SULIS: Sustainable Urban Landscape Information Series — Design

PARTS IN THIS SERIES

SUSTAINABILITY AND LANDSCAPE DESIGN

Discusses the major considerations that need to be incorporated into a landscape design if a sustainable landscape is to be the outcome. Landscape functionality, cost effectiveness, and environmental impacts are a few of the items discussed.

THE BASE PLAN

Describes how information is gathered, compiled and used in the development of a landscape design. How to conduct an interview, carry out a site survey and site analysis, and how to use information collected from counties, municipalities and developers are some of the topics discussed.

THE LANDSCAPE DESIGN SEQUENCE

Explains the essential steps to create a sustainable landscape design. The design sequence includes the creation of bubble diagrams, concept plans, and draft designs

THE COMPLETED LANDSCAPE DESIGN

Describes the transition from a draft to the completed landscape design. Important principles and elements of design are defined. Examples of how each is used in the development of a sustainable design are included.

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SUSTAINABILITY AND LANDSCAPE DESIGN

There are five considerations in designing a sustainable landscape. The landscape should be:

- Visually Pleasing
- Cost Effective
- Functional
- Maintainable
- Environmentally Sound

These considerations are not new nor have they been without considerable discussion. Problems arise, however when some considerations are forgotten or unrecognized until after the design process is complete and implementation has started.

Sustainability in the design process is also affected by the order of the main considerations. Having a visually pleasing landscape is usually the most important consideration and is addressed first in the design process. This is easy to understand since it is the primary concern for most clients. A close second, or of equal importance to a client, is cost.

Many times functionality, maintenance and the environment receive less attention or are neglected altogether until a problem arises in the completed landscape.

With a sustainable approach to landscape design, the visually pleasing and cost effectiveness considerations should be the last ones evaluated.

This in no way diminishes the importance of a "good looking" or cost effective landscape, but challenges the designer to create that beauty from a more sustainable approach.

A more sustainable order of considerations would be:

- Functional
- Maintainable
- Environmentally sound
- Cost effective
- Visually pleasing

It is important to note that none of these considerations are mutually exclusive in the design process. The development of any design will require that each piece be revisited several times in light of the others before the best solution is reached.

FUNCTIONAL LANDSCAPES

Sustainable designs need to be functional. A functional landscape allows for the easy accomplishment of movement, work, recreation and leisure that occurs in and around the landscape. These functions are related to the actual process or activities associated with a family, a business, or a public place.

Examples that are **not** functional:



Steps or ramped steps with the improper riser to tread ratio, making them uncomfortable or unsafe to use.

Service roads too narrow and loading zones with limited space for turning.



Turf areas located on steep slopes that are difficult or dangerous to maintain.

MAINTAINABLE LANDSCAPES

The functional and maintainable considerations are closely related. A functional design has more to do with the users of the landscape while a landscape that is maintainable is easier for landscape managers to take care of. In other words, a landscape should be functional from both a use and maintenance standpoint.

A maintainable landscape provides for reduced maintenance at a particular maintenance level or condition. This lowers labor costs and makes maintenance operations easier.

A maintainable landscape also reduces the need for inputs such as fertilizers, pesticides, equipment, water and other things. It is important to note that it only reduces the amount of input needed; it does not eliminate it.

Examples of landscape situations that are **difficult to maintain**:



Sidewalks too narrow for snow removal equipment. This increases the annual maintenance costs to repair the adjacent areas.



Turf areas too narrow to mow with larger, more efficient mowers. These areas are not only difficult to maintain, but have limited functional value.



Edging that interferes with mowing and doesn't really edge.

ENVIRONMENTALLY SOUND LANDSCAPES

An environmentally sound landscape design must first be functional and maintainable. In addition, the proper design of plants and related hardscaping greatly affects the quality of that landscape over its entire life. For example, a philosophy of "right plant right place" as well as "right plant right purpose" can dictate the amount of environmental, disease, and insect stress that a plant can tolerate. A plant continually in stress will require more maintenance. That means more labor, fertilizer, pesticides, and ultimately cost.

Examples of landscape designs that are not environmentally sound:



Signs, trees, etc. too close to streets or walks make application of fertilizers and pesticides more difficult. This increases the potential for these materials to spill onto streets, eventually reaching lakes and streams.



Lawn clippings discharged onto hard surface areas ultimately increase phosphorus levels in storm sewers.

COST EFFECTIVE LANDSCAPES

In a sustainable landscape design, the consideration of cost effectiveness is impacted by the processes, plants and hard-goods used in the implementation of that landscape, and by the quality of each.

Cost should not dictate whether the landscape is functional, maintainable, or environmentally sound. These considerations should be met regardless of the budget. In other words a simple low cost landscape should be as sustainable as an extensive high cost landscape. In many cases, the installation cost of a sustainable landscape may be less.

Certainly the ongoing maintenance costs of a functional, maintainable, and environmentally sound landscape will be lower, which means considerable savings throughout the life of the landscape.

Examples of landscape designs that are **not** cost effective:



Over-planting and improper spacing. This landscape looks fine now, but in a few years it will be overgrown, difficult, and costly to maintain.



This wall makes maintenance difficult and really serves no function.

VISUALLY PLEASING LANDSCAPE

A visually pleasing landscape is what we all strive for. The considerations of functionality, maintainability, environmental soundness, and cost effectiveness provide the framework needed to create a visually pleasing landscape. Designing a sustainable landscape requires the integration of more variables but should not affect the aesthetic value of the landscape.

Examples of a landscape design that is **not** visually pleasing:



Poor foundation plantings (busy, no key plants, no open space, no concept lines).

Examples of landscape designs that are visually pleasing and demonstrate sustainability:



Use of retaining walls to reduce slope.





Proper plant spacing around a foundation.

Use of an edging line to eliminate a mowing problem.

It is important to note that none of these considerations are mutually exclusive in the design process. The development of any design will require that each piece be revisited several times in light of the others before the best solution is reached.

THE BASE PLAN

Please be sure to read the Sustainability and Landscape Design section of this information series. The information is needed to fully understand the information in this section.

The Base Plan is developed from the information collected about the site. Base plan information is the starting point in the development of a landscape design. Information is obtained from many places and can involve communicating with many people. The development of a base plan is necessary to design residential, commercial, and public grounds areas.

Depending on the size and complexity of the landscape project, segments of the process used to create a base plan may be combined or eliminated. Larger and more complex projects will require a greater number of maps, plans, and other informational pieces. This process normally includes:

- Interview
- Site survey
- Site analysis
- Plot plan
- Site plan
- Structure and utility blueprints

A final step incorporates this information into one drawing called a Base Plan.

THE INTERVIEW, ASKING THE RIGHT QUESTIONS

In a residential landscape design program, the information gathering procedure is simply called the client or family interview and frequently involves the designer and the owner of the residence.

In commercial designs, the process is somewhat more involved and may include a needs assessment. Owners, managers, supervisors, maintenance personnel, or city or county officials may be involved along with a landscape designer, architect or engineers in the preparation of a needs assessment.

The interview and needs assessment are very important parts of the design program that stress sustainability. They should be completed as a "self evaluation" when home or business owners are designing their own property, and as a prerequisite to working with a landscape designer or architect. This is very difficult for individuals without formal training to do, because many of the questions may seem unrelated to the project they visualize.

Professional landscape designers and architects may effectively conduct the interview or needs assessment but may not be aware of the most important questions relating to a functional, maintainable, environmentally sound, and cost effective landscape. Frequently, the specifics of a commercial landscape are left solely up to the designer or architect. "Just make it look as good as possible within the allocated budget!", is often the attitude as money and construction deadlines become short.

When this happens, the designer or architect may not have the information needed relating to sustainability. Unfortunately, the primary goal is to finish the project, even if it is at the expense

of quality and sustainability. To avoid difficulties, the maintenance personnel involved should always be included in the interview and needs assessment process.

