STONE CANYON
Ranch

Section Two:
Landscape & Irrigation Standards & Guidelines

STONE CANYON
Ranch

Stone Canyon Ranch Landscape Standards and Guidelines

Introduction

The Stone Canyon Ranch community is located within the high desert ecology of western Colorado. This semi-arid country with its hot, dry summers can be very demanding for plants not suited to this region and can require large amounts of water to sustain. Therefore the use of low water planting, drip irrigation and installation practices aimed to conserve water is encouraged.

The landscape goal of this community is to create a natural, Xeriscape buffer zone between the buildings with plants that are indigenous to this environment. This is the Native Landscape Zone and will be vegetated with low grasses, juniper, pine and other plants that will survive with minimal to no water once established. While the open spaces between the residences will have a strict plant palette, there will be a zone within the building envelope that will allow for a more diverse, creative planting schedule. This Manicured Landscape Zone is where all lawns, flower beds, patios, terraces and other man made features will be allowed. Plants shall be selected to compliment architectural elements such as entries and patios while maintaining a xeric quality around the remaining facade. The final foundation zone will be the area from the foundation out ten feet (10'). This area is designed to minimize water discharge near the building foundation.

Plan Submittal and Approval

The DRC will require two (2) complete sets of 10 scale or larger drawings for the landscape and irrigation plans. All plans must be received prior to receipt of Certificate of Occupancy. These plans will address all site structures such as patios, retaining walls, privacy walls, pools and fences relative to the building, property boundary and easements. Materials must be called out on the plans as well as any details needed to clarify the design. Samples may be requested by the DRC. The plans will illustrate any planting berms, landscape boulders, planting beds and structural planters as well as a clear plant schedule indicating plant species and count.

These plans will be submitted as a complete package for the DRC. Once the DRC has reviewed the plans and accepted the design, a Certificate of Approval shall be issued to the owner.

The owner will have nine months from the issuance of the Certificate of Approval to complete installation of all landscaping and irrigation in accordance to the accepted plans. DRC will issue variances to this time frame on a per property basis, all request for delay should be made in a timely manner. The DRC will evaluate the installed landscapes for final approval.

The owner agrees to place in escrow an amount of twenty thousand dollars ($20,000). These funds will be distributed to the homeowner in four equal payments of five thousand dollars ($5,000) upon completion of four specific phases. The first distribution will be after the irrigation system is installed and buried. The second distribution will occur upon completion of final grade and all walls, walks and patios are in place per the approved plan. The third will be dispersed after all trees and shrubs are planted to specification. The final payment of five thousand dollars ($5,000) will be paid to the home owner when all the planting, hardscape, walls and mulch beds are installed and approved. The DRC may arrange to have the installation of the landscape and irrigation completed in accordance with or close to the approved landscape/irrigation plans, with use of said funds in the event the installation is not completed after the nine month period and no variances have been approved. If the escrow is insufficient to complete the installation the owner will have sole responsibility to pay the difference.

Grading

Grading is to achieve positive drainage away from the foundation to existing drainage swales or inlets. Stormwater should exit the site according to natural drainage patterns, deliberate swales or daylighting pipes into neighboring properties is prohibited. The grading should be a smooth, consistent slope with no abrupt grade change or deep swales and should mimic the natural topography of the site. A positive slope away from the foundation must be achieved for a minimum of five (5) feet. All interior courtyards or enclosed patios must drain to inlets at a minimum of 2% slope, inlets must drain to daylight or tie into storm system.

Irrigation

All planted areas will be irrigated with an automatic sprinkler system tied into the pressurized community irrigation lines. The system shall be designed to minimize overspray with low angle nozzles next to pavement and spray/impact heads located only in turf and groundcover areas. All planting beds, shrubs and trees shall be watered with drip irrigation. The native landscape zone will have a permanent system of spray or impact heads used to establish native seeding and occasional use during the dry season to maintain a healthy grass cover at all times.

Mulch and Landscape Boulders

Wood and rock mulch should appear indigenous of this area and should flow through the entire community. Tans, browns and subtle pinks are encouraged while gray river rock and gravel as well as garish colored mulches are discouraged. Where neighboring plant beds connect they should be tied together with similar mulch and continuity in design. A unified planting edge shall be illustrated on the landscape plan by showing 10' of the neighboring lots existing design.

All landscape boulders shall be set into the existing grade at least one third the diameter of the boulder to anchor the rock into the site. All boulders should blend with the approved mulch and be homogenous with the character of the community.

Walls and Fencing

Retaining walls shall be a maximum of 48" tall. Where grade requires an excess of 48", retaining walls shall be stepped with a minimum of 36" between tiers for planting. The DRC may approve a taller, structural wall on a per site basis.

