Water-wise Landscape Design
Our goals are that you
- Understand how to create your own site map
- Analyze the conditions of your site.
- Understand the city code that applies to your front yard
- Explore some basic design features

What are YOUR goals for this class?

Class Goals

- Prepare for your design consultation
  - Draw your site map
  - Analyze opportunities and constraints
  - Design ideas
Step 2 is to make sure that you’re choosing an appropriate location for your water-wise landscape.

Project Area

- Where turf is not needed
- Which is defined by a fence, property line, or sidewalk
- Is on a separate irrigation zone
- That meets the Water-wise Landscape Rebate size requirements (500 sq. ft.)
The first step in drawing your site map is to collect your supplies. Whether you opt to create a design yourself or utilize Aurora Water Conservation’s design service, request a site map packet by calling 303-739-7195. It typically takes ten days to receive it. Contact us if you have not received it within two weeks.

<table>
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<th>Collect Your Supplies</th>
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<td>• Site Map Packet</td>
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While you may obtain an aerial via an online mapping tool, it is often difficult to print the map to a workable scale (1 inch = 8 feet, 10 feet, 16 feet, or 20 feet).
An example of an aerial provided in the site map packet. Aerial shows square footages based on plant type and approximates the quantity of water used for each
Your aerial will be printed at a scale of 1”=8 feet, 10 feet, or 20 feet.
The scale is indicated in the lower right hand corner of the sheet. It consists of numeric and graphical portion. Both are required on any design.
It may be easier to draw lines on the aerial before overlaying the vellum

Note the dotted yellow line. This is an easement.

Mark the following:
• house
• driveway
• sidewalks
• patio
• other impermeable areas
• landscape beds

TIP: Tape the aerial to a window with a lot of light, then tape the vellum over the aerial. This may help the landscape features pop out.
Once you’ve drawn the lines, place the vellum over the aerial and trace the lines you’ve drawn. Again, it may be easier to trace the lines when the aerial is backlit.
Trace major lines onto the vellum.
Draw trees and shrubs on the vellum.
To draw existing trees:

• Determine the location of the tree. Measure from the trunk to a fixed object in two different directions (use a property line, sidewalk, driveway, fence, etc.) and record these numbers.
• Find the tree diameter by measuring along the ground from the trunk to the approximate tips of the longest branches (the edge of the canopy). Multiply by 2. This is your diameter.
• Put your tree location and diameter into your site map’s scale. For example, using a 1 inch = 8 feet scale: if your tree canopy diameter is eight feet, the circle you draw to represent your tree will be one inch in diameter.
• Draw on site map with a circle template, compass, or household item like a lid or can of food.
Walk your proposed project area. Inventory the area for each of the above characteristics. In addition, ask yourself the following questions:

- What are current issues on the site?
- What are the existing site features?
- How do you want it to look?
- Is grass needed?
- How do you want to use the space?

Choose your specific goals and desires before attending the design consultation.
Label the site map with:

- Name
- Address
- North arrow
- Scales
- Stop or yield signs
- Water meter
- Irrigation heads and zones
- Window locations
Understand the following conditions on your property and be ready to discuss them with the designer if necessary. You do not need to include them on the vellum.

- **Easements** – research if you suspect you may have an easement. Call Public Works at 303-739-7300. Be aware that the type of easement influences the type of work that can take place in that area. Structures are typically not permitted. Also to note, there may be limitations on the type of plant material that may be utilized. For example, trees are typically not allowed in a utility easement. Utility companies have the right to tear up the landscaping in such easements.
- **Estimate a slope** and note your drainage patterns.
- **Extreme exposures and microclimates** – Wind, reflected light or heat, continually moist soils or sheltered areas.
- **Patterns of use** – Note the circulation / use patterns. These may be places to ideal for pathways.
- **Sunny and shady Areas** – Mentally note if your yard’s sun exposure is blocked by any features such as neighbor’s home or tree. Understand sun angles.
There are three particles that make up our soils: clay, silt and sand.

Soil is never comprised of just one of these particles, it’s always a mixture. Clayey soils contain mostly clay particles. For example, a clayey soil could be 56% clay, 33% silt, and 11% sand. A sandy soil is comprised mostly of sand particles. For example, 14% clay, 25% silt, 61% sand.

The physical characteristics of soil are best evaluated while the soil is damp. When rubbed between a finger and a thumb, a moist CLAY soil will feel sticky or silky smooth. It holds its shape moderately to very well. When rubbed between a finger, a moist SANDY soil will feel very gritty. It does not hold a shape well.

Aurora soils are comprised predominately either clayey or sandy.

