOLAR ENERGY & THE RESIDENCE
ABOUT THE PUBLISHERS

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Planning Department
61 West 100 North
Logan, Utah 84321

Logan is busting at the seams. The intended population of 25,000 for which Logan was initially designed has been exceeded. Where are future families going to live? How large can we grow?

In 1976, Logan City adopted an updated Master Plan and a set of general development guidelines that provide direction and timing for its inevitable growth and expansion. The attitude of establishing a well-designed community has been demonstrated by these actions.

This Guide to Residential Landscape Development contains information designed to inform Logan homeowners of their roles in building well-designed homes, properties, and neighborhoods. Logan residents can help city officials in maintaining the quality environment we have by using these design and construction pointers on their own properties.

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LEGAL CONSIDERATIONS &
SITE ANALYSIS

GUIDE TO RESIDENTIAL
LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Legal Considerations

INTRODUCTION

Ideally, several legal considerations ought to be reviewed prior to buying property. In reality, most of us become aware of such possible external complications only when it is too late. The procedures outlined in this chapter could be called "grief savers."

1. Obtain a plot plan of the site from the developer or previous owner.

2. Review restrictions on building. Set backs and height limits are defined in the Logan Land Use Ordinance. Find out in which zone the property is located and the restrictions peculiar to that zone.

3. Determine if any protective covenants are attached to the property. A protective covenant is an instrument describing restriction placed on the land by a developer or previous owner over and above the zoning restriction. Information regarding protective covenants is available in the County Recorder's office or attached to the warranty deed.

4. Check in the County Recorder's office to see if any easements and rights-of-way apply.

5. Before activating any do-it-yourself construction, inquire at the Building Inspection office about possible building permits and inspection requirements.

HOW IT ALL WORKS

All land use development within Logan must be approved by some governmental authority. This insures adherence to the city's land use ordinances which, in turn, were created to provide reasonable safety, privacy, and stability for all citizens.

Logan’s basic land use ordinance, the one that designates certain zones within the city and restricts the kind of building and occupancy that can occur in each zone, is changed periodically. This ordinance explains such items as set-backs, height limits of structures, and parking space requirements associated with residential and commercial development. A copy of the Logan Land Use Ordinance can be obtained from the Logan City Planning Department.

The initial approval for construction is a building permit, which is issued by a Building Inspector who is employed by the City’s Department of Public Works. You have to submit plans of your proposed construction project when you apply for a permit.

Building permits are required for all commercial and residential building and remodeling work, as well as for such things as fences, garages, accessory buildings, and signs. If plumbing or electrical wiring is involved, specific plumbing or electrical permits are required.

The Building Inspector has to inspect each job at the following stages: footing, foundation, water connection, rough-in (framing, electrical wiring, plumbing), and final. Twenty-four hours notice to the inspector is required. The building inspector must issue a Certificate of Occupancy to the homeowner once inspection is complete before he moves into the structure.

Any individual can build, remodel, wire, or plumb his/her own house so long as the inspections are carried out. Any individual who rents or leases an apartment or commercial facility, however, must hire a licensed contractor to construct, remodel, wire, or plumb it. In these cases, the permits are issued to the contractor, not to the individual. The contractor thus is responsible for the safety of the inhabitants of the building.
The legislative body of Logan can revise or enact new zoning or land use ordinances, so long as they are in accord with the master plan and promote its goals. These zoning ordinances and the accompanying illustrative maps are legally binding and should be respected as laws. They can (and should be) amended from time to time, however, to respond to changes and innovations in housing and business.

Logan’s Building Inspector is charged with enforcing the city’s zoning ordinances as well as its Building Code.

The City of Logan tries to optimize its approved construction methods by annually adopting an up-to-date version of the State’s Uniform Building Code, as do other cities in Utah. Contractors must conform with the code’s provisions for such items as electrical wiring, plumbing, and framing.

Logan’s governing body is assisted in decisions relative to the city’s master plan, zoning map, zoning ordinances, and building code by the Planning Commission, which is an administrative body made up of seven citizens appointed by the mayor with advice and consent from the council. They advise and make recommendations to the Municipal Council.

The commission meets in the city offices on the second Wednesday of each month and evaluates requests for such items as subdivisions, rezoning, cluster and innerblock development, planned unit development (PUD), and special use permits.

Logan’s Board of Adjustment is independent of the administrative functions of government. This board can grant variances to zoning ordinances provided that such requests meet their rules of procedure. Board members can also act as an appellate body to and for any person who has been aggrieved by the acts of an administrative official when dealing with zoning ordinances.

The Board of Adjustment consists of five citizens appointed by the Municipal Council and meets in the city offices on the first Tuesday of each month at 9:00 A.M.

So some of what you can do to or with your property depends on legally binding constraints created by others. But beyond those “givens” you have tremendous leeway to act for good or ill.
One good action you can take involves what we call a site analysis. If at all possible, some of these steps should be completed before you commit yourself to any purchase. But even if not initiated until after you have bought your property, a comprehensive site analysis can save you more headaches than you may want to believe.

The site analysis process begins when you identify the unique characteristics of a location and decide which ones will enhance and which ones will hinder your accomplishing the family goals you establish when completing the Family Inventory Checklist (See Chapter Two). The methods we describe for recording and mapping the natural and cultural features on the homesite, either for an existing landscape or a new residence, should help make your site analysis both efficient and productive.

We have provided a checklist you can follow in analyzing your property. First, apply the site analysis checklist to your property and then prepare your base map and record all information applying to your specific site. The way to draw your map is described on pages 24-26.

Your site analysis should include:

- site selection
- drainage and soils
- solar radiation and other climate considerations
- vegetation
- natural features and their characteristics
- existing structures
- walkways and driveways
- neighborhood characteristics
Site Analysis Checklist

SITE SELECTION

Features outside the property lines can make the difference between pleasant living and constant aggravation. So notice: whether automobile traffic is at a bothersome level; where storm sewer systems and natural drainage ways lay; if neighborhood streets, public areas and other residential lots are clean and orderly; what the neighborhood growth pattern (if any) seems to be; if utilities and services such as power, gas, garbage collection, police and fire protection, shopping areas, schools, churches, medical facilities, and recreational potentials are acceptable.

Can the site provide the degree of privacy you want?  
Yes__ No__

Can you locate property lines? What is the precise size and shape of your property?  
Yes__ No__

Do you know the zoning regulations, building codes, and ordinances by which the neighborhood is governed?  
Yes__ No__

Have you completed a title search of the property?  
(Only through a proper title search can you, the buyer, be reasonably sure you will not be bothered by unexpected claims against the property.)  
Yes__ No__

Have you considered the past, present, and future trends in property values?  
Yes__ No__

DRAINAGE

Is the site’s drainage pattern toward existing or proposed structures?  
Yes__ No__

Is the site’s drainage pattern toward a neighboring property?  
Yes__ No__

Is there a natural slope that can be used for septic-tank drainage?  
Yes__ No__

Do areas of your property show signs of erosion?  
Yes__ No__

Does water stand on the surface in any area?  
Yes__ No__

Does water drain from the property readily after a heavy rain?  
Yes__ No__

Does your property lie lower than the surrounding properties?  
Yes__ No__

Is your property in an area subject to flooding from adjacent streams?  
Yes__ No__
SOIL

Does topsoil need to be added?  

Is your soil exceptionally acid or alkaline? (See your county extension office about a soil test.)

Does the structure of the soil present a problem (excessive clay or sand or large number of rocks)?

Does your soil need fertilizers? (See your county extension office about a soil test.)

SOLAR RADIATION AND CLIMATE CONSIDERATIONS

Does the existing or could the proposed house have minimal western and maximum southern exposure? 

Do the prevailing winds indicate a need for protection in certain areas? (Write down wind directions and speeds.)

Will the temperature extremes in your area affect your choice of plants? (Write down the usual temperature extremes. Temperature extremes depend on your property’s location in relationship to canyon winds or general air flows off hillsides.)

Will irrigation be necessary? (Determine and record the average monthly rainfall during the growing season - March to November. Adjacent neighborhoods can differ from yours and soil types are relevant.)

Is the humidity high in your neighborhood? 

Your notes should describe the location and extent of the following microclimatic factors so that you can take them into consideration when designing for and selecting plant materials.

What areas are in the shade of buildings?
Where are the sunny areas near buildings?

________________________________________________________________________

________________________________________________________________________

Are there areas where sunlight is reflected to the ground from glass?

________________________________________________________________________

________________________________________________________________________

Where are the wet areas and the dry areas?

________________________________________________________________________

________________________________________________________________________

What air circulation patterns caused by the buildings do you need to consider?

________________________________________________________________________

________________________________________________________________________

Where are the frost areas?

________________________________________________________________________

________________________________________________________________________

Where and how extensive are the snow retention areas?

________________________________________________________________________

________________________________________________________________________
STRUCTURES

On a separate sheet of paper, evaluate the condition and suitability of any existing structures including patio, terrace, fence, or wall on your property.

What is the architectural style of your present or proposed home? (This can be relevant to your choice of a landscaping style.)

Should (can) the locations of structures be improved?                      Yes __ No __
Can access to the structures be improved?                                 Yes __ No __
Will the locations of the structures affect plantings?                     Yes __ No __
Do you need more yard or home protection against sun and wind?            Yes __ No __
Are any of the structures too large or too small in relation to the lot?  Yes __ No __
Can the construction materials be made to blend with the surroundings?    Yes __ No __
Are dry walls or retaining walls necessary to obtain sufficient level area? Yes __ No __
Are underground utilities exposed or subject to intrusion during construction? Yes __ No __
Do utility meters or air conditioner units require screening?              Yes __ No __
Do you want permanent seating in any areas of the yard?                   Yes __ No __
Does the children's play area require paved surfacing?                    Yes __ No __
Are steps needed to provide access between different levels?             Yes __ No __
Would a ramp be desirable between different levels?                       Yes __ No __
Is a storage structure needed in the service area?                        Yes __ No __
Is a storage structure needed in the children's play area?                Yes __ No __

VEGETATION

Will the removal of existing vegetation create an undesirable microclimate around and in the house? Yes __ No __
Will the removal of existing vegetation create serious erosion problems? Yes __ No __
Is there a need for low-maintenance ground covers?                         Yes __ No __
Does the lawn need to be improved?                                        Yes __ No __
Are the genus and species of existing plants desirable?  
Is the general condition of each plant good enough to justify saving it?  
Can the existing vegetation withstand cutting and filling the soil required during construction?  
Is there a need for additional vegetation to create shade?  
Are there more plants than you need or want for such things as shade, and enframing views?  
Are any of the plants native species?  
Will there be any significant alteration of the native plant's original growing environment because of construction?  
Will the native plants combine well with ornamental plants if a combination of the two should be necessary?

NATURAL FEATURES

Are there bodies of water or rock outcroppings on your land that you may want to feature?  
Are there sunken or eroded areas that you may need to modify?  
Do you have steep slopes that require retaining walls or special plantings?  
Will existing slopes prevent using the yard for lawn games?  
Will neighboring ground elevations and/or houses affect your landscaping needs?

WALKWAYS AND DRIVEWAYS

Does the walk or drive need to be relocated for greater convenience or attractiveness?  
Does either need to be made wider?  
Does water drain onto them?  
Would expanding (modifying) the walk at the entry allow for a courtyard treatment?  
Do you need off-street parking?  
Is there adequate lighting along the walks and drives?
Do you need a secondary walk around the house? Yes  No  
Can stepping-stones be used to carry the traffic? Yes  No  
Are walks needed from the rear entry to the service area or to other activity spaces in the outdoor living area? Yes  No  

NEIGHBORHOOD CHARACTERISTICS

What future development is likely to occur within your planning zone? (See Land Use Ordinance) Yes  No  
Is your property in a hazard zone? (See Guidelines for Development, 1976) Yes  No  
Do you want to change your neighbor’s visual access to your property? Yes  No  
Do you want to frame a good view or to screen a bad one? Yes  No  
Are noises and/or air pollution from a nearby boundary road of concern? Yes  No  
Are there pleasant adjoining areas (golf course, park, grove of trees) that you can take advantage of in your plan? Yes  No  
Will you want the exposed-to-the-public parts of your property to be as private as possible? Yes  No  
Are the family activity outdoor areas of your property adequately protected from public view? Yes  No  

Use the “Other References” sections at the back of Chapters 1-12 as you run into questions or items not covered here. Some questions that arise can be answered by people in the Logan City Planning Department. Don’t hesitate to contact them.

DRAWING YOUR BASE MAP

It is time now to sit down at a table or desk and start drawing. The first drawing you need is your base map. By preparing this map, you gain an overall picture of your property. This drawing is also called a plan view of the property (as if seen from directly overhead). And on it you locate legal property boundaries as well as all the existing objects and conditions that you’ve recorded in your site analysis checklist. Plot plans of your property should have been given to you by the developer or previous owner. These plans are prepared as a house is being built and show its location, property lines, size of property, northern direction, and in some cases will include contours depicting the topography. If a plot plan is not available, the Logan City Engineering Department has plans of each lot in the city, showing dimensions as they were first surveyed. Referring to these may be helpful.
As to the materials, a good quality tracing paper is recommended for drawing so that blue prints (Ozalid prints) can be made from your original. You'll find blue prints useful as you proceed with your designing site characteristics so you can record ongoing developments. Logan City Engineering Department will make blueprints for you.

A mechanical pencil with an "H" lead (or a number "2" pencil), gum eraser, an architectural scale, (a measuring device used to convert on the ground dimensions to drawing dimensions.) T-square, and plastic triangle (either 30-60 or 45 degree) will help you draw your base map accurately and clearly.

Here is a simple method you can follow:

1. On a sketch pad, outline all existing site features in a plan view. Measure distances between objects and from property lines.

2. Convert this information into a base map by accurately drawing the site as a plan view to the scale of 1/8" = 1' - 0" using the architectural scale, T-square and triangle. (If a tree is 24' from the back property line, that would require only 3" on the 1/8" = 1' - 0" scale.)

   a. If you don't have them from records, measure your property on the ground
and transfer those dimensions onto the scaled drawing. Note size and shape of property and indicate which way is north.

b. Outline your house to scale and show its doors and windows. Identify architectural type or style.

c. Use the information you recorded in your site analysis checklist. Plot existing trees, utility poles, and structures such as garages, walls, fences, rocks and other natural features including stream beds or severe elevation changes. See Figure 5.

d. It is important to know how the land surface slopes. Such knowledge sometimes reveals places where water will pond up or flow into foundations of walls or the house. A simple way to determine the slope of a piece of land is illustrated in Figure 6. If your property has a lot of topographic variation, a surveyor should be contacted to prepare a topographic map.

e. Include as much information on your map as possible. Every item should be drawn to the prescribed scale because as your design progresses, additional objects will be placed on the lot and their relationship to existing conditions must be accurate.

3. Make several blue prints of your completed base map for future use in recording other types of information and designing the plan.
Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

744.42  
At51

712.64  
Ec53

728  
D922

744.424  
H785

744.422  
M363

744  
M824

712.5  
R823

712  
Si56

712.6  
W388

720.223  
W426
HOMEOWNER'S GOALS

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Homeowner’s Goals

IDENTIFYING FAMILY LIFE STYLES AND PRIORITIES

Few people build or buy a home without many hours of preplanning. The emphasis is generally on optimizing the productivity of every square foot of space. But a plan that “works” beautifully for one family can be a dismal failure for another. Attitudes towards privacy, entertainment patterns, ages of children — these and dozens of other individualized factors make the difference.

These same kinds of personal life-style factors need equal attention as you design your yard areas. Logan’s climate (even in a mild year) will keep you from making year-round direct use of your yard, but it can give aesthetic pleasure and physical comfort in every month.

If you are building, you will obviously have more freedom to personalize your yard than if you have bought a ready-made place. But the preplanning process described here can be valuable in either case. If you are in a prepurchase stage you may want to check into the information in Chapter One before putting down any earnest money.

The checklist in this Chapter (a good way to start your design process) is meant to provoke your thinking rather than to be a comprehensive guide. And your goal as you fill it out should be to identify what is truly important to each member of your family. That means that even your young children, with their still-active imaginations and refreshing ways of seeing, should have a voice in your decisions. At the same time, some allowances must be made for foreseeable (and unexpected) changes in the habits and attitudes of each family member.

The following four steps can put you on the road to identifying your family’s priorities for outdoor activities:

1. Fill out the following checklist and add any items that seem relevant.
2. Browse through this entire Guide, paying particular attention to the references listed at the back of each chapter to help clarify your thinking.
3. Be realistic about your budget constraints — but recognize that you don’t have to do everything at once.
4. Match your budget to your family-defined priorities within a long-term, flexible time schedule.

When you’ve completed the checklist, established your family’s priorities, and defined a reasonable time schedule you are ready for action.
Family Inventory Checklist

FAMILY MEMBERS
Name __________________________ Age ___________ Hobbies _____________
__________________________________________
__________________________________________
__________________________________________

As you fill out this checklist, consider each item as an addition to your new home, or an alteration of an existing landscape design. If you are still in the “shopping” stage, you can use the checklist to help you identify what you will want or need around your home when you do buy.

PUBLIC AREA

Do you need a driveway? Yes__ No__
Surface material ________________________________
Number of Cars in family _________________________

Do you need off-street parking for guests? Yes__ No__
Surface Material ________________________________
Number of cars _________________________________

Do you need privacy from the front street? Yes__ No__

Do you want to have an entrance court? Yes__ No__
Surface Material ________________________________
Is Shade needed? Yes__ No__

Does the front yard need utility lighting at night for safety? Yes__ No__

Do you want landscape lighting for dramatic night-time effects? Yes__ No__

List existing structures in the front yard (fences, walls, decks, paving)
________________________________________________________________________

List structures you would like to add or include in the public area.
________________________________________________________________________
**SERVICE AREA**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you want a vegetable garden?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>Types of Vegetables</td>
<td></td>
</tr>
<tr>
<td>Do you want a flower-cutting garden?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>Flower Types</td>
<td></td>
</tr>
<tr>
<td>Do you want to use a compost bin to create your own fertilizers?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you want to garden during the winter?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhouse</td>
<td>Cold Frame</td>
<td></td>
</tr>
<tr>
<td>Does your dog (or other pets) need someplace to run?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doghouse</td>
<td>Size of Dog run</td>
<td></td>
</tr>
<tr>
<td>Other pet requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you want clotheslines?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent use</td>
<td>Occasional Use</td>
<td></td>
</tr>
<tr>
<td>Permanent</td>
<td>Portable</td>
<td></td>
</tr>
<tr>
<td>Surface Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a need for storing recreational vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camper</td>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>Boat</td>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>Trailer</td>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>Snowmobiles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would you like to have a place to store lawn and garden equipment?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itemize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional garden supplies needing storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itemize patio furniture to be stored during winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do trash containers need to be stored?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>Preferred location</td>
<td></td>
</tr>
</tbody>
</table>
FAMILY PRIVATE AREA

Garden Maintenance

Based on your interests in working in the landscape, to what extent should your future landscape plan be maintenance free?

Minimum Maintenance ______ Moderate Maintenance ______ High Maintenance ______

List family allergy problems that might be aggravated by some addition to the property. ______________

____________________________

Outdoor Living and Entertaining Considerations

Do you want your patio to accommodate guests as well as family members? Yes__ No__

Large groups______ Small groups ______ Formal occasions ______

Informal occasions ______

Number of people to use the patio most often ______

Surfacing Material ______

Lawn Games Area

Will the lawn area be used at night, thus needing lighting? Yes__ No__

Do you want any of the following:

- Badminton (24’ x 54’)
- Croquet (30’ x 60’)
- Putting green (30’ diameter)
- Tetherball (20’ diameter)
- Basketballs (40’ x 40’)
- Horseshoes (20’ x 40’)
- Shuffelboard (6’ x 45’)
- Tennis (60’ x 120’)
- Other ______

Facilities needed for Outdoor Cooking

Do you want a permanent-type cooking grill? Yes__ No__

Size ______ Gas ______ Charcoal ______

Would you rather use a portable grill? Yes__ No__

Would you like a built-in barbeque pit? Yes__ No__

Do you need a sink with running water? Yes__ No__

Is running water available? Yes__ No__
Should electrical outlets be included outside for easy access?
Yes__ No__

Is an overhead needed to protect people and furniture?
Yes__ No__

Is there storage room for patio furniture?
Yes__ No__

Swimming Pools

Have you investigated legal requirements?
Yes__ No__

Have you considered liability insurance?
Yes__ No__

Would you prefer a portable pool?

<table>
<thead>
<tr>
<th>Size</th>
<th>Wading</th>
<th>Round</th>
<th>Rectangular</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yes__ No__

Have you considered a permanent pool and patio area?

<table>
<thead>
<tr>
<th>Size</th>
<th>Shape</th>
<th>Diving Area</th>
<th>Decking Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yes__ No__

Have you considered pool enclosure?