Wall material should be of a similar color and texture as the surrounding landscape and architectural environment. Stacked boulder walls, residential masonry block walls (with varied size and colors) and stone faced or stucco structural walls are encouraged while wood timber and railroad tie walls are discouraged. Trees and shrubs should be planted at intervals along face of walls.

All fencing will be designed and installed by the contractor prior to landscaping, any modifications to said fencing shall have prior approval by the DRC.

Lighting

All exterior lighting should be addressed in the landscape plan to illustrate their relation to landscape elements and planting beds. Lighting must be designed and constructed to highlight architectural and landscape features while minimizing light pollution and glare to neighboring properties. Security and safety lighting shall be installed to address pedestrian needs through light bollards and step lights as needed. Floodlights are not allowed at the front and sides of the buildings. Floodlights may be installed in the rear entries of the buildings only if installed with a motion detector and located to reduce glare to adjacent lots. All light bollards and fixtures shall be submitted to the DRC for approval prior to installation.

Planting Requirements

As a minimum each lot shall have the following plant count;

Manicured/Foundation Zones

Evergreen Trees: 2 - 6' height or taller.

Deciduous Trees: 2 - 1-1/2" caliper or greater.

Shrubs: Count is to be determined by building envelope size. For every 100 square feet of Manicured Area (building Envelope) three (3) shrubs are required. Of these one shall be a 5 gallon shrub and the other two shall be either a 5 gallon shrub or a one gallon ornamental grass, vine or perennial.

Native Landscape Zone

For every five thousand (5,000) square feet of area in the Native Zone there shall be one (1), 1-1/2" caliper tree and six (6), 5-gallon shrubs from the schedule in Table 1.

Refer to Table 1 for recommended plant material for each of the following zones. This table is meant as a guide for plant types except in the Native Landscape Zone. Any species other than those listed should meet the xeric, low water qualities of this environment.

Foundation Planting Zone

The foundation planting zone is designed to reduce exposure to moisture to the foundation from irrigation water. This zone is defined by a 10' offset from the face of the foundation walls, a 5' offset may be allowed in certain instances and must be approved by the DRC. This area will be planted with low water shrubs, vines and perennials and only drip irrigation will be allowed. *No turf is allowed within the Foundation Planting Zone!* All enclosed/raised planters in this zone shall be sealed and have drainage inlets designed to carry any excess moisture away from the foundation. Shrub and perennial beds should be located at key points to maximize visual impact while maintaining a small overall percentage of the landscape and will be drip irrigated.

Roof drain gutters shall be designed to convey stormwater away from the foundation.

As a minimum each lot shall have the following plant count:

Manicured/Foundation Zones
Evergreen Trees: 2 - 6' height or taller.
Deciduous Trees: 2 - 1-1/2" caliper or greater.
Shrubs: Count is to be determined by building envelope size. For every 100 square feet of Manicured Area (building Envelope) three (3) shrubs are required. Of these one shall be a five gallon shrub and the other two shall be either a five gallon shrub or a one gallon ornamental grass, vine or perennial.

Manicured Landscape Zone

The Manicured Landscape Zone is the area within the building envelope. All lawn and ornamental planting will be restricted to this zone as well as patios, hot tubs, pools and privacy walls. Lawn size will be restricted to 10% of the overall lot size and must be fully restricted to the MLZ. All planting beds adjacent to grass shall be contained by metal edger, TREX composite edging or colored concrete mowing curbs.

This area shall be completely landscaped with a weed barrier fabric covered by 3" of approved mulch materials. Some steep slopes where the mulch would edge down the hill will be allowed to have a native grass cover to prevent erosion. This treatment must be approved by the DRC.

Native Landscape Zone

This zone shall encompass all open areas between the streets and building envelopes. The intent of this zone is to provide a continuous style indigenous to the Redlands and the Monument that will flow throughout the development as well as a buffer between buildings. Since water is a premium this zone will be reseeded with the "Redlands Native Grass" seed mix to stabilize all disturbed areas and reduce the introduction of undesirable plants. All trees and shrubs planted in this area will be xeric in nature and should be selected from the native plant list in Table 1.

Views from neighboring lots should be taken into account when designing in the NLZ. Keep trees in clusters and position species so that their mature height and spread will screen

undesirable views such as parking, mechanical equipment, utilities and dog runs, while maintaining the dramatic views to the Monument and the Grand Valley.

The community is enclosed by a privacy planting berm previously installed in the Native Landscape Zone. The owners of lots that include this berm will be responsible for maintenance of all plant material and mulch on and around the berm, existing plants cannot be counted towards plant totals in the landscape plan.

