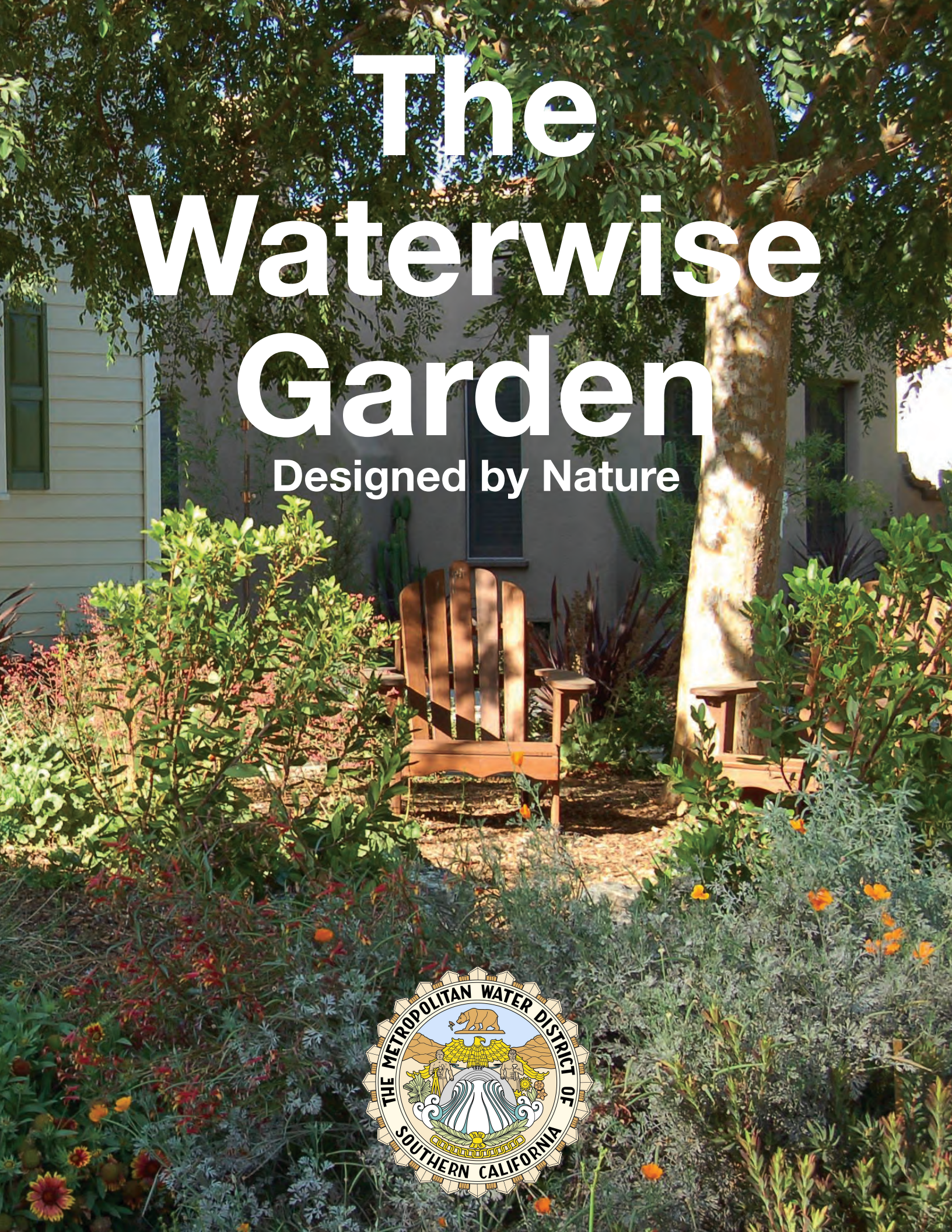


The Waterwise Garden

Designed by Nature

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

This Guidebook provides landscape design tips,
and step-by-step guidelines for transforming your yard
from lawn to a waterwise and sustainable garden.