Questions often missed when conducting landscape design interviews and needs assessments:

- Who will be maintaining the landscape?
- What size mower will be used?
- What will the spaces in the landscape be used for?
- How much labor is available for maintenance?
- What is the supply, equipment, and expense budget?

LANDSCAPE DESIGN QUESTIONNAIRE

Name:Address:	Home Phone: Cell Phone:	
Email:		
City, State, Zip:		
Name and age of family members: (list any outdo	oor hobbies or sports that take place in the yard)	
Any Pets? \Box Yes \Box No If yes, what kind?		
What style of house do you have? (Victorian, cot	tage, etc)	
How old is the house? years		
Do you have plot plans or architectural plans for the house or lot? \Box Yes \Box No		
What is the approximate budget for the design and installation of the landscape? \$ Comments		
Landscape Maintenance and Installation - Chec	k all that apply:	
Who will maintain the landscape? \Box Owner \Box O	Contractor 🗆 Other	
Who will install the landscape? \Box Owner \Box Contractor \Box Other		
Soil / Drainage issues - Check all that apply		
□ Poor Drainage □ Compacted Soil □ Excessive	Runoff	
\Box Steep Slopes \Box Poor Water Holding \Box Other G	rade Problems	

Utilities

Above ground utilities	
Polow ground utilities	
below ground utilities	

Light Conditions - Please provide information on the amount of sun the landscape receives. Be specific.

Area		Amount of light	hours per day
Area		Amount of light hours per	
Area Area Area		Amount of light	hours per day
		Amount of light	hours per day
		Amount of light hours per da	
Area		Amount of light	hours per day
Special Considerations – C	Check all that apply		
□ Screens needed	□ Traffic noise	□ Windbreaks	□ Snow drifting
\Box Shade needed	□ Too much shade	□ Fence needed	□ Poor driveway
□ Turnaround needed	□ Poor walks	\Box Existing plants	
🗆 Too much lawn	□ Not enough lawn	\Box Paths on turf	
Others (please specify)			
Plant Selection			
Plants client likes			
Plants client dislikes			
What type of foundation p	lanting do you prefer?		
□ Deciduous shrubs	□ Evergreen shrubs	□ Combination	

Service Areas – Check all that apply			
□ Cloths line	□ Compost bin	□ Dog kennel	□ Boat/trailer storage
□ Vegetable garden - Appro	x. size?sq f	t	□ Grill/fire pit
□ Outdoor kitchen			
□ Others			-
Recreational/Entertainmen	t Areas		
Would you like recreational	areas? □ Yes □ No		
If yes, please indicate the ty	pe of recreation		
Would you like a deck or patio? □ Yes □ No			
If yes, please indicate the av	erage number of peop	ole you usually ente	rtain))
Please check all items that you would like incorporated into the landscape design:			
□ Annual flowers	□ Perennial flowers	□ Or	namental grasses
🗆 Prairie garden	□ Water garden	🗆 Bu	tterfly garden
□ Vegetable garden	□ Trees	□ Sh	rubs
□ Entry garden	□ Driveway/car turna	around 🗆 Pat	tio garden
□ Walks/paths	□ Deck	🗆 Sta	irs
□ Retaining walls: □ timber	□ block	□ Ou	tdoor lighting
□ Swimming pool	□ Foundation plantin	ngs 🗆 Ch	ildren's play area
□ Irrigation	□ Lawn	□ Sh	rub beds border
□ Fencing	□ Mail box		g kennel
□ Large lawn for recreation	L	□ Wil	dlife garden
□ Large shade trees	□ Other		

Would you like planting beds mulched? \Box Yes \Box No		
If yes, would you prefer:		
□ Decorative rock	\Box Wood chips	
□ Shredded bark	□ Compost	□ Other
Desce preside our other information that you feel will be useful in the development of your		

Please provide any other information that you feel will be useful in the development of your landscape design. Please be as specific as possible.

THE SITE SURVEY

A site survey (often called the site inventory) involves a specific and honest evaluation of the property. It includes categories like existing plants and structures, good and bad views, soil, drainage, and site topography. Measurements are also taken during the site survey to accurately locate these areas.

It is often difficult for someone who lives or works in direct proximity to a site to see what others do when they observe or pass through that same area. This is not only true of what we directly see in the landscape (a photographic view), but is especially true of the support structure we do not see; i.e., soil and drainage.

Like the interview, a site survey should include information from the property owner, the landscape architect or designer, and the individual ultimately responsible for the ongoing maintenance. The site survey team should walk and talk about the property together.

For example: In a newly constructed landscape, a plant may die and be replaced, only to die and be replaced again, or the plant might hang on for months in poor condition while secondary problems such as insects and diseases move in. The real problem, poor drainage, should have been recognized during the site survey.



It is easy to try to micro-manage failing plants, increasing labor inputs, dollars, and supplies, trying to guess what the problem is. If the drainage problem had been identified and solved during the site survey process, or another plant had been chosen that would grow in a wet environment, the sustainability of that plant in the landscape would have been improved. A site survey is a process of collecting information. If done correctly, it will point out all important site characteristics. It will include positive features as well as problem areas that may have a negative impact on the landscape and ultimately reduce sustainability.

Money spent improving site problems prior to installation is not as evident as the money spent on the visible components of the landscape. Attention to site preparation will reduce annual maintenance and replacement costs, saving money in the long term.

Rushing to complete a landscape by ignoring a site survey is never conducive to developing a sustainable landscape.

SITE EVALUATION FORM

(Adapted from: Landscaping Your Home WM. R. Nelson Jr. CHP, pg. 22.23)

BUILDINGS AND STRUCTURES (walls, walks, fences, decks, patios, etc.) Can structures be relocated to improve the site?
Do structures have poor access?
Can plantings be used to protect or shade structures?
Are structures proportional to the lot size?
What type of construction material will best blend with existing structures?
Can retaining walls be used to reduce slopes?
Are there structural areas or utilities that require screening?
Are paved areas needed to make areas more functional?
Can steps of ramps be used to give better access to any areas?
Is additional storage space needed?
Is additional storage space needed?Other

TOPOGRAPHICAL FEATURES (Hills, water, woodlands, wetlands, prairie, etc.)
Are there water features on the lot?
Are there steep slopes that need to be reduced?
Are there rocky areas that will affect plantings?
Are there rock features that you would like to incorporate into the design?
Are there areas that need to be raised or filled?
Are there erosion prone areas?
Are adjacent lots at the same level?
Other

DRAINAGE

Is there adequate drainage away from structures?
Does drainage flow onto neighboring properties?
Do neighboring properties drain onto the lot?
Are there low spots that can be filled to improve drainage?
Are there erosion areas that can be eliminated with better drainage?
Is there standing water?

SOIL PROPERTIES

Is additional topsoil needed?	
Does the pH of the soil need to be altered?	
Does the soil drain fast or slow?	
Can drainage be improved with soil amendments?	
Is there adequate organic matter in the soil?	
Has a soil test been done on the site?	
Will fertilizer need to be added to help plantings?	

VEGETATION

Is there existing vegetation on the lot?
Will trees or plantings need to be removed?
Is there existing turf that can be improved?
Does the existing turf need to be larger or smaller?
Can existing vegetation be incorporated into a new design?
Can native areas be incorporated into the design?
Are there areas where plants other than grass may be used as a ground cover?

MICROCLIMATES

Are plantings needed to shade structures?
Are windbreaks needed to reduce wind?
Are there heat sinks on the lot that will affect plant selection?
Does the region get enough rain to provide adequate irrigation?
What is the general climate in the area?
Does the region get enough snow for winter protection?

Is snow removal a problem on the property?	
Are there areas where snow piles or drifts?	