As a minimum each lot shall have the following plant count;

Native Landscape Zone

For every five thousand (5,000) square feet of area in the Native Zone there shall be one (1), 1-1/2" caliper deciduous tree or six foot tall evergreen and six (6), 5-gallon shrubs from the schedule in Table 1.

Refer to Table 1 for recommended plant material.

Table 1

Foundation Planting Zone

The Foundation Planting Zone is within the building envelope and therefore has more freedom in plant selection than the Native Zone. The following list is provided as a guide illustrating the low water/xeric plant material appropriate to this zone, there are many other non-native species of plants that are well adapted to this region that will fit into this zone and will allow a greater freedom of design.

Evergreen Trees

Common Name	Scientific Name
Manhattan Blue Juniper	*Juniperus virginiana 'Manhattan Blue'*
Wichita Juniper	*Juniperus sabina 'Wichita'*
Rocky Mountain Juniper	*Juniperus scopulorum*
Rocky Mountain Juniper	*Juniperus scopulorum*
Bristlecone Pine	*Pinus aristata*
Pinyon Pine	*Pinus cembroides edulis*
Pinon Pine	*Pinus cembroides edulis*
Dwarf Mugo Pine	*Pinus mugo 'Compacta'*
Ponderosa pine	*Pinus ponderosa*

Deciduous Trees

Common Name	Scientific Name
Amur Maple	*Acer ginnala*
Rocky Mountain Maple	*Acer glabrum*
Big Tooth Maple	*Acer grandidentatum*
Purple Smoke Tree	*Cotinus coggygria*
Cockspur Hawthorn	*Crataegus crus-galli inermis*
Washington Hawthorn	*Crataegus phaenopyrum*
Winter King Hawthorn	*Crataegus viridis 'Winter King'*
Ginkgo/Maidenhair tree	*Ginkgo biloba*
Golden Raintree	*Koelreuteria paniculata*
Crabapple	*Malus species*
New Mexico Locust	*Robinia neomexicana*

Shrubs

Common Name	Scientific Name
Silver Sagebrush	*Artemisia cana*
Fringed Sage	*Artemisia frigida*
Saltbush	*Atriplex canescens*
Siberian Peashrub	*Caragana arborescens*
Pygmy Peashrub	*Caragana pygmaea*
Mountain mahogany	*Cercocarpus* spp
Fernbush	*Chamaebatiaria millefolium*
Rabbitbrush	*Chrysothamnus* spp.
Redstem Dogwood	*Cornus sericea*
Cranberry Cotoneaster	*Cotoneaster apiculatus*
Spreading Cotoneaster	*Cotoneaster divaricatus*
Cliff rose	*Cowania mexicana*
Apache Plume	*Fallugia paradoxa*
New Mexican privet	*Forestiera neomexicana*
Forsythia	*Forsythia x intermedia*
Blue oat grass	*Helictotrichon sempervirens*
Creeping Juniper	*Juniperus horizontalis*
Savin Juniper	*Juniperus sabina*
Flame grass	*Miscanthus 'Purpurascens'*
Moor grass	*Molina caerulea ssp. arundinacea*
Dwarf Fountain grass	*Pennisetum alopecuroides* 'Hameln'
Mugo Pine	*Pinus mugo*
Potentilla	*Potentilla fruticosa*
Sand Cherry	*Prunus besseyi*
Smooth Sumac	*Rhus glabra*
Dwarf Mountain Sumac	*Rhus glabra 'Cismontana'*
Oakleaf Sumac	*Rhus trilobata*
Staghorn Sumac	*Rhus typhina*
Persian Yellow Rose	*Rosa foetida 'Persiana'*
Austrian Brier Rose	*Rosa foetida bicolor*
Rugosa Rose	*Rosa rugosa*
Woods Rose	*Rosa woodsii*
Silver Buffaloberry	*Shepherdia argentea*
Bumald Spiraea	*Spirea x bumalda*
Dwarf Korean Lilac	*Syringa meyeri 'Palibin'*
Miss Kim Lilac	*Syringa patula*
Common Lilac	*Syringa vulgaris*
English Yew	*Taxus baccata*
Japanese Yew	*Taxus cuspidata*
Anglojap Yew	*Taxus x media*
Yucca sp.	*Yucca filamentosa*

Manicured Planting Zone

The manicured Planting Zone will be the area defined by the building envelope, outside of the Foundation Planting Zone. This is the only area where sod will be permitted. The plant selection in this area is open to the designer to select whatever species they feel will compliment the architecture and fit their design needs. It is the understanding of the home owner and the designer that xeriscape planting principles are favored in this development and low water plants should be used as frequently as possible.