Published May 2020
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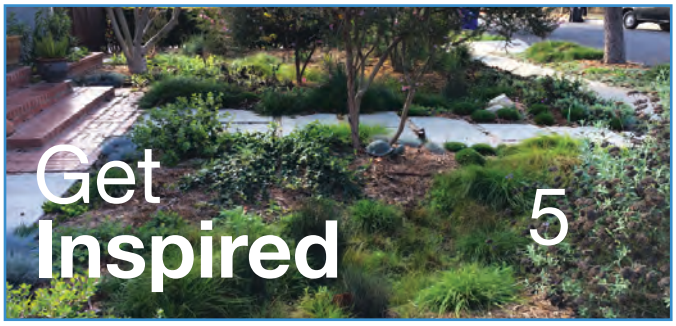
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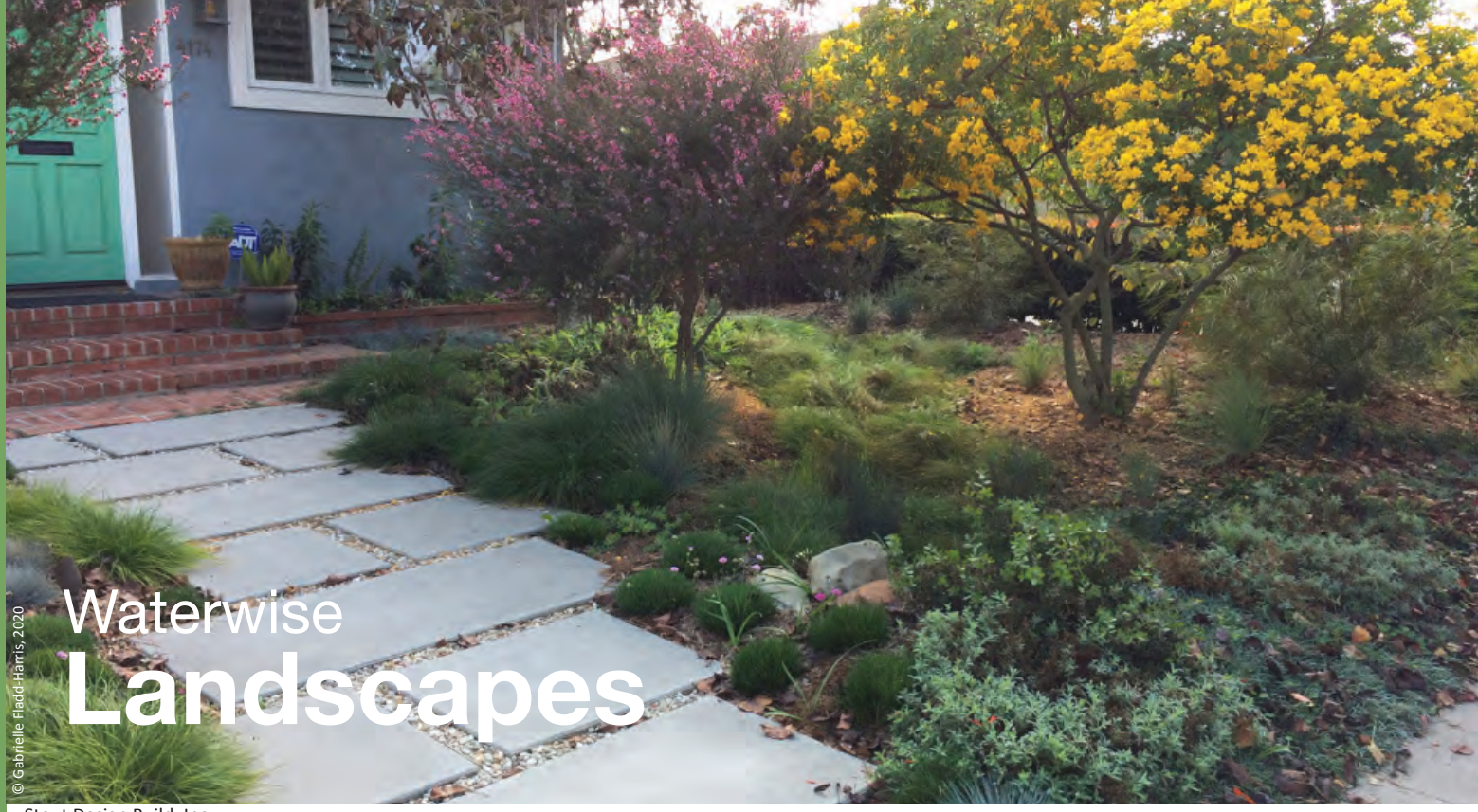
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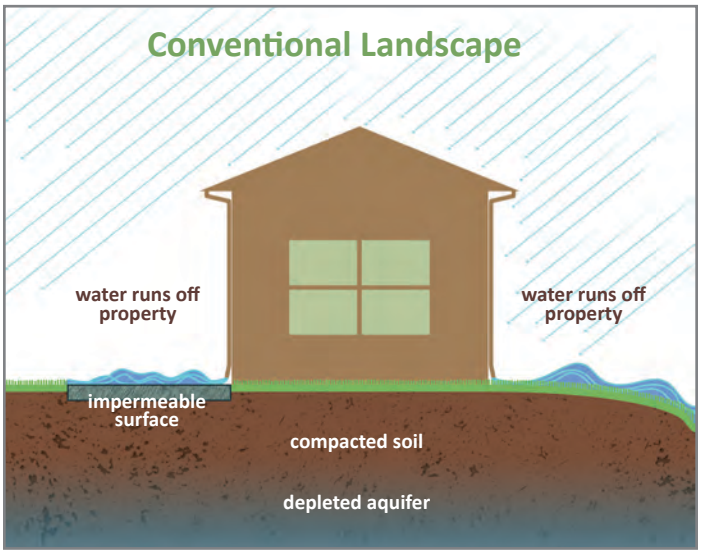
These **Beautiful** gardens...

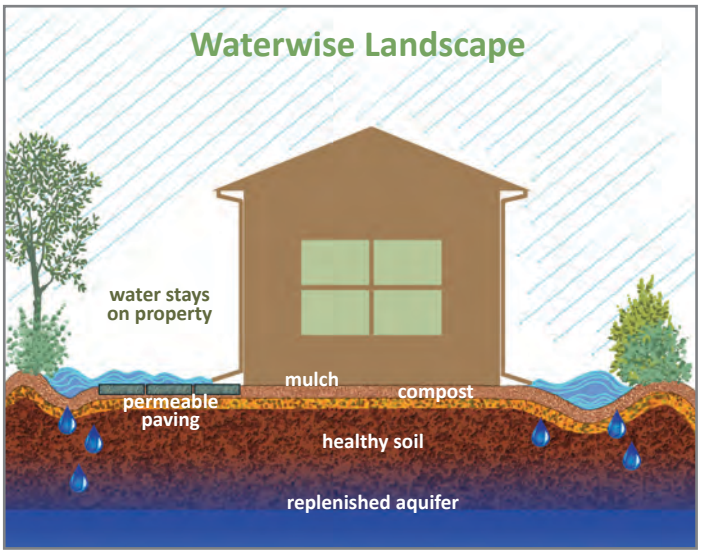
require less water, but don't look dry; they are attractive, lush and evergreen because they were transformed from grassy yards using the principles of sustainable landscaping.

While some conventional landscapes may waste water by allowing water to run off the property, waterwise landscapes are designed to hold on to rainwater and reduce the demand for supplemental irrigation. In the pages that follow, you'll see inspirational gardens that allow us to continue enjoying Southern California's varied and amazing climate and outdoor lifestyle, while conserving valuable natural resources and creating a diverse habitat of plants and insects.

If we want landscapes that are truly resilient to changes in climate and ecosystems, we need to go beyond sustainable and water wise principles to begin managing each property as though it were a mini-watershed. By paying attention to the design of the garden, building soil and keeping rain on our properties, selecting climate-appropriate plants and managing supplemental irrigation, we transform our grass-covered landscapes into abundant watershed wise enhancements to our properties and neighborhoods.

Now dig in!





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In three **Easy Steps**

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Healthy soil is made by adding compost, covering your garden with mulch, and by avoiding soil disturbance as much as possible. Compost boosts soil organisms that reduce diseases and pests. There's no need for adding fertilizers or pesticides on sustainable gardens.

Maintaining 3" of small-size organic mulch on top of every open space in the landscape keeps the garden looking clean while slowly building the soil. The mulch holds in water, so less irrigation is required (*see p. 63*).