<table>
<thead>
<tr>
<th>Architectural wall or fence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Fence</td>
</tr>
<tr>
<td>Plant Materials</td>
</tr>
<tr>
<td>Outdoor lighting at night</td>
</tr>
<tr>
<td>Dressing facility</td>
</tr>
<tr>
<td>Equipment storage</td>
</tr>
</tbody>
</table>

Yes__ No__

PRIVATE AREA

Children’s Play Area

Some or all of the following play items might be included in the play area. Check those that you would like to add or include on your property:

Blackboard
Climbing ropes
“Junk” Playground
Sandbox
Slide
Swings
Playhouse
Tricycle “Freeway”
Wading pool
Other
Do the children want (have) shaded areas in the playground 

Which shade device would you like to use or can you afford? 

- Trees
- Fences
- Overhead Structures
- Other

What kind of surfaces do the children want to walk on in their play area? 

- Sand
- Wood
- Grass
- Wood chips
- Small gravel
- Other

Will there be play equipment that needs to be stored during the winter? 

Do you need to build or buy a storage shed for these items? 

Size ________

Permanent Seating

Which of the following seating arrangements would you like to use? 

- Movable benches
- Seat-high planters or walls
- Tables

Materials ______________________________

Is shade desirable in the sitting area? 

Which of the following would be the best shade producer? 

- Table Umbrella
- Overhead Structure (Includes trellises, fabric canopy)
- Trees
Special Interest Garden Accessories and Features

In addition to the vegetable garden, which of the following ornamental type gardens would you add to your property?

- Natural Study Garden
- Hobby Garden (Potted plants)
- Herb Garden
- Flower borders (Annuals, perennials, roses, others)

Here are some other accessories you might want to consider:

<table>
<thead>
<tr>
<th>Container Plantings</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planter Boxes</td>
<td>Type</td>
</tr>
<tr>
<td>Dwarf Fruit Trees</td>
<td>Type</td>
</tr>
<tr>
<td>Small fruit bushes</td>
<td>Type</td>
</tr>
<tr>
<td>Vine fruits</td>
<td>Type</td>
</tr>
<tr>
<td>List your favorite plants</td>
<td></td>
</tr>
</tbody>
</table>

Sculpture
Landscape Lighting
Water fountain
Reflecting pool
Fish
Bird feeder
Birdhouse
Bird-attracting Plants
RENOVATING THE EXISTING GARDEN

1. Prepare an accurate base plan showing all existing features.

2. List all problem areas.

3. Reduce or expand lawn areas.

4. List the trees to remain

5. List the shrubs to remain

6. Improve or install below-surface drainage lines.

7. Install a sprinkling system.

Include any of the other items in this checklist as possible improvement items in the existing garden.

Additional Improvements:
LANDSCAPE DESIGN PRINCIPLES

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Landscape Design Principles

INTRODUCTION

Possible legal hang-ups in buying or remodeling your property have been offset or avoided (Chapter One).

Sites have been evaluated — with one selected, purchased, and comprehensively analyzed (Chapter One).

Your family's goals and expectations have been defined (Chapter Two).

Now—finally—you get to the more creative part of residential landscape design. At this stage you can apply design principles to your own personal world. The ultimate aim is to organize available space and relevant objects to optimally accommodate your family's activity and need priorities, while simultaneously working with nature to give yourselves an aesthetically pleasing environment. For example, you'll want to organize home and yard so that family entertaining can take place in one area, and gardening and storage in another. Trees and shrubs should be chosen and located so that they are in circumstances conducive to luxurious growth. The final result will be an attractive and valuable property that your family can thoroughly enjoy.

The principles of design we utilize are concerned with:

I Organizing Activities and Patterns of People Circulation
   A What are the activities?
   B Where do they take place?
   C How much space does each demand?
   D How do you get from one activity area to another?

II Principles of Composition
   A Unity
   B Rhythm-Repetition
   C Variety
   D Dominance
   E Time

III Factors you can Manipulate
   A Space
   B Form
   C Texture
   D Color

IV Maintenance Considerations

Examples of the kinds of checklists and drawings that each homeowner can use in developing his design are scattered throughout this chapter. We include plan views and sketches and sufficient data to start you on your construction phase. The "Other References" sections on pages 56-58 can be used as a source of additional inspiration.
Organizing Activities and Patterns of People Circulation

ACTIVITY CATEGORIES

As your first step, you can evaluate your family's list of yard-oriented activities and uses in terms of four categories. See Figure 7.

The four categories are based on the degree of privacy most families want for specific activities, and is one form of organization you can use as you create your landscape design. Some activities are listed in more than one category, which allows you to interweave activities to create a more unified landscape design.

Public — Those that you don’t mind sharing with the general public. A home’s public area(s) generally occurs toward the front yard, adjacent to access roads, where little privacy is possible.

- Sprinkling system
- Walks
- Driveway
- Parking (visitor)
- Carport
- Fences, walls
- Ornamental garden
- Entrance court
- Open lawn
- Mail boxes
- Utility meters
- Residential graphics
- Seating
- Lighting

Service — Activities that support the household or are required to maintain a healthy home environment are considered service—activities such as clothes drying, garbage, and tool storage. For convenience, the service area is usually situated near the garage and kitchen, and may involve the back or side yards. Ideally, this area is not visible to neighbors.

- Clothes line
- Firewood storage
- Storage shed (tools, pool and garden maintenance equipment)
- Greenhouse
- Sprinkling system
- Walks
- Driveway
- Parking (service)
- Carport
- Decks
- Fences, walls
- Utility garden
- Corral
- Barn
- Basketball
- Utility meter
- Compost pile
- Dog run
- Garbage Storage
- Seating
- Lighting
**Activity Compatibility**

A well designed property will be organized so that public and service areas will be separated by family private and private areas.

<table>
<thead>
<tr>
<th>PUBLIC AREA</th>
<th>SERVICE AREA</th>
<th>FAMILY PRIVATE AREA</th>
<th>PRIVATE AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC AREA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVICE AREA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAMILY PRIVATE AREA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRIVATE AREA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Family-Private** — These activities are primarily concerned with family entertainment and outdoor living. An area designated for such use can be enjoyed by family members and invited guests with any degree of privacy desired by the family. This space is generally secluded from public view.

- Overhead structures
- Art or hobby studio
- Swimming pools
- Greenhouse
- Sprinkling system
- Patio
- Walks or paths
- Decks
- Fences, walls
- Tot lot
- Utility garden
- Ornamental garden
- Open lawn (multi-use play)
- Nature study
- Basketball
- Tennis
- Accessories (pots, planter boxes)
- Seating
- Badminton
- Volleyball
- Lighting

**Private** — Such activities are usually enjoyed by just one or two family members at a time. The area(s) designated for this purpose provides a retreat, a private place “no one knows about”. If space allows, your landscape design should include these kinds of places for each family member.

- Outdoor art or hobby studio
- Sprinkling system
- Patios
- Fences
- Walls
- Ornamental garden
- Nature study
- Accessories (pots, planters, fountains)
- Seating
- Lighting
WHERE DO THE ACTIVITIES GO

With everything neatly categorized, the next decision is where to place the activities on your property. For this you need your site analysis, plus knowledge of your family’s preferences. One way to think about locating activities centers around four principles:

1. Natural and Cultural Compatibility — According to this principle, activities should be located according to natural features. For example, if there is a river or unusual landforms on your property, you’ll want to capitalize on their beauty. But at the same time you’ll want to minimize disturbances to any river banks or established slopes. Logan has many river banks denuded of vegetation, and as a result, these banks are further eroded by spring run-offs each year. Slopes that are cut back to make room for an activity will also erode, unless precautions are taken.

Natural hazard zones for high water tables, flood plains, slope, bedrock, and proximity to fault lines have been mapped for Logan. [Persons interested in finding whether they live in a hazard zone can obtain a copy of the Guidelines for Development (1976) at the Logan City Offices.]

Cultural features such as planning laws and existing patterns of developed land also influence activity decisions. The Logan Land Use Ordinance, for example, has been developed to regulate heights of, and setback requirements for such things as buildings, overhead structures, and fences.

Helpful additional pointers include the information in Chapter One and the following:

- Level properties are mechanically easier to landscape than sloping or undulating sites, but they require more ingenuity to make them interesting.

- Sloping sites offer opportunities for unique designs, views, and effects.

- The Land Use Ordinance may preclude certain activities in your zone.

- Logan’s Guidelines for Development describes natural and cultural features of the city that may be relevant to your decisions.
2. **Community and Privacy Needs** —
The home is generally thought of as a sanctuary and place of refuge from the world. In a community most people act one way, in their home another. People interact with many others in the community, but at home, contacts are special and few. Given the public, service, family private, and private categories of activities, locations for these activities are logically chosen on the basis of proximity to city streets, property boundaries, and individual space needs. See Figure 8.

The following questions may help you in your decisions:

- Are questions between you and your neighbors on home and property ownership and maintenance resolved?
- Are public, service, and private areas clearly separated?
- Are there clear boundaries between neighboring properties? (The sharpness of separation can vary depending upon the needs of the homeowners.)
- Does your entry have a protected arrival and a sheltered standing space for guests?
- Are walking surfaces safe and visually pleasing?
- Is there adequate access for the handicapped?
- Is there provision to keep access clear of weather interference — overheating, wind, puddles, snow, and ice?
- Can access points be securely barred?
- Are small children and pets separated from bicycling?
- Is the dwelling protected from city noise?
- Is there adequate illumination of the entry and absence of abrupt contrast from the outside to the inside?

Is there sufficient parking for owners and visitors; adequate maneuvering space?

Is there temporary space for service and delivery vehicles?

Does pedestrian access from automobile to dwelling involve a minimum possible walking distance?

Is partial weather control provided between the automobile and the building?

Is there provision of space for maintenance and control of public utilities — telephone, electricity, main water, sewage, district heating, gas, air conditioning, incinerators?

Is the garbage collection point enclosed to prevent pollution by undesirable sites and smells?
### Climate Compatibility

To live with the local climate in Logan, rather than having to continually fight it requires informed planning. Your plans for family activities as well as for energy conservation can benefit from your understanding the prevailing climate and what it can do to vegetation and building materials. For example, plant materials must be located in spaces compatible with their requisite temperature and humidity ranges, light tolerances, and soil characteristics for luxurious growth.

Locating activities without attention to climate can mean either too much sun or not enough; too much wind or too little breeze. Figure 9 identifies on which side of the house some common activities can be located to create the most comfortable living conditions. Refer to Chapters 6-12 for more detail.

Here are some additional pointers:

- North-facing walls or houses, garages, and greenhouses can be buffered with plant material or a fence to reduce the loss of heat from the house to the outdoors during the winter.

- South-facing windows, walls, and other outdoor living areas can be shaded with deciduous trees or overhangs to provide protection from sun in the summer, while letting in the winter sun.

- You can create windbreaks to divert prevailing storm-associated winds.

- Because Logan’s climate includes occasional drought years, methods of storing rain and run-off water for future uses might be included in the landscape plan of your property.
4. Interior/Exterior Relationships—

Figure 13 shows each room in a typical home, and the outdoor activities that are generally best located adjacent to those rooms. You may find that working through the following questions will help you toward an efficient interaction between the inside and outside of your home.

**Public**

- Is there protection at the front door for casual callers and guests during cold or rainy weather?
- Can guests get to the outdoor living area without going through the house?

**Service**

- Is there car space or a garage near main entrances to the house?
- Can you get from the vegetable garden into the house without passing through the living room?
- Can large garden and maintenance tools be moved from where they are stored to where they are used without going through the house?
- Can you easily get from the laundry facilities to the clothes lines?
- Can refuse be collected and fuel delivered easily?
- How far does the user have to carry garbage from the house to its storage point? Can this activity take place without going through living areas?
- Is the fuel storage convenient to where it will be used?
- Is there a covered route from the house to: garage? fuel storage? garbage storage?

**Family-Private**

- Does the kitchen overlook the place where small children are likely to play?
- Can the patio be used in the summer as an extension of the indoor living spaces?
- Can you easily get from the kitchen to the outdoor living area?

**Private**

- Does the site plan give reasonable privacy to living rooms and bedrooms from people calling or passing by?
- Is your outdoor living area screened from neighbors’ views?
- Are neighbors’ outdoor living areas and rooms screened from your view?

<table>
<thead>
<tr>
<th>Entrance Court</th>
<th>Public Area</th>
<th>Service Area</th>
<th>Family Private Area</th>
<th>Private Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garage</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living Room</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dining Room</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Den/Studio</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitchen</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workroom</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Room</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atrium</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Room</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Bedroom</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedroom</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathroom</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HOW MUCH SPACE PER ACTIVITY

Within your home’s designated Private, Family Private, Service, and Public areas, you now have to evaluate the space requirements of specific activities. The size and shape of your property and house will obviously influence where and how each activity is placed. Knowing the range of space that each activity might require is essential. The space needs of some activities can vary greatly depending on the needs and desires of the family, others are virtually inflexible in specific volumes of space. To decrease the required minimum dimensions of a carport (20’ x 20’ x 10’ high) by squeezing it into a smaller space only hampers its use. Pages 44-47 give examples of typical size ranges and requirements of common residential activities. The following suggestions can help you identify and choose practicable spaces for activities around the home.

- Cut out the paper shapes on pages 44-47. These represent common activities that might be included in your design. Move the shapes around on your plan. This way you can visualize different combinations and compatibilities of activities.

- Small properties and/or average budgets may preclude activities that require large spaces. Swimming pools, and tennis and basketball courts come under this category.

- Sloping sites generally are not suitable for activities requiring large spaces because excessive (and expensive) grading is required.

- Be sure to note which of your activity spaces can be overlapped to maximize your enjoyment of your site. (For example, lawn areas can be used for entertainment space, volleyball, and badminton courts, and children’s play space, as long as the activities are staggered over time.)

- Because activities such as tennis, volleyball, and basketball function better when oriented north and south, your homesite may not allow you to enjoy certain activities to the fullest.

PEOPLE CIRCULATION – TYING IT ALL TOGETHER

Once all your family’s desired activities have been identified and evaluated as to compatibility with your property, it is time to consider connecting areas with convenient walkways. The following suggestions will make moving from one area to another easy and pleasing. See Chapter Six - Driveways and Walkways for more specific ideas.

- Walkways and driveways should be visible from inside the house so you can keep an eye on the children or any unwanted trespassers.

- Walks in Public and Service areas should be short, straight, and direct — the shortest distance between the origin and destination points — since that is the route most people will take anyway.

- Informal walks and paths in the Private areas might meander, creating greater interest.

- Walkways and driveways should be wide enough and strong enough to accommodate gardening equipment, service vehicles, toys and other equipment.

- You may want to create views and vistas or interesting points of interest for the pleasure of people walking from one space or area to another.

- Walkways and driveways can have interesting paving patterns and at the same time be easily maintained.

As you begin locating activities on your property, cut out and arrange any of the following templates, or make up your own to fit your needs. Using these cut-outs allows a great deal of flexibility as you design. Remember, except for the game areas, these sizes are just suggestions — a place to begin.
driveway 20' x 20'
parking 9' x 20'
parking (2 cars) 18' x 20'

storage shed 12' x 12'
shed 6' x 12'
shed 6' x 6'
dog run 12' x 20'

greenhouse 14' x 18'
gh 7' x 12'
dog run 8' x 10''

garden for family of 4
400 square feet
garden for family of 3
250 square feet

garbage storage 6' x 6'
g.o. 4' x 4'
garden for family of 5 or 6
500 square feet

overhead structure 15'x10'

overhead structure 8'x16'

patio 8'x12'

patio 10'x20'

patio 12'x12'

play area 12'x20'

play area 8'x12'

table tennis 15'x23'

table
volleyball/American croquet  30' x 60'

badminton  20' x 44'

basketball  40' x 40'

tether ball  12' x 20'

hopscotch
Relationships of areas and activities also involve construction materials, plant materials, or other landscape objects. You can personalize your landscape by choosing objects and materials that express your family's personality.

The following sections discuss basic principles of composition and the characteristics of space, form, texture, and color that distinguish one object or material from another.

These principles of composition and the characteristics of objects or materials are far more important to your planning process than the objects themselves. You can evaluate any object and material proposed for your landscape plane on the basis of its form, texture, and how they relate to each other within or act to define a space.

You can enhance the aesthetic quality and efficiency of your landscape if you apply these five principles of composition: Unity, Rhythm-Repition, Variety, Dominance, and Time.
UNITY

Unity is achieved when your combination or ordering of landscape elements promote an undivided (unified) total effect. It is oneness, a condition of harmony or accord in which deviation or change is avoided. To gain unity in your home and landscape you need to:

- identify the basic concept you want your landscape architectural design to convey (whether a low-maintenance garden, a native plant garden, or a climate-control-oriented garden) and carry this throughout your entire design.
- use similar forms and shapes in lawn areas, planting beds, plant materials, and building materials.
- have repetition of a color or texture.
- use a limited number of building and/or plant materials.
- favor horizontal lines in your landforms, architecture, and plant materials to create a unified restful experience.
- find the best location for each activity, with nothing "out of place."

RHYTHM-REPETITION

Rhythm is defined as an ordered sequence, a harmonious or orderly movement, a fluctuation or variation with recurrences of action or situations at fairly regular intervals. In landscapes it requires an ordered sequence of harmonious or related compositional elements.

- Rhythm in landscape design gives unity just as a theme does in music.
- Repetitious sequences can occur in views, one revealed after another as one moves through the landscape.

- Flagstone paths or stepping stones create a rhythmic pattern that can be more interesting than a continuous walkway.

- A sequence of plant materials or mounds can give pleasing repetitions, as can a row of planter boxes, ceramic pots or other objects.

VARIETY

To gain variety (the opposite of monotony) you include different forms, objects or materials in your landscape design, with the assortment being either chaotic or restful. By carefully combining contrasting objects and materials, you can create visual interest—a myriad of things to touch, smell, see, and feel.

- Variety is frequently used in and around a design's focal point (see below) as a contrast to the prevailing theme of forms and materials.

- Too much variety results in chaos — disruption of concentration.

- Too little variety can result in monotony and boredom.

- With a variety of views and spaces you can provide a more exciting landscape design than will a variety of textures and colors.
DOMINANCE

The focal point in a landscape is the point or object toward which the eye is directed or drawn because of contrast or interest. You achieve variety, unity, and repetition in your landscape only if some object or space is perceived as dominant in relation to its surroundings. See Figure 18.

- This dominant focal point can be either a specimen tree, a piece of sculpture or some other prominent feature.

- Focal points can be created by adding an object to a space that contrasts with its surroundings, such as a sculpture placed in a space surrounded by plantings.

TIME

Each hour, day, season, and year causes changes in the home landscape.

- Landscapes are continually changing. The weathering processes constantly affect construction materials, sometimes diminishing their structural strengths and generally changing their color and texture.

- Plant growth, form, texture and color are all triggered and changed by seasonal differences. Plant materials arranged to take advantage of seasonal changes, especially colors, are much more exciting. See Chapter 12, Installation and Care of Plant Materials.

- A successful landscape design might include materials that, over time, improve in their aesthetic and structural qualities. Such materials must be weather-resistant and will require some maintenance.

- Quality construction techniques increase the life and enjoyment of the residential landscape design.
Factors You Can Manipulate

The essential characteristics of objects and materials are their space requirements, form, texture and color. It is these characteristics that you can manipulate to achieve unity, variety, repetition, and dominance in your landscape design.

SPACE

Space can be defined as a volume of air that has defined boundaries. The houses and trees surrounding your property define a space that is yours. As soon as you put a home on your property you create interior and exterior space. You can divide or manipulate your exterior space by placing objects such as walls, fences, architectural creations, or plant materials into it. The interior space enclosed by the walls, doors, windows and roofs of your house offers similar division and manipulation potentials.

• Technically, you define volumes of air in your exterior space by structuring the base plane, vertical plane, and overhead plane. See Figure 21.

• You create a feeling of enclosure by the vertical and horizontal relationships of your walls, fences, overheads, and plant materials. See Figure 20.

• The relative height, form, and density of plant materials are basic building blocks you can use to define exterior space. See Figure 22.

• As you divide a large space into a variety of smaller spaces, each one can be visualized as building a repetitious rhythm, and one particular space may become dominant among all the others. See Figure 23.
FORM

The shape, size, and structure of an object define its form. We compare the forms of objects with those of other objects as well as with the space in which they are placed. The generalized forms—cube, pyramid, round, oval—can be arranged in space to create interesting effects. See Figure 24.

As you design your landscape, you’ll want to consider:

- matching or contrasting forms of objects with the architecture and space in which they reside—cubes with cubes, pyramids with pyramids.

- blending forms with your site’s character as defined by plants, topography, and hard surfaces. See Figure 25.