Native Planting Zone

The Native Planting Zone will flow throughout the project outside of the building envelopes reclaiming all of the disturbed property as well as the previous agricultural land to a native, high desert environment. The plant material selected will ensure the community has a consistent design character throughout the development, it is imperative that selections for the Native Landscape Zone are drawn from the designated palette.

Evergreen Trees

Common Name	Scientific Name
Rocky Mountain Juniper	*Juniperus scopulorum*
One-Seed Juniper	*Juniperus monosperma*
Rocky Mountain Juniper	*Juniperus scopulorum*
Bristlecone Pine	*Pinus aristata*
Pinyon Pine	*Pinus cembroides edulis*

Deciduous Trees

Common Name	Scientific Name
Rocky Mountain Maple	*Acer glabrum*
Big Tooth Maple	*Acer grandidentatum*
Purple Smoke Tree	*Cotinus coggygria*
Cockspur Hawthorn	*Crataegus crus-galli inermis*
Washington Hawthorn	*Crataegus phaenopyrum*
Winter King Hawthorn	*Crataegus viridis 'Winter King'*
New Mexico Locust	*Robinia neomexicana*

Shrubs

Common Name	Scientific Name
Silver Sagebrush	*Artemisia cana*
Fringed Sage	*Artemisia frigida*
Saltbush	*Atriplex canescens*
Mountain mahogany	*Cercocarpus* spp
Fernbush	*Chamaebatiaria millefolium*
Rabbitbrush	*Chrysothamnus* spp.
Cliff rose	*Cowania mexicana*
Apache Plume	*Fallugia paradoxa*
New Mexican privet	*Forestiera neomexicana*
Potentilla	*Potentilla fruticosa*
Sand Cherry	*Prunus besseyi*
Oakleaf Sumac	*Rhus trilobata*
Staghorn Sumac	*Rhus typhina*
Austrian Brier Rose	*Rosa foetida bicolor*
Woods Rose	*Rosa woodsii*
Silver Buffaloberry	*Shepherdia argentea*
Yucca sp.	*Yucca filamentosa*

STONE CANYON
Ranch

Appendix C:
Architectural Control Committee Landscape Application

STONE CANYON
Ranch

Stone Canyon Ranch Homeowners Association, Inc.

Architectural Control Committee (ACC) Checklist and Application Instructions

INSTRUCTIONS:

These Checklists and Applications are to be used for **all** submittals including, but not limited to, new house plans, landscaping and irrigation plans (front and backyard), fencing, color changes, exterior alterations, etc. The Stone Canyon Ranch Architectural Control Committee (ACC) generally meets on the first and third Tuesday of each month. The Checklist portion of this form is intended to assist in assuring that the submittal is complete and will help provide for a quicker review process. Anyone preparing a submittal should compare the information they are about to submit with the requirements of this form and "check off" each required item. If any item is not checked the submittal is not complete and **should not** be submitted. **Two complete sets** each of the following information, *as applicable*, specifications and plans must be submitted:

1. **Plot/Site Plan** in a minimum 1 inch equals 10 feet scale including Items A thru F noted on the Checklist.

2. **Architectural Drawings** in ¼ inch equals one foot scale.

3. **Licensed Engineer Grading and Drainage Plans.**

4. **Landscape/Fence/Irrigation Plan** (2 sets) in minimum one inch equals ten feet scale including requirements in the Checklist and Application (to be completed prior to Certificate of Occupancy).

In addition to the checklist, anyone preparing a submittal should fill in all of the places where information is requested. The ACC will use this information in reviewing the submittal. If information is requested but is not applicable to the submittal, write N/A in the space. DO NOT fill in any information in the Conditions of Approval portion of this form. This is for ACC use only.

It is highly recommended that each applicant thoroughly review the requirements of the ACC Standards and Guidelines, the Recorded Plat and Special Building Lot Considerations and the Recorded Covenants, Conditions and Restrictions and Amendments prior to preparing a submittal.

When a submittal is ready **two complete sets** of all information required above and related application fees should be sent or hand delivered to:

Monument Homes
603A 28 1/4 Road
Grand Junction, CO 81506

We look forward to working with you on your house and landscape plans.

Thank you,

Stone Canyon Ranch
Architectural Control Committee

STONE CANYON RANCH
ACC LANDSCAPE AND IRRIGATION CHECKLIST AND APPLICATION

Street Address: _____ Date:_____
Lot: _____
Owner: _____
Address: _____
Phone:_____(Home) _____(Work) _____(Fax)
Contractor: _____ Phone:_____
Submittal Date: _____
Estimated Construction Start Date: _____
Estimated Construction Completion Date:_____

SUBMITTAL REQUIREMENTS: (Items 1, 2, 3, & 4 need to be submitted in **duplicate** form. Check-off items included in submittal. Fill-in spaces as indicated.)