When downspouts are directed to these landscapes, the soil becomes a giant sponge that helps keep plants healthy and happy, whether it's raining or we're in a drought.

see BEFORE image on p.26

Flower to the People



Selecting climate-appropriate plants like those from Mediterranean climates and, even better, from Southern California's own native plant communities, makes your garden automatically adapted to the seasonal summer drought, wet winter months, and various microclimates. Many plants from the five Mediterranean climates, (South Africa, area around the Mediterranean Sea, Chile, Australia, and certain regions of California) are appropriate for our gardens, but the Southern California summer is drier than the other Mediterranean climates.

Local native plants benefit the local native birds and insect species by providing food and nesting materials! There are many dry-adapted evergreen and long-flowering California native plants. When you use them in your garden, you get year-long interest and a garden filled with life, on reduced summer irrigation (*see p. 48*).

Flower to the People



There may be years when there isn't enough winter rain, or you may have plants you love that struggle to thrive in the long, hot, dry summers. In those cases, you want to apply supplemental water through a highly efficient irrigation system.

Efficient irrigation makes sure every drop of water applied to the landscape stays there for the benefit of the plants. By using weather-based "smart" irrigation controllers and drip irrigation that applies water directly to the roots of the plants, you can keep your landscape healthy without wasting water *(see p. 65*).

You also can reduce your irrigation use just by paying closer attention to it. Grab a cup of coffee and get to know your irrigation controller!



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Envision your Waterwise landscape

A healthy landscape is one that offers both lasting beauty and practical functions . . . season after season. The homeowners whose garden we use in our examples in this handbook want to remove the lawn without using chemicals and replace it with a low maintenance and low water landscape that uses local California native plants to reflect the lush chaparral-covered hillsides and oak savannahs of our region. They want to start spending more time in their garden with their family and dog, and attract birds, butterflies, and other beneficial insects. They also want to capture all the rainwater from the roof, and keep it in their garden.

Think about the elements of your landscape that are most important to you. Jot down a few ideas that will help you determine your next steps.

Consider how much maintenance you want to take on. Are you ready to lose the lawn? Would you like fruit trees or edible shrubs? Are you falling in love with California native and California friendly plants?

Consider how you move through the garden. Do you have a patio near the house, or out in the yard? Would a nice wide entry pathway make your home more welcoming? Does enclosing the front yard make the most of a small space and provide needed privacy?

Surfrider Ocean Friendly Garden



© Pamela Berstler, 2020

Plan your garden with long-term health and maintenance in mind. Look for opportunities to improve the soil with compost and mulch, shape and contour the land to make the most of rainfall, and select climate-appropriate plants that thrive in the local environment. Think about providing resources for local native insects and fauna, and keeping pollution out of the local waterways.

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The art of garden-making draws from the principles of scale, color, texture, and placement of plants and features. Landscapes are living, dynamic performances, and the long-term health and viability of the garden requires knowledge of the science behind what we see with our eyes. A well-designed landscape will continue to grow, change, surprise, and delight for decades.

Dirt Diva Designs



© Pamela Berstler, 2020

A well-executed landscape design, whether you do it yourself or have professional help, not only makes your home more enjoyable, it adds to your useable space. Studies have shown that thoughtfully developed outdoor spaces can increase the value of a home by up to twenty percent. And a well-maintained landscape ensures that you retain that value.

Consider your **Budget**



Scope Your Project

If your budget is limited, you may want to make small improvements first and then bigger changes in a year or two. Working with a professional designer can help you plan these phases. You may start with weed removal and preliminary planting, then add features such as a dry creek bed or a rain garden. **Plan ahead before you lose the lawn**. Like anything, an ounce of prevention is worth a pound of cure. Implementing the basic functionality of a sustainable landscape does not add to your overall installation budget.

When you invest in your landscaping, you are investing in the long-term value of your property. Don't forget to plan an ongoing maintenance budget allocation for keeping the garden healthy over time (*see p. 67*). **Stretch your dollars by taking advantage of rebates and incentives. Remember, always review your local water agency's current project requirements to ensure you qualify for any rebates.**

Landscape = Planting + Infrastructure

Planting includes ground preparation, contouring, and installation of plants. Infrastructure includes irrigation, lighting, and anything that's built on top of the landscape. Consider that the landscape is raw ground to be prepared, graded, etc. Landscape contractors, plumbers and electricians typically work on a landscape. Many people who do it themselves can remove turf, make grade changes and build soil through sheet mulching. Planting also can be accomplished using the techniques outlined in this book. The more you do yourself, work with what you have, or select low cost materials, the more affordable you will make your landscape changes.

There is no such thing as a typical budget for landscape design and installation. While a good **RULE OF THUMB** is to budget 5% - 10% of your home's current market value in a landscape renovation, every site is different, and the situations encountered on that site will dramatically influence the overall budget for the project. Location, expectations of the neighborhood, and aesthetics must be combined with all of the functional requirements discussed in this book to inform the final budget for your landscape. When you take into consideration special site circumstances such as slopes or tricky drainage, expect to spend more on design and installation.

Need help getting the job done?

Building a garden is a collaborative experience. If your property has a slope or you live in a landslide or fire-prone zone, you may need to seek the professional advice of a licensed civil engineer, landscape architect, or other professional before grading and capturing rainwater on existing hillsides. Protect your investment by hiring a licensed arborist for your tree care and licensed contractors for installation.

Invest in Design



The more time you spend researching your options and planning your garden, the better prepared you will be during construction. Measure twice, dig once! Spend the time yourself, or expect to pay 10% - 20% of your budget on professional design assistance.

Invest in Soil



Soil preparation is the single greatest investment you can make in the long term health and beauty of your garden. Buy your compost in bulk, and expect to spend at least 10% of your budget on building healthy soil (*see pp. 29-30, 39-40*).

Invest in Rain



Capturing and holding on to rainfall from the roof and adjacent hard surfaces, helps prepare your garden for the long, dry summer and reduces irrigation demand. Expect to spend up to 20% of your budget on labor for grading for rain detention and materials for drainage (*see pp. 41-43*).

Invest in Stewardship



Plan from the beginning for maintaining the landscape. Select experienced gardeners who are on board with your vision. Expect to see your gardener less frequently for greater periods of time, and expect to pay for sustainable expertise (*see p. 69*).

On the Go Garden

© Jim Davidson, 2020

Urban Water Group, Inc.