- being sure that you place plant materials in spaces that are large enough to accommodate their ultimate shape and size and allow for them changing with stage of development, and season.

TEXTURE

The quality of texture is expressed by the surface of a material or a group of materials or objects. As you landscape you need to think about two types of textures. As sunlight or artificial light shines on a surface, the particular characteristics of that surface determine visual texture. As the viewer moves away from the object, the texture becomes finer. (Only at a distance can the texture of a group of objects be evaluated visually as a group.) Surface irregularities can be felt through the hands, especially on structural materials such as concrete, wood, or brick, creating a second kind of texture—tactile texture. (Notice the texture of this brochure cover.) Adjectives to describe textures include: shiny-dull, coarse-fine, rough-smooth, hard-soft.
You can use texture as a versatile tool in your landscape design:

- By grouping objects of similar textures you can create unity. This is most useful in a small patio or intimate plant arrangements.
- If you combine a variety of textures, you can strengthen composition in a large outdoor living space by establishing points of interest.
- By realizing that coarse textures reduce the apparent size of a space, while fine textures expand it.
- By using the visibility of objects with shiny, coarse, rough and hard textures to demand visual attention. These objects can give your garden a focal point.
- On the other hand, objects with soft, dull, fine or smooth textures are best used as backdrops.
- By selecting plant materials, whether for use as specimens or in groupings to achieve visual effects through their foliage and/or woody structures.
- By capitalizing on rough, tactile texture qualities being synonymous with safe walking and play surfaces, especially in potentially dangerous situations where water, snow or ice may collect.
- By remembering that some sources of textural effects change with the seasons. For example, a shrub with shiny coarse texture in summer may appear fine and dull in winter.

**COLOR**

All objects and materials in a landscape contribute color—which changes over time. Seasonal variations in plant materials are exciting to watch and can be utilized to enhance your home landscape.

Two aspects of color are emphasized here:

1. **All-Green Garden** — If your choice is all green, the attractiveness you achieve will depend on a knowledgeable use of plant forms, textures, and subtle color variations. You’ll also want to be especially careful to provide accents or focal points so as to avoid monotony.

   You can give your garden light and airy effects by using open planting masses, light-to-medium textured shrubs, and light greens and yellow-greens with one or two darker green plants for accent. Or, you can create a heavy, closed-in effect by planting vegetation hedges and screens, and using coarse-textured glossy dark green plant materials.

   In an all-green garden, a prime compositional tool is variations in massing, height, or shades of green. By skilled use of this tool you can de-emphasize functional edges or boundaries between use-areas and provide a smooth transition from one use-area to another. See “Other References” in Chapter 12, Installation and Care of Plant Materials.
2. Color in the Garden — If you choose to grow a colorful garden, you’ll be vitally concerned with bulb, annual, and perennial flowers, which can produce colorful floral compositions in spring, summer, and fall. You may want to present your flowers against a backdrop of shrubs and trees that change leaf color drastically in spring, summer, or fall.

Your basic color scheme should be kept simple and direct. Up to three colors in a small garden are enough to provide accents to the basic green backdrop plantings without overwhelming the total view. The colors can come from either flowers or colorful objects. In thinking about the beauty of flowers, however, you also have to think about maintenance.

When choosing your flowers, other plants and objects, you’ll want the colors of your home to harmonize with those of your landscaping materials. Warm colors (yellow, orange, red brown, olive green) should be used together and will provide psychological comfort during cold winters. A mass of cool colors (blue, cool green, grey, violet) can bring a psychological refreshment to a hot homesite. In general, you won’t want to mix warm and cool colors. “Landscape” colors—brown, green, blue—are best in exposed areas and in large quantities. Primary colors (red, yellow, blue) should be held to small quantities and in more specifically planned locations. In Logan’s short growing season native or desert-like, drab plant material is abundant and bright colors are especially welcome.

Fragrance relations are another delicate refinement of the planting scheme that you’ll want to be aware of. Some people prefer strong fragrances, others mild, while some prefer none.

**Maintenance Considerations**

As you dream your design dreams, keep a practical view of maintenance needs. Realistically decide how much time your family wants to spend on upkeep of structural and garden elements. You don’t want to have to choose between giving up activities or letting your landscaping deteriorate. Therefore, the potential maintenance of both construction and planting should be built into your design process.

Early in your dream, you also have to decide if money saved by using cheap materials and construction methods will make up for the long-range costs of repainting, repairing, repatching, replanting and replenishing. You may want to go slowly — but first class. Cheap installations are almost always expensive to maintain — in labor if not in money. On the other hand, money spent for better construction and installation can free you from such maintenance costs.
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SOLAR ENERGY & THE RESIDENCE

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Solar Energy & The Residence

INTRODUCTION

Contrary to the generally accepted opinion, solar energy is not new. It has existed throughout the ages. Strictly speaking, all forms of energy found on the earth are derived from the sun. The light which originates on the sun has been used by plants and animals for eons of time. It is the source of all fossil fuel. It creates winds. Its gravitational force creates the tides.

Historically, solar energy provided the energy used in preindustrial Cache Valley. As wind, it served to turn mills for grinding grain, and pump water from wells. Wood was used for home construction as well as for heat. As the wood supplies became depleted, the pioneers turned to coal and oil. Today, there is talk of future fossil fuel shortages and the need for finding less expensive energy alternatives. The Logan City Planning Department believes these shortages to be very real. The purpose of this chapter is to illustrate how solar energy can be used to supplement the heating of homes.
SOLAR ENERGY SYSTEMS

Interception and concentration of the incoming rays of the sun can be a major source of energy used in the home. This energy can be captured and put to use by means of one or both of two general systems: active solar energy systems and passive solar energy systems.

Active Systems. An active solar energy system is defined as one that uses hardware to capture the sun's energy and depends upon the forced circulation of air or liquid to transfer the heat energy obtained from the system. Active systems require collector panels to collect and concentrate the incoming energy, storage units to store excess energy until needed, and transfer systems to move the heat to where it is needed.

Passive Systems. Some passive systems also require collectors and storage systems but passive units depend primarily upon natural convection and radiation to transfer the collected energy to where it is needed. The heat collection and storage areas of a passive system are usually integrated with the living space of the home. A good passive system requires proper location and orientation of the building to take maximum advantage of the incoming solar energy.

The design of good solar systems both active and passive is currently in a state of flux. New technology and new approaches are continually being developed. It is recommended that residents of Logan carefully investigate the latest developments in solar heating before investing in any particular house design. It should be emphasized that current technology provides no solar system that can provide all the energy needs of a home. All systems require a conventional backup source of energy. The advantage of solar energy systems is that a properly designed, integrated system will materially decrease the fossil fuel requirements of a home.
HOME CONVERSION

Older Homes. Many older homes have the potential for conversion to supplementary solar heating systems but for others such conversions are less practical. Regardless of the costs of solar conversion, all existing homes will benefit from frequent inspections to locate areas of potential energy waste. Weatherization of existing homes will produce marked reductions in energy consumption. Some of the more important items to check in such a survey are:

1. Excessive interchange of air between the inside and outside of the building (infiltration).
2. The amount of insulation (R values) in ceilings and walls.
3. Are storm windows and doors properly installed to reduce infiltration losses?
4. Are current cultural practices designed to reduce energy consumption?
   Is thermostat being turned down at night?
   Is thermostat kept as cool as is comfortable during the day?
   Are doors and windows kept closed as children run in and out?
   Is the part of the house not in use shut off to conserve heat?

New Home Construction. Due to the potential critical reduction in available fossil fuel and resulting spiraling costs of home heating, all new home construction should be designed to minimize energy requirements. While the present state of the art may make the use of supplementary solar heating uneconomical, it is still recommended that all new construction be designed for the addition of some form of supplementary solar heating with minimal structural modification when such techniques become feasible.

In many locations passive systems may already be economical in new construction. Some important energy conservation considerations for new construction are:

1. Maximum practical insulation (R values) in ceilings, walls and floors.
2. Use of double-glazed windows or efficient storm window construction.
3. Maximization of south-facing doors and windows designed for limited penetration of summer sunshine but maximum winter insulation.
4. High roof vents allow the escape of warm air drawn upward by sun heated chambers which draw cool air into the house at ground level.
5. Use of reflective or light-colored roof surfaces which reduce the heating of attics or upper story rooms.
SITE INTEGRATION

The final design of the building should be integrated with the characteristics of the site if one desires to maximize the energy efficiency of the home. Such a procedure has been given the name of Solararchitecture.

To properly integrate the architectural design of the building with the site, one must first make a careful analysis of the microclimate of the site and relate these results to the dominant topographic features. Minor changes in topography in terms of changes in slope and aspect, and modification or construction of berms and planting of shelterbelts and windbreaks can be used to modify undesirable microclimate features and improve the solar characteristics of the building site.

Landscaping can be used to optimize energy use within the home.

A few tips which apply directly to the Logan City area are:

1. Conifers and dense tree masses planted on the windward side of the home to serve as a windbreak will greatly reduce heat losses from the home. See Figure 32.

2. Properly spaced plantings of conifers and dense tree masses on the north, northeast and northwest sides of homes will reflect additional energy to the cold northern exposures. See Figure 33.

3. Such plantings on southern exposures will be detrimental to energy conservation in the home. Deciduous or leaf-bearing trees on the south, however, will allow the lower elevation winter sun to enter southern windows and doors but shade those openings during the hot summer season. See Figure 34.

4. Banked earth or berms can also be used to protect the structure from strong cold winds and snow build-up, especially on the northern aspects. See Figure 35.

5. Reflective walls and mirrors can be used to reflect winter sun down to melt snow and ice on porch and driveway.
Solar Collector Systems. The design of solar collector systems should also be site-specific. The orientation of the collector for optimum efficiency, both in terms of the azimuth angle and elevation angle of the collector surface will vary with local site considerations. The shading effects of nearby buildings or mountains may force changes in azimuth orientation while the latitude of the site and seasonal variations in energy demands will control the elevation angle selected for fixed collector systems. Fixed collectors are more rugged and less subject to damage from wind, snow and hail but are also less efficient than movable collector systems.

If south-facing windows or attached greenhouses are to be used as passive collectors the orientation of the entire structure must be considered. For more detailed information on analyzing your specific site you might want to contact the Logan City Planning Department, the County Extension Agent or the State Climatologist.
Microclimate Variations. Most microclimate variations within the confines of Logan City are the result of the topographic diversity of the region. The Bear River and Wellsville mountain ranges which enclose Cache Valley, enhance the normal climatic variations. Sunrise at the foot of the eastern mountains may be one and one-half to two hours later than would occur on flat terrain. An earlier sunset caused by the Wellsville range further decreases the number of daylight hours and reduces the total incident solar energy that reaches residents of the city.

The accumulation of cold air in the bottom of the valley increases the annual accumulation of heating-degree days from 6733 at the mouth of Logan Canyon to 7129 in downtown Logan. The drainage winds from the mouth of the canyon tend to equalize this difference in heating-degree days by extracting additional energy from poorly insulated homes on the bench.

ENERGY CONSERVATION TIPS FOR THE COMMON HOUSEHOLD

There are many types of cultural practices and modifications of existing structures which will reduce the fuel requirements of a home. Some of the more significant methods are given below: See Figure 40.

1. Shade walls and paved areas adjacent to the house with deciduous trees to moderate the temperature contrasts between the living quarters and the home exterior.

2. Reduce paved areas on the south and west sides of the house and instead use vegetation to moderate the summer temperatures.

3. Use deciduous trees to landscape the southern exposures of the home but use reflecting evergreens and/or berms on the north side of the home.

4. Use ponds, water fountains, and/or sprinklers to moderate temperatures in the outdoor living areas during the summer.
5 A double-walled greenhouse on the south side of a building can collect large amounts of useful heat energy during the winter. This heat can easily be transferred to the house. Summer overheating can be reduced by use of deciduous shade trees.

6 Locate the home on a site which will offer the advantage of cooling summer breezes but install windbreaks to reduce excessive winter winds.

7 Select a site that has landforms and adjacent structures that provide desirable shading.

8 Winterize your home (old or new). Check on needs for storm windows, added insulation, weather stripping, calking, fireplaces without dampers, and other sources of energy loss from your house.

9 Take advantage of the use of overhead structures, overhangs, shutters, awnings and trees to reduce summer heat and allow winter solar energy to enter the home.

SUMMARY

There is a great deal that the average homeowner or potential builder of a new home can do to reduce the impact of increasing costs of fossil fuels. The first thing you can do is to continually review the need for improved weatherization of your home. Second, review the economic feasibility of using some of the newer energy-saving devices and techniques such as supplementary solar heating. All new homes constructed in the Logan area should have the built-in potential for adding supplementary active solar heating systems (collectors) as economic conditions and new technology make this type of heating more realistic. In addition, every homeowner can effectively landscape design their properties to reduce energy losses in the home and at the same time capture the sun's energy to heat homes and properties.
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A Residential Landscape Design Guide
for the Citizens of Logan, Utah

Volume 3
CONSTRUCTION

In Volume Three you are introduced to the transferring of your design ideas and intentions to construction realities. We provide suggestions on how to construct, install, maintain and supervise the various structures and activities that you will want or need to include in your residential landscape design.

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City of Logan, Utah
Planning Department
61 West 100 North
Logan, Utah 84321

Logan is busting at the seams. The intended population of 25,000 for which Logan was initially designed has been exceeded. Where are future families going to live? How large can we grow?

In 1976, Logan City adopted an updated Master Plan and a set of general development guidelines that provide direction and timing for its inevitable growth and expansion. The attitude of establishing a well-designed community has been demonstrated by these actions.

This Guide to Residential Landscape Development contains information designed to inform Logan homeowners of their roles in building well-designed homes, properties, and neighborhoods. Logan residents can help city officials in maintaining the quality environment we have by using these design and construction pointers on their own properties.

Published under the direction of the Logan City Planning Department

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SITE GRADING, SOIL QUALITY, DRAINAGE & IRRIGATION

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Rough Grading

INTRODUCTION

Kids move dirt around for fun. They generally work with small (shovel and bucket scale) quantities.

When adults move dirt around they tend to have a goal other than fun in mind. They also tend to work with power equipment that can shift dirt in square yard, ton, or hillside quantities.

Sometimes residential landscape design requires the removal and/or relocation of dirt, a process which, in this context, is called grading. The goals of grading are generally one or more of the following:

- change drainage patterns
- create conditions satisfactory for construction work
- modify climatic factors
- screen undesirable or create pleasant visual effects.

But before you begin to contemplate grading, you'll probably find it useful to know something about the material a grader pushes around.
A SOILS PRIMER

Soils are generally classified as sandy, clay, or loam.

Sandy soils, as you'd expect, do not retain moisture well and do contain many air spaces. Clay soils are composed of extremely fine particles, and become gummy when wet and hard when dry. The small particles pack closely together, absorb moisture poorly, and hold little air. Loams are mixtures of sand and clay and have desirable amounts of decayed organic material (humus). Loam is the soil preferred by most plants.

The minerals in a soil (along with water) provide the nutrients required by vegetation. The sun is the energy source, while the air provides the carbon dioxide needed for plant photosynthesis. Decay of plant parts, i.e., the dropping of leaves and branches and the ultimate death of the plant itself, returns organic material to the soil. This process (plus water) creates an acid solution that dissolves additional minerals in the soil and makes them available for absorption by other plants, as well as providing another source of nutrients. The water-holding capacity of a soil is also improved by organic material. And water in a soil (up to a point) does good things for most plants.

In essence then, the quality of the soil in your yard determines what you can achieve with landscaping techniques that utilize vegetation. So during grading operations you'll want to be alert to what is happening to the soil involved.
FINGERPRINTING YOUR SOIL

In the parts of Logan, where soil types have been mapped, the designated type applies to only a few inches below the surface. On sites where major excavation has occurred, the indicated topsoil “type” may have been overlayed by or mixed with poorer quality subsoil. You can check on your neighborhood’s soil type by referring to the Logan City Guidelines for Development.

But even with that information, it is a good idea to have your soils tested for composition, nutrient value, and alkalinity, among other things. The Department of Soil Science and Biometeorology at Utah State University and the county extension office provide this service.

The soils in the Logan area are generally gravelly on the upper benches and clay on the valley floor. They have little moisture-holding capacity coupled with poor drainage, and are slightly alkaline. As a result, plants are not likely to grow well unless you condition your soil, primarily by adding organic materials.
ROUGH GRADING

Now you can better evaluate the mechanics of grading, which divide into two categories: rough, and final.

The rough grading (cut and fill) process establishes the site's general slopes, high and low points, and drainage pattern. If you follow the general natural or existing slope of your property, you will minimize cutting and filling and cost. Steep slopes or river banks require gentle treatment during rough grading operations or destructive erosion can result. Then too, cutting or filling of more than 6” around existing vegetation will usually kill it unless tree wells or other expensive precautions are taken. On the other hand, diseased, dead, or unwanted plant material can be easily destroyed while (ideally) the healthy, wanted vegetation is preserved.

During rough grading the available topsoil (if of adequate quality) should be preserved and/or a high quality soil can be stockpiled for later distribution. Because rough grading generally involves moving large quantities of earth, you'll probably have to rely on a professional who has power equipment and know how.
**LEGAL CONSTRAINTS**

Before you lose a grader on your property, however, you need to consider certain legal constraints. Sometimes property lines don't coincide with natural landforms such as steep slopes. Any grading that increases the hazards of erosion on adjacent properties or causes excessive run-off to flow from your property onto your neighbor's must be avoided. Logan City requires that all grading meet existing grades on adjacent properties, without disturbing the neighbor's landscape.

**SLOPE CONSTRAINTS**

The most common natural factor that restricts grading is the instability of soils on slopes. A steep slope is susceptible to water and wind erosion, and you'll waste a great deal of time trying to maintain a vegetative covering on them. Different soil types obviously have different slope stability ratios, but you can safely follow some general guidelines. On a cut slope, the maximum desirable is a 100% (1:1) slope in which you gain 1 foot horizontally for each one gained vertically. On a fill slope, a more gentle 33% or 3:1 slope is the maximum recommended. See Figure 45. The difference in recommendations is needed because, on a fill slope, the material will be less compacted and more susceptible to erosion. In either case, the cost of maintaining extremely steep slopes is prohibitive.

Generally, if you must cope with an exceptionally steep (100% grade or greater) slope, your best bet will be to use a retaining wall. Such walls commonly are made of cement and you'd probably need the help of an engineer in construction done.
USE OF BERMS

On many sites, carefully designed and placed earth berms (mounds) can reduce unwanted effects of snow, wind, and sun. You might also consider berms as a way to minimize the transfer of heat energy between your house and the environment. These mounds of earth are best created during your rough grading operation.

If you place earth mounds in the path of winter storms, which in Logan approach from the north and west, you can reduce snow drifting, and divert wind and snow away from your home. Berms combined with plant material and located close to walls create a dead air space that insulates a house from hot sun in the day and cold air at night. You can also use berms to form sun bowls or traps that will accelerate snow melt in winter and provide an excellent early-spring garden plot or sitting area. Berms planted with trees and shrubs can also absorb noises, giving you quiet spaces. Berms that are to be planted to grass should not exceed a 3:1 slope to allow for mowing.

The forms of your berms and the intervening open spaces can be manipulated to enhance your landscape design. You might want to consider creating landforms around your home that reflect the landforms of your neighborhood and/or valley itself. For example, the terrain at the valley edges and the canyons is dynamic, with a mix of steep slopes, mounds and small hills, while the valley bottom is gently rolling or level. As an alternative, your man-made landforms can reflect the architectural lines and thrusts of your house design.

Whether you are creating a slope or leveling out holes, poor-quality fill material is never a bargain. It may contain large chunks of concrete, asphalt, and/or wood. None of these enhance the growing capacity of plants, they may pollute the ground, and/or eventually work their way to the ground surface.

If you want a level area for lawn or perhaps a tennis court, you'll need special grading to achieve the recommended minimum of .5% slope for an asphalt or concrete pad and 2% on lawn.
Final Grading

Final grading puts the "polish" on your property. When your final grading is finished, you are ready to plant lawns and other vegetation.

TOPSOIL PREPARATION

Topsoil (nutrient-rich, rock- and debris-free soil) preparation can mean simply the redistribution of what was already on your property. Or in many cases, since the heavy equipment used in the rough grading can adversely over-compact your layer of subsoil, the depth and quality of topsoil you provide will be crucial to your lawn's appearance and the health of any relatively shallow-rooted vegetation. This procedure normally takes place after all of your major construction work is completed, and can be preceded by modification of the exposed subsoils. You may want to add fertility- and structure-improving materials before spreading your topsoil. Also, if your property is in a high-water table area, you may be advised to bring in additional fill to raise the level of soil a safe distance above the water table. Your trade-off could be the cost of waterproofing your basements and foundations.