Check-off:

1. **Plot/Site Plan** (in a 1 inch = 10'0" scale) with the following information:
   a. Lot, Block, & Filing No.
   b. Address
   c. Setbacks (fill-in with the shortest distance between a property line and the exterior wall closest to that property line.):

      Dwelling

      Front: _____ feet
      Left Side: _____ feet
      Rear: _____ feet
      Right Side: _____ feet

   d. Licensed Engineered Site Grading and Drainage Plan
   e. First (main) Floor top of foundation elevation _____ feet
   f. Driveways and walks location
   g. Total Lot Square Footage

2. **Landscape and Irrigation Plans** (in 1" = 10'0" scale including all property boundaries) with the following information:
   a. Planting Plan (Indicate square footage of the turf grass and the Designated Planting Area – DPA)
   b. Plant Schedule
   c. Irrigation Sprinkler Plan (Indicate the Foundation Planting Zone)
   d. Ground Cover Material (with weed barrier)
   e. Other Site Improvements (walks, patios, decks, pool, spa, etc.)
   f. Lighting Plan, if applicable
   g. Fencing Plan, if applicable including location, height and description

3. **Tan Granite Color** (Attach Sample) Check Size: ____1/2" ____1" ____1 ½"

4. **Rock pathways** (Attach Sample, if applicable)

5. **Landscape Application Fee**: $75.00 Fee payable to: Stone Canyon Ranch Homeowners Association.

Owner's Signature: _____ Print Name: _____

Lot Address _____ Approval Date: _____
Lot _____ ACC Initials: _____

STONE CANYON RANCH
ACC LANDSCAPE AND IRRIGATION CHECKLIST AND APPLICATION

Conditions of Approval:

Plot Plan, Architectural Drawings and Engineering Compliance Letter:

1. Provide an adequate trash container on site. Owner shall require Owner's contractor to maintain the Lot so that it is free of debris and trash at all times during construction and shall be responsible to collect any trash discharged from the Lot.

2. Owner shall require Owner's contractor to remove any waste concrete and properly dispose of it away from the subdivision premises.

3. Hours of construction for exterior work shall be from 7:00 a.m. to Sunset, subject to City of Grand Junction and Mesa County regulations.

4. All dogs must be on leashes at all times per City and County ordinances.

5. Music and radios are allowed, but shall not be heard beyond the Lot boundary.

6. All work subject to City and County building codes.

7.

8.

9.

10.

11.

12.

13.

Notes: ACC Architectural Standards and Guidelines dated December 2005 are made a part of this approval and are incorporated herein. Pages 1, 2 and 3 of this Checklist/Application are included in the Conditions and Approval.

Approval for construction is subject to the above conditions. Landscape and irrigation completion shall occur within nine months after issuance of the Certificate of Occupancy from the City of Grand Junction:

_____ _____

Chairman — Approval Date

Stone Canyon Ranch Architectural Control Committee

Lot Address _____ Approval Date: _____

Lot _____ ACC Initials: _____

STONE CANYON
Ranch

Appendix D:
Landscape Acceptance Certificate

STONE CANYON
Ranch

Homeowner
Stone Canyon Ranch
Grand Junction, Colorado 81503

Re: Final Landscape Acceptance Lot # _____

Dear _____,

This letter shall confirm that the home and landscaping pursuant to your application dated _____ approved for construction through this Architectural Control Committee have been completed in accordance with the approved plans and specifications.

Sincerely,

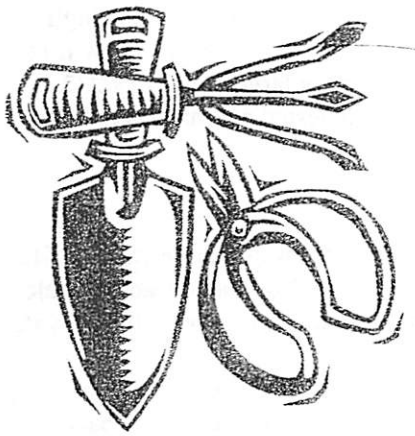
Chairman
Stone Canyon Ranch
HOA Architectural Control Committee

Dated: _____

CC: City of Grand Junction – Building Department

STONE CANYON
Ranch

Appendix E:
High Desert Xeriscape Information & Resources



BASICS

Xeriscaping: Creative Landscaping no. 7.228

by J.R. Feucht [1]

Quick Facts...