WALKS, PATHS, & DRIVES

Do walks and paths provide proper access to buildings and areas on the property?

Can walks or paths be relocated to provide better access?
Are walks, paths, and drives the proper width?
Can any walks, paths or drives be widened to make them more functional?
Can walks, paths, or drives be given more interest?
Do walks, paths or drives have water or ice problems?
Can additional areas be created to provide off street parking?
Is lighting needed along any of the areas?
Do walks and paths provide adequate access to all areas?
Do traffic paths form across any of the turf areas?

EXTENSIONAL LANDSCAPE

Are there views that need to be changed?	
Is a screen planting needed to block a poor view?	
Is a screen planting needed to reduce noise?	
Are there views that can be framed or added?	
Are public and service areas adequately screened?	

THE SITE ANALYSIS

While the site survey is a collection of information, the site analysis is an evaluation of the challenges and potential benefits included in that information. The site analysis is a combination of sketches, plans, and notes.

Example of a Site Analysis



Many designers find it productive to begin development of the site analysis while completing the site survey.

Definition: A site analysis aids the designer in the thought process that leads to the actual design sequence.



PLOT PLANS

The Lot and Plot Plans

A lot plan is a plan developed to scale showing property lines, bearings and distance, true north, easements, setbacks, right-of-ways, sidewalks, streets and boulevards. The plot plan shows the lot with the structures accurately located on it. Plot plan information is usually available from the developer, or the city or county offices. Completed plot plans can be obtained for most new developments. A surveyor may need to be hired to accurately identify this information on older properties.



Key to a Typical Plot Plan

A "Plot Plan" is an engineer's scale drawing of the lot showing the placement of the proposed house. The following descriptions refer to the plot plan above.

ID Description

- A These numbers represent the existing elevation, before the house is built (in feet above sea level). They show which points are higher or lower than others.
- **B** These numbers represent the proposed elevations, after the house is built. The developer may change elevations during construction to create a smoother yard or to prevent erosion problems, or to accommodate the design of the house.
- **C** These lines show where easements for utilities or drainage are located.
- D Arrows like this show the direction water will move following heavy rains or during spring snow melt.
- **E** A double line indicates the edge of the adjoining roadways.
- F Dashed lines show the setback distances established by local authorities or the developer.The house and other structures must be at least this far from the property lines.
- **G** These large numbers indicate the distance from point to point, or from corner to corner. In this case, the southeast lot line is 80.78 feet long.
- **H** These smaller numbers give other distances, such as the dimensions of the house or distances between the house and the lot line.
- These numbers are surveyors notations that tell which way the lot line runs. In this case, it is read "North 40 degrees, 33 minutes, 57 seconds East." It means that starting at the southern corner of this lot, the southeast lot line runs in a direction 40 degrees, 33 minutes and 57 seconds east of a line drawn due north from the southern lot corner.
- J This "R" number gives the radius of the curve in the adjoining road, and is used to determine the exact lot line and roadway. It means a circle with a diameter of 213.73 feet would give a curve with the correct arc to form this lot line.
- K This triangle is another surveyor's notation which indicates the direction the curved lot line will go. It is similar to that of straight lot lines, as described under letter "H" above.
- L This is the lot number within the subdivision or development. When property is initially divided, the surveyor prepares a "metes and bounds" legal description. For this lot, it would read something like "Beginning at a surveyor's monument being the south corner of the property, thence North 40 degrees, 33 minutes, 57 seconds East a distance of 80.87 feet, thence North 65 degrees, 23 minutes, 53 seconds West, a distance of 128.15 feet, thence ..." To make things simpler, the developer files legal descriptions of each lot with the proper authorities, and gives each lot a number. From that point on, the property's legal description would be "Lot 17, Block __ of the Plat of _____, County of _____, State of _____."

THE SITE PLAN

In new properties, the site plan may be the same as the plot plan. In older properties, many changes and additions have occurred since the original plot plan was completed. Structure and utility blueprint information is frequently used to update the site plan.

Example Site Plan



STRUCTURE AND UTILITY BLUEPRINTS

Structure and utility blueprints can be obtained from the architect, the builder, or the city office. These maps show utilities such as gas, electric, and sewer. The information on them is very important and needs to be considered throughout the design of the landscape.

Example Blueprints



THE LANDSCAPE DESIGN SEQUENCE

Please be sure to read the Sustainability and Landscape Design and Base Plan sections of this information series. Previous information is needed to fully understand the information in this section.

There are four main steps in the landscape design sequence. Each step is prerequisite to the next step. The landscape design sequence varies depending on the size and complexity of the landscape project. The process may require numerous drafts for a large project. A smaller landscape may only require a visualization exercise to complete one or more of the steps. In any case, the landscape design sequence cannot begin until the base plan has been completed.

The four steps in the landscape design sequence are:

- Bubble Diagrams
- Concept Plans
- Draft Designs
- The Completed Landscape Design

The completed landscape design, because of its importance and complexity, is treated separately, in the Completed Landscape Design section.

BUBBLE DIAGRAMS

Bubble diagrams are used to define spaces within the landscape. Each space will receive specific attention during the landscape design process. These spaces are identified from information on the base plan and in the landscape design program. Spaces are frequently defined by the function that will take place in them.



Several bubble diagrams are completed before the best one is selected.

A bubble diagram defines spaces that are identified on the base plan.

At first, bubbles have many shapes and sizes. They roughly correspond to what will eventually be a real space in the landscape, but they are not specific and are without detail. A designer may sketch many different bubble diagrams before the best solution is determined.

Once a bubble diagram is chosen it will continue to be refined. The sizes and shapes will change. Some bubbles may divide into more than one while others will converge.

Examples of spaces that need to be located on bubble diagrams:



Dog kennel



RV parking area

Firewood storage

Spaces can also define hard-features, specific plant groupings, view areas, or topographical features.



Entry or patio garden



Open area to view of a pond or lake.

In a sustainable design, spaces are especially important to separate areas that require different maintenance levels.



Mulched bed next to lawns or other groundcovers

A high maintenance lawn next to a low maintenance shrub bed, woods, or prairie.



Ground cover area

Spaces can also be important because they impact a specific environmental concern.



Lawn areas narrow next to streets and walks



Trees under power lines

CONCEPT PLANS AND LINES

At a point when individual bubbles begin to take on specific characteristics, the process enters the concept planning stage. As with many segments of the landscape design process, part of the process is a visualization exercise and part of it takes place on paper.

As individual spaces within a concept plan evolve, the relationship between spaces also materializes. Concept plans are more detailed than bubble diagrams. The shapes of spaces begin to look like what the spaces in the completed landscape will look like.

In a concept plan, the shapes merge to form borders with one another. These borders will also become the separation points between spaces in the completed landscape. In a concept plan, we call these borders concept lines.

Some concept lines can become real lines in the landscape and some are imaginary. Landscape edging that divides a mulched bed from a lawn is an example of a concept line that becomes a "real line" in the landscape.

Imaginary concept lines will not become hard lines like edging or visible transitions between spaces; e.g., cement to lawn, mulch to ground cover. They do divide spaces that are different from one another; e.g., a shaded lawn from full sun lawn, a high maintenance area to a low maintenance area, bermed areas from flat areas. There are an infinite number of spaces that concept lines can divide in a landscape.

Concept plans and concept lines provide good clues to the future sustainability of a landscape design. An analysis of spaces created by them should trigger considerations of function, maintenance, environment, and cost effectiveness. In other words, the greater the definition between spaces, the easier it is to build sustainability into the landscape.

Examples of how concept plans affect the sustainability of a landscape:



Trees and shrubs located outside an open, irrigated turf area



Front sidewalks should be located away from foundations to providing adequate room for an entry garden with proper plant spacing, and allow direct access from the driveway.