Only after all of your structural elements have been installed, (screens, pavements, pools, overheads, sprinkling systems) and the basic drainage patterns have been established in the form of swales and berms, can you seriously think about preparing the soil for planting.

As a start in that direction, you have to remove remnant construction wastes from your subsoils. Then topsoil is spread over the subsoil. Depending on the quality and quantity of topsoil available, you may want to add certain amendments to your soil as it is distributed. Ideally, your topsoil will be a good quality, silt loam, free from toxic or noxious materials, rocks of ½" or larger, large plant parts and other foreign objects.

But even with good quality topsoil you still may want to consider soil conditioning for your property to optimize one or more of the following goals:

- **Increase Fertility** by adding material to the soil (amending), such as chemical nutrients, earthworms, and organic matter, or by replacing poor soil with better.

- **Improve Soil Texture** by adding smaller or larger soil particles (clay to sand or gravel to sand, loam).

- **Provide Drainage Control** of surface or subsurface runoffs to avoid erosion or unwanted ponding; or, slow runoffs to promote absorption of the water into the ground or to capture it in a pond or reservoir.
SMOOTHING THE CONTOURS

This can be an exciting time! Once the topsoil is prepared for the various kinds of plants you want to include, it is time to rake smooth the entire soil surface. You will now get an accurate view of just what the final land surface will look like. The exactness of final grades of berms, lawn and shrub areas cannot be overstressed. Minimum slopes on lawns (3% slopes away from foundations) and paved surfaces (.5%) must be met or you will be faced with puddles of water where you don't want them. Sometimes final grading can be a tedious task. But time spent in removing all larger rocks, and debris, as well as smoothing out undulations on the surface will improve the visual aspects of your property and make for easier planting and irrigating later on.

TOOLS FOR LANDSCAPING AND GROUNDS MAINTENANCE

Heavy Equipment

bobcat — A small, four-wheel front loader used for small scale earth moving in tight situations. It is often available with attachments for cable laying, rototilling, or an auger for tree planting.

front loader — a large, tractor-like vehicle used for earth and rock moving on a residential scale.

backhoe — An attachment for a front loader used to dig trenches.

weedchopper — An attachment for riding lawn mowers or tractors that will cut tall weeds along roadsides or in fields.

rototiller — A motorized ground-breaker used to loosen and mix soil for gradens or large plantings.

york rake — Attachment for a tractor or front loader that can be used for clearing large areas of surface rocks and for spreading soil.

Hand Tools

Shovel, pick, spade, hoe, hedge clippers, leaf rake, heavy rake, lawn mower, sod lifter.

Note: Most of the items listed are available in Logan on a rental basis. In all cases the cost of rental is based largely upon maintenance time required for each item, since all equipment must be thoroughly checked and serviced before going out again. Large equipment is also available (with an operator at additional cost).
Soil Quality

SOIL AMENDMENTS

Soil amendments may be organic or mineral in composition, and are added to soils to improve their air and water-retention capacities. The organic amendments consist of ground tree barks, sawdust, peat moss, leaf mold, manure, and others. These are best used on a large scale and require frequent reapplication as the amendments decompose. The final result is a soft humus that binds small clay particles into clumps, increasing aeration and drainage.

Composting is one way to build soil quality with naturally available materials. It involves returning grass cuttings, hedge and flower trimmings, fallen leaves, vegetable refuse, and chopped brush to the soil after first rotting it down in a pile or pit. To get a compost unit into operation, you alternate layers of soil and refuse and, with time, their interactions create a very fertile mixture. Strong odors may result, so where you locate your compost pile is critical. This approach is less expensive and more ecologically responsible than burning or hauling away such material and then buying commercially created additives.

Mineral amendments such as pumice, perlite, or vermiculite remain almost permanently in the soil and are especially valuable in clay soils. The main function of these additives is to increase aeration, which in turn, improves the soil’s capability of breaking down organic amendments. Their high cost, however, limits mineral amendments to small quantity use in potting soils.

Logan soils commonly lack usable nitrogen and iron. Without adequate nitrogen, your plants may not grow at all. Most organic amendments should contain at least 1.5 percent nitrogen for use in Logan. The frequency with which you must add nitrogen will depend upon the length of the year’s growing season and your soil type.

A lack of iron will cause your plants to develop yellow leaves as they have trouble manufacturing their green chlorophyll. The addition of iron sulfates to the soil may help unless your soil binds the iron to itself instead of releasing it to the plant roots. In such cases, you may have to spray the foliage with iron-enriched aerosols.

The actual planting suggestions are found in Chapter 12 - Installation and Care of Plant Materials. Another soil additive that helps in plant establishment as you plant vegetation as well as in preserving the final grading is the mulch.
MULCHING

When you mulch your soil, you cover or insulate its surface as a way to improve its capabilities relative to:

**Moisture Retention** — Mulching reduces the evaporation rate of water from the top 6-8 inches of soil. A thick straw mulch will reduce evaporation by as much as 70 percent. This not only saves water, but it helps maintain a more even moisture supply in the upper layers of the soil.

**Temperature Modification** — Clear and black plastic increase the soil temperature 6-10 degrees when the sun shines, promoting early spring growth. Clear plastic stimulates plant growth; black plastic inhibits it. Brown paper mulches reduce soil temperature 8 degrees and inhibit growth. Paper is biodegradable, while plastics are not — but plastics last longer than paper. Organic mulches reduce soil temperature 10 degrees, stop the growth of most annual weeds and need regular renewal.

**Facilitate Cultivation** — Mulches maintain soil textures, and decrease the number of times cultivation is necessary.

**Encourage Root Growth** — By insulating the top few inches of soil from the sun’s heat thus helping to maintain their moisture, mulching encourages root growth.

You’ll want to keep the thickness of fine-textured mulches at 1-2”, with your rough-textured mulches being kept at 3-4” thick. Since organic mulches break down over time as they improve the soil structure, occasional reapplications will be necessary.

Organic mulches can include:

- buckwheat hulls
- chunk bark
- compost
- *crushed corncobs
- *whole corncobs
- hay or straw
- lawn clippings
- leaf mold
- *leaves
- straw-loaded manure
- peat moss
- pine needles
- poultry litter
- *sawdust
- shredded hardwood bark
- *wood chips or shavings

*These mulches will deplete nitrogen in your soil. So if you use these, increase your fertilizer applications by ¼ over what is recommended for the plant or crop.
Drainage

You will want a minimum 3% slope (grade) away from your house foundations and fences to insure a proper removal of storm and irrigation water. Many leaky basements are due to rain water settling against foundations and eventually seeping through or under the concrete. Water directed away from the home by an adequate grade should enter the curb and gutter or some other appropriate drainage field. (It is illegal to drain water onto adjacent properties.) Under normal circumstances, you will establish the pattern for your property during grading operations. If you are lavish in your use of plant materials, storm-delivered water will be absorbed by the cultivated ground and the plant roots, thus decreasing the need for mechanical drainage toward the street.

Ideally, excess water, whether from irrigation or natural runoff, should be captured and stored for future use, or directed toward especially thirsty vegetation.

Whenever existing soil is disturbed or fill material is spread on the site, all loose soils should be compacted to 90 percent of their compaction potentials if possible. This amounts to approximately what undisturbed soil measures, and can eliminate problems of settling sidewalks, lawn, without adversely affecting drainage. The final elevation of your compacted subgrade fill should allow for adding 1” to 2” of topsoil, while still remaining 1” below proposed walks and driveways.
IRRIGATION ALTERNATIVES

The 16-18 inches average annual rainfall received around Logan can support only native plant species. Most of the popular ornamental trees and shrubs, as well as grasses and/or vegetable crops die or barely survive unless given supplemental moisture. So if you want vegetation, you have to plan for ways to give your plants water along with their soil-borne nutrients.

In deciding how to get the water to where it is needed, you'll want to look at various possibilities. A sprinkling system is a collection of pipes, valves, heads, fittings, etc. that distributes pressurized water. Drip or trickle irrigation is a low-pressure, above-ground method of supplying water to plants. This system is one of the best ways to conserve water. Furrow or flood irrigation is an inexpensive, potentially wasteful, but effective way to water gardens and large lawn areas. An advantage of sprinklers over a drip- or flood-irrigation method is their effect on the moisture content of the air. As that increases, so does the feeling of coolness.

Logan's settlers developed a canal and ditch, flood-irrigation system that is still functioning. If you live along one of today's ditch banks, you may own one or more shares of water. If so, at specified times, you can direct your share of the water onto your property. Or you may want to try the method used by many homeowners in Logan, who dam gutters and flood-irrigate their lawns and gardens. By using canal or ditch water for irrigation, you conserve the higher quality culinary water and save money.
If you don’t have access to the canal water, and are concerned with a quarter-acre or smaller lot, you can probably rely on a portable hose and nozzle system. The only drawback to this approach to irrigation may be the time necessary to complete the job. If you have a half-acre or more, and/or if time is crucial, you may want to invest in an underground irrigation system. (Some such systems can even be turned on and off with an electric timing clock that regulates the number of minutes each valve is on, and when each valve operates during a 24-hour period.) With such a system water pressure activates the irrigation heads, which spray water onto the desired surfaces. You may still have to hand water certain kinds of plants that have special rooting habits or water needs.

In any desert climate such as Logan's, ways to conserve water are important. You can use native plant materials and drought-tolerant plants to reduce your need to irrigate. Any type of mulch that retains soil moisture will have a comparable effect. You can also figure ways to slow down and catch potential runoffs in spots where the water can be absorbed and held in the soil or used by especially thirsty plants.

**LEGAL RESTRICTIONS**

If your irrigation system is to be hooked to a culinary water line, you have to be careful not to allow contaminated water to backflow into your freshwater supply. Special valves are available that will do the job. You can be held legally responsible if you neglect to take this precaution. A contractor licensed to install sprinkling systems can insure that proper hook-up procedures are followed.

**NATURAL RESTRICTIONS**

In parts of Logan, your irrigation system might be able to be hooked up to a canal water source. Canal water, however, usually has particulate matter in suspension that can clog some sprinkling heads. So if this is an option for you, you’ll have to use the larger, impact spray heads. Another natural restriction you need to check out is your available water pressure measured at the city water meter. It takes a given pressure to operate a certain number of sprinkler heads on one (or maybe two) valve(s). Thus, when the valve(s) is operating, very little, if any, pressure will be left to operate other valves, or household utilities.

Whatever method you use, the best time to irrigate is in the evening. That way you limit evaporation losses and your plants have all night to absorb water. In many parts of Logan, wind is a factor in irrigation efforts. Wind wastes water by scattering spray droplets onto surfaces other than plant materials. Wind also increases the rate of evaporation of water droplets in the air and on the ground. So you may have to adjust your watering schedule to accommodate air-flow patterns. Then too, you’ll want to allow for rainstorms. If you set out an empty tin can, you’ll be able to measure how much rain is actually delivered by a storm, and modify your watering schedule accordingly.
CONSTRUCTION TECHNIQUES/MATERIALS

Underground irrigation systems, once considered a luxury, now more readily fit the average family budget. Costs have been reduced through the use of durable, rodent-proof plastic pipe and fittings that can be ordered in complete units with instructions. The installation of these units generally requires no special tools or skills. The fastest way to install a system is to lay it out on the surface, making all necessary attachments. You'll then want to test the system several times while it is above ground, making spray head adjustments as needed. Next you dig your trenches (8" - 1' deep), so that the nozzles are at their correct operating height.

Since so much digging is required, the best time to put in an irrigation system is before any vegetation is in place. However, if you want to put in a system in an existing patch of lawn, you can rent a lawn stripper. This machine can cut a 12-inch wide by 2-inch deep strip of sod that can be replanted as soon as the pipes are installed. A machine-driven trencher can give you your trenches without a backache. However and whenever you dig your trenches, though, they should be firmly tamped and soaked to prevent settling under the lawn. Also, in Logan, you'll need to install special drains at the lowest elevation points of your system. Without the drains, water trapped within the pipes may freeze in the winter and rupture the system.

You can install your irrigation system to serve both lawn and shrub areas. For your lawn, pop-up spray heads are recommended and should be set flush with the soil surface. In shrub areas, you'll want the heads far enough above the soil surface to not get clogged, even up to 3 feet high.

Local contractors and plumbing outfitters can provide you with simplified manufacturers' guidelines for installing sprinkling systems.

MAINTENANCE

Your irrigation system will last longer if you occasionally clean its heads and valves. You might also want to protect the valve or valve bank by putting them below ground inside a cement or wooden box with a lid. Every fall, unless your design provides for automatic drainage, you'll need to find a way to drain the system of all water.
Other References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

GRADING REFERENCES

712
C225

712.64
Ec53

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Am35h


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624.15
M928

IRRIGATION REFERENCES

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DRIVEWAYS & WALKWAYS

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT
CITY OF LOGAN, UTAH


**INTRODUCTION**

Your home’s driveway, turnaround areas (if any) and parking areas are integral elements of your landscape design. In fact, they often give your visitors their first impression of your home. That generally means you’ll want to screen or soften the outlines of these areas while keeping them readily accessible from street and home.

Some principles you’ll want to keep in mind are:

- Driveways establish the entrance to your home. If possible, you’ll want to clearly distinguish between your service entrance and the main (visitors’) entry to the house.

- Driveways should allow direct, quick access to the house from cars parked outside the garage or carport. Ideally, of course, in Logan’s climate the access way is covered to protect users from rain and snow.

- Driveways and turnarounds should be low-maintenance areas that facilitate easy snow removal. You’ll want to be sure that the slope of your driveway is gradual, and away from access routes to the house, so that icing is minimal.

- If you have room, off-street parking for visitors or extra vehicles should be adjacent to your driveway so entry to your garage or carport isn’t blocked.

- As you plan for your driveway, you’ll also want to allow for the maneuvering of your automobiles and any recreation vehicles you have. Skimping on this space may save money but can drastically increase maintenance costs due to damaged vehicles, vegetation, or home, or even human injury.

- Vegetation must be kept back from the junction between driveway and the road (or low-growing varieties selected) to allow safe, visually clear backing in the street.

In this chapter we present illustrations of a variety of ways to solve (or avoid) driveway problems.
2.17-5-2 Specified Requirements

(a) House or apartment — Two (2) spaces for each unit except as provided in (p) below.

(c) Boarding Houses, Dormitories, Fraternities, or Sororities — Two (2) spaces per three (3) individuals, plus one additional space for each additional individual exceeding three, and up to and including five (5) individuals.

(p) Dwelling unit occupied by four or more individuals unrelated by blood, marriage, or adoption — Two (2) spaces per three (3) individuals, plus one (1) additional space for each additional individual exceeding three (3) and up to and including five (5) individuals.

2.17-5-3 Special Off-Street Park Requirements

(b) In the R1, R2, R3, R4 districts the parking or storage of any truck, truck trailer exceeding one ton for more than 24 hours in any three day period shall not be allowed in the required front yard or side yard area.

(c) Parking shall be provided only in a private garage, or in an area properly located for a future garage.

(d) Prior to the issuance of any building permit, a plan which clearly and accurately designates parking spaces, access aisles, driveways, and the relationship to the use to be served by the off-street parking shall be forwarded to the department of planning for approval. Approval will be based on:

(1) Adequate number of spaces.

(2) Relation of parking to use.

(3) All parking spaces must be usable and accessible by adequate roadway-parking configuration to be approved by City Planner.

(4) Parking stall to be 9’ x 20’ hard surface.

(e) In the R1, R2, R3, R3A, and R4 zones no driveway shall be wider than twenty-two (22) feet in any required front yard. Dwelling units with garages or carports which are parallel to the street which require more than the twenty-two (22) foot maximum must be approved by the City Planner and the Building Inspector.

(f) Location of Parking Space. Parking space as required above shall be on the same lot with the main building, or in the case of nonresidential buildings, may be located not further than three hundred (300) feet therefrom.
NATURAL RESTRICTIONS

• To insure yourself of proper drainage off of your asphalt or concrete driveway (and off-street parking areas if any) a minimum 1% slope should be maintained in a direction away from the home and main walkways. A maximum slope of 8% on driveways is suggested to accommodate wheel-chair movement, and reduce hazards of pedestrian (and car) slippage on ice. You might also want to investigate the special rough-textured finishes that can reduce this hazard.

• If your driveway is to be created on earth-fill material, you'll want to precheck the bearing capacity of that soil since it must withstand the imposed weights of concrete or asphalt and vehicles. Your fill material must be tamped to 90% of complete possible compaction or it will eventually settle and your driveway will be damaged. Sand or gravel are especially good as base materials.

• Your subsoil under the driveway also needs consideration. This soil goes through freeze-thaw cycles, which can cause expansion, contraction and movement of surface materials. Unfortunately, there is no perfect guard against these phenomena.

• If your driveway has a southern and/or western exposure, it will have less snow accumulation during the winter. But your tradeoff is for a highly reflective and hot surface in the summer. In such cases, you can plant deciduous trees to accommodate both seasonal effects.

• As you choose your paving materials, you'll want types that neither reflect a lot of sunlight, nor absorb too much heat. Light-colored material such as concrete reflect sunlight and heat. Dark materials such as asphalt absorb sunlight and give off heat. In essence, you'll have to choose which problems you prefer living with and then take defensive action. Too much reflected light and heat can be moderated by shading with shadows from trees or overhead structures.
AESTHETICS

The driveways and off-street parking areas of most homes are visible from the street. If your property is not the exception, the appearance of these areas can be critical to the quality of your home’s overall appearance. So you’ll want to give some time to thinking about ways to camouflage them and soften their often stark outlines.

One thing you can do is be sure the driveway surface material and the overhead structures compliment the materials used on the exterior of your home. The colors, shapes and sizes of plant materials can also be creatively used to give you a pleasing, year-round effect.

CONSTRUCTION TECHNIQUES/MATERIALS

- To avoid (or at least minimize) cracking potentials, concrete driveways should be 5” thick and have reinforcing 6” x 6” wire mesh within the slab. Expansion and contraction joints should be used frequently to reduce stress and tension cracking and splitting. (Average spacing of expansion joints is 10 feet.)

- If you use asphalt, it should have a 2-3” thick layer poured over a 6” layer of crushed gravel or standard road base.

- You might want to look at brick, exposed aggregate concrete, gravel and turf-block (a combination of concrete block and lawn) as alternate surfaces. Each of these, though, creates its own special maintenance problems and/or is unusually expensive to install.

- Both asphalt and concrete can be colored to compliment your home’s exterior. In the Logan area, however, colored asphalt is not yet available and the costs of pouring colored concrete are twice the rate charged for regular concrete.
**MAINTENANCE**

- If you make sure that proper installation techniques are followed, asphalt and concrete surfaces are easily maintained. Snow blowers, sand, salt additives to melt snows, and cleaning agents other than solvents will not greatly damage such driveways, but some of the chemicals can be exceedingly hard on your plant materials if they drain into the root zone.

- Stains from dripping oil pans and gas leaks will eventually erode most materials. Metal drip pans are an ugly, but effective way to deal with this inevitable problem.

- Although expensive, and a drain on energy sources, heated driveways are a great advantage during cold, winter months. To create one, you lay hot water pipes within the driveway.

As you think about accommodating car traffic, you’ll also want to consider pedestrian movement since similar materials can be used for both purposes. It is also a good idea to create your driveways and walkways more or less simultaneously if you can. Certainly they should be designed as a unit to insure that they “work together”.
Walkways

INTRODUCTION

Walkways should make it easy for people to walk and/or move equipment from one location around your home to another. As with your driveways, the width, surface material, length, and slope of your walkways determine their safety and aesthetic potentials. How you design your walkways also depends upon how you want them to function and how much traffic they will carry. The larger the number of users, the wider the walk. Wider-than-normal walk widths are also suggested for the elderly or the handicapped.

You can use steps and/or ramps to change elevations within a walk but these require handrails and very gradual slopes to insure the safety of the person who uses them. Your walkways, steps, and ramps can either enhance or detract from your home or garden, depending upon the principles and materials you use.

The principles you'll want to apply relative to your walkways include:

- Where pedestrian traffic is heavy and direct, you'll need continuous surfaced walks. Rules of thumb for desirable widths are: (1) city-maintained sidewalk (4'-6'), (2) major pedestrian entrance to your home (4'-6'), (3) routes from your front yard to the back (3'-4'), (4) paths to garden areas frequented by wheeled implements such as lawn mowers and wheelbarrows (3'-4'), and (5) (if you have them) along rivers, within groves of trees, and in nature study areas you’ll want paths 2'-3' wide. See Figure 63.

- Garden paths can be relatively informal and casual. For these you can use separate units such as stepping stones, flag stones or wood placed in utilitarian patterns. Or you might prefer continuous paths of gravel, sand or wood chips, which also convey a rustic, natural feeling and lend themselves to meandering, graceful patterns. In your front entrance court, however, such paths would not survive the traffic.