Proper planning is the first step in landscaping to reduce water use.

Steep slopes with south and west exposures require more frequent water to maintain the same plant cover as east or north slopes.

Terracing slopes reduces runoff.

Limit irrigated bluegrass turf to small or heavily used areas.

Soil preparation is a key to water conservation.

Proper irrigation practices and system design can lead to 30 to 80 percent water savings.

Mulches help reduce water needs and control weeds.

Colorado State University Cooperative Extension

Xeriscaping (zer-i-skaping) is a word originally coined by a special task force of the Denver Water Department, Associated Landscape Contractors of Colorado and Colorado State University to describe landscaping with water conservation as a major objective. The derivation of the word is from the Greek "xeros," meaning dry, and landscaping — thus, xeriscaping.

The need for landscaping to conserve water received new impetus following the drought of 1977 throughout the western states and the recognition that nearly 50 percent of the water used by the average household is for turfgrass and landscape plantings.

Unfortunately, many homeowners have cut back on turfgrass areas by substituting vast "seas of gravel and plastic" as their answer to water conservation. This practice is not only self-defeating as far as water conservation is concerned, it also produces damaging effects to trees and shrubs. It is not xeriscaping.

Planning — An Important First Step

Whether you want to redesign an old landscape or start fresh with a new one, a plan is a must. The plan does not have to be elaborate but should take into consideration the exposures on the site. As a rule, south and west exposures result in the greatest water losses, especially areas near buildings or paved surfaces. You can save water in these locations simply by changing to plants adapted to reduced water use. However, don't be too quick to rip out the sod and substitute plastic and gravel. Extensive use of rock on south and west exposures can raise temperatures near the house and result in wasteful water runoff.

Slope of Property

Slope or grade is another consideration. Steep slopes, especially those on south and west exposures, waste water through runoff and rapid water evaporation. A drought-resistant ground cover can slow water loss and shade the soil. See fact sheet 7.230, *Xeriscaping: Ground Cover Plants*, for suggested ground covers. Strategically placed trees also can shade a severe exposure, creating cooler soil with less evaporation. Terracing slopes helps save water by slowing runoff and permitting more water to soak in.

Reduce Irrigated Turf

Avoid narrow strips of turf, hard to maintain corners, and isolated islands of grass that need special attention. Not only is maintenance more costly, but watering becomes difficult, often wasteful. If your yard is already landscaped, see 7.234, *Xeriscaping: Retrofit Your Yard*, for information on ways to evaluate and eliminate unneeded turfgrass areas.

Bluegrass turf can be reduced to areas near the house or that get high use. In outlying areas, use more drought-resistant grasses or even meadow mixes containing wildflowers, particularly if your property is large. Refer to 7.232, *Xeriscaping: Turf and Ornamental Grasses*, for suggested alternatives to bluegrass.

Soil Preparation

Proper soil preparation is the key to successful water conservation. If the soil is very sandy, water and valuable nutrients will be lost due to leaching below the root zone. If your soil is heavy clay, common in this area, you will lose water through runoff.

A good soil, one that supports healthy plant life and conserves moisture, has a balance of rather coarse soil clusters (aggregates), sand and pore spaces. The "ideal" soil has as much as 50 percent by volume pore space, with the soil itself consisting of a good balance of sand, silt and clay.

A major problem with heavy soils is that clay tends to dominate the soil complex. Clay is composed of microscopic crystals arranged in flat plates. When a soil has a high number of these crystals, they act much like a glue, cementing the particles of sand and silt together and resulting in a compact, almost airless soil.

Steps to Xeriscaping

- *Evaluate your property's exposure and slope and how your family uses the yard.*
- *Reduce irrigated turf where appropriate and replace it with low-water alternatives.*
- *Prepare the soil. This is your best opportunity.*
- *Irrigate properly.*
- *Use mulch to save water, inhibit weeds and improve the soil.*
- *Select appropriate plants.*

Such soils usually repel surface water, resulting in runoff. What water does get into these soils is held so tightly by the clay itself that plants cannot use it. Plants in a clay soil, even though it is moist, often wilt from lack of moisture. Plant roots also need air to thrive. In clay soils, air spaces are small and may be filled with water, so plant roots often suffer from oxygen starvation.

In very sandy soils, the opposite is true. Sandy soils have very large pore spaces. Because the particles are large, there is little surface area to hold the water, so sandy soils tend to lose water rapidly.