A helpful hint for developing effective spaces in a concept plan is to consider the larger spaces first in the concept plan. This assures that these spaces will be properly designed and makes the design of corresponding smaller spaces easier.

For example, a common large space in residential and commercial landscapes is the lawn area. A pleasing lawn shape on the concept plan will usually indicate lawn areas that are more functional and maintainable. Because the shapes created by the lawn concept line correspond to that of the bedlines, the two lines become one and provide a visually pleasing appearance.

Large spaces that should be considered first in a concept plan:

- Lakes
- Woods
- Prairies
- Lawn and large ground cover areas
- Parking lots
- Courtyards

Spaces and shapes that are impacted by the large spaces in a concept plan:

- Decks
- Patios
- Walks
- Pools
- Plant material beds and borders





HOW LINE FORMS DICTATE SPACE AND STYLE

By Tim Ripp

DESCRIPTION:

Design principles are the fundamental guidelines every landscape designer should use as a basis for creating their plans. These principles include scale, line value contrast, lettering and line forms. There are five basic line forms:

- Rectilinear
- Arc and tangent
- Arc and radii
- Arc and arc
- Curvilinear

Line forms emphasize real and imaginary lines and play an important role in the creation of large and small spaces within a landscape. In landscape design, spaces define "outdoor rooms" and the movement and flow between those rooms. Line forms dictate traffic patterns within the landscape and help visitors guide visitors through the various spaces. Placement of hard features will also depend on the line forms used and the flow they create.

Each type of line form -- rectilinear, arc and tangent, curvilinear, etc. -- will create spaces differently and the designer should be aware that the line form they choose to define a space will depend on the design style they are trying to achieve and the desired experience. Blending styles and remembering that "form follows function" allows a designer to accentuate the best elements within a landscape.

LINE FORMS AND STYLES:

Rectilinear Line Form

Rectilinear:

Grid: the pattern created by lines running side by side (parallel) and intersecting with lines running at right angles (perpendicular) to the parallel lines.

Form

- No arching or curved lines;
- Line segments may be of any length or various lengths;
- All lines are straight;
- All lines are either parallel or perpendicular to one another;
- Lines intersect at 90-degree angles;
- Promotes a regular grid pattern style

- The intersections of this grid pattern dictate gathering spaces;
- Rigid style;

- Very formal style;
- Typically symmetrical;
- May create the feeling of cold and unwelcoming if underdeveloped.

	P Attern.	
and the second second		
		90°

Figure 1: Example of a grid pattern in a rectilinear line form. (Illustration by Tim Ripp)



Figure 2: Example of rectilinear form in a landscape design plan view. (Illustration by Tim Ripp)

Arc and Tangent Line Form

Arc: any portion of a circle or ellipse.

Tangent: a straight-line segment that meets an arc, but does not break the curve.

Form

- A series of arcs connected by straight-line tangents;
- Only two types of line segments: straight tangents and arcs;
- Arcs may be either circular or elliptical;
- Lines that do not meet are either straight or intersect at 90° angles;
- Lines can be either parallel or perpendicular;
- Lines extending beyond an arc will form a grid;
- Tangents cannot intersect directly;
- Circular arcs will have a constant radius, but circles may differ within the design;
- Elliptical arcs have a slope that is ever increasing / decreasing.

- Less formal;
- May be symmetrical;
- Patterns. Of straight-line tangents express rectilinear form;
- Straight-line tangents promote movement;
- Arc segments dominate the design;
- Curves increase the overall flow within the design;
- Arc areas promote pause and gathering areas.



Figure 3: Example of arc and tangent form. (Illustration by Tim Ripp)



Figure 4: Arc and tangent form used for concept lines in a landscape design. (Illustration by Tim Ripp)

Arc and Radii Line Form

Form

- Two major line segments, straight lines and arcs which are a portion of circles and ellipses;
- Straight-line segments must radiate from the center point of a circle or ellipse;
- The straight-line segments constitute the radius and must be complemented by the presence of at least some portion of the circle or ellipse;
- Straight-line segments must intersect circle or ellipse at an angle perpendicular to the tangent of that arc;
- All radii must intersect at right angles, or run parallel or perpendicular to each other;
- Radii can be of varying lengths;
- Arcs can be of any length and size;
- Straight-line segments will form a grid pattern similar to the rectilinear form.

- Formal style due to the grid pattern that develops;
- Arcs tend to promote gathering spaces;
- Radii dissecting arcs tend to extend space within the arc beyond it;
- Straight-line segments connecting two or more arcs will often promote movement between spaces.



Figure 5: The form of arc and radii (Illustration by Tim Ripp)

Arc and Arc Line Form

Form

- Utilizes only one type of line segment;
- Line segments are always portions of arcs, either circles or ellipses;
- Circular arcs will have consistent radii;
- Elliptical arcs will connect all major axis with the end of minor axis;
- Circles and ellipses may be of varying lengths within the design;
- Arcs may intersect in a variety of configurations as long as the relationship of the intersections remains consistent within the design plan;

- Informal overall design concept;
- Configuration of overlapping circles and ellipses which open into one another and promotes sharing of space;
- Although informal, the style of this type of line form is not necessarily natural of flowing;
- Greater space within an arc promotes its use as a gathering space;
- Smaller arcs and the space within an arc promote movement.



Figure 6: Example of arc and arc line form. (Illustration by Tim Ripp)



Figure 7: Arc and Arc line form as a concept line in a plan view. (Illustration by Tim Ripp)

Curvilinear / Biomorphic / Organic Line Form

Form

- Line segments consist of only one type of spatial edge;
- All spatial lines are curving;
- All arcs have consistently changing radii;
- Arcing lines may increase / decrease along the direction of movement through the plan;
- Arcing lines may change orientation / direction so as to never re-curve /close upon itself;
- Line segments can be of any length.

- Very informal;
- Natural, flowing lines;
- Reflects forms found in nature;
- Movement of free-form lines in the landscape offers more possibility for exploration and discovery;
- Tends to blend manicured landscapes into more natural environments;



Figure 8: Example of curvilinear / organic line form. (Illustration by Tim Ripp)



Figure 9: Curvilinear line form in a landscape design plan view. (Illustration by Tim Ripp)

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DRAFT DESIGNS

The number of draft designs, sometimes called preliminary designs, depends on the size and complexity of the project. A rough draft is redeveloped until the designer is satisfied with the results and ready for the completed landscape design.

Draft designs continue to define what is happening in the concept plan. The concept lines and spaces created in the concept plan now have specific forms and functions. Some designers refer to these spaces as the outdoor rooms of the residence or business.

It is at this point in the landscape design sequence that the consideration of sustainability is very important. While sustainability is sometimes lost when larger spaces are created, it is the design within these larger spaces and the smaller spaces next to them that have the greatest effect on sustainability. Spaces containing plants are where the largest gains and losses to sustainability occur.

Assignment of plant spaces in draft designs

Plant spaces are usually identified by a specific classification (tree, shrub, annual flower, etc.) or by their function (screen planting, foundation planting, or patio garden). The location of the plant spaces on the draft design helps determine plants or plant groupings.

The order in which specific plants and plant groupings are located on the draft design is also important. Plants with important functions are usually located first. This will vary with the specifics of each individual project, but trees are generally located first during the development of draft designs.

Plants and Plant Groupings



Trees









Key plants





Screen plantings

Foundation plantings

35



Border plantings



Corner plantings



Freestanding or group plantings







Accent plants

.

Specimen plants

Mass plantings

antings

36


Annual flower gardens and perennial flower gardens

As the draft design evolves, more specifics may be added. Hard-features may now have precise dimensions but may still be lacking texture, color or specific material selection. Plant beds and borders may now be composed of mass plantings, accent plants, trees and specimen plants.