Clean Architectural Plants











1 Brahea armata
Blue Hesper Palm

2 Leymus condensatus 'Canyon Prince'
Clumping Wild Rye

3 Aloe arborescens
Torch Aloe

4 Arbutus unedo 'Compacta'
Compact Strawberry Tree

5 Sedum nussbaumerianum
Orange Stonecrop

On the Go Style landscapes are beautiful and functional, so active homeowners can concentrate on making weekend memories and don't have to worry about their garden when they are away from home. The key to this style is to be minimal, but not barren. Instead of mixing lots of different plants in your pallette, consider paring down the list to a few, easy-care plant groups surrounded by organic mulch or large swaths of groundcover.

Billowy meadows of native grasses and flowering perennials can both soften and contrast effectively with clean hardscape lines. Structural succulents, bold shrubs, and dramatic trees pull the look together for a stress-free environment.



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Lower Water Sedge Lawns



1 Carex pansa
California Meadow Sedge



2 Achillea millefolium
Yarrow



3 Zephyranthes
Fairy Lily

Clean and contemporary hardscape surfaces are softened with gently wavy Sedge Lawns that include seasonally flowering bulbs. As with the Natural Lawn *(see p. 14)*, evergreen Sedge Lawns can be mown regularly, or left wild and raked annually to freshen/dethatch.

Amelia B. Lima & Associates, Inc



Leaving enough space between individual plants allows them to grow to their natural size. Fill the space between them with small woodchip mulch, and you are good to go!

Stunning Focal Point Succulents



1 Agave victoriae-reginae
Queen Victoria Agave



2 Agave vilmoriniana
Octopus Agave



3 Kalanchoe beharensis
Felt Plant

Sculptural plants look stunning year-round, alone or massed. Surround sculptural plants with smaller succulent varieties and evergreen or flowering ground covers. Dramatic succulent and sculptural plants add form and color to minimal styles. Plant single plant species in a beautiful container, then group pots or use alone as focal points.

Tips For On the Go Style Gardens

1. **Weather-Based Irrigation Control** is essential for managing irrigation efficiently even when you're only using the garden 2 days a week (*see p. 65*).

2. **Simple Permeable Hardscape** creates strong lines in the garden and is easy to maintain and keep clean.

3. **Raised Beds and Containers** allow you to highlight seasonal or showy plants while keeping digging to a minimum. These also allow for some seasonal food growing.

4. **Easy-Care Plant Groups** of three to seven or more odd numbered plants keep the eye moving around the garden and adds to the "organized" feel that relieves stress.

5. **Try Succulents** for clean and colorful groundcovers or bold architectural structure. These relatively low maintenance plants work well in the ground or in containers and compliment almost any architectural building style.

6. **Try Ornamental Grasses** to soften the lines of hardscape or buildings. Be sure to mass plant these, creating the sense of a meadow or open space. Alternatively, larger grasses can be used along with succulents as architectural elements.

7. **Edible Perennials and Trees** provide food and work in containers or in the ground. Perennials don't need to be replaced every season like most vegetables. (*see p. 19*).

8. **Mulch** keeps weeds down, soil moist, and builds a soil sponge that boosts your garden's immune system (*see p. 29*).

9. **Support Structures** keep things climbing so they are easy to see and even easier to clean up for entertaining guests.



Easy outdoor living

© Michael Todoran, 2020

Stout Design Build, Inc.

Natural Form Winners











1 Callistemon 'Little John'
Dwarf Bottlebrush

2 Frangula (rhamnus) californica 'Eve Case'
Eve Case Coffeeberry

3 Salvia 'Bee's Bliss'
Bee's Bliss Sage

4 Ceanothus (various)
California Lilac

5 Heuchera 'Santa Ana Cardinal'
Santa Ana Coral Bells

Easy Outdoor Living landscapes compliment many different architectural styles. These gardens predominantly feature large groupings of mostly local native plants surrounded by deep organic wood chip mulch.

Selecting plants for their natural forms, and choosing evergreen and variegated plants as the garden backbone helps to make maintenance an annual or semi-annual event rather than a weekly repetitive chore. Add in naturally long flowering perennial shrubs in large swaths for a sharper look.

Wide, permeable pathways make it easy to walk through the garden and spot weeds or plants that need special care.



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Evergreen Options



1 Rhaphiolepis indica
India Hawthorn



2 Rhus ovata
Sugar Bush



3 Westringia fruticosa 'Morning Light'
Coast Rosemary

Select evergreen shrubs (shrubs that don't lose their leaves) to provide year-round interest and create a neutral backdrop for flowering perennials. Be sure to correctly space these plants for fire safety, especially on hillsides (*see p. 57*).



Urban Water Group, Inc.

Reduce your ongoing maintenance and keep your garden "under control" by leaving enough space between plants and selecting plants for their foliage color, leaf shape, or natural form. Planting smaller plants and giving them room to grow makes for healthier roots, so you don't need to add fertilizers and other inputs. Do not prune these plants into boxes or balls; poor pruning encourages weak growth and short life. Fill the space between plants with small composted woodchip mulch, and you are good to go!

Long Flowering Plants



1 Grevillea rosemarinifolia
Rosemary Grevillea



2 Grewia occidentalis
Lavender Starflower



3 Sphaeralcea ambigua
Desert Mallow

Choose long flowering plants and shrubs to reduce deadheading duty and keep the garden looking tidy with just one or two big clean ups a year.

Tips For Easy Outdoor Living Style Gardens

1. **Mulch** builds healthy living soil, which is the key to improving soil moisture retention and boosting the immune system of plants so they can make it through a long, dry period without additional attention (*see p. 63*).

2. **Plants With Natural Forms** do not require staking or clipping to maintain their shape. Maintenance is reduced because you don't have to spend time shaping them.

3. **Native Drought Adapted Plants** are acclimated to various Mediterranean climates and do not require special attention or maintenance (*see p. 30*).

4. **Big Beds and Drifts** of the same kind of plant are easier to maintain than a jumble of many different kinds of plants in small spaces. Remember to plant in odd numbered multiples for a more natural effect.

5. **Natural Meadow and Lawn** is significantly easier to maintain than a conventional turf lawn because it requires less water and no additional inputs if maintained organically. Natural Lawn is cut less frequently, and the grass clippings are best left on the lawn itself as organic matter to build the soil (*see p. 13*).

6. **Low Growing Groundcovers** fill gaps and keep weeds in check, thus reducing maintenance. Groundcovers also shade the surface of the soil, helping keep the moisture in.

7. **Wide Permeable Paths** rather than narrow winding walkways are easier for bringing wheelbarrows and trash bins for those infrequent maintenance days.