A good soil is not made in just one year. Add organic matter annually to garden areas. In areas to be sodded or seeded, add organic amendments as a one-time procedure. Take advantage of this one time before seeding or sodding by doing a thorough, complete job. This encourages deep roots that tap the water stored in the soil and reduces the need for wasteful, frequent water applications. For more information on soil improvement, refer to 7.222, *Soil: Key to Successful Gardening*.

Xerigation — Saving Water with Proper Irrigation

Proper irrigation practices can lead to a 30 to 80 percent water savings around the home grounds. If a sprinkler system is already installed, check it for overall coverage. If areas are not properly covered or water is falling on driveways and patios, adjust the system. This may mean replacing heads, adding more heads, or changing heads to do a more efficient job.

With the system on, observe places that are receiving water where it is not needed. Overlaps onto paved areas or into shrub borders may result in considerable water waste. Overwatering trees and shrubs may lead to other problems.

Irrigate turf areas differently than shrub borders and flower beds. North and east exposures need less frequent watering than south and west exposures. Apply water to slopes more slowly than to flat surfaces. Examine these closely and correct inefficiencies in irrigation system design.

If you do not have a sprinkler system and are just beginning to install a landscape, you can avoid the pitfalls of poorly designed and installed systems. Have a professional irrigation company do the job correctly. Make sure the system is designed to fit the landscape and the water needs of the plants and that it is zoned to reduce unnecessary applications of water. Coordinate the landscape

design itself, selection of plants and the irrigation system to result in a sensible water-saving scheme.

Consider a drip system for outlying shrub borders and raised planters, around trees and shrubs, and in narrow strips where conventional above-ground systems would result in water waste.

If you use hoses instead of an underground system, you can observe water patterns. Instead of watering the entire lawn each time, spot water based on visible signs of need, such as turf that begins to turn a gray-green color.

Avoid frequent, shallow sprinklings that lead to shallow root development. Compact soils result in quick puddling and water runoff. They need aeration with machines that pull soil plugs.

Trees and shrubs separate from the lawn are best watered with deep root watering devices.

Xerimulch the Landscape

Properly selected and applied mulches in flower and shrub beds reduce water use by decreasing soil temperatures and the amount of soil exposed to wind. Mulches also discourage weeds and can improve soil conditions.

There are two basic types of mulches: organic and inorganic. Organic mulches include straw, partially decomposed compost, wood chips, bark, and even ground corncobs or newspapers. Inorganic mulches include plastic film, gravel and woven fabrics. Sometimes a combination of both organic and inorganic is used.

If soil improvement is a priority, use organic mulches. Wood chips and compost are most appropriate. As these materials break down, they become an organic amendment to the soil. Earthworms and other soil organisms help incorporate the organic component into the soil. Organic mulch is preferred because most soils in this area are low in organic content and need organic amendments to improve aeration and water-holding capacity.

Inorganic mulches, such as plastic film, effectively exclude weeds for a time, but they also tend to exclude the water and air essential to plant roots. Woven fabrics and fiber mats are preferred over polyethylene films. Fabrics and mats exclude weeds yet allow water and air exchange. Used in combination with decorative rock or bark chunks, they often outlast the less expensive but short-lived polyethylene films. For more information, refer to 7.214, *Mulches for Home Grounds.*

Selecting Plants

Carefully select plants to be compatible with soil, exposure and irrigation systems. For recommended plants, see:

- 7.229, *Xeriscaping: Trees and Shrubs.*
- 7.230, *Xeriscaping: Ground Cover Plants.*
- 7.231, *Xeriscaping: Garden Flowers.*
- 7.234, *Xeriscaping: Retrofit Your Yard.*

[1]J.R. Feucht, Colorado State University Cooperative Extension landscape plants specialist and professor (retired), horticulture.
Prepared in cooperation with the Technical Advisory Committee for Xeriscape Front Range, an affiliate of the National Xeriscape Council, Inc. Reviewed by D.E. Whiting, Cooperative Extension ornamental horticulture specialist, horticulture and landscape architecture.

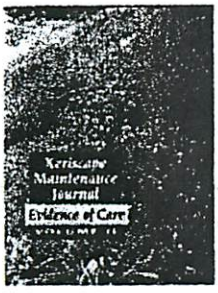
Denver Water Bookstore

www.denverwater.org

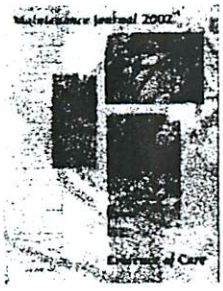
Denver Water publishes information in support of its mission of providing a secure and safe supply of water to its customers.