Example draft design



THE COMPLETED LANDSCAPE DESIGN

Please be sure to read the Sustainability and Landscape Design, and Base Plan and the Landscape Design Sequence sections of this information series. Previous information is needed to fully understand the information in this section.

When the landscape design sequence has been completed through the draft design stage, the designer is ready to begin development of a final or completed landscape design. To complete a landscape design, specific hard-goods and plant materials must be selected. These selections are made through the use of principles of design and elements of design. This process is completed with the development of a plan view drawing which represents the final or completed landscape design.

- Principles of design is a process that defines and ties all individual components together to create unity within a design. Example of principles of design would be: simplicity, variety, balance, emphasis, sequence, and scale.
- Elements of design are the criteria used in selecting and organizing plants and hard-goods into the landscape. Using these criteria the designer will be more likely to use a wider variety of plants.
- This process is completed with the development of a plan view drawing which represents the final or completed landscape design.

PRINCIPLES OF DESIGN

If several "professional landscape designers" were given the same design problem (a residence, commercial building, or public grounds), the same base map and design program, and the same budget, they would each develop a different solution to the problem. Their final designs would also look much different. While one design might have more appeal to the client than the others, all could be excellent solutions to the design problem and ultimately create excellent sustainable landscapes.

These different landscape designs would have one thing in common: the designers would all have applied appropriate principles of design in the development of their design solutions. Principles of design are guidelines to follow in determining the specifics that transform draft designs into completed landscape designs. In other words, it is this process that defines and ties all the individual components of the design together. This is often described as unity within a design. It impacts how the design looks on paper and ultimately as the installed landscape.



Unity in a completed landscape

What are the principles of design?

Designers differ in the number of design principles they feel are important. The number and specific definitions of these design principles are not as important as the overall philosophy of how they create unity within a landscape design.

By definition, some principles of design are almost the same, some are contradictory, and some may be appropriate in one design while others are not. Most importantly, there are countless examples of how a design principle can be expressed. All could be correct depending on the circumstances. In other words, there can be more than one correct answer to a landscape design problem.

For these reasons, applying principles of design to the creation of a final design is very difficult for a designer with little experience. It is much easier to learn how to apply the principles of design through observation and experience rather than by definition only.

Principles of Design:

- Simplicity
- Variety
- Balance
- Emphasis
- Sequence
- Scale

Simplicity

Simplicity means understanding what is, and is not important in a landscape design. Details that will not have a major impact on the landscape are omitted to keep it uncluttered.



Variety

Variety is mixing up the form, texture, and color combinations in a landscape to create extra interest without sacrificing the simplicity of the design.



Balance

Balance is the relationship between elements in the landscape. Balance can be formal or informal. Formal balance would usually mean that one side of the landscape is a mirror of the other, while informal balance is when plant sizes and numbers are only relatively similar on both sides.



Example of formal balance:



Emphasis

Plants and plant groupings provide a representation of the types of plants that will occupy an area once the landscape design is completed. A plant grouping might show a shrub border between properties, or it may represent a perennial bed location.

Specimen plants can be part of a larger planting, but usually stand alone in the landscape. Specimen plants provide specific seasonal interest or color through flowers, fruit, or leaves.

Accent plants are plants of special interest that are usually part of a larger planting. Accent plants provide interest throughout the seasons through specific forms, textures, colors, etc.

Key plants are plants that are usually placed in highly visible location. They can be used alone or in groups of three or more. They are associated with screening or softening of architectural features, such as building corners, steps, fences, etc. They can provide emphasis if the chosen species provides interesting seasonal interest, form or texture.

Plant groups are plants of the same species spaced so that when mature, they just touch each other and you can still see the outline of each individual plant.

Massed plants are plants of the same species spaced so that when mature, they grow together to form a solid area of that species. You will not be able to discern individual plants in a mass.



Sequence

Sequence is a gradual transition from one area to another within a landscape. A landscape with sequence has one element changing at a time rather than several changing at once. A landscape with a coarse-textured plant next to a fine-textured plant is an example of poor sequence.



Plan view of good sequence



Scale

Scale is the relative size of one part of a landscape to another. Scale may be the proportion or ratio of size between components in the landscape.



ELEMENTS OF DESIGN

We know that unity is achieved in a landscape design through the appropriate application of the principles of design. We also know that principles of design are demonstrated in the way plants are selected and organized in the landscape design. This process actually begins in the draft landscape design and continues throughout the process of finalizing the completed landscape plan.

The criteria used in the selection and organization of specific plants are known as elements of design. Think of the elements of design as the characteristics that describe a plant.

The number of design elements and the order in which they are considered will change with the specifics of a particular plan. However, some are more important and should be considered first;

we will call these the primary elements of design and are used to describe the plant itself. Other characteristics relate to the growing site and can be almost limitless in number. These are referred to as secondary elements of design. Sometimes a secondary element of design becomes more important than a primary element.

Determining the elements of design to be used in the selection of plants not only makes those choices easier, but more specific to the plant and plant groupings outlined in the draft design.

Likewise, a great deal of flexibility is created in this process as many plants will meet the same set of design elements. Instead of considering only one plant for a specific "spot" in the landscape, any number of plant species possessing those design elements can fit that "spot."

This process is extremely important to the sustainability of a landscape. If a designer thinks of only one particular plant when designing a landscape, he/she is stuck with all the characteristics of that plant, some of which may not fit that particular situation.

Primary elements of design

- Plant type (e.g., tree, shrub, vine and groundcover)
- Height and width
- Texture
- Form
- Seasonal interest or color

Height and width

Height and Width are the estimated mature sizes a plant will reach, both in upright and outward directions. These two elements are very important in plant selection and plant location. If plants are selected without considering height and width, they are often improperly spaced and can cause problems in the future of a landscape.



Example of height and width (mature):

Texture

Texture is the coarseness or fineness of the plant and should be one of the first design considerations when placing plants in a landscape. It can also be created by rough or smooth looking surfaces, thin or thick leaf set, or by darkness or lightness. As a rule, plants with fine textures should be used in greater numbers, and plants with coarse textures should be used in fewer numbers.



Plan view of plant textures:

Form

Form is the outline a plant creates as well as the 3-D features it produces; e.g., columnar, round, vase, weeping, oval. Form should be considered early in the design process.



Seasonal interest and color

Seasonal Interest and Color are created by the colors that we see when we look at a plant. Color is the element that is often first noticed about a plant. Color is often used in a landscape to provide interest throughout the entire growing season. This is often referred to as seasonal interest. Seasonal interest is simply the time of the year when a plant provides a special characteristic such as flowers, fall color, fruits, etc.



Secondary elements of design

Secondary elements of design are the additional characteristics that are considered in a plant. The greater the number of secondary elements, the fewer the plant varieties that will fit. Secondary elements are also very important to the sustainability of a design as they include not only positive traits, but problems a plant may have (disease, insect, soil, and environmental).

Examples of Secondary Elements of Design:

- Drought tolerance
- Insect and disease resistance
- Soil adaptability
- Full sun or shade tolerance
- Moisture tolerance

Refer to the Plant Elements of Design plant selection program at the University of Minnesota Extension website (extension.umn.edu/yard-and-garden) to learn about specific plants that fit these criteria.

Selecting Specific Plants Using Primary and Secondary Elements of Design

In the draft design, the landscape spaces are composed of individual plants, plant groupings, and hard-features.

The process of selecting specific plants that will make up each space begins with the understanding that each hard-feature, plant and plant grouping is a separate entity. Think of these individuals and groupings as pieces in the landscape design puzzle. It is necessary to study each piece carefully to know where, and how, it will fit into the puzzle.

This allows the designer to focus on the functionality, maintainability, environmental impact, cost effectiveness, and aesthetics of each space in the landscape. Once the selection of each individual or the design of each grouping is completed, they can be blended together through the use of appropriate design principles, bringing unity to the overall design.