8. **Avoid Rambling Climbers** that grow fast and large and require constant attention to keep in bounds.

9. **Weather-Based Irrigation Control** is essential for managing irrigation efficiently even when you're only using the garden a few days a week (*see p. 65*).

Stout Design Build, Inc.



Family Gathering Spot

© Marilee Kuhlmann, 2020

Urban Water Group, Inc.

Tough and Beautiful Mediterraneans











1 Lavandula (various)
Lavender

2 Rosmarinus officinalis prostratus
Creeping Rosemary

3 Teucrium chamaedrys
Germander

4 Cistus skanbergii
Pink Rockrose

5 Prunus ilicifolia ssp ilicifolia
Hollyleaf Cherry

Family Gathering Style landscapes take advantage of different garden "zones" that provide places for the entire family to eat, cook, play safely, or sit and enjoy the garden.

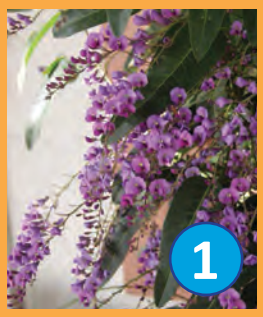
Brick, tile, gravel, decomposed granite or fine wood mulch carpet large outdoor patios and furnished garden rooms. Generous tree canopies provide cooling shade and places to rest within the garden.

Patios should be permeable wherever possible, to allow direct rainwater infiltration, or contoured to capture all runoff in adjacent swales (*see p. 42*).

Laura Morton Design


© Laura Morton 2020

Vines for Arbors



1 Hardenbergia violacea
Purple Vine Lilac



2 Clytostoma callistegioides
Lavender Trumpet Vine



3 Rosa 'Climbing Cecile Brunner'
Climbing Rose

Plant colorful, flowering vines on arbors, trellises, bare walls and fences to shade garden rooms, patios, and add privacy.


© Alex Stevens 2020

The centerpiece of the **Family Gathering Style** garden is an arbor-covered patio with enough space for dining tables and chairs. With sufficient tree cover, this gathering area provides a physical place within the garden for your family to congregate. Consider both the surrounding view and the view of the nearby garden beds, and make sure there is a clear wide pathway with minimal steps getting you there.

Edible Fruit Trees



1 Punica granatum
Pomegranate



2 Acca sellowiana
Pineapple Guava



3 Prunus salcinia 'Santa Rosa'
Santa Rosa Plum

Many beautiful fruit trees thrive in Southern California, creating bountiful orchards and singular patio trees.

Tips For Family Gathering Style Gardens

1. **Explore the Senses** with plants that have great color contrast, strong fragrance or are soft to the touch.

2. **Edibles and Perennial Herbs** can be planted right in the garden to provide garnishes and additions to meals year round, connecting everyone with the outdoors, even in the rainy season.

3. **Raised Beds, Accessible On All Sides** make it easy to get around the entire planter without bending over. Raising a bed to 48" (waist height) allows for standing gardening, and 18" - 24" (knee height) allows you to sit on the edge of the bed.

4. **Wide Paths, No Steps** allow everyone to enjoy the garden without worrying about tripping and falling.

5. **Covered Dining Area** should be located closer to the home, near any outdoor cooking areas. As is the case inside the house, the cooking/dining area of the garden will become the natural heart of the site.

6. **Kids' Safe Play Area** should be visible from the cooking/dining area so adults are able to watch over kids without having to wander throughout the garden.

7. **Trees or Shade Coverings** should be used throughout the garden to protect the family from weather extremes and to provide a sense of enclosure or protection.

8. **Vertical Growing Surfaces** such as trellises or arches make gathering of fruit and flowers accessible to everyone.

9. **Garden Resting Spots** provide vantage points for enjoying the garden while watching kids, and talking to neighbors. Spend some time in thrift stores looking for unusual chairs and benches to decorate the garden!

Dirt Diva Designs


© Pamela Berstler, 2020



Kids, Pets, Fun and Friendly

© Pamela Berstler 2020

Pet and Kid Friendly Plants











1 Vitis 'Roger's Red'
Roger's Red Grape

2 Dietes bicolor
Fortnight Lily

3 Muhlenbergia rigens
Deer Grass

4 Teucrium fruticans 'Azureum'
Azureum Bush Germander

5 Asclepias fascicularis
Narrow Leaf Milkweed

Kid and Pet Friendly Style

gardens have family areas with living boundaries created by groups of plants or low evergreen hedges. Kids get safe, special places where they can go for some creative playtime.

A small Natural Lawn or walkable groundcover area could create an open space that uses less water than a traditional cool season lawn (*see p. 13*). Raised beds provide an opportunity to grow seasonal vegetables such as tomatoes, corn, or pumpkins. Flowering perennials attract birds and butterflies, so be sure to make provisions to keep away outdoor cats.

Add to the adventure by incorporating a dry creek bed or permeable pathways wide enough for trikes and bikes.

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Easy Perennial Containers



1 Asparagus densiflorus 'Myers'
Myers Asparagus Fern



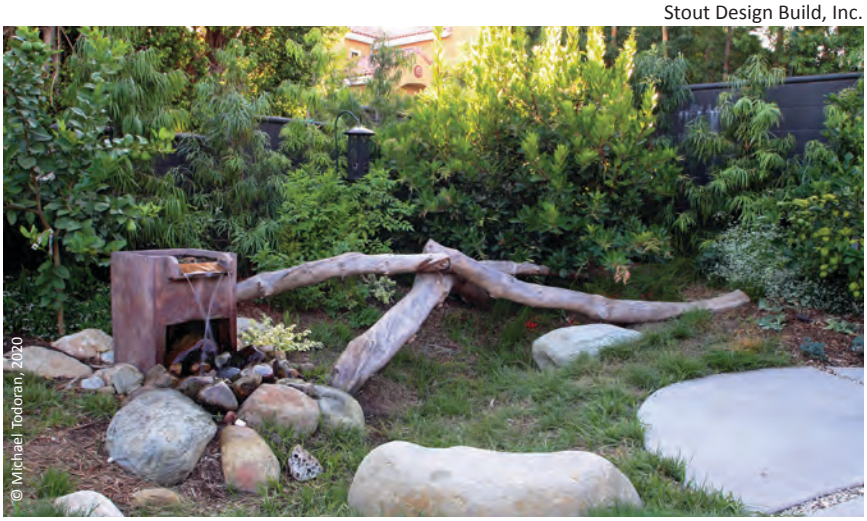
2 Cistanthe grandiflora
Rock Purslane



3 Pelargonium sidoides
Geranium

Blooming all summer, and repeatedly throughout the year, bushy perennial plants will bring flowers, butterflies, and hummingbirds to sunny patio containers with just weekly watering and a gentle annual haircut.