List of Conservation Books

Xeriscape Maintenance Journal, Evidence of Care, Vol. III,
published by Colorado Water Wise Council.
Third in a series of journals on caring for your Xeriscape. All-new information is covered each month. Also new is a section for placing photos of your garden. Each Journal photo is captioned with the plant name(s) on the photo credit page. This issue continues with a generic calendar, monthly task list, storage pocket and note space each month. Collect all three editions, and you will receive 36 months of valuable information on how to maintain your Xeriscape.
$6, soft cover only



Xeriscape Maintenance Journal, Evidence of Care, Vol. II,
published by Colorado Water Wise Council.
With 56 pages of color photos, monthly checklist of garden tasks, ample room for garden notes each month, generic calendar useful for the year of your choice, storage pocket for receipts or photos, authoritative advice on how to maintain your Xeriscape.
$6, soft cover only



Xeriscape Maintenance Journal, Evidence of Care, Vol. 1,
published by Colorado Water Wise Council.
A full-color, "gardening tool" that is both a quick reference guide and attractive journal in which to make garden notes. It features 52 pages of inspirational photos, timely gardening tips & how-to instructions, calendar and note space to record "to do" garden tasks by month and handy storage pocket for receipts, plant tags, photos, etc.
$6, soft cover only

Xeriscape Plant Guide, edited by Denver Water, published by Fulcrum Publishing.
This one-of-a-kind guide contains color photos, botanical illustrations and all the information you'd ever want to know about Xeriscape plants. It features over 120 waterwise annuals, perennials, shrubs, trees and grasses that do well in the Colorado Front Range climate.
$26, soft cover only

Xeriscape Handbook, by Gayle Weinstein, published by Fulcrum Publishing.
A must for the true gardener! This book tells you everything you need to know about natural, waterwise gardening from planning right through to maintaining your garden.
$23 soft cover only

WaterWise Landscaping with Trees, Shrubs & Vines,
by Jim Knopf, published by Chamisa Books.
A great reference on woody plant material for Xeriscape landscaping. This book lists over 100 selected plants appropriate for the Rocky Mountain region. It covers steps to water conservation, meeting the growing demand for water and fire-safe Xeriscape. Also featured are photographs of design ideas.
$23 soft cover only

NOTE: Shipping, handling and tax are added to all bookstore purchase.

Seven Steps for Xeriscape

This is a basic introduction to Xeriscape.
For further advice, contact a landscape professional.

1. Planning & Design — Whether you are renovating an existing landscape or installing a new one, planning is a must. Many people create their own designs with excellent results. Landscape professionals can also serve as helpful resources. They can provide advice, offer critique or can develop original plans for you. Remember that you can install your Xeriscape landscape in phases to minimize initial expense.

2. Soil Improvements — Soil improvement allows for better absorption of water and improved water-holding capacity of the soil. Soils that contain organic matter also release beneficial nutrients to plants. Improve soils prior to the installation of any irrigation system.

3. Limited Turf Areas — Locate turf only in areas where it provides functional benefits. Turf is best separated from plantings of trees, shrubs, groundcovers and flowers so it can be watered separately. Often, turf can be replaced with other less water demanding materials such as ground covers and mulches.

4. Efficient Irrigation — Well planned sprinkler systems can save water. For efficient water use, plan to irrigate turf areas separately from other plantings. Landscape plantings should also be grouped according to similar water needs.

Turf areas are best watered with sprinklers. Trees, shrubs, garden flowers and ground covers can be watered efficiently with low volume, drip, spray or bubbler emitters. Regular adjustments of your irrigation system will save you water and money. Watering may also be economically accomplished with the use of a hand set sprinkler. Make sure that you apply only as much water as the soil can absorb to avoid wasteful runoff. This requires an attentive person who is willing to spend the time to closely monitor water progress.

5. Use Mulches — Mulched planting beds are an ideal replacement for turf areas. Mulches cover and cool soil, minimize evaporation, reduce weed growth and slow erosion. Mulches also provide landscape interest. Organic mulches are typically bark chips, wood grindings or pole peelings. Inorganic mulches include rock and various gravel products. Place mulch directly on the soil or on breathable fabric. Avoid using sheet plastic in planting areas. Most attractive Xeriscapes will have 60% or more of mulch areas covered with plants.

6. Use Lower Water Demand Plants — Most plants have a place in Xeriscape, especially adapted varieties. Numerous attractive trees, shrubs, garden flowers and ground covers are available to complement your Xeriscape. Low water requiring grasses are also available for turf areas.

7. Appropriate Maintenance — Regular maintenance preserves the intended beauty of your landscape and saves water. A well designed Xeriscape saves maintenance costs. Pruning, weeding, proper fertilization, pest control and irrigation system adjustments stretch water savings. Always water according to plant needs and current soil moisture conditions.