For example selecting plants begins with a visualization process. Designers must see in their mind what a particular grouping, or piece of the puzzle, will look like in an installed landscape. Once this is done, this idea can be transferred to paper in the form of a sketch for review and continued refinement.

These sketches are not fancy and may not be to scale, but they aid the designer in the process of using elements of design to select plants. After a designer has determined the necessary elements of design, he or she can select the specific plants to fit the requirements of that particular plant grouping.

PLAN VIEW DRAWINGS

A landscape design is completed when the designer has selected the hard-features and plants to fill all the spaces.

A large project can be very detailed and may require several design sheets to convey all the information. A variety of detailed drawings, elevations and perspectives, are often included to show the specifics of soil manipulation and hard-feature construction.

A designer also uses a variety of lines, graphics, notes, and legends to help present the information found in the completed landscape design.

An evaluation of sustainability is provided to help evaluate your plans functionality, maintainability, environmental soundness, cost effectiveness, and its aesthetic value.

In conclusion, a sustainable landscape design is the first step in the creation of a sustainable landscape. Sustainability should be the primary consideration in the design of residential, commercial, recreational, and public grounds. Sustainability is a common factor shared by homeowners designing their own properties, owners of small businesses and commercial properties working with landscape design/build firms, as well as by landscape architects designing the layout of recreational and public grounds.

Landscape design symbols

In drawing a completed landscape design, designers use graphics and symbols, rather than words, to show many of the various components of the plan. Different graphics are used to indicate different types of plants, such as evergreens, deciduous trees, or groundcovers. Hardscape materials, such as brick, flagstone, and decking are also shown with different groups.



There are an endless number of different graphics that can be used to depict plants and hardscapes. What follows are some possibilities:



Decks and patios







DRAWINGS TO ENHANCE YOUR DESIGN

By Elizabeth Vaughan

DESCRIPTION/PURPOSE

As a landscape designer, your objective is to provide your customer with a design that is

- functional
- maintainable
- environmentally sound
- cost effective, and
- visually pleasing

As a businessperson, your objective is also to sell your design. However, most homeowners viewing a landscape design presented in plan view (drawing 1) will have trouble visualizing what it will look like in their yard.



Drawing 1

Landscape designers can use other drawings to compliment the plan view including section, elevation, section/elevation, and perspective drawings. Following are examples of each of these drawings as well as tips on improving drawing speed without sacrificing quality.

SECTION DRAWING

A section drawing shows a cross-section of the site plan, providing a view of the horizontal and vertical dimensions.

- Easy and quick to do.
- Best to use when vertical details need to be communicated: stairs, grade changes, slopes, etc.
- Requires a plan view drawing and the measurement of elevations that you want to show on your section.

Step-by-Step Process:

• Place a sheet of paper on your plan view drawing (graph paper is helpful). Draw a base line through the area that you want to show in section. Then, use known vertical information and draw a point on the base line that corresponds to each elevation. In drawing 2, each contour line represents five feet above or below pond level.



Drawing 2 Adapted from Reid 1987 p. 117

• Construct a series of horizontal lines above and below your base line to represent even increments of vertical change. Then, from the points on your base line, draw a vertical guideline, and connect the dots. In drawing 3, the lowest point is the bottom of the pond at -15 ft., and the highest point is the hill at 25 ft.



Drawing 3 Adapted from Reid 1987 p. 117

• On a clean sheet of paper, trace your elevation line. Then, draw in any corresponding features on the baseline at the correct elevations (drawing 4). Since a section shows only the profile along a cut line, it is not necessary to include features behind the line. If more detail is desired, a section/elevation drawing is a better choice (Reid 1987; Wang 1996).



Adapted from Reid 1987 p. 117

ELEVATION DRAWING

An elevation drawing represents a side view of the site plan.

- Elements are drawn as if a person is standing directly in front of the scene with no perspective.
- Elevations show more depth and surface detailing than sections but are not nearly as detailed as perspective drawings.
- Relatively easy to do.
- Best to use when a simple structure façade needs to be shown (Pierceall 1984; Reid 1987; Wang 1996).

Step-by-Step Process:

- 1. If something will be built from this drawing, then exact scale is necessary. However, if the drawing is simply for presentation, then scale can be approximated. Drawing 5 is used for presentation and is thus not drawn to exact scale.
- 2. After establishing the scale you want to use, lightly sketch in any façade from measurements or from photographs. If there are items to show in front of the façade (such as plants), make sure your lines are light. For quick methods of sketching in structures, see "Tips and Tricks on Improving Drawing Speed."
- 3. Sketch in any plants you want to show. Be sure to show the height of trees or plants in relation to other plants and to the structure. In your sketches, it is helpful to the client if your drawings represent the plant's approximate shape and growth form (Reid 1987).



Drawing 5

SECTION/ELEVATION DRAWING

A section/elevation drawing shows a cross-section of the landscape plus elements a selected distance beyond the base line (drawing 6).

- All vertical features are drawn at the same scale.
- Easy to do.
- More interesting and informative than either a section or elevation drawing.
- A good choice for showing vertical elements as they relate to activities and use.

Step-by-Step Process:

• Follow all the steps for Section Drawing and Elevation Drawing.



Drawing 6 Adapted from Wang 1996 p. 95

PERSPECTIVE DRAWING

- A perspective drawing presents images as if one is looking through a camera lens (drawing 7).
- Depth, proportion, and relative distances are included to convey the volume of a space.
- Most difficult to do, but often the most important in helping clients visualize a space.
- Line, textures, and shadows are more important in perspective drawings than any other (Pierceall 1984).
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Drawing 7 Adapted from Reid 1987 p. 166

There are many books that focus in great detail on perspective drawing. True perspectives are drawn to scale and are important for large-scale, high-budget projects. However, for many

landscape designers, accurate perspective drawings drawn to exact scale are not necessary. In many cases, all you need to draw is a good likeness of what your plan will look like. Simply learning the basic elements of one- and two-point perspective will give you the tools to create quality drawings that will be extremely important in selling your design.

One-point perspective:

Key aspects of one-point perspective (drawing 8):

- All lines parallel to the line of site converge to one vanishing point on the horizon line (A).
- All horizontal lines that are perpendicular to the line of site are drawn parallel to horizon line (B).
- All vertical lines in the space are drawn vertical in perspective (C).



Drawing 8 Adapted from Reid 1987 p. 158

Step-by-Step Process:

• One-point perspective is similar to viewing one face of a transparent cube straight on. So, begin by drawing that face as a square (drawing 9).



Drawing 9 Adapted from Ching 1990 p. 110

- Next, draw a horizontal line (H.L.) through the square that represents the eye level of the viewer. The lower or higher the line is, the lower or higher the viewer is. In drawing 10, eye level is about 5 feet above the ground plane, or the bottom of the square.
- Establish the center of vision (C.V.) on the horizon line and draw lines from the center of vision through each corner of the square. In drawing 10, these represent the horizontal edges of the cube which are parallel to our central line of sight and which converge at the center of vision. If the center of vision is left of center, then more of the right side of the cube will be seen as in drawing 10. If the center of vision is right of center, more of the left will be seen.



Drawing 10 Adapted from Ching 1990 p. 110

• Determine the depth of the cube. The cube's depth depends on how far away you are. The closer you are, the more you will see of the top, bottom, and sides. The farther away you are, the flatter the top, bottom, and sides will appear. One method to estimate the cube's depth is by using a 45° right triangle. Since the sides of a 45° right triangle are equal, if drawn in perspective, its diagonal will mark off equal segments in perpendicular lines (drawing 11).