Plants are very adaptable, most will perform well regardless of the soil they are planted in. Soil type directs us on how we should water.
Aurora City Council passed ordinance 146-1452, making it illegal for Homeowner’s Associations (HOA) or Metro Districts to (1) have covenants or restrictions preventing the installation of water-wise landscapes or (2) requiring part or all of a landscape to be comprised of high water-use grass. The State of Colorado has a similar law. Zeroscape and landscapes of inorganic or organic mulch do not fall into the category of a water-wise landscape. The landscape must contain at least 50% long-lived plant material to meet city code or at least 60% long-lived plant material for any project area to be eligible for the water-wise landscape rebate.

Aurora Water Conservation has worked with several HOA’s to develop water-wise landscape standards for the community that meet or exceed City code requirements and are in harmony with the aforementioned City and State regulations. Prior to your consult, please obtain and email us a copy of the landscape standards for your HOA or Metro District so that we may review them and understand what guidelines we have to work with. For HOA’s and Metro Districts that do not have water-wise landscape guidelines or have guidelines that are restrictive, we are willing to discuss the City and State regulations with them and assist in development of water-wise landscape guidelines specific to the community. When water-wise landscape guidelines do not exist for a community, we will default to City code or rebate program guidelines.

Aurora Water Conservation cannot provide legal advice regarding either of these regulations.
Rainwater diversion is meant to slow down the movement of water across your property in order to (1) help your plants get more water and (2) slow or stop erosion.

Permeable Paving is a range of materials – typically porous concrete, porous asphalt or pavers. Permeable surfaces allow water to percolate into the ground instead of being channeled into streets where it picks up contaminants that are then dumped into sewers and waterways. Allowing rainwater, storm water, and, yes, polluted runoff, to disperse more naturally into the ground instead improves water quality, and replenishes subsurface water. Permeable paving is typically very costly.

French Drains are a means of directing water directly into the ground. Commonly made from perforated pipe or a length of landscape fabric filled with rock.

Berms and swales direct the flow of water across your property. You cannot create swales near existing trees because digging will damage the roots.

Drawings courtesy of Brad Lancaster and Joe Marshall 2005
A dry creek bed, a bench and a flagstone patio, are aesthetically pleasing elements that you can consider to add beauty and function to your landscape.

These elements are not considered hardscapes features.
50% of any landscapeable area of your front yard (or any area facing a public right-of-way) must be covered in long-lived plant material, not annuals. This is an example of how we determine how many plants are required:

Area of front yard: 1,000 square feet (s.f.)
Plant coverage requirement = area of the front yard times 50%:
   \[ 1,000 \text{ s.f.} \times 0.50 = 500 \text{ s.f.} \]

Now that we know the plant material requirement, we need to determine how many plants need to be installed. City Code gives plant types specific square foot values:

- Shrubs = 32 s.f.
- Perennials = 10 s.f.
- Ornamental grasses = 10 s.f.

Number of plants = plant material requirement divided by a plant square foot value:
   \[ \frac{500 \text{ s.f.}}{32 \text{ s.f.}} = 15.6 \text{ shrubs} \]

Rounding up, we need to install 16 shrubs. Ornamental grasses and perennials may be used instead of shrubs. For each shrub, use 3 ornamental grasses or perennials or combination of. If you know you want all ornamental grasses and perennials, divide 500 s.f. by 10 s.f.

In terms of mulch, you may cover your front yard in any organic mulch, such as bark or wood chips. If you prefer inorganic mulch, such as gravel, cobble or pea gravel, you can only use up to 50% on the landscapeable area.
Current code requires implementation of one hardscape feature in your front yard. You have the following hardscape options to choose from:

- **Boulders** – Minimum of 3, 2’x3’x18” high or larger
- **Wall** – 1-2.5’ high natural stone or masonry wall
- **Berm** – No more than 2.5’ tall, not to exceed 1:4 slope

All fences must be in compliance with building regulations. Fencing does not count as a hardscape feature.
Send up to 10 photos to 
zverslui@auroragov.org

Practical photos are required for your design consultation. The photos should accurately represent the proposed project area. As in the example above, for a front yard project, take a photo that will capture the overall project area. Several other photos from the sidewalk or other areas of the project will help provide an up-close perspective.

Make sure images have a high enough resolution. Modern-day cell phones and digital cameras will accomplish this just fine. Images sizes between 250K and 3MB are sufficient. Email the photos to zverslui@auroragov.org before your consultation. Please add a subject such as “Design Consultation Photos – (your property address).”
Before we will schedule you to meet with a designer, you must create a list of at least 5 plants. This list will help the designer understand the type of plant material you would like to see in your landscape and serve as a starting point for making other plant recommendations.