- You’ll want to evaluate your family’s preferred routes around your home in terms of frequency, time of use and purpose as a guide to designing appropriate walkways.

- If you can’t avoid, or deliberately want, abrupt elevation changes along a walkway, you’ll have to plan for ramps or steps.
NATURAL RESTRICTIONS

- All the natural restrictions that were described as applying to driveways also apply to your walkways.

- Some trees have roots that grow close to or on the soil surface. These can lift and break walks. If your property has such trees, your driveway/walkway design should take their rooting habits into account.

- When evaluating walkway materials, the same factors are relevant as were described for driveways.

- As you plan your entrance walks, one factor that is often overlooked is the advisability of allowing for complete indoor visual supervision of the front yard access routes.

AESTHETICS

- The materials you use for walks and paths can generally be chosen to match or complement those of your home. The fewer the materials used, the more unified your effect.

- The way you lay out your front entrance walk and court, is seen by the rest of the world as indicative of the hospitality of your home. The ideal is generally an attractive and functional entrance that welcomes visitors.

- You shouldn't hesitate to be creative in using paving patterns for your walkway.
CONSTRUCTION TECHNIQUES/MATERIALS

Continuous Surface Walks (4’ - 6’ wide)

Concrete
Exposed aggregate concrete
Brick in mortar or on sand
Asphalt

Informal garden paths (2’ - 4’ wide)

Pea gravel
Crushed rock
Wood chips
Flag stone in lawn or ground cover
Turf block in lawn or ground cover
Pre-cast concrete pavers in lawn or ground cover
Sand
Soil

To help you narrow down your design options, here are some questions concerning characteristics of walkway surfacing materials.

Texture

Will the paving need to be smooth for children to play on or rough to provide sure footing during the winter?

Should it be slick enough for dancing yet rugged enough for games and winter maintenance?

Can the paving material resist stains around a bar-b-que area, or can it resist marking and scratching caused by moving furniture?
Appearance

Are the color, texture and pattern of the paving going to blend with the house design and garden plan?

Will it have to match the indoor flooring?

Will the materials reflect light on the shady sides of the house or will they cause glare from too much reflected sunlight?

Cost

Is the cost of the paving materials and installation within the proposed budget?

Are there hidden costs involved such as drainage provisions, unstable soil or special construction techniques?

Installation

Can the materials be delivered to the homesite?

When are the best times to begin installation?

Is it a one-man job or is assistance wanted?

How long does installation take and will that cause inconveniences?

How soon after installation can the walk or path be used?

Maintenance

Will cleaning and/or snow removal be a problem?

How easily will it show dirt and dust?

Can grass clippings, leaves, and other debris be removed easily?

Durability

Is the paving to be permanent or temporary?

How will snow, water, frost, or extreme heat affect it.
- If you use materials such as unit pavers (bricks), sand, gravel, or wood chips, you'll also need header boards or edging, especially if the materials might scatter onto other surfaces.

- By seeking careful and quality installation of walks and paths, you'll enhance durability, even though the initial costs might be higher. Most walks and paths can be easily installed by the homeowner and his family. (See "Other References").

To avoid (or at least minimize) cracking potentials, concrete walkways should be 5" thick and have reinforcing 6" x 6" wire mesh within the slab. Expansion and contraction joints should be used frequently to reduce stress and tension cracking and splitting. (Average spacing of expansion joints is 10 feet.)

If you use asphalt, it should have a 2-3" thick layer poured over a 6" layer of crushed gravel or standard road base.

- Ramps on walks should not exceed 8% slopes for safety reasons and wheelchair accessibility.

- Steps should parallel the existing slope, using the formula: 2 x (Riser) + (tread) = 26 or 27 inches. See Figure 70. At least three steps are necessary in each stair for easier use. Long stairways should contain 10 steps between landings if the site allows, and a sturdy handrail is advised for young children, the elderly, and in the winter.

**MAINTENANCE**

In Logan, concrete, asphalt, and brick in mortar tend to often crack, warp and break up sooner than in milder climates. The two prime reasons for this are:

1. Moisture that is absorbed into the material during the winter days freezes at night, expanding within the material, causing it to fracture.
2. Moisture that collects under the surface material during the day, freezes at night, expanding and exerting upward pressure. A number of acrylic sealers are available for application on concrete and brick. These sealers prevent moisture from infiltrating the materials, but they need annual renewal for best results.
Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

**DRIVEWAY REFERENCES**

712
C225

624.15
M928


624.15
Un8

**WALKWAY REFERENCES**

712
C225


712.54
Ec53


720.9
So75


712.5
R823

Sidewalks in the Suburbs, American Society of Planning Officials 711.58
Am33s

Notes
OVERHEAD STRUCTURES,
PATIOS & DECKS

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Overhead Structures

INTRODUCTION

You can use an overhead structure to enclose an outdoor space. It works by simply cutting off or limiting the view of the sky. In one sense it can be an outdoor ceiling without walls, which offers some degree of protection from sun, wind, rain, and snow. Overhead structures are considered architectural extensions if attached to another structure, or they can be free-standing. Your options when creating overheads also include solid roofs or an open framework, and you can use various construction techniques and materials to achieve different light qualities and degrees of cover. Generally, overhead structures are used to cover patios, work areas, carports, walkways, or entry courts to house or garage.

You may want to consider building some type of overhead structure with one or more of the following objectives in mind:

- Increase the usability of an outdoor space by providing protection from the sun, wind, rain, and snow.

- Provide a gradual transition from the house to an outdoor area.

- Create a focal point and gathering place in an open lawn area.
In Logan, you need a building permit before you can build an overhead. The cost of your permit will be determined by your estimated cost for materials and labor. Present plans of your design to the City Planner for approval within the laws.

Then too, you'll have to observe the legally defined minimum set-back requirements:

### Attached Overhead Structure

<table>
<thead>
<tr>
<th>Zone</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
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<tr>
<td>Sideyard (interior)</td>
<td>8'</td>
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<td>8'</td>
<td>8'</td>
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<tr>
<td>Sideyard (on-street)</td>
<td>20</td>
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<td>20</td>
<td>20</td>
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<tr>
<td>Rearyard</td>
<td>10</td>
<td>10</td>
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</tr>
<tr>
<td>Height limits</td>
<td>35</td>
<td>35</td>
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</tbody>
</table>

### Free-Standing Overhead Structure

<table>
<thead>
<tr>
<th>Distance from dwelling</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontyard</td>
<td>60</td>
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<tr>
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<tr>
<td>Rearyard</td>
<td>3'</td>
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<td>3'</td>
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<tr>
<td>Height</td>
<td>15</td>
<td>15</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

### Land Use Ordinance

17-4-6 (b)

(2) The front yard shall be measured from the property line to the front face of the building, covered porch, covered terrace, or attached accessory building. Steps, uncovered porches, eaves, and roof extensions may project into the required front yard for a distance not to exceed four (4) feet. Where no front yard is required, all stairs, eaves, roofs, and other projections shall be located behind the property line.

17-4-7 (b)

(1) Every part of the required side yard shall be open and unobstructed except for the normal projections of window sills, belt courses, cornices, chimneys, and other architectural features projecting no more than twelve (12) inches into the required side yard and roof eaves projecting no more than thirty-six (36) inches into the required side yard.

### Special Rear Yard Regulations

17-4-8 (b)

(4) Accessory buildings may be located in the required rear yard provided the building is at least three (3) feet from the rear lot line.

(5) The ordinary projections of window sills, belt courses, cornices, chimneys, and roof overhangs may extend three (3) feet into the required rear yard.

### Maximum Coverage

17-4-9

No accessory building nor group of accessory buildings shall occupy more than twenty-five (25) percent of any required setback.

### Height Regulations

17-4-10

(a) No building or structure shall be located, erected or altered so as to exceed the height limit specified on the space requirements chart for the district in which the building is located. Airport height regulation promulgated by the Federal Aviation Authority shall be considered part of this ordinance and shall be given full force and effect.
NATURAL RESTRICTIONS

- Footings for overheads must meet the same installation standards as required for foundations for homes and garages. To minimize cracking of footings for posts or walls, and/or structural failure of the overhead itself, your concrete footing must be at least 30 inches deep. That puts the footing below Logan's normal frost depth, which is the deepest level at which the soil is likely to freeze.

- Whatever material you choose to use in your overhead, you'll want to weather-proof it immediately, and keep it clean and treated against weather damage on a regular basis to maintain its beauty and strength.

- If you decide on a solid overhead (100% coverage) your design must allow for maximum snow and wind loads in the Logan vicinity. Since these maximum loads will vary with location, roof pitch and orientation to the sun, absolute figures cannot be quoted. If you are faced with snow buildup or strong winds, or if you feel insecure about structural requirements a professional architect, landscape architect or structural engineer can give you the answers.

AESTHETICS

- To optimize the visual appeal of an overhead, your materials and design should reflect and/or complement architectural features of your home.

- As you contemplate building an overhead, remember that the scale of materials and the space that the overhead defines should be compatible with the user(s) and their patterns of use. (How many people will be gathering under the overhead at any point in time? Would massive lumber be compatible with your home and your family's evaluations of "beautiful"?)

- Whatever material you choose should be allowed to show its own unique properties. For example, it is a waste of natural beauty to paint redwood and cedar rather than simply stain them with translucent sealers or let them weather naturally. Canvas, on the other hand, can be beautified by being dyed bright colors.
One major goal of many people who build overheads, is to achieve protection from climatic extremes, for both the inside and the outside of their homes. By a careful combination of materials and design, you can control the amount of daily sun delivered to a patio or into your home. You can also use the height, length and width of your overhead to optimize seasonal sun exposures. You may want to consider building an overhead to replace or complement trees as shade producers away from the home.

The ideal location for your overhead structure will depend largely on the sun and shade patterns that affect your property through the year and at various times of day. Summers in Logan bring high temperatures even though the sun is never directly overhead.

In July, the sun rises on the northeast and sets in the northwest. In December, the sun rises on the southeast and sets in the southwest. The sun's arc is high in the summer and low in the winter. These patterns make it necessary for you to think about four basic orientations:

**Southern**

Spaces to the south of your home require a removable overhead. In the summer you'd want protection. In the winter you'd want the sun to help you heat your home. Louvers or lath structures with an east-west orientation are possibilities. Deciduous trees can also be used.

**Western**

Spaces to the west of your home can be oppressively hot in midsummer. The sun is about six times as hot on a wall in summer than in winter, and this heat is reflected into the adjacent space. Late afternoon sun will penetrate under virtually any overhead, but can be blocked by a vertical sun screen. For a west-oriented patio, you'd want to avoid perishable materials such as canvas, bamboo, or reeds.
One disadvantage to using an overhead to produce shade on the hot west side of a house is that excessive heat may build up under the structure. A better solution is to use deciduous trees for shade. The trees allow air to circulate more freely, creating a cooler space.

Eastern

Spaces to the east of your home are shaded by the house in the summer evenings and can be extra cold in the winter evenings. If you want an overhead on the east side of your home, it should be removable (panels, rolls, screens) so you can gain warmth from the winter sun. Perishable overheads should not be used as the sun may not dry them out in the colder months. A glass, plastic or fiberglass overhead will shed rain, yet allow light to penetrate.

Northern

Spaces to the north of your home are shaded to some degree all year round, and rarely need an overhead structure except as a shield from rain or snow. A glass, plastic, or fiberglass overhead will also work well on north exposures, but problems of snow and ice buildup may result.

CONSTRUCTION TECHNIQUES/MATERIALS

The following questions are posed to help you clarify your thinking.

1. What do you want to control by the overhead — sun, rain, wind, snow, glare?

2. What degree of overhead cover is needed — 100, 75, 50%?

3. Do you desire morning and/or evening sun?

4. Do you desire to shield summer sun, and still admit winter sun?

5. How large do you want your overhead structure?

6. What kind of materials do you want to use?

7. Do you want it attached to your home or away from your home?

8. How can the structure compliment your home?

9. Are you using similar or complimentary materials as are used in the exterior of your home?

10. Are you using similar forms (style) as those used in the exterior of your home?
The styles and materials you can choose among include (but aren't limited to) those described below:

**Lath** is inexpensive and easy to install, and it can provide as little or as much protection as any other cover, unless you need watertightness. A lath overhead, which amounts to spaced wood strips supported by beams and cross pieces, can be free standing or attached to your home. The striped shadow pattern cuts the effect of the sun, but lets in enough light to encourage some plants to thrive. The shade cast by your lath shelter will depend on its orientation, and on the thickness and spacing of the lath members. To gain maximum relief from the noon sun, run your lath east-west. If you want the greatest relief in the early morning or late afternoon, run your lath north-south.

**Louver** is like lath, in that it is made up of parallel boards, but the boards are set on edge or at an angle to take the greatest advantage of their width in blocking the sun. Adjustable louvers can give you almost any degree of light or shade you may want through the day. Fixed louvers can be designed to block the sun during the part of the day the sun is unwanted. As with lath, a louver overhead isn't waterproof.

**Eggcrate** is a way to protect an area while still admitting most of the available sunshine. If your patio is on the north side of the house where the sun seldom enters, or on the eastern side where only the morning sun enters freely, or if trees surround the patio and block the sun you may want an eggcrate overhead. An eggcrate structure is open to the sky but substantial enough to give a feeling of protection. Eggcrate overheads are natural showcases for climbing vines, which can provide color and beauty as well as built-in responsiveness to seasons.

**Canvas** or one of its synthetic substitutes, will withstand sun, wind, and rain. The traditional pull-up, striped awning that has long been used to shield home and office
windows from the sun is today supplemented by sheets of solid colored canvas laced to pipe or lumber frames or strung from cables for adjustable weather control. The light weight of canvas requires less support and framing than wood. It is also relatively waterproof.

Fiberglass is light, shatter resistant, and easy to work with. You can buy it in different colors and textures. Since it is translucent, it transmits light (the amount depends on the color and texture) but keeps out the rain. One disadvantage of fiberglass you need to consider is that it rarely can be made to harmonize with the building materials of your home.

Plexiglass is similar to glass, but is more flexible and durable. Plexiglass in an overhead is especially complementary to contemporary architectural motifs. Plexiglass panels can be ordered in shades to match your home’s window glass.

MAINTENANCE

- Since any overhead you build is exposed to the weather, the materials you use should be weather-proofed. All metal nails, bolts, joist hangers, etc. should be either galvanized or rust-proof painted. Woods should be properly stained, painted, and/or sealed. Canvas should be water-proofed if used for protection from rain. If not, canvas material should be washable, so as to maintain its new look.

- In your initial planning, you’ll want to insure yourself of a structurally sound overhead. That implies allowing for wind stresses, snow loads and maximum human use. An overhead that looks nice but is not safely constructed is a hazard. If you are hesitant about designing and/or building an overhead, consult an architect or a landscape architect.
Patios and Decks

INTRODUCTION

Besides overheads, you can use patios or decks to expand indoor living space to the outdoors. A patio can be either at the same elevation as the ground (on-grade) or elevated and supported at an appropriate height (decks and terraces). If you choose to build a raised deck, it can also serve as an overhead structure. These kinds of outdoor living areas provide highly useful space for family and guests, and can add interest to a yard.

The word “patio” comes from the Spanish and was defined by them as a courtyard or an inner court open to sky. Today, a patio can also be an extension of an interior room, it is often paved and is especially popular for outdoor dining and leisurely outdoor activity.

A patio is normally built on-grade, with a slight slope away from the house and provides a transition between house and garden. In effect, a patio can establish an indoor-outdoor relationship of plants and structural materials. Most families want their patio next to a walkway that connects the house and its storage area. That makes it easier to move patio furniture and other equipment to and from storage.

The term deck refers to a structure above the surface grade built around the house. A deck can create additional outdoor living space over uneven ground or on non-groundlevel parts of your home.
LEGAL RESTRICTIONS

In Logan, you need a building permit before you can build a patios. The cost of your permit will be determined by your estimated cost for materials and labor. Present plans of your design to the City Planner for approval within the laws.

Then too, you’ll have to observe the legally defined minimum set-back requirements:

<table>
<thead>
<tr>
<th>Attached patio or deck:</th>
<th>Free-Standing patio or deck:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone</td>
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</tr>
<tr>
<td>Setbacks</td>
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<tr>
<td>Frontyard</td>
<td>25'</td>
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<tr>
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NATURAL RESTRICTIONS

- Your best orientation for a patio is to have it facing the east. The south would be your second best choice and such a patio would require a sun-screen during summer afternoons. If your patio must have a north or west orientation, your family will probably not get much use out of it. Your patio should be protected from extreme winds, snow drifting, the hot sun, undesirable views, and over exposure to the public.

- You'll want to keep plant materials that attract bees (or any insects) or shed bothersome fruits, and leaves far enough away from the patio to reduce hazards and maintenance needs.

- Any paving materials you use will be subject to the deteriorating effects of freezing water and soils that were described for driveways and walkways.

AESTHETICS

- The pleasing effects of your patio or deck — a sense of space and light, the smell of the garden vegetation, the colors of the plants, and the sounds of nature — can be enhanced by such items as fences and walls, and portable or built-in furniture. You may even want to include a water feature, potted plants, and sculpture. Too many items, however, can create a cluttered look — but too few can be boring.

- Since your patio is an outdoor room, its contents should be compatible with those of your home's interior and the construction materials on the exterior of the house. Its components should also be compatible with your walkways and paths.

- Often, a patio can be an outdoor studio for the artist, or an atrium or plant room (greenhouse) for the horticulturist. Depending on your family — you might want your patio to include a swimming pool or accommodate a play area for small
children. Raised decks can be used for private activities as well as lookout posts (for supervising children’s play) if projected from the second or third floor.

CLIMATE MODIFICATION

As noted along the way, you’ll want your patio or deck to be optimally oriented to the sun. Your home’s patio can give your family an outdoor space that can be used year-round. Care in your design can have the sun warming the patio/deck in winter, keep snow from drifting in, and provide adequate shade in the summer.

Paving materials that neither reflect a lot of sunlight, nor absorb too much heat are ideal for patios.

CONSTRUCTION TECHNIQUES/MATERIALS

You can be creative in how you apply your patio paving and yet achieve a pleasing, unified effect. Regardless of the material you decide to use, however, careful installation is essential to insure a long lasting finish. See “Other References” on pages 106-107.

1. On-grade materials for patio-paving can include:
   - pre-cast concrete
   - poured-in-place concrete
   - exposed aggregate concrete
   - brick
   - flagstone
   - turf block and lawn

2. Deck materials can include:
   - redwood
   - cedar
   - fir
3. Here are some questions concerning various characteristics of surfacing materials for patios and decks:

**Texture**

Will the paving need to be smooth for children to play on or rough to provide sure footing during the winter?

Should it be slick enough for dancing yet rugged enough for games and winter maintenance?

Can the paving material resist stains around a bar-b-que area, or can it resist marking and scratching caused by moving furniture?

**Appearance**

Are the color, texture, and pattern of the paving or deck going to blend with the house design and garden plan?

Will it have to match the indoor flooring?

Will the materials reflect light on the shady sides of the house or will they cause glare from too much reflected sunlight?

**Maintenance**

Can the paving be cleaned?

How easily will it show dirt and dust?

Can grass clippings, leaves, and other debris be removed easily?

Will weeds grow in crevices within the paving pattern?

**Durability**

Is the paving to be permanently installed or only temporary?

What will be the effects on it of snow, water, frost or extreme heat?

**Cost**

Is the cost of the paving materials and installation within the proposed budget?

Are there hidden costs involved such as drainage provisions, unstable soil or special construction techniques?

**Installation**

Can the materials be delivered to the homesite?

When are the best times to begin installation?

Is it a one-man job or is assistance wanted?

How long does installation take and will that cause inconveniences?

How soon after installation can the patio be used?

**MAINTENANCE**

Apply weatherproof sealers to all woods (except redwood and cedar), brick and the concretes as a preservative.

Winter storage for portable embellishments in the patio should be provided.

Plant materials used in and around the patio should be maintenance-free unless the homeowner enjoys caring for plants.
Other References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

OVERHEAD STRUCTURES REFERENCES


**Home Building and Remodeling**, Hudson Home Guide No. 95.

**Home Plans and Projects**, Hudson Home Guide No. 93


Parker, Harry S.: 
620.1 P225

728.9 Su74


Patios, Porches and Pools, Golden Hands 
Special No. 36, (Available at local bookstores.)

Practical Guide to Home Landscaping, 

Remodeling Your Home, Sunset Garden Books, 
Lane Publishing Company, Menlo Park, Cal. 
728 Su74

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Lane Publishing Company, Menlo Park, Cal.

Carpenter, Jot D. (editor): 
712 C225

Decks, Sunset Garden Books, Lane Publishing Company, Menlo Park, Cal.