Stout Design Build, Inc.



Secret areas and hideouts where kids or adults can gather and get away are essential for keeping people active in the garden. Consider growing a willow arbor, or installing a hut. Enclosing a hiding place, even if it is just with a low-growing hedge, is a good way to contain kids within the garden.

Low Growing Hedges



1 Arctostaphylos 'Sunset'
Sunset Manzanita



2 Leucophyllum frutescens
Texas Sage



3 Abutilon palmeri
Indian Mallow

Naturally low-growing hedges may be planted using a wide variety of drought-adapted shrubs that grow no taller than 3' - 4'. These can be used to screen seating areas or create kid-height enclosures with interiors easily seen from nearby patios and walkways.

Tips For Kid and Pet Friendly Style Gardens

1. **Organic Woodchip Mulch** throughout the planted and play areas provides soft landings and has the additional benefit of improving soil quality. Organic mulch is a prefered walking surface for dogs, and if contained by edging, makes a great running surface.

2. **Make A Small Natural Lawn** as a soft play surface, if your kids are into running around. Make sure to maintain it organically and manage your irrigation efficiently.

3. **Raised Beds For Seasonal Edibles** grow fun annual things like squash, pumpkins, and sun flowers.

4. **Avoid Fragile or Thorny Plants** because they will not withstand the pounding of lost balls or games of hide and seek. Planting poisonous plants is never a good idea if there are young people and pets around the garden.

5. **Big Rock Creekbeds** are better than piles of little stones that are easily picked up and thrown around. The additional benefit of big rocks is that they can be used as seating or for climbing.

6. **Natural Is OK** because it's easier to maintain, and provides more visual interest. Woody shrubs that are not cut back continually provide cover for nesting birds raising their young. Allow plants to hold on to their dried seed heads, and you will be rewarded by nature.

7. **Protect Special Plants** by adding some low fencing or by placing sticks vertically in garden beds. This is especially important in perennial flower beds that host the birds and butterflies you don't want disturbed by outdoor cats.

8. **Beware Of Burrs** from grasses that could get into pets' hair or become hurtful splinters for paws. Either cut grass seed heads regularly, or don't plant them at all.

9. **Keep Something Overgrown** or an area covered with leaves for your dog to forage in. They will thank you for remembering their wild side!

Dirt Diva Designs





Groundcovers
and lawn alternatives

Stout Design Build, Inc.



Consider a **Natural Lawn**

Grass lawns that are maintained organically and efficiently can offer a cool surface for both active recreation or just hanging out, but most lawns are maintained inefficiently. It's time to rethink using lawn as all-purpose wall-to-wall groundcover carpet.

Your lawn can be turned into a water conserving **Natural Lawn** that needs up to 50% less water than contemporary fescue lawns. An eight minute shower every two weeks can be enough water to keep it lush, depending on the irrigation system and the specific landscape conditions. To make your lawn more natural, aerate and cast clover seed mixed with worm castings uniformly over the existing lawn area and water thoroughly. No fertilizers or herbicides are needed, as it will grow less vigorously if they are applied. Less frequent mowing every few weeks keeps the lawn at 3"- 4" height. Weeding is almost completely unnecessary; we're encouraging little flowers like English Daisies (*Bellis perennis*), Dutch Clover (*Trifolium repens*) and, in low damp spots, Plantain (*Platago major*).

Walkable Groundcovers are a good alternative to lawn and can be introduced on the edges of lawn to transition to garden areas. If you don't need to walk on it, then groundcovers can be as high as 36" tall and still look like unified green open space.

Maintain Your Natural Lawn

Apply ¼" deep layer of good compost or worm castings every fall (September through November). If the compost smells of manure do not use it! It will kill the lawn. Use only well-composted materials or worm castings. There should be no noticeable foul odor and good compost has a pleasant, earthy smell.

Keeping grasses longer (4" - 5") provides habitat for small butterflies whose larvae feeds on them. Resist cutting the lawn on a fixed schedule. Allowing the clover and other tiny flowers to grow, ripen and set seed will perpetuate the lawn without any additional over-seeding in the spring or fall. This is the way nature keeps the lawn evergreen and maintenance costs down – the lawn does all the work. If you are mowing frequently, an application of new seed may be required every spring or fall to keep the appearance more uniform.

Ask your lawn care professional about their equipment and insist on a mulching mower, or purchase one to store and use exclusively on your property, keeping other's chemicals, weeds and pests away from your fabulous smart, healthy, and beautiful natural lawn.

Great Groundcovers



1 Asteriscus maritimus
Gold Coin Plant



2 Lomandra longifolia 'Breeze'
Dwarf Mat Rush



3 Arctostaphylos edmunsii 'Carmel Sur'
Creeping Manzanita


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Walkable Groundcovers



1 Dymondia margaretae
Silver Carpet



2 Cerastium tomentosum
Snow In Summer



3 Phyla nodiflora
Common Lippia


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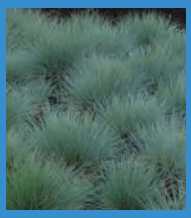
Step Up Your Groundcover Game

1. **California Native Grasses** can be naturally drought-adapted and provide habitat (food and shelter) for important insect and bird species.

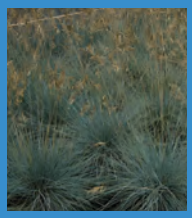
2. **Mow Less Frequently** or not at all to keep the grass from growing too quickly and using more water. Some ornamental grasses don't need to be mowed, and others like to be kept long so the old growth shades the new.

3. **Please Don't Pick The Daisies** nor apply any herbicide to them. English Daisies, Clover, Plantain, and even Dandelion reduce compaction, provide evergreen groundcover and have flowers that feed insects and birds. Whack them back only if they get too feisty.