Please email the list prior to the consult.

The photos from left to right are of: species tulip, banana yucca, dwarf fountain grass, coneflower and serviceberry.
Water-wise Plants

- Water-wise Demonstration Gardens
- Denver Botanic Garden
- Local garden centers and nurseries
- Websites
  - plantselect.org
  - aurorawater.org
  - highcountrygardens.com
  - drought-smart-plants.com
- Aurora Public Libraries
- Water Conservation office

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As mentioned before, we would prefer that you email any HOA guidelines prior to your design consult so that we have an opportunity to review them.

Time to Schedule

• Verify completion of site map packet
• Email photos and plant list to Zach at zverslui@auroragov.org
• Designer will contact you to schedule
Design Consultation

Materials needed

- Completed site map
- Site Survey Worksheet & Plant list
- Photographs
- HOA guidelines (if applicable)

Reschedule at least 48 hours prior to consult
The Plan

An example of a final design.
This is an example of the plant list you will receive after your design is complete. It shows:

- The landscape coverage, shown as a percentage based on the total converted square footage.
  - City code requires this to be at least 50%
  - The water-wise landscape rebate requires this to be at least 60%
- The percentage of plants listed which are moderate water users, as opposed to strictly xeric.
- The symbol, quantity, botanic name, common name and minimum acceptable container size of each plant in your design.
This slide shows a planting in its 1st year.
That same planting in its 3rd year. This customer opted to leave in the existing irrigation system and make adjustments to sprinklers so that only the plants are being watered. The Russian sage is flopped over because its branches are heavy with water. The ‘flopping’ of plants can also be a result of too much water.
This water-wise landscape is newly planted. Note the use of cobble to edge the sidewalk, the masonry units to edge between the mulches, and the natural rock wall.
Here is the same yard a few years later! It has filled in and looks great.
A finished first-year water-wise landscape. Notice the use of a retaining wall.
This is a mature water-wise landscape. It shows a fantastic use of boulders, three different kinds of mulch and a variety of plant textures and colors to create year-round interest. This design is pricey to install because of the many boulders and conifers.

Boulders are priced by the ton. Fortunately, not all boulders are created equal. For example, there can be a significant difference in price for two different boulders of similar sizes due to differences in material density and color. Depending on the scope of the project, selecting boulders with a lower density can save hundreds of dollars in material costs. While gorgeous, you’ll pay a premium for moss-rock boulders because of their higher density and popularity.
This design uses medium-sized rocks as a border for the garden bed. These plants are mature.
Great mixing of rock material for mulch. This is a young landscape, so the perennials will fill in. Though not showing it right now, there will also be purple and yellow blooms.
Here is a design that has a great mix of mulches and boulders with colorful perennials. The purple *Salvia nemerosa* (May night meadow sage) blooms purple throughout the growing season. Seasonal interest was a, which adds a substantial amount of color.
All of the Kentucky bluegrass was removed and replaced with buffalo grass sod. Notice that is a more yellow-green color than Kentucky bluegrass. Buffalo grass is available as seed or sod and sometimes plugs. Compared to a Kentucky bluegrass lawn, which generally needs to be irrigated with 28 inches of water each season, buffalograss and other warm-season grasses will perform well with 5-10 inches of water.
This yard has used creeping thyme and phlox as a colorful groundcover. It blooms in late spring-early summer. Note that groundcovers should be used only in low-foot traffic areas. The pathway steppers clearly direct foot traffic away from the sensitive groundcovers.

Note the black micro-sprinklers surrounding the thyme (pink). This method of irrigation is not drip. While we typically do not recommend use of micro-sprinklers, their application here is very appropriate. Ultimately, efficient irrigation is dependent more on the user controlling when and for how long the system runs than the irrigation method.
This yard was winner of the 2016 Water-wise Landscape Award for its great color and use of both groundcover and blue grama grass as alternatives to Kentucky bluegrass.

The customer uses less than 5” of water a year to maintain this water-wise landscape. For perspective, Kentucky bluegrass requires 28” of supplemental water, water-wise landscapes should not receive more than 15”
While this design is dominated by rock mulch, the property is still code compliant. It is more of a sparsely planted landscape, but has a great diversity of shrubs with colorful blooms, evergreen and purple leaves. You can also see plenty of ornamental grasses. This project will appear less sparse as plant material matures.
Streetscapes (aka tree lawns) are perfect places for a water-wise design since they are difficult to water with pop-up sprinklers due to their narrow shape. Here are two different styles. These xeriscapes are newly planted and aren’t colorful yet.
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