Decks and Patios, Hudson Home Guides, 

Do-It-Yourself Garden Construction 

Eckbo, Garrett: 
712.64 Ec53

Faust, Joan Lee (editor): 
635.9 N42


Home Building and Remodeling, 
Hudson Home Guide No. 95.

728.6 B466h


Home Plans and Projects, Hudson Home Guide No. 93.

Ideas for Planning Your New Home, 
728.6 Id2


Leavy, Herb: 
Walks, Walls & Patios, 

Numm, Richard B.: 
Decks and Patios, 

Parker, Harry S.: 
693.5 P221
694
P221

620.1
P225

1952.
728.9
Su74

Patios, Porches and Pools, Golden Hands Special No. 36, available at local bookstores.


728
Su74

Notes
GREENHOUSES, UTILITY & STORAGE AREAS

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Greenhouses and Other Storage Facilities

INTRODUCTION

By preplanning for a conveniently located utility and storage area, or greenhouse you can save yourself and your family a great deal of time, energy, and frustration. Ideally, you visually camouflage your utility and storage area, while still making it easily accessible in all weather. That generally means putting it in or close to your home's service area (described in Chapter 3) and providing it with shelves, compartments and bins.

CONCEPTS

- Plant propagation, and firewood storage areas are logically included.
- Other uses for a utility and storage area can include coordination of tools, spray materials, supplies, and power equipment for home and garden maintenance. If gardening is a major love, you may need storage structures for stacking peat moss, leaf mold or compost pile, fertilizer, pots, flats, and other garden accessories as well as a water-proof locker for certain supplies. Covered bins for soil, sand, a prepared soil mix, and fertilizer can be invaluable to any gardener.
- Most homeowners find it helpful to keep lumber for small repairs and sometimes firewood or coal in one specified place. These materials should be elevated above the soil and out of the weather. If you have a swimming pool, you'll need a place to store the pool filter and maintenance equipment.
- Whatever you use it for, your utility storage area should be equipped with or close to a source of running water. You will probably want it close to the garage or kitchen. A covered walkway connecting the utility storage area and the back door can save wear and tear on the house during bad weather. Whether you have one shed or several storage sheds, they should be disguised sufficiently so that neither neighbors nor visitors are confronted with an ugly view.
Before building a utility storage unit in Logan, you’ll have to purchase a building permit. The cost of that permit will be determined by the cost of the materials and labor you expect to invest in the structure. The homeowner should present his proposed design and layout of a greenhouse or storage unit to the City Planner for approval within the laws. Minimum set-back requirements for utility storage units are as follows:

**Attached Greenhouse or Storage Shed:**

<table>
<thead>
<tr>
<th>Zone</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
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<tbody>
<tr>
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<td>Height limits</td>
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**Free-Standing Greenhouse or Storage Shed:**

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<thead>
<tr>
<th>Zone</th>
<th>R1</th>
<th>R2</th>
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<td>Height</td>
<td>15’</td>
<td>15’</td>
<td>20’</td>
<td>20’</td>
</tr>
</tbody>
</table>

**Land Use Ordinance 17-4-6 (b)**

(2) The front yard shall be measured from the property line to the front face of the building, covered porch, covered terrace, or attached accessory building. Steps, uncovered porches, eaves, and roof extensions may project into the required front yard for a distance not to exceed four (4) feet. Where no front yard is required, all stairs, eaves, roofs, and other projections shall be located behind the property line.

**17-4-7 (b)**

(1) Every part of the required side yard shall be open and unobstructed except for the normal projections of window sills, belt courses, cornices, chimneys, and other architectural features projecting no more than twelve (12) inches into the required side yard and roof eaves projecting no more than thirty-six (36) inches into the required side yard.

**Special Rear Yard Regulations 17-4-8 (b)**

(4) Accessory buildings may be located in the required rear yard provided the building is at least three (3) feet from the rear lot line.

(5) The ordinary projections of window sills, belt courses, cornices, chimneys, and roof overhangs may extend three (3) feet into the required rear yard.

**Maximum Coverage 17-4-9**

No accessory building nor group of accessory buildings shall occupy more than twenty-five (25) percent of any required setback.

**Height Regulations 17-4-10**

(a) No building or structure shall be located, erected or altered so as to exceed the height limit specified on the space requirements chart for the district in which the building is located. Airport height regulation promulgated by the Federal Aviation Authority shall be considered part of this ordinance and shall be given full force and effect.
NATURAL RESTRICTIONS

- Your footings for any utility storage units must conform to the same standards of installation as the foundations for your home and garage. That is, to minimize cracking of footings for posts or walls, and structural failure to the unit itself, the concrete footing must be at least 30 inches deep, or below frost depth. (The frost depth is the deepest level at which the soil freezes.) And an early treatment to protect your construction material from the weather will pay off in future years.

AESTHETICS

- As you think about where to place and how to build your utility storage area, be sure to consider ways to blend it into the landscape in a quiet way. Sometimes that can be done by using hidden spaces created by other architecture or fences. Imaginative use of plant materials can help with the goal of camouflage.

- If a greenhouse is part of your design, you can choose among large numbers of commercially available structures that are well adapted to most homes and situations—in backyards, on terraces, or as room extensions. One argument for including a greenhouse is its potential as an outdoor room where you and your family can be a part of the outdoor environment year-round. When attached to your home, a greenhouse can also be used as a climate modifier, collecting heat from the winter sun which can be used to warm up other parts of the house.

CLIMATE MODIFICATION

- To capture the most November-February sunlight, when days are naturally short and overcast, and the sun is weak and low on the horizon, a greenhouse may need to be carefully positioned. Free-standing greenhouses can be faced in any direction that compliments the home. But if yours is to be attached to the home or some other structure, try to have it face south, southeast or southwest, in that order. To use your greenhouse as a sun room or solarium, you’ll have to take precautions when installation is in progress. Most greenhouse suppliers will give you the necessary information free of charge.

- Entrances to your utility and storage areas should be kept free from ice and snow buildup. The diversion of irrigation, storm and ground water away from these areas can be a problem in the summer unless you have preplanned. Depending on where your property is located, you may want to pay special attention to whether you can place your storage/utility area so it serves as a wind barrier, perhaps also diverting bothersome odors from compost piles, animals, etc. away from your home.
CONSTRUCTION TECHNIQUES

- Most commercially purchased greenhouses are constructed on lightframe aluminum grids with panels of tempered glass, with overall quality available. Whatever your source of a greenhouse, you’ll need footings similar to those in your home. Two of the best flooring materials are dirt or brick in sand, since these allow ground moisture to evaporate and naturally humidify the greenhouse interior. For details concerning greenhouse types, sizes, and heating systems, you’ll want to check with dealers and perhaps look into magazines and other literature.

- Prefabricated structures can also be purchased for general storage purposes. Quality of construction materials and visual appeal can be a problem, however, in many of these products. A home-made storage system will probably cost less in money and more in time, but it is the best way to satisfy your personal needs and desires. Keeping the construction and craftsmanship of the final product under your control can be a very worthwhile goal. That way you can use the best materials you can possibly afford. Your initial investment in a good design and quality materials will insure a long life and a higher resale value.

MATERIALS

- If you need or want to fence your storage/utility area, chain-link fencing material is less expensive than wood, and can be hidden by vines or other plant materials.

- In the Logan areas, redwood, cedar or douglas fir can be used for fences and walls. They are all available locally, and only douglas fir needs to be weather proofed with some kind of sealer/stain.
MAINTENANCE

- All metal nails, bolts, joist hangers, etc. used in utility/storage construction should be either galvanized or rust-proof painted. Woods should be properly stained and/or sealed.

- Structural soundness should be designed into your building to allow for wind stresses, snow loads and maximum loads of human use.

- Since a greenhouse requires controlled atmosphere conditions to function, you have to figure on it as a high-maintenance structure.

COSTS

- Heating costs for greenhouses could be high during the winter unless you design for storing solar heat.

- The cost of installing a walk-in greenhouse is comparable to adding on a room. Itemized costs include the greenhouse structure, foundation, heating, ventilating and other equipment as needed to satisfy your use plans. A greenhouse does, however, add a great deal of a value to a home.

- Window greenhouses such as shown in Figure 93 are relatively inexpensive.
Other References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

Basic Carpentry Illustrated, Sunset Garden Books, Lane Publishing Company, Menlo Park, Cal.

690.03
B791

Do-It-Yourself Garden Construction Knowhow, West Edition, Ortho Books Division,

712.64
Ec53

635.9
N42


Home Building and Remodeling
Hudson Home Guide No. 95.

728.6
B466h

Homeowners, How-To Handbook, Summer 1977, No. 6

Home Plans and Projects, Hudson Home Guide No. 93

Horticulture Magazine (Monthly) Available in the periodical section at the USU Library

House and Garden (Monthly) Available in most magazine stands.

635.0444
H868

635.98
K181

635.9652
K863

635.982
N334
712.6
Or8

Patios, Porches and Pools, Golden Hands Special N. 36, available at local bookstores.

640
P412


728
Su74

Fences and Walls

INTRODUCTION

The fence or wall you decide to build should be designed to fulfill the use(s) you have in mind. Whether it’s for keeping children and pets in or out, marking a boundary, screening a service area, shielding an outdoor activity from sun and wind, enhancing security, or retaining a steep slope, the purpose of your fence or wall must be defined before you can begin to think about materials and installation.

CONCEPTS

Fences are generally made of wood or metal, often in combination with plant materials. In contrast, walls are commonly constructed of masonry materials, concrete, or combinations of these and plant material for the purpose either of screening or of retaining soils where you have an abrupt change in elevation. Either a fence or a wall can provide visual as well as auditory screening. But so can hedges, whether of shrubs or of shrubs plus trees, and mounds of earth (or berms) with or without vegetative cover. So you’ll want to be sure to consider ALL of your options.

Then too, because a fence seems to become more transparent, lower in height, and less architecturally related to the house as it is placed farther away from the house—where you’ll place your fence on your property is a crucial factor in your choice of materials.

- A completely opaque, solid fence or wall is best within 15'-20' of your home if you want to create privacy, divide the garden spatially into a series of outdoor rooms, and/or screen undesirable elements from the garden. The functional height is 6'-8'.

- A translucent screen can be from 3½' - 6' high, when you use it to create a mood, serve as a background for plants, let in or filter light and air, and/or provide some protection for children and pets. Such screens are effective when 15'-25' from the house.

- A transparent screen can be 3½' or higher and used to good effect anywhere beyond 25' from the home within legal requirements. Transparent screens are mostly used to define boundaries and edges, control pedestrian circulation, and/or contain children or pets. These screens can be designed to be unobtrusive and to blend with the surrounding landscape.

Before you become too entranced by the idea of fencing, remember that you should consult each neighbor that will be affected by your screening operations as to fence size, location and materials. Settling differences of opinion before construction begins may save considerable grief later.
LEGAL RESTRICTIONS

A building permit must be purchased at the City offices before fence construction is started. At this time the homeowner should present his proposed fence layout to the City planner for approval within the laws.

<table>
<thead>
<tr>
<th>Zone</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Heights</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frontyard (25 ft. setback)</td>
<td>4'</td>
<td>4'</td>
<td>4'</td>
<td>4'</td>
</tr>
<tr>
<td>Rearyard (3 ft. setback)</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
</tr>
<tr>
<td>Sideyard, interior (25 ft.)</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
</tr>
<tr>
<td>Sideyard, on-street (0 ft.)</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
</tr>
</tbody>
</table>

NATURAL RESTRICTIONS

Any fence you build should be able to withstand wind loads, snow drifting, assaults by playing children, and other short- and long-term natural (and human) forces. Obviously, as with everything, the quality of materials and craftsmanship you use will modify maintenance needs and life of your fence.

AESTHETICS

- If your fence or wall is to be attached to your home, you are creating an architectural extension of the house. Ideally, these are either built at the same time as the house or carefully matched as to construction materials. Even if you are building a fence adjacent to but not attached to your home, you’ll want to think about compatibility of materials. The scale and materials you choose will determine whether you unify old and new construction.

- Vegetation used in conjunction with fences and walls should be chosen and positioned to compliment the structure rather than merely hide it. See the plant materials chapter for more guidelines.
And you may want to investigate the use of small, free-standing screens and fences to define your utility/storage, garden, outdoor living, work and play areas.

CLIMATE MODIFICATION

- One practical and easy-to-achieve goal for fences and walls can be to modify the microclimate of a small area. They do this by creating sheltered corners and pockets that trap the sun or keep out wind and blowing snow.

- Where a fence or wall would collect and reflect too much heat, you can have a wire-mesh fence with vines or shrubs. This arrangement will absorb much of the sun, while still producing an opaque screen.

- You may want to delay fence and wall building until you know the wind patterns in your yard.

- Noise can be exceedingly difficult to control, and it is the thickness and mass of a fence or wall that determines its relative value in this regard. Sometimes the greatest benefit derived from erecting a screen for noise control is psychological, since having a physical barrier between residential activities and the noise source can be good for morale.

CONSTRUCTION
TECHNIQUES/MATERIALS

- Your lot size may preclude certain kinds and sizes of fences. For example, because a small site generally has a greater need for privacy, 6 feet or higher solid fences may be almost mandatory. The periphery of large sites, including pastures, can best be fenced using post and rail-type
construction. This gives a transparent yet effective boundary definition, while privacy is established by the distances between houses. Similarly, people living in cluster developments have greater needs for creating private areas than do those in agricultural residential zones.

- Another factor you should be aware of is flat topography favors solid fences. Undulating topography is better suited to a transparent screen such as a chain-link fence with vines, or a wind break. Transparent screens or stepped panel fences work best on steep slopes. Some alternatives are illustrated in Figure 101.

- When building your fence or wall you’ll want to give special attention to the proper installation of your posts and footings. Footings should be at least 30 inches below your property’s finished grade and secured with cement that is properly mixed for maximum strength. The design of retaining walls and footings depends upon their intended use. Where walls over 4 feet high are needed you’ll probably do well to consult with an engineering firm.

MAINTENANCE

- If you can find and afford it, cedar, redwood, and fir are good choices for fencing material. Of all wood, redwood is the most durable and needs the least maintenance. It is usually sold in two categories:
All heart redwood—excellent for posts and other members of a fence that comes in contact with the ground. This type has a natural protection against termites and decay.

Sapwood—which lacks the built-in preservatives is more economical and can be used to good advantage above the ground.

- There is no need to paint or stain redwood or cedar. The sun may affect it shortly after installation and cause dark streaks to appear. However, this condition will soon disappear and ultimately the redwood will weather-bleach to a pleasing driftwood gray. Cedar has a similar appearance.

- Nails for use on outdoor fences should be treated with aluminum-alloy, or be stainless steel or galvanized. Common nails won't hold as well and will rust and stain wood.

- The local lumber dealers can help you evaluate wood sizes relative to your needs and answer questions that arise as you begin construction.

- Masonry building modules (brick, concrete block, and stone) come in many sizes and colors. Ideally, your decision as to which to use should depend on the building material of your house, and of course, your budget.

- For a rustic look, railroad ties and discarded telephone poles can be stacked and structured for use as retaining walls.

- Fences and walls need very little maintenance if proper installation methods are followed.
Other References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

Basic Carpentry Illustrated, Sunset Garden Books, Lane Publishing Company, Menlo Park, Cal.

712
C225


635.9
N42

Fences, American Society of Planning Officials
711.51
Am35f


721.8
H113

728.6
Id2


“Sunset Magazine”, available in the periodical section of the U. S. U. Library. (Available at local bookstores.)
Notes
PLAY AREAS

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT

CITY OF LOGAN, UTAH
Play Areas

INTRODUCTION

Since not only small children enjoy playing, you may want to think about a play area that will be inviting to all age groups. In general, such an area should present its users with physical and mental challenges, be safe from traffic and other hazards and be easy to maintain, and durable.

CONCEPTS

A play structure for young children plus spaces and facilities for older children and adults can be part of your home’s play area. Generally a play structure is a three-dimensional apparatus that allows its users to go up, over, across and down. By letting the children in your family help design the structure, you’ll probably optimize the use it receives. Your young children and their friends would also be likely to play in and on areas such as sandboxes; large hard surfaces for skating, tricycling, and running; and what looks to adults like a neglected weed patch.

If your play area design is successful, you’ll help your young children in these ways:

Physical Development—Play apparatus should provide a sufficient challenge to each age group of children. Equipment that allows them to painlessly discover their physical capacities and limitations is most desirable.

Social Interaction—Children have a tendency to play roles. Areas that encourage this use of the imagination should be provided. Also, interaction with other children helps them to learn to work together.

Problem Solving Skills—A wide variety of choices and experiences that occur as play offer a child many opportunities to make decisions and solve problems. One way to achieve these results is to include both passive zones (enclosed and intimate) and active zones (large and more open).

For your adults and teenagers, you’ll want to consider whether your property and budget will support such things as:

- tennis
- swimming
- volleyball
- basketball
- shuffle-board
- a space for entertaining and dancing
- horseshoes
- croquet.

And early in your planning, you’ll want to establish how much separation you need between specific adult and child areas. Another early decision must be how much you want to and can do at various stages of your home’s development.
One idea you may want to consider is the creation of a private patio for your children only, planned into the landscape design. While they are very small, you can provide a cushioning ground surface such as sand or sawdust to reduce injuries from inevitable falls, with a smaller hard surface runway for tricycles and rollerskates. You would also want to be sure that use of such an area can be conveniently visually supervised from inside the home.

If one of your goals is to keep your children around home as much and as long as possible, you should think about how to include flexibility in their play areas. As children grow and change their play habits and interests, you’ll want to be able to readily convert out-grown play structure and spaces to more appropriate uses. For example, a fair-sized, hard-surfaced area can have the outlines of hop-scotch, four-square, and other hard surface games painted on. Or corner points and other significant intersections can be marked in the surface and temporary chalk lines drawn in to complete the patterns. In either case, such an area can later be used for badminton, basketball practice, and dancing.

A large lawn area will be valuable to every member of the family. Wrestling, playing with pets, trampoline, touch football, and catch are just a few potential uses. Maintenance of the lawn can even be included in the activities.
LEGAL RESTRICTIONS

A building permit is required for the construction of any accessory structure. An accessory building in the case of play equipment might be a playhouse on stilts or any structure whose volume simulates an accessory building.

Present your play structure plans to the city planner for approval under the laws.

Then too, you’ll have to observe the legally defined minimum set-back requirements:

### Attached Play Structure:

<table>
<thead>
<tr>
<th>Zone</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
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<tbody>
<tr>
<td>Setbacks</td>
<td></td>
<td></td>
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<tr>
<td>Frontyard</td>
<td>25'</td>
<td>25'</td>
<td>25'</td>
<td>25'</td>
</tr>
<tr>
<td>Sideyard (interior)</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
<td>8'</td>
</tr>
<tr>
<td>Sideyard (on-street)</td>
<td>20'</td>
<td>20'</td>
<td>20'</td>
<td>20'</td>
</tr>
<tr>
<td>Rearyard</td>
<td>10'</td>
<td>10'</td>
<td>10'</td>
<td>10'</td>
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<tr>
<td>Height limits</td>
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### Free-Standing Play Structure:

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<tr>
<th>Zone</th>
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<th>R2</th>
<th>R3</th>
<th>R4</th>
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</thead>
<tbody>
<tr>
<td>Distance from dwelling</td>
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</tr>
<tr>
<td>Frontyard</td>
<td>60'</td>
<td>60'</td>
<td>60'</td>
<td>60'</td>
</tr>
<tr>
<td>Sideyard (interior)</td>
<td>3'</td>
<td>3'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>Rearyard</td>
<td>3'</td>
<td>3'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>Height</td>
<td>15'</td>
<td>15'</td>
<td>20'</td>
<td>20'</td>
</tr>
</tbody>
</table>

Land Use Ordinance
17-4-6 (b)
(2) The front yard shall be measured from the property line to the front face of the building, covered porch, covered terrace, or attached accessory building. Steps, uncovered porches, eaves, and roof extensions may project into the required front yard for a distance not to exceed four (4) feet. Where no front yard is required, all stairs, eaves, roofs, and other projections shall be located behind the property line.

17-4-7 (b)
(1) Every part of the required side yard shall be open and unobstructed except for the normal projections of window sills, belt courses, cornices, chimneys, and other architectural features projecting no more than twelve (12) inches into the required side yard and roof eaves projecting no more than thirty-six (36) inches into the required side yard.

Special Rear Yard Regulations
17-4-8 (b)
(4) Accessory buildings may be located in the required rear yard provided the building is at least three (3) feet from the rear lot line.

(5) The ordinary projections of window sills, belt courses, cornices, chimneys, and roof overhangs may extend three (3) feet into the required rear yard.

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17-4-9
No accessory building nor group of accessory buildings shall occupy more than twenty-five (25) percent of any required setback.