Drawing 11 Adapted from Ching 1990 p. 110

- For example, to determine the cube's depth in drawing 12, assume you are standing 30 feet away from the front face of the cube. Then, measure 30 feet (at the same scale as the cube) from the center of vision to a point on the horizon line. This point is the vanishing point (V.P.) for all 45° diagonals receding to the right. From the left end of the square's baseline, draw a line to the V.P. This line will cut off a segment of the right-hand baseline that is equal to the front baseline.
- If the diagonal vanishing point is moved toward the center of vision, this is equivalent to moving closer to the cube (V.P. 2 in drawing 12) (Ching 1990; Leach 1990).



Drawing 12 Adapted from Ching 1990 p. 111

Two-point perspective:

Two-point perspective is similar to viewing the corner of a transparent cube. If you can see two sides of an object, then use two-point perspective.

Key aspects of two-point perspective (drawing 13):

- If you establish each side's vanishing point and extend all parallel lines until they reach them, then the angle of the lines will be correct.
- There are two vanishing points (right and left).
- There are no horizontal lines except at horizon line, and all parallel lines on the same plane or object surface vanish to the same vanishing point (Ching 1990; Pierceall 1984).



Adapted from Ching 1990 p. 112

Step-by-Step Process to draw a simple house in two-point perspective:

• Establish your eye level with the horizon, and draw the horizon line. Then, draw in the near corner of the house. Next, draw in all guidelines (for the top and bottom of the roof and the front and side of the house) making sure to extend the lines to their vanishing point (drawing 14).



Drawing 14 Adapted from Smith 1994 p. 42

• Establish the center of the sides by drawing 2 diagonal lines from corner to corner. A perpendicular line through the point at which they intersect indicates the centers (drawing 15).



Drawing 15 Adapted from Smith 1994 p. 42

• Draw in the top and bottom of the windows, and extend the lines to the same vanishing point (drawing 16).



Adapted from Smith 1994 p. 43

• Sketch in the position of the door and windows, using the lines of the roof and horizon as a guide. The basic outlines of your house are finished (drawing 17). On a clean sheet of paper, trace the house lines and add in the details (Smith 1994).



Adapted from Smith 1994 p. 42-43

Perspective Points to Remember

• Size: with two identical objects, the one further away will appear smaller, and the one closer appears larger (drawing 18). With two objects of differing sizes, the larger one appears closer and the smaller one appears further away.



Drawing 18 Adapted from Ching 1990 p. 93

• Overlapping: an object in front of another creates an illusion of depth (drawing 19).



Drawing 19 Adapted from Ching 1990 p. 93

• Vertical location: the higher an object is in a picture plane, the farther away it appears (drawing 20).



Drawing 20 Adapted from Ching 1990 p. 95

• Aerial perspective: objects look lighter in tone the farther away they are from us (drawing 21).



Drawing 21

• Texture: a surface texture receding into the distance will gradually show less detail (drawing 22) (Ching 1990).



Drawing 22 Adapted from Ching 1990 p. 97

TIPS AND TRICKS ON IMPROVING YOUR DRAWING SPEED

You can speed up the process of creating elevation or perspective drawings by using photos of a site using a slide projector, LCD projector, computer scanner, or overhead projector.

Step-by-Step Process:

- Take photographs of the areas of your site that you want to show in a drawing.
- Depending on the equipment you will use, have the photos made into slides, clear overhead copies, or transfer them to graphic files by using a scanner or digital camera. (The fastest way is to use a digital camera when taking the photos).
- Enlarge the photos so that you can trace the important elements in them. If you are using a slide, overhead, or LCD projector, set up a screen onto which you can place your paper, and adjust the size and focus of the image onto your paper. If you are using an enlarged paper copy of your photo, using a lightbox will help you see the photo's images.
- Trace the essential edges and objects. Sketch in plants or other objects from your base plan that do not appear in the photograph. Remove the paper and add in shadows and textures to make your drawing look more realistic.

Additional Tips:

- Take photos of your plan view drawing at various angles to simulate a bird's eye view. When taking the photos, frame the plan to fill the camera's viewfinder. Follow steps 3 and 4 above.
- Develop your own library of landscape graphics to use in elevation, section and perspective drawings.
- Practice: by practicing your drawing skills, your speed and ability will improve.

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A COMPLETE LANDSCAPE DESIGN



PLANT KEY

No.	Common Name	Scientific Name	Plant Type	Height x Width	Form	Seasonal Interest	Comments
1	Patmore Ash	Fraxinus pennsylvanica 'Patmore'	Deciduous Tree	50' x 35'	Upright/oval		Canopy tree; disease and drought tolerant
2	Neon Flash Spirea	Spiraea japonica 'Neon Flash'	Deciduous Shrub	3 1/2' x 3'	Mound	Rose/pink flowers in June and July	Shrub mass; tolerates snow damage
3	PJM Compact Rhododendron	Rhododendron 'PJM'	Broadleaf Evergreen	4' x 4'	Upright	Lavender flowers in early spring	Shrub mass; shade tolerant
4	Serviceberry	Amelanchier canadensis	Deciduous Shrub	20' x 14'	Multiple stemmed	White flowers in early spring; red/purple fruit; yellow/red fall foliage	Accent plant; edible fruit
5	Broadmoor Juniper	Juniperus horizontalis 'Broadmoor'	Evergreen Shrub	4' x 1'	Low mounding	Evergreen	Shrub mass
6	Siberian Iris/Stargazer Oriental Lily	lris Sibirica/Lilium 'Stargazer'	Perennial	2 1/2' x 2'	Upright	Early and late summer flowers	Low maintenance perennial bed
7	Yellow Daylily	Hemerocallis 'Hyperion'	Perennial	2' x 2'	Upright/arching	Light yellow flowers in summer	Low maintenance perennial bed
8	Gro-Low Fragrant Sumac	Rhus aromatica 'Gro-Low'	Deciduous shrub	5' x 2 1/2'	Low spreading	Fragrant yellow spring flowers; red fruit; orange/red fall foliage	Shrub mass; wildlife food
9	Skyracer Moor grass	Molinia caerulea arundina 'Skyracer'	Ornamental Grass	6' x 3'	Upright	August-winter seed heads	Key plant
10	Glossy Black Chokeberry	Aronia melanocarpa elata	Deciduous Shrub	5' x 5'	Upright rounded	White flowers in May; black fruits through winter	Shrub border; wildlife food
11	Honeycrisp	Malus 'Honeycrisp'	Fruit Tree	8' x 12'	Rounded tree	Spring flowers; fall fruit	Edible fruit
12	Karl Foerster Grass	Calamagrostis x acutiflora 'Karl Foerster'	Ornamental Grass	4 1/2 x 3	Upright	Pink flowers in July; seed heads through winter	Key Plant
13	Carefree Beauty Rose	Rosa 'Carefree Beauty'	Deciduous Shrub	3' x 3'	Round	Coral pink flowers spring through fall; orange fruit in fall	Shrub mass
14	Compact American Cranberrybush	Viburnum opulus 'Compactum'	Deciduous Shrub	5' x 5'	Round	Scarlet fruit in fall, winter; deep red fall color	Shrub border; wildlife food