Plants For Tough Spots:



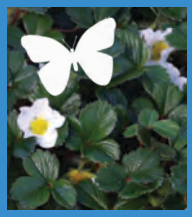
Festuca ovina
Sheep's Fescue



Festuca californica
California Fescue



Agrostis pallens
Bent Grass



Fragaria chiloensis
Strawberry


© Pamela Berstler 2020



Trees are **Priceless**

While planting trees means improved water quality, resulting in less runoff and erosion, it's also good for the pocketbook. Because trees provide shade and actively cool the air beneath their canopy through evaporative cooling, properly placing trees around buildings can reduce air conditioning needs by 30%! Trees are living solar powered air conditioners. Healthy, mature trees can be individually worth tens of thousands of dollars each. Protect your investment by hiring licensed arborists to keep your trees healthy and beautiful with annual assessments and pruning only when necessary.

Choose the Right Tree for your space and your needs. Trees are both slow-growing and long lived, so planting a tree is a big investment in both time and money. Consider the mature size of the tree when you plant it. At the nursery it's short and cute, like a puppy, but a small tree can quickly grow into a 30 foot tall tree with a 30 foot wide canopy of branches, or bigger. If you've selected a large tree species, it can top 70 feet tall and wide at maturity. Select a tree that will best fill the space you have, not one that will need annual pruning to keep it small.

Consider litter and allergen issues - some people are particularly allergic to specific tree species, and some fruit and nuts (olives, persimmons, black walnut, etc.) will stain patios and can make sidewalks slippery. And consider evergreen vs. deciduous species for different spaces. Hot summer patios are perfect places to add leafy deciduous shade trees. Deciduous trees will lose their leaves in winter, making them an even greater choice on cloudy, shorter winter days when the lighter tree canopy will allow more sunlight through. Evergreen trees and shrubs are better for privacy screening and year-round tidiness. When making your tree choices, also consider fruit, flowers and seasonal color.

Low Water Landscape Trees



1 Chilopsis linearis
Desert Willow



2 Quercus agrifolia
Coast Live Oak



3 Prosopis chilensis
Thornless Chilean Mesquite

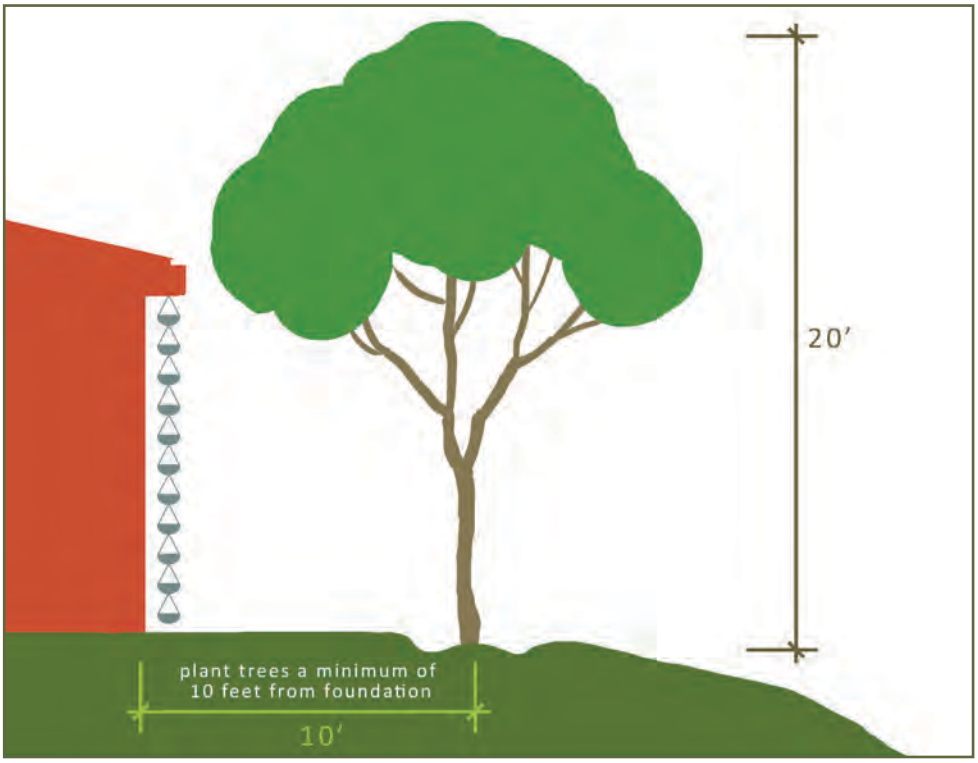


4 Arbutus 'Marina'
Strawberry Tree



5 Lyonothamnus floribundus
Catalina Iron Bark

Keep trees **Happy**



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Right Tree, Right Place

Place your trees carefully. Make sure the placement of the tree is sufficiently far away from the house. Small trees (30' wide or less) should be no closer than 10 feet. And large trees (70' wide or more) should be planted no closer than 20 feet from the house. Also consider nearby trees, other structures (like power and phone lines), views and where shade will fall at different times of the day, in different seasons. Check the firescaping regulations in your area to be sure you have not created fire ladders or placed the trees too close to the structure (*see p. 49*).

On the ground, pay attention to water, sewer, septic and other utilities, as well as patios, sidewalks and driveways. If you will be planting near any of these, choose trees with low root-damage potential. If you are in a windy area, near the top of a bluff or hillside for example, select trees with strong branches and small leaves, so wind will easily pass through their canopy and gusts won't topple trees or sheer branches off.

Small trees are like living umbrellas, adding dappled shade, habitat and color to smaller planting areas without taking over.

Perfect Patio Trees



1 Parkinsonia 'Desert Museum'
Palo Verde



2 Xchitalpa linearis 'Pink Dawn'
Pink Chitalpa



3 Lagerstroemia indica 'Tuscarora'
Tuscarora Crape Myrtle



Protect Roots, Save Trees

Trees depend on their roots for survival. Roots anchor tree trunks and canopies against strong winds and earth movement. They absorb water and nutrients, and connect trees to the soil and plant communities that surround them. Landscape and construction projects can easily damage tree roots, killing trees, unless the roots are respected and protected.

1. **Avoid Heavy Construction Equipment** near trunks or under tree canopies. Equipment can break branches, compact the soil and damage tree roots.
2. **Avoid Poisons** like paints, solvents, cleaners, herbicides and other chemicals that can contaminate soil and kill roots, too.
3. **Minimize Root Shock** when removing existing plant material, especially grass, by keeping the trees well-watered. Many trees will go into shock when water is reduced, so water them regularly during construction and landscape renovation, especially for the first year after turf or other high-water plant material is removed, even if you remove surrounding irrigation.
4. **Slow and Deep Watering** under the tree canopy is best. Try using tree bags, soaker hoses, or in-line drip irrigation.
5. **Plan Ahead For Water Management** and put trees on their own irrigation hydrozone in renovated landscapes.