Height Regulations
17-4-10
(a) No building or structure shall be located, erected or altered so as to exceed the height limit specified on the space requirements chart for the district in which the building is located. Airport height regulation promulgated by the Federal Aviation Authority shall be considered part of this ordinance and shall be given full force and effect.
NATURAL RESTRICTIONS

If a play area is to be used by children, its scale must fit their abilities to reach, jump, climb and so on. For example, for:

- **Children under six.** Play activities can reasonably include chair swings, sandboxes, small slides and low climbing devices (4-foot maximum height).

- **Children six to twelve years and older.** Play activities may include large swings, wider and longer slides, horizontal bars, balance beams and horizontal ladders.

The requirements for adult-scaled apparatus, games, and courts are given in Chapter Three, Landscape Design Principles.

AESTHETICS

As a parent, you probably already know that clutter and children are inseparable. You’ll want to devise ways to screen the in play areas from the view of areas where adult visitors might assemble. Other play apparatus and hard court surfaces for basketball and tennis, ideally are designed into your total landscape so they blend with, rather than detract from, the rest of your yard areas.

CLIMATE MODIFICATION

During the summer, children as well as adults seem to follow the shade, so play areas should have some pockets of shade all day long. In contrast, during spring and fall, it is sunshine that is treasured. Since deciduous trees are bare at these times of year, they are good choices for all seasons.

The conditions described in the patio and decks chapter as enhancing year-round
comfort should also be created wherever you expect children to congregate. For example, if local wind patterns in your area are a problem, they should be considered and perhaps screened from the play area with fences, walls, hedges, shrubs, and/or trees.

CONSTRUCTION TECHNIQUES

Commercial play structures are readily available and easily assembled but often prove less versatile and less appealing than multi-use objects such as cardboard boxes, logs, or tires. Let your children help you decide what to use and how and you'll probably end up with an adventure playground that will give them (and you) a rewarding variety of play experiences. Objects and structures that can be rearranged and modified more or less at will are superb. For example, a short ladder can be used upright, sideways, or obliquely.

MATERIALS

The materials to be used in any play structure will depend on availability and costs.

- If new wood is preferred and you aren't priced out of the market, you'll want lightweight, exterior lumber, resistant to decay and weathering, and splinter-free. In essence, lumber used in constructing a play facility should be comparable to that used in house framing. Standard grade would be the minimum acceptable with select grade preferred.

- By including a variety of other materials (see following illustration), however, you'll enhance play potentials.

- For surfacing a play area, you can check into tanbark, sand, synthetic (all weather) surfaces, rubberized asphalt,
and concrete. Sand is the least expensive and most commonly used. Four to six inches of sand contained within a curb presents a pleasing effect, provides good drainage, and cushions falls.

If you do your own construction, be sure to:

- Counter sink nuts and bolts to prevent child injury from protruding objects.

- Chamfer or round and sand all four sides of lumber to one-half inch. Lumber exposed to weathering requires a non-toxic preservative that will provide a smooth finish and increase the longevity of the wood. Wood stain is a better preservative than paint and adds a natural aesthetic appeal to the structure.

- Redwood and cedar are naturally weather resistant and require no wood treatment. To preserve other woods beware of creosote as it is dangerous to eye and skin tissue.

- When using metal, cover all surfaces with a rust-resistant paint or use galvanized steel.

- Cover ends of pipe to keep fingers from getting caught. Cover exposed cables and chains with garden hoses.
Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.


711.558
B436

712
C225

747.77
Su44

711.558
D262

Friedberg, M. Paul: Handcrafted Playgrounds, (Sketch material illustrating the types of playgrounds one can build, including details of construction and materials used.), Random House, New York, 1975.


Hogan, Paul: Playgrounds for Free, (Discussion of the process of handmade playgrounds including those materials that can be used. Illustrated both in sketch and photographs.), The MIT Press, Cambridge, 1974.


“Sunset Magazine” (Monthly), Available in the periodical section of the U.S.U. Library. (Available at local bookstores.)
Notes
WATER FEATURES, LIGHTING, METERS, MAILBOXES, DOG RUNS & RESIDENTIAL GRAPHICS

GUIDE TO RESIDENTIAL LANDSCAPE DEVELOPMENT
CITY OF LOGAN, UTAH
Water Features

INTRODUCTION

For your summers in Logan, and despite occasional drought years, you may want to consider ornamental water features such as ponds, fountains, and swimming pools. Moving water can create a refreshing, cooling atmosphere reminiscent of mountain streams, but even held or standing water such as in ponds and pools can make your home a more pleasant place in the summer. Falling or moving water can involve flowing streams under the influence of gravity, or pressurized water that produces vertical or diagonal flows and their associated sounds. You can also arrange your design to optimize wave action created by wind, restful movement of an object back and forth in water, or exciting quick and large flows of water into a pond. In any case, the sounds of running water are psychologically cooling and relaxing for most people.

A swimming pool offers an obviously refreshing source of recreation during the summer months. Its use may be extended into the fall and winter by installing a plastic bubble and a heater-blower around the pool to maintain a comfortable temperature. Reflective pools, which are less expensive to create and maintain, are visually pleasing as well as attractive to birds and other animals. You might want to arrange to have a pool of unchlorinated water as part of your open-air irrigation system for plants. Such a pool can be used to store storm and run-off water for beneficial purposes.

If your overall design includes water features, you could use them to provide a physical separation between incompatible use areas.
LEGAL RESTRICTIONS

• Logan City has no specific ordinance defining the setback and enclosure requirements for swimming pools as of June, 1978. The City Building Inspecting Division, however, has interpreted present laws as designating a swimming pool to be part of the main living facility. The setback for sideyards is 8' and for a rear yard is 10'. The City encourages homeowners to install at least 6' fences (maximum 8') around their pools. These guidelines are standard procedures elsewhere in the country to help establish and maintain safety.

• Liability insurance coverage on water features (swimming pools) may be included in a homeowner's existing insurance plan as a "premise liability". If not, additional coverage should be added to protect you from the legal hazards of owning an "attractive nuisance" as insurance agents call them. If you are contemplating whether to add that swimming pool, check with your agent.

NATURAL RESTRICTIONS

• Your use of a natural water system on your property must obviously depend on its existence, type, (surface or groundwater) and whether the flow is intermittent or continual.

• Major continual surface streams in Logan, such as the Logan River or one of the many canals that divert water from its channel, must have its edges or banks maintained in a natural or established state. That means that existing vegetation within 10' of the bank cannot legally be removed.

• The soils on your property will dictate how successfully you might build a new surface waterway. If you have coarse soils, water will percolate into the ground quite rapidly. Ideally, introduced streams and pools should have water-tight bottoms.

• Before going too far with plans for a swimming pool you’ll need to determine the bearing capacity of your soil. That will define what size swimming pool you can build. And if your pool is to have a concrete bottom, it will have to be at least 30" below the ground surface (the frost depth or deepest point at which soil will freeze in this area). Similarly, any concrete and tile work should be protected from the effects of frost action and freezing ice by properly sealing and water-proofing such surfaces.

• In locating your swimming pool, you’ll want to avoid large, overhanging deciduous trees which can lead to bird droppings, leaf-drop, and shadows on the water that lower its temperature.

• Whatever artificial water features you design into your landscape, Logan’s winter temperatures require either abandonment in the winter or expensive temperature control devices.
A swimming pool can be designed into a garden so as to compliment the garden. Its size, color, texture and lighting of bottoms and sides, edgings and copings, and transition to adjacent materials contribute to the pleasure of swimming and the quality of the garden. The standard shapes of commercially available pools should never dictate your overall design. Instead, as an ideal, try to have your composition of forms and location of activities decide the location, size and form of your swimming pool. This same philosophy applies to all water features in the garden.

As you evaluate whether, where and how to use water in your design, be sure to consider all of its characteristics. Water can present a wide range of reflectivity and moods—from still water with a dark lining (quietude, repose, and depth) to the sparkling quality of moving water pulled by gravity down an incline (tension and the primitive qualities of mountain streams trickling or splashing about). A thin film of water on materials, as is experienced after a rain storm, enriches colors and textures. Objects and surfaces seem cleaner and clearer just after being hosed down. You can manipulate this quality in your yard.
CLIMATE MODIFICATION

The natural outdoor living conditions in Utah are normally too hot and dry in summer and/or too cold in winter for full-time use. There is a great opportunity for Logan homeowners to create living conditions that improve and extend comfortable use of the outdoors. One way is to use water in the home landscape.

- Moving water (sprinkling systems as well as streams and fountains) can introduce small water droplets into the air, effectively cooling the air. When used with (when irrigating) shade trees and windbreaks, the outdoor living area becomes a cool, shady, humidified space, shielding out the hot summer sun and winds. See Figure 111.

- By giving your swimming pool a full exposure to the spring, summer and fall sun, you can use the sun’s energy to heat the water. As the water heats up, it is also evaporating. This moisture-laden air can reduce the air temperature significantly.

- Depending on where you live in Logan, your outdoor air conditioning needs will vary. If you live on the benches, temperatures are milder, whereas in the valley homeowners will experience colder minimum and warmer maximum temperatures. If you live at the mouth of Logan or some other canyon, strong morning and evening winds will change temperatures. Study your particular situation and decide which climate modifications will improve comfort.

CONSTRUCTION
TECHNIQUES/MATERIALS

- In general, your material options include: poured-in-place concrete, granite and plaster, stone, brick and tile, and/or metal and plastic.

- For swimming pools, the Gunite and Plaster System is relatively low in cost and therefore is more in demand. Wet concrete is sprayed in layers into a reinforcing-steel lattice work. Brick and tile are the most common edgings and copings.
To reduce wear and tear on your home, a shower and dressing room facility can be located near your pool, perhaps as part of a covered lounge area around the pool. The same facility can house your pool maintenance equipment.

In Logan, water features other than swimming pools should have sealed bottoms or linings. You can slow the percolation rate of water dramatically using soil with a high clay content. Or you can use 5 ml. clear or black plastic held in place with cobble stones. Concrete can also be used but does not produce the natural quality that the first two methods do.

MAINTENANCE

A swimming pool must have equipment adequate for its size and shape, one item of which is the filter system that helps keep the water clear and the pool clean. The pool needs to be cleaned and chlorinated regularly, and the surfaces skimmed to remove floating material. Monthly service and repair is encouraged to prolong use and enjoyment.

To prevent mosquitos, gnats, and other pests from gathering around your ponds, you’ll have to flush them occasionally and keep the water’s edge clear of trash and excessive moss and algae. Draining your water features each winter will also help discourage insect populations.

Supervision of children and potential trespassers is part of having a swimming pool. See legal restrictions for further information.
Lighting

INTRODUCTION

In the past, outdoor lighting beyond the usual door fixture has been viewed by most home owners as a luxury. While an outdoor lighting system is still not inexpensive, properly located light fixtures can be a good investment in safety, security, utility and beauty.

Aside from gas fixtures, which are usually more decorative than functional, your main choice will be between the conventional 120-volt lighting and the newer 12-volt type. The traditional 120-volt system gives bright illumination and offers a wide selection in fixtures, but this relatively high voltage system does have inherent dangers. On the other hand, with low-voltage (1v) lighting, if a child should happen to poke his finger into a light socket or cut a wire, no serious shock would result.

If your garden and patio are to be enjoyed at night, a lighting system that at least illuminates entries, steps, paths and any obstacles likely to be stumbled over by unwary guests is necessary. At the same time you can gain protection from intruders and create dramatic visual effects. As you begin to think about lighting, you may find you need one or more of the following: (1) subdued, inconspicuous lighting for social gatherings, (2) clear, bold illumination for objects and activities that need it, (3) light specifically placed to discourage intruders, and (4) decorative lighting to create certain moods.

Some “tricks” to remember as you design the details of your lighting system include:

- for a nicer atmosphere, use many small lights rather than a few bright, powerful lights.
- lighting hedges and fences can create a curtain effect.
- activity areas, such as a barbeque pit or a game area, require bright lighting and should be on separate switches, and particularly interesting portions of your gardens may warrant special lights.

LEGAL RESTRICTIONS

- To install a 110- or 120-volt lighting system in Logan, you will need a licensed contractor.
- Site inspections are required by Logan City only for 120-volt systems.
- If you decide on a 10- or 12-volt system, you can do the work yourself if you want.

NATURAL RESTRICTIONS

- Bedrock, high water table, trees or other site characteristics that could interfere with burying cables and locating light fixtures in certain places should be pre-identified and coped with as necessary.

AESTHETICS

- By lighting plant materials from above, below, or the sides you can reveal continually new dramatic dimensions of color and form. The light quality of a low-voltage system is less glaring than that from a 120-volt system.
- Grass, rocks, brick, fences and especially water (swimming pools with underwater lighting) become uniquely beautiful when brushed with light.

- Lights can extend the enjoyment of your garden into the winter. A winter night landscape has many qualities that can be appreciated from indoors if they are made visible with light.

- Indirectness is the key to a successful lighting scheme. You'll not want your light source fixtures visible from the patio or other major people-gathering places. You'll also want to avoid having a light shine or reflect directly into anyone's eyes.

- Used indiscriminantly, colored lights give a "carnival" effect. For most situations, you'll probably want to keep your lights uncolored.

- You can soften indoor/outdoor relationships by having the lights inside and outside your home of similar intensity.
CONSTRUCTION
TECHNIQUES/MATERIALS

• Outdoor lighting systems of 110-120 volts must be carefully installed with insulated cables buried 6” to protect them from shovels, lawn mowers, and other normal garden cultivation.

• Any homeowner can install a low voltage system with a minimum of tools and experience.

• The heart of any low-voltage system is the transformer, which reduces your 110- or 120-volt household current to 12 volts. Such transformers can plug into any weather-proof outlet. The size of your transformer controls how many fixtures you can have, and the length of wire that you can use. Transformers are available in 72 to 300 watts. A 72-watt model will let you have three or four lights and 100 feet of wire. A 300-watt model can support six to eight lights and two 100-foot lengths of wire.

• If you plan a low-voltage lighting scheme, first determine the transformer size you’ll need. If you think that you’ll eventually want more lighting, you can initially get a transformer that will meet your future needs more economically than you can buy several small ones over time.

• A 12-volt system can be controlled by plugs, switches or automatic timers. While plugging and unplugging the transformer gives a simple control, switches and timers are better. You can put in your switches before or after your transformer is in place. Some transformers have built-in timers that can be set to turn the lights on and off at the hours you choose. Others can be programmed for the full year, allowing for changing day lengths.

• Your fixture choice will depend on whether you want sealed beam or open filament bulbs in spot, mushroom, or flood types. Each does a different job and before deciding what kind to use where, you may want to experiment with different types and layouts. Small changes in the quantity or quality of light or in a lighting angle can make a remarkable difference in the effect you achieve.
Meters

Where your water, electric and gas meters are located is most often determined by the utility companies whose personnel must observe and maintain them periodically. The meters must be accessible from the street and inconspicuous to both ward off vandals and preserve a pleasing view of the house.

WATER METER

Every house in the city of Logan must be hooked into the city water supply. The water meter, which is installed and maintained by the city, must be located 18 inches from the sidewalk between the sidewalk and the street. If there is no sidewalk, the meter will be placed on the property line. Plant material planted around the meter should allow easy access.

ELECTRICITY METER

Electric meters are usually attached to the house and fed electricity with underground cables. In addition, city ordinances now require yard lamps, which are attached to each home’s electric meter. Since yard lamps are to replace large, bright street lighting and thereby create a stronger residential feeling in each neighborhood, the city assumes the operating cost of these lights. The initial cost of the lamps is included in the lot price, and the developer installs them. Available with black or white posts, the lamp is to be located 3' inside the front property line. Precise location is decided by the owner and the builder, but meter and yard lights must be accessible to service people.

GAS METER

The location of the gas meter is usually determined by agreement among homeowner, contractor and a serviceman from the gas company. The main considerations in locating the meter is that it not be near a driveway, in front of a window, or under a drip line where winter ice could form on the meter, freezing the diaphragm and stopping the gas flow.

A service line will be run from the main gas line for up to 150 feet to reach the front of the house and/or for an additional 5 feet down one side. Beyond those distances, the gas company charges.

If the line is run down the side of the house, Federal regulations require a 3-foot minimum distance between the line and the house. It should also be noted that when a line is to be run further than 5 feet down one side, the installation charge starts at the front of the house. Hookups to non residential buildings such as garage or a dog kennel cost extra.

A gas line run across your lot may cross other utilities. If the lines run parallel, however, there must be at least 3 feet between them. This insures that if one line must be dug up, there is no damage to adjacent lines.

Although gas companies discourage enclosure of their meters they may be enclosed if quick and easy access is provided and the enclosure is large enough for maintenance work. If you decide to enclose your gas meter, the regulator must be vented. This is done by the gas company. Because the meters must be changed every ten years (for meter accuracy checks), any enclosures or plantings you want should be located so they are not disturbed.
Mailboxes

INTRODUCTION

In Logan the local postal service uses door deliveries, curbline service and rural deliveries. The type of service depends upon your neighborhood and the number of dwelling units per acre. The required mailbox types for each delivery service and basic guidelines that the local post master has established are outlined below.

You must provide and erect your box at your own expense.

DOOR DELIVERY

If your property is one of the sections of Logan still receiving “to-the-door” delivery of mail, the following regulations should be followed:

- The house number should be clearly readable from the roadside.
- Receptacles should be in good working order.
- Walks and steps should allow safe, convenient delivery.
- Mailboxes should be made of a material that relates to the house design, in terms of size, texture and color.
- Since house-mounted mail receptacles have no flag, the postman will not stop unless he has mail. If you want to have your postman pick up mail on occasion, you can purchase some type of flag-mounted mailbox or design and build your own.

CURBLINE SERVICE

If your home is in a new development or subdivision you may have curbline mail service. In that case, your mailbox is to be located close to the curb in front of your house, on your property line and fastened securely to a sturdy post.

The following are general recommendations and requirements for curbline service:

- Your name and house numbers must be on your box (minimum 1” high lettering)
- Flags are not required, but are handy to let the postman know you want him to stop.
- Two residences may share the same post, or if possible keep their posts no more than one foot apart.
- Subdivisions must be 50% built-up before curbline service to each home will be provided. You may have to get a P. O. Box number or locate a pole box on an established route.
- Mailboxes should be located no more than 3 to 4 feet from the roadway, and 44 inches above ground, so that the box is easily accessible for deliveries.
- If cars block your mailbox, the postman will not stop.
- If you have questions talk to your local postman.
RURAL ROUTES

If you live in a rural part of Logan, you’ll be encouraged to group your mailbox with your neighbors’ (Figure 117) if practical. A newly installed box is required to be the traditional or suburban type (Figures 118 and 119). Just as in grouped boxes (Figure 120), the rural type can be covered or modified, but must provide some type of “flag” system. For further information or for answers to questions, contact your local Postmaster.

The following are requirements and recommendations for rural mail receptacles:

- Your mailbox must be located so the carrier can service it without leaving his vehicle.

- The box must be waterproof, 44” from the ground to bottom of box, 3 to 4 feet away from roadway, and on right hand side of road as traveled by carrier.

- The arrival area should be filled and properly graded, and kept free of snow.

- Your box numbers (not less than an inch high) must be on the side of the box visible to carrier as he approaches or on the front if boxes are grouped. You may want to paint the box to prevent rust, or install a cover.

- Be sure the size of box you buy will accommodate all types of mail.

Since Cache Valley receives a considerable amount of snow and snow removal is a problem, the use of a semi-arch or extended arm is recommended to allow snow plows to sweep under or near boxes without damaging the supports. This allows the carrier an easy access during winter seasons. See Figure 121.

Wherever you live, your mailbox can be a way to communicate your individuality. Designing and constructing a mailbox or mailbox cover could be a weekend project, and sharing a post with your neighbor could save money. All mailboxes are to be federal-approved types, or inspected and permitted by the local postmaster or postman to insure they are convenient for both you and the postman and provide adequate, weather-proof space for mail.

- Posts should be placed below frostline, or 3 feet below ground and set in concrete.

- Redwood is one of the best wood products to use for the post and any box cover.

- Metal should be painted to prevent rust.
Dog Runs

If you have an “outdoor” dog, or even if your family dog shares your home, a dog run can be a tremendous convenience unless you are fencing your entire yard. Chaining a dog continually can have adverse effects on his/her attitude toward human beings.

A dog run is a place where your dog can be safe, comfortable and not a nuisance to family and friends. Ideally, the run encloses adequate shelter, grass, fresh water, and play objects.

As you consider installing a dog run, think in terms of matching the area to your dog’s size and energy level. If your dog is not an escape artist, you could use redwood posts and wood framing with wire mesh, instead of typical chain link fencing. Whatever material you use you can screen part of it with plant material to give your dog some shade. And be sure to provide your dog with shelter from all weather. By connecting the shelter and pen to the garage you and your dog can have access from the garage during bad weather.