15	Short hosta	Hosta 'Golden Tiara'	Perennial	1' x 2'	Mound	Summer lavender flower spikes	Shade tolerant perennial mass
16	Pagoda Dogwood	Cornus alternifolia	Deciduous Shrub/Tree	20' x 20'	Rounded; horizontal branching	Pale yellow flowers in May; blue-black fruits	Accent plant
17	Tall Blue Hosta	Hosta 'Krossa Regal'	Perennial	3' x 2'	Vase shaped	Summer lavender flower spikes	Shade tolerant perennial mass
19	The Rocket	Ligularia stenocephala 'The Rocket'	Perennial	5' x 3'	Upright	Large yellow flower spikes in summer	Perennial mass
20	Ostrich Fern	Matteuccia struthiopteris	Perennial	3' x 2 1/2'	Vase shaped	Lush green summer foliage	Shade tolerant perennial mass
21	White Lights Azalea	Rhododendron x 'White Lights'	Deciduous Shrub	6' x 5'	Rounded	White flowers	Shrub border, cold hardy
22	American Cranberrybush	Viburnum trilobum	Deciduous Shrub	10' x 10'	Rounded	White flowers in late May; scarlet berries into winter	Key plant; wildlife food
23	Various annua flowers, spring bulbs	Various	Annuals/Spring Bulbs	Variable	Variable	Spring and summer color	Mass planting
24	Ginger	Asarum canadense	Perennial	6" x 8"	Low, mat forming	Green groundcover	Mass planting
25	Common witchhazel	Hamamelis virginiana	Deciduous Shrub	15' x 18'	Rounded vase shape	Late fall yellow flowers	Accent plant; shade tolerant
26	Hummingbird Clethra	Clethra alnifolia 'Hummingbird'	Deciduous Shrub	4' x 5'	Mounded	Summer flowers	Shrub border; shade tolerant
27	Lady's Mantle	Alchemilla mollis	Perennial	1 1/2' x 1 1/2'	Mounded	Lime green summer flowers	Perennial mass; good dried flowers
28	Hosta	Hosta 'Francee'	Perennial	1 1/2' x 1 1/2'	Mounded	Summer lavender flower spikes	Perennial mass; shade tolerant
29	Isanti Dogwood	Cornus sericea 'Isanti'	Deciduous Shrub	5' x 5'	Mounded	White flowers and white fruit; red twigs in summer	Key plant; wildlife food
30	Fanal False Spirea	Astilbe x arendsii 'Fanal'	Perennial	2' x 2'	Mounded	Feathery summer flowers; attractive dried flower heads	Perennial mass; shade tolerant
31	Baptisia	Baptisia australis	Perennial	3' x 2'	Upright rounded	Violet-blue late spring flowers	Perennial mass
32	Blue leaf Hosta	Hosta fortunei 'Hyacinthina'	Perennial	2' x 2'	Mounded	Lavender flower spikes in summer	Perennial mass; shade tolerant
33	Rosy Lights Azalea	Rhododendron x 'Rosy Lights'	Deciduous Shrub	5' x 5'	Rounded	Dark rosy pink flowers in May/June	Shrub mass; fragrant flowers

34	President Grevy	Syringa vulgaris	Deciduous	8' x 12'	Upright	Late spring blue	Accent plant;
35	Anemone	Anemone sylvestris	Perennial	12" x 12"	Mounded	Fragrant white flowers in spring; white fruit	Perennial mass; shade tolerant
36	Deutschland Astilbe	Astilbe x arendsii 'Deutschland'	Perennial	20" x 24"	Mounded	White flower spikes; attractive dried flower heads	Perennial mass; shade tolerant
37	Golden Leaf Hosta	Hosta 'Bright Glow'	Perennial	12" x 16"	Mounded	White flower spikes	Perennial mass; shade tolerant
38	White Foamflower	Tiarella cordifolia	Perennial	15" x 15"	Rounded	Pink flowers in late spring/early summer	Perennial mass; shade tolerant
39	Northcountry Blueberry	Vaccinium 'Northcountry'	Deciduous Shrub	3' x 2'	Mounded	Deep blue fruit in late summer; bright fall foliage	Foundation planting; edible fruit
40	Solomon's Seal	Polygonatum odoratum	Perennial	24" x 12"	Mounded upright	Creamy white flowers in late spring/early summer	Perennial mass; shade tolerant
41	Nora Barlow Columbine	Aquilegia x hybrida 'Nora Barlow'	Perennial	30" x 18"	Mounded	Red-pink spring flowers	Perennial mass
42	Candytuft	lberis sempervirens	Perennial	12" x 12"	Mounded	Late spring white flowers	Perennial mass
43	Spring Snow Crab	Malus 'Spring Snow'	Deciduous Tree	25' x 15'	Rounded	Spring white flowers; red fruit	Accent plant; wildlife food
44	Various herbs and vegetables	Various	Herbs & Vegetables	Variable	Variable	Spring/summer	Food
45	Flame Amur Maple	Acer ginnala 'Flame'	Deciduous Shrub/Tree	15' x 15'	Spreading	Bright fall foliage	Specimen plant

RESIDENTIAL SUSTAINABLE LANDSCAPE EVALUATION FORM

Functional

- Are driveways wide enough to allow easy access to garage and parking areas? Is room provided for those using vehicles to enter and exit easily?
- Do driveway curves allow room for large trucks and service vehicles?
- Is additional parking for recreational vehicles easily accessible from driveways?
- Are walks wide enough for users to meet safely? Are they sloped to minimize ice and snow buildup?
- Are step riser and tread distances easily negotiated in summer and winter?
- When necessary, do stepping stones allow for direct access? Are they spaced correctly for safe and easy movement?

- Though infrequent, is vehicle access available to the sides and rear of the lot providing access for maintenance/repair vehicles, new construction, firewood storage, gardening and landscaping?
- Are service and recreational areas in convenient locations for easy access and use? Are they visible when necessary and screened when not? Common areas of concern include: play areas, vegetable gardens, storage sheds, compost piles, wood storage, and dog kennel?
- Are patios and decks easily accessible from the appropriate indoor room, kitchen, recreational or bedroom? Is there convenient access to outdoor furniture storage, grills, etc?
- Are plants located to moderate environments caused by wind, rain, sun and snow?
- Are plants selected in complement site lines from decks and patios and from inside through doorways and windows?

Maintainable

- Are concept and bed lines appropriate for riding mowers and do they minimize string trimming and hand weeding?
- Does edging effectively separate mulch and groundcovers? Is edging used to create mowing strips along buildings, walls, fences, and gardens to retain lawn, minimize weeds and reduce herbicide applications?
- Are plants located next to walks and drives tolerant of salt and snow? Are open areas available to pile snow that is mechanically pushed or piled?
- Are mulches used around trees, shrub beds, and borders to improve plant health? Is mulch used to separate plants from irrigated lawn?
- Does spacing allow plants to reach their full mature height and spread without damaging each other or requiring excessive pruning?
- Are plants spaced to allow for the maintenance of walks, steps, foundations, siding, overhangs and downspouts?
- Is a water source located close to dog kennels, vegetable gardens or car wash areas?

Environmentally Sound

- Are small or narrow turf areas avoided to lessen the application of fertilizer and pesticides to non-target, and hard surface areas?
- Are plants hardy? Are they selected and designed to insure plant health and reduce stress? Plants in stress are more susceptible to environmental problems, diseases and insect problems and require additional applications of water, fertilizer, and pesticides.
- Will trees clear power lines at mature height and spread?

Cost Effective

- Was the development of the base plan accurate? Are all structures, utilities, easements, property lines and existing plants located correctly to insure accurate landscape design?
- Was appropriate attention paid to soils, drainage and slopes insuring that hard-features and plants will be properly designed, installed and reach their maximum life expectancy.
- Has a completed landscape design that is functional, maintainable and environmentally sound, insured maximum value in the cost of implementation? Will the balance between quality and cost insure easier and lower cost maintenance for the life of that landscape?
Visually Pleasing

- Were concept lines used to create functional, maintainable, environmentally sound and cost effective spaces in the landscape? Were these spaces blended together to create a unified and visually pleasing landscape?
- Were plants used to create entry and patio gardens, focal points, and special interest areas?
- Were plants used to soften buildings and hard-features?
- Were plants used to blend inside and outside spaces?
- Are the principles of design apparent throughout the completed landscape design?
- Are trees, key, accent, and specimen plants used to create interest throughout the landscape?

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