Plan for Parkways

Image courtesy Eastern MWD

Parkway Plants











1 Arctotis
African Daisy

2 Guara lindheimeri
Butterfly Flower

3 Lessingia flaginifolia var. californica
Silver Carpet

4 Teucrium cossonii
Majorcan teucrium

5 Calylophus hartwegii
Sundrops

Start Your Project at the Parkway strip

While you don't own your **Parkway,** you are responsible for maintaining it, since it is public property maintained by private property owners. Parkways present some particular challenges, even though they're small.

Cars! Unless you live on a no-parking street, car doors will open onto the curb and into your parkway strip. People need some space to get out and walk around their cars. However you decide to plant your parkway strip, be sure to leave at least 18" (or more) as a step-out area that is clear from the edge of the curb for those doors to swing open and allow people to move. Consider placing bricks, pavers, gravel or decomposed granite in this area; or just spread mulch. Try not to plant in this step-out area. Keep your plants back from this edge to protect them from the damaging foot traffic.

Trees. If your parkway already has nice big street trees, then you also have nice big roots. Those roots may even be above ground, moving the concrete and otherwise causing trouble. Respect the roots – don't dig around them, cut them or otherwise bother them. Plant only in areas where the roots are not visible, and never closer than 24" from the trunk of the tree.

Utilities and Irrigation. Your water meter and other pipes and utilities are often found in the parkway. Be sure to CALL DIG ALERT (Dial 8-1-1) at least two days before you dig so marks can be made to avoid breaking or damaging underground cables and pipes.

Many parkways are mere strips. If the area is less than 10 feet wide, you should not be using spray irrigation because it is too difficult to keep water off the street or sidewalk when they are in use. Consider hand watering or connecting your parkway to the closest drip irrigation line in the front yard. If your front yard and parkway are sharing irrigation, make sure your plants in both sections have similar water and sun needs.

Low water **Parkways**



A parkway covered in uniform and low water-use Fragaria chiloensis *(Strawberry)*.

Stout Design Build, Inc.



Carpet-like Dymondia margaretae *(Silver Carpet*) makes a clean and walkable parkway surface.



Ceanothus 'Yankee Point' (*California Lilac)* quickly covers this parkway, but is not walkable.

Planting A Parkway In Six Easy Steps

1. **Call Dig Alert (Dial 8-1-1)** to mark any utility lines, underground cables, and pipes.

2. **Protect Your Trees** by respecting, and protecting their roots

3. **Contour For Water Capture.** Gently contour the parkway area into a shallow bowl, capturing water that may run off of adjacent sidewalks and driveways.

4. **Select Plants** that can be maintained to allow both access to parked cars and better visibility to see oncoming traffic (both people and cars).

5. **Be Cautious!** Consider the parkway a high-traffic area and avoid unfriendly plants (like prickly cactus). Don't leave big holes open overnight, avoid creating tripping hazards, and help keep everyone safe!

6. **Gravel or Decomposed Granite** can be used in parkway areas, especially under mature street trees with surface roots, where digging holes to plant ground cover may damage the trees. Both materials should be contained by curbs, concrete sidewalks and/or landscape edging, and maintained at a finished height below the surrounding sidewalk and curb grade so they don't spread out over paved areas and become tripping hazards.

In the parkway below, Achillea millefolium *(Yarrow)* and Guara lindheimeri *(Butterfly Flower)* create long-lasting flowers with walkable mulch between.

Image courtesy Eastern MWD



Eat your yard



Group Edibles together for irrigation.

You don't have to become a farmer to enjoy edibles in the landscape because many native plants, vegetables and herbs have fruit and leaves you can harvest, and they can be mixed into any climate-appropriate planting scheme. Organic methods including sheet mulching *(see pp. 39-40)* and Integrated Pest Management ensure the health of the soil, the crops and the people who eat them. Be sure to check your water agency's watering restrictions to confirm watering schedules.

Edible Perennials & Fruiting Shrubs



1 Salvia elegans
Pineapple Sage



2 Ribes aureum
Golden Currant



3 Allium schoenoprasum
Chives



4 Pelargonium tomentosum
Peppermint Geranium



5 Aloysia citriodora
Lemon Verbena

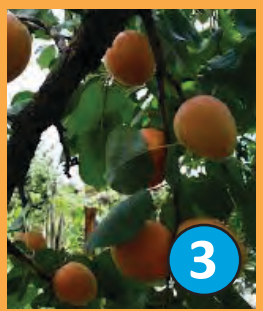
Five Great Fruit Trees



1 Citrus 'Nagami'
Dwarf Kumquat



2 Ziziphus jujuba
Jujube, Chinese Date



3 Prunus armeniaca
Apricot



4 Morus nigra 'Persian'
Persian Fruiting Mulberry



5 Citrus'Improved Meyer'
Improved Meyer Lemon

Plant for **Pollinators**





Plant A Pollinator Garden

Look for the Butterfly icon on pictures of certain plants throughout this book. These are plants that attract beneficial insects and support the life cycle of butterflies. Try to get several in your garden that bloom during each season so you host the larvae and caterpillars as well as the full-grown nectar-seeking showstoppers. Find out more at *www.calscape.org*.

Gotta Get Bees

Consider creating a small patch of open space in your landscape design that accommodates solitary ground nesting bees and insects, especially if you have planted California native plants. By installing some nesting boxes, building an insect hotel, or just pushing some mulch aside for a few square feet, you can invite bees to show up.



Nature provides checks and balances in a garden, and you can attract insects and creatures that will help you maintain your garden without pesticides. Flowering plants rely on insects for pollination and thus reproduction. In turn, they provide for different insect species that feed on various plant parts and prey on other insects. Some bugs eat too much, destroy plants and spread diseases. Other bugs, beneficial insects, fight off the bad guys, keeping them in check by eating them or disrupting their reproductive process.

Use only organic methods, avoid chemical inputs, and actively cultivate a diversity of plants that provide resources at different times of the year, and you will be rewarded with a healthy and balanced mini-ecosystem.



Pollinator Attractors











1 Asclepias subulata
Desert Milkweed