You’ll probably want to cover part of the run with a concrete slab, but give your dog an alternative surface, too. Be sure you have a good drainage system and some overhead protection to keep part of the run dry during storms.

Your dog would also appreciate something he can jump onto for resting or checking the neighborhood scene.

The height of the fence, the materials, and whether you have to bury the bottom in cement, will depend on the size of your dog and its dedication to escape efforts.
Signs and Graphics

If you want to “dress-up” your home with special house numbers or name plaques or permanent commercial signs, you’ll want to relate them to the structure of your home. To be functional, house numbers and family name plaques must obviously be legible, visible both day and night, durable, safe, and require little maintenance.

LEGAL RESTRICTIONS

Before you plan any residential graphics, you’ll need to know the following rules from the Logan City Sign Ordinance.

- In all residential zones (R1, R2, R3, R3A, R4) one- and two-family (duplex) structures are limited to 4 square feet of sign area for numbers and family name per structure.
- Multi-family attached housing has sign area limits set at 12 square feet per street-front.
- Free-standing signs in residential zones are not to exceed 6 feet in height.
- Seasonal decorations and temporary signs are not legally considered residential graphics.

AESTHETICS

Whether you choose ready-made or custom-made numbers and letters, try to have them compliment the surface on which they are displayed. At the same time, they should be easily seen. For night times you’ll want the numbers by a light, or where the headlights of your guests’ cars will spot them. Or, you can accentuate numbers and other signs by framing them, giving them a more dominant appearance.
Other References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

WATER FEATURES REFERENCES


The Outdoor Swimming Pool, Conference for National Cooperation in Aquatics, New York, 1956. 725.74 C76

OTHER REFERENCES

Guidelines for Development for the City of Logan, Utah.

Land Use Ordinance for the City of Logan, Utah.

Logan City Sign Ordinance
INTRODUCTION

To most people, landscaping is synonymous with plants, but as you have already seen, a landscaping design has to consider far more than which trees, shrubs, flowers and groundcovers should be used. Nevertheless, your decisions about vegetation are crucial to the image your home conveys, will certainly affect its resale value, and can reduce your energy costs.

Fortunately, since you live in Utah, you do not have to rely heavily on books (mostly geared to other climates and growing conditions) or your neighbor's know-how (which may not be much more than your own). Instead, you can take advantage of Utah State University's Ornamental Display Gardens at Farmington. The way these gardens are arranged, and the number of years they have been growing, combine to let you see how hundreds of plants can be used in an average landscape and how popular trees and other long-lived plants actually look when mature.

The Farmington unit is open year-round to the public at no charge. Additional information can be obtained from the Plant Science Department (ext. 7232) at Utah State University.

But until you can investigate the resources at Farmington, you can be considering how plants can be used to help conserve energy. A buffer of shrubs and trees surrounding the home will moderate local weather extremes. By proper choice and placement you can decrease the amount of heat lost through walls and windows, and provide shade during the summer. Densely planted materials can be effectively used to create privacy, absorb noises, filter and deflect dust and/or odors, and camouflage ugly views. Or you may have a view of the mountains or valley that can be enframed by vegetation. Plants also excel as erosion-control devices on slopes or river banks, and you might want to use vegetation to direct traffic around your yard and to discourage unwanted visitors.

You and your family's personal preferences should determine what plants you install — within the climate/soil constraints of your property. But before making specific choices, you'll want to know ultimate size, spread, maturation rate, maintenance requirements, and any natural restrictions that apply to your alternatives.

Many literature sources (See "Other References") present extensive lists and illustrations of plant materials adapted to this area. Rather than repeat those lists, in this chapter you will find ideas about how and why to use plants around your home, and suggestions as to the installation and maintenance procedures that are basic to most yards.

If you can find a source, native plant materials usually require less irrigation and maintenance (if planted in their natural habitats) than do most "imported" ornamentals. But these plants have growth, form, and color limitations that you may not find appealing. Also, a special permit is required from the Forest Service before you can transplant native plant materials from the mountains to your homes.

When choosing your plants, be sure to precatalogue characteristics such as color, texture, form, ultimate size, disease resistance and long-term maintenance needs, as well as whether they attract birds and/or other wildlife. Then evaluate these in terms of your personal likes and dislikes, as well as your landscaping design.
LEGAL RESTRICTIONS

- Plant materials placed on corner lots near the intersection, must grow no higher than 4 feet, and be 20 feet from where the roads meet.

- You are required to contact city officials if your plants obstruct overhead or underground pipes and wiring.

NATURAL RESTRICTIONS

- To survive in Logan, plants must be able to withstand fluctuating seasonal temperatures, short growing season, low humidity, low precipitation and harsh soil conditions. — unless you are willing and able to give them an artificial environment. You will also need to consider how hot and cold seasonal extremes are magnified on southwest and north sides of homes, respectively. And, since winds can increase the normal loss of moisture from plant leaves and branches, plants that are exposed to consistent canyon winds will have to be able to withstand such stress or be regularly supplied with adequate moisture.

- An early fall or late spring frost can kill your more tender plants, being especially dangerous for fruit and vegetable bearing plants, while heavy snows can break tree branches and limbs. Such hazards can’t be entirely avoided, but you can lessen their potentials by selecting plants that are adapted to northern Utah conditions.

- Depending on where you live in Logan, your plant choices will vary. If you live on the benches, temperatures are milder and the growing season (159 days) is longer as compared to the valley floor conditions (129 days). The valley floor will experience colder minimum and warmer maximum temperatures throughout the year. Evaluate your conditions and choose plants accordingly.
AESTHETICS

The appearance of your home can be enhanced by a careful addition of trees, shrubs and ground covers, especially if the seasonal changes in your plants are kept in mind as you design your landscape. With some pre-planning, you can let plants provide a gentle transition between your home's interior and the "outside" world. The secret is in massing compatible plant forms, textures, and color, to achieve a pleasing flow of lines and impressions.

- If neighborhood harmony and unity matter to you, you may want to use only (or mostly) vegetation that appears elsewhere in your vicinity. Or, if your home is near a river, the existing vegetation can provide a guide to what does well in those soils.

CLIMATE MODIFICATION

- Windbreaks, planted across prevailing winds, divert air currents, sand, dust and snow up, over, or around the location.

- A properly tree-shaded house will require far less air conditioning. Trees also cool the air in the summer by giving off moisture from the leaves, and trapping evaporating water from sprinkling systems and other water features.

- One goal of your landscape design can be to provide your family with a naturally cool indoor climate during hot summer months, and a solar-warmed home in winter. See Figure 129.
SPECIFIC CLIMATE MODIFICATION TECHNIQUES

To Make it Warmer:

Limit shade from the sun.

Have expanses of paved areas or untilled ground, rock or masonry, and south slopes, which absorb (and then release) more solar radiation than can other surfaces and exposures.

Build structural ceilings or plant canopies to trap heat given off from the ground at night.

Divert cooling winds.

To Make it Cooler:

Use shade trees and vines adjacent to or on walls.

Build overhangs, awnings, or canopies, which can make an area relatively cool in the daytime, and warm at night.

Plant ground covers instead of paving surfaces.

Prune the lower portions of your tree canopy to increase general air circulation.

To Make it Less Windy:

Use windbreaks, baffles and diverters, made of either soil (berms), plants or structures.

To Increase Ventilation

Prune the lower branches of your trees.

Minimize plantings under trees.

Create breezeways, structurally or with plants.

To Make it More Humid:

Overhead vegetation slows evaporation from the ground and increases transpiration (loss of water from trees and shrubs).

Irrigate heavily and often.

Use low windbreaks and ground covers whenever possible.

See Chapter 11 and its section on water features.

To Make it Drier:

Maximize southern exposures.

Maximize ventilation.

Use paved ground surfaces.

Good site drainage that removes storm waters and excess irrigation is essential.
# Plant Use Chart
Recommended for homes

The following chart describes several ways you can use plants. Consider the possible uses of trees, shrubs, and groundcovers before you buy. Your planned landscape will be much more beneficial and less of a maintenance headache if you do.

<table>
<thead>
<tr>
<th>Native Species</th>
<th>Characteristics</th>
<th>Various Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer palmatum (JAPANESE MAPLE)</td>
<td>S</td>
<td>-</td>
</tr>
<tr>
<td>Acer platanoides (NORWAY MAPLE)</td>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>Aesculus hippocastanum (HORSECHESTNUT)</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>Betula papyrifera (PAPER BIRCH)</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>Cercis canadensis (EASTERN REDBUD)</td>
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<tr>
<td>Crataegus oxycantha pumila (PAUL'S SCARLET HAWTHORN)</td>
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<tr>
<td>Elaeagnus angustifolia (RUSSIAN OLIVE)</td>
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</tr>
<tr>
<td>Fraxinus pennsylvanica lanceolata (GREEN ASH)</td>
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<tr>
<td>Gleditsia triacanthos inermis (THORNLESS HONEYLOCUST)</td>
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<tr>
<td>Malus 'Hopa' (HOPA CRABAPPLE)</td>
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</tr>
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<td>Populus tremuloides (QUAKING ASPEN)</td>
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<td>Sorbus aucuparia (EUROPEAN MOUNTAIN ASH)</td>
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<td>Tilia cordata (LITTLE LEAF LINDEN)</td>
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<td>Picea pungens (COLORADO SPRUCE)</td>
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<td>Pinus densiflora (PINYON PINE)</td>
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<td>Pinus nigra (AUSTRIAN PINE)</td>
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<td>Berberis maintenonii (MENTOR BARBERRY)</td>
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<td>Caragana arborescens (SIBERIAN PEA SHRUB)</td>
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<td>Cornus stolonifera (RED OSIER DOGWOOD)</td>
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<td>Cotoneaster acutifolius (PEKING COTONEASTER)</td>
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<td>Cotoneaster horizontalis (WINTERCREEP)</td>
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<td>Euonymus alatus compacta (DWARF WINGED EUONYMUS)</td>
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<td>Forsythia intermedia (GOLDENBELLS)</td>
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<td>Mahonia aquifolium compacta (DWARF OREGON GRAPE HOLLY)</td>
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<td>Potentilla fruticosa (SHRUBBY CINQUEFOIL)</td>
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<td>Prunus virginiana (DWARF FLOWERING ALMOND)</td>
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<td>Pyracantha coccinea 'Wyattii' (WYATTII FIRETHORN)</td>
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<td>Rhododendron 'Elegans' (SMOOTH SUMAC)</td>
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<td>Shepherdia argentea (SILVER BUFFALOBERRY)</td>
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<td>Spiraea vanhouttei 'SWEETENED CURDLE' (VANHOUTTE SPIREA)</td>
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<td>Symphoricarpos albus (COMMON SNOWBERRY)</td>
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<td>Syringa chinensis (CHINESE LILAC)</td>
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<td>Viburnum burkwoodii (BURKWOOD VIBURNUM)</td>
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<tr>
<td>Juniperus chinensis 'Sapphira' (SAPPHIRA JUNIPER)</td>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>Pinus mugo mughus (DWARF MUGO PINE)</td>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>Taxus cuspidata (JAPANESE YEW)</td>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>Akebia quinata (CARPET BIUOLE)</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>Euonymus fortunei (WINTERCREEPER)</td>
<td>S</td>
<td>-</td>
</tr>
<tr>
<td>Festuca ovina glauca (BLUE FESCUE)</td>
<td>S</td>
<td>-</td>
</tr>
<tr>
<td>Hedera helix (ENGLISH IVY)</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>Juniperus horizontalis (CREeping JUNIPER)</td>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>Lonicera japonica 'Halliana' (HALL'S HONEYSUCKLE)</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>Mahonia repens (CREeping MAHONIA)</td>
<td>M</td>
<td>-</td>
</tr>
<tr>
<td>Parthenocissus quinquefolia (VIRGINIA CREEPER)</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>Vinca minor (PERIWINKLE)</td>
<td>M</td>
<td>-</td>
</tr>
</tbody>
</table>

*H - High  M - Moderate  L - Low  
°F - Fast  M - Medium  S - Slow
INSTALLATION TECHNIQUES

Because different plants differ in their installation needs — your best bet is to check in specific terms when you are ready to plant. Good sources of information are the Utah State University Farmington Display Gardens and bulletins issued by the Utah State University Extension Service, as well as local nurseries. See Figure 132 for planting and staking details.

MAINTENANCE

- Most plants do well if you keep them in a mix of 3 parts topsoil (good quality silt loam) to 1 part peat moss.

- Some newly planted trees and shrubs will need guy wire or stake support for their first few years, especially in areas of high winds.

- Irrigation and drainage should be matched to each plant species and its environment.

- Some shrubs and trees need regular pruning to maintain their desired size and form.

- You may have to supply iron and/or other special feeding treatments to various plants over the years. Irrigation and plant growth can deplete a soil’s nutrients.

- If insects, other pests and/or weeds cause disease or inhibit plant growth, you’ll want to use controls before it is too late. Again, your local sources of information about what to use and how are the Utah State University Farmington Display Gardens and the Extension Service, and garden supply stores.

- A mulch of 2 to 3 inches (wood chips, bark, etc.) will help prevent weed growth and evaporation of soil moisture.

- Slow-time release fertilizers can be placed around the base in the bottom of the hole before planting. As the plant grows, additional regular feedings can be given.

- When planting trees and shrubs, the crown should be pruned to balance the loss of roots, thus equalizing the growth rates of both parts. Pruning cuts should be painted with tree paint to prevent disease and drying.

- Lawns have unique watering, mowing, feeding and weeding needs, depending on the species you install. Generally, long waterings once each week, weekly mowings and spring feeding (and weeding) will help establish a well-manicured lawn.
Pruning Techniques

SINGLE LEADER — Commonly used on shade trees to produce one dominant trunk. Prune those branches which are below the desired height of the branching mass.

MODIFIED LEADER — Used with apple, apricot, cherry, peach and some other fruit trees.

1. Cut the top of a year-old tree to induce the formation of side branches and a new leader. The early removal of all but selected branches produces a scaffold effect.

2. In two to three years cut back the new leader to promote strong-side growth and no further central leader growth.

OPEN CENTER PRUNING — Sometimes used for fruit trees and low branching vase-shaped specimens.

1. Cut back year-old specimen to three-foot height.

2. Select a number of side shoots and prune all others.

COMPENSATORY PRUNING — (transplanting only) — This is used to balance the leaf mass and the root ball if the roots have been severely damaged in transplanting, thus making it harder for the plant to absorb the needed minerals and water.

1. Cut all roots which have been severely damaged.

2. Prune back the branching mass.

REJUVENATION PRUNING — Used to correct tall, leggy, deformed or overgrown plants.

1. Cut plant to within one foot of the ground in late winter or early spring before the new plant growth occurs.

2. Fertilize generously.

3. Mulch ground.

4. Keep plant well watered during dry seasons.

PRUNING TO DEVELOP REQUIRED FORM

1. Start with young specimens.

2. Remove those branches which are not needed for branching and trunk development.

HEDGES

1. Hedges should be sheared regularly, one or two times per season for the first few years; more often for fast growers.

2. Trim at a 75-80 degree angle so that upper branches do not shade the lower ones.

PRUNING FLOWERING TREES AND SHRUBS

1. For plants whose new shoots flower in the summer or fall, prune in early spring before new growth occurs to save the flowering effect.

2. For flowers that occur on second year branch growth prune after flowering occurs.

BERRIED TREES AND SHRUBS

1. Prune to correct any over-crowding and bad balance, but try not to disturb berry display.

EVERGREENS

1. Most will need only a removal of unwanted branches.

2. New growth should be ½ to ⅘ grown but still soft when cut to ⅕ to ⅘ of its original length.
GROUND CARE EQUIPMENT

- A riding mower is suitable for large lawn expanses and may have an attachment for collecting leaves in the fall. Your other alternatives are power mowers (with or without self propulsion) and the old fashioned, quiet, push mowers.

- Push carts for spreading fertilizer or seed on lawns can be more effective than a small hand-held fertilizer and seeder in spreading materials over relatively large areas.

- A leaf sweeper can be push-operated or work as a power mower attachment to collect leaves and grass clippings.

- A turf aerator is a large roller attachment for riding mowers that pulls plugs of earth from the ground allowing air into the lawn and soil.

- To dig holes for tree planting, fence posting or footings, you may use an auger, which is a large motorized screw, hand operated or as a bobcat attachment. Or you may prefer a posthole digger, which is a small double shovel.

Sprayer — A hand-pumped, five-gallon container used for spraying fruit trees, gardens, and lawns.

Tree Feeder — An attachment for garden hoses which contains fertilizer and is placed 2' - 3' into the ground to feed tree roots.

Standard Tools — Shovel, pick, spade, hoe, hedge clippers, leaf rake, heavy rake, wheelbarrow.

NOTE: Most of this equipment is available in Logan on a rental basis. In all cases the cost of rental is based largely upon maintenance time required for each item, since all equipment must be thoroughly checked and serviced before going out again. Large equipment is also available with an operator at additional cost.

TREE MAINTENANCE EQUIPMENT

Long Handled Pruners — Used for cutting small diameter tree limbs.

Hand Pruners — Used for pruning small branches and twigs.

Pole Saw — A long-handled saw used for cutting otherwise inaccessible tree limbs.

Chainsaw — Used for cutting large tree limbs and tree trunks.

Fogger — A backpacked, motor-run sprayer that produces a very fine mist and is used to apply pesticides in densely weeded areas and around fruit trees.
# Pesticide Spray Schedule

<table>
<thead>
<tr>
<th>TIME OF YEAR</th>
<th>INSECT OR DISEASE</th>
<th>PESTICIDE SPRAY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WINTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>While bud on fruit trees are dormant</td>
<td>Aphids, scale insects, red spider mites</td>
<td>DNOC/petroleum oil or taroil</td>
</tr>
<tr>
<td></td>
<td>Moss or lichens on trunks and branches</td>
<td>Taroil</td>
</tr>
<tr>
<td>Between swelling and bursting of the buds. Exception: Peaches — spray just as buds begin to swell</td>
<td>Aphids, scale insects, leaf suckers, blossom weevil, caterpillers</td>
<td>Demeton-S-methyl, Dimethoate, malathion</td>
</tr>
<tr>
<td></td>
<td>Peach leaf curl</td>
<td>Proprietary copper compound or lime sulphur</td>
</tr>
<tr>
<td></td>
<td>The insecticide treatments can also be applied to bush fruits and ornamental shrubs including pines</td>
<td></td>
</tr>
<tr>
<td><strong>EARLY SPRAYS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not spray when bees are flying</td>
<td>If apple or pear scab seems likely</td>
<td>Benomyl, captan or mancozeb-with-zineb</td>
</tr>
<tr>
<td></td>
<td>Apple mildew</td>
<td>Dinocap, benomyl or lime sulphur</td>
</tr>
<tr>
<td><strong>AFTER BUD BLAST</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Immediately after petal fall</td>
<td>Aphids, red spider mites sawflies</td>
<td>Demeton-S-methyl, dimethoate, malathion</td>
</tr>
<tr>
<td>2. About mid-June and again in early to mid-July</td>
<td>Scab on apple and pear</td>
<td>Benomyl, captan, or mancozeb-with-zineb</td>
</tr>
<tr>
<td>3. Mid-July</td>
<td>Apple mildew</td>
<td>Dinocap, Benomyl, or lime sulphur</td>
</tr>
<tr>
<td></td>
<td>Fruit maggots</td>
<td>Malathion</td>
</tr>
<tr>
<td></td>
<td>Plum sawfly</td>
<td>Dimethoate</td>
</tr>
<tr>
<td></td>
<td>Scab on apple and pear</td>
<td>See 1.</td>
</tr>
<tr>
<td></td>
<td>Apple mildew</td>
<td>Dinocap, benomyl</td>
</tr>
<tr>
<td></td>
<td>Plum rust</td>
<td>Mancozeb-with-zineb</td>
</tr>
<tr>
<td></td>
<td>Bacterial canker or plums cherries, peaches, and almonds</td>
<td>Proprietary copper compound</td>
</tr>
<tr>
<td><strong>AFTER FLOWERING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In autumn. Especially effective as a spray at start of leaf-fall followed by another 2-3 weeks later</td>
<td>Bacterial canker or plum cherries, peaches and almonds</td>
<td>See above descriptions</td>
</tr>
<tr>
<td></td>
<td>Peach leaf curl</td>
<td></td>
</tr>
</tbody>
</table>

(Pesticides should only be used when absolutely necessary.)

Taken from: CHILTON'S ENCYCLOPEDIA OF GARDENING
Other References

Some of the following references include call numbers. These books are currently available at the Utah State University Library. From time to time, the Library will receive new publications that will be helpful. Also, local book stores have in stock many of these references, and continually receive newer, up-to-date literature.

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Ar67

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B153h

635.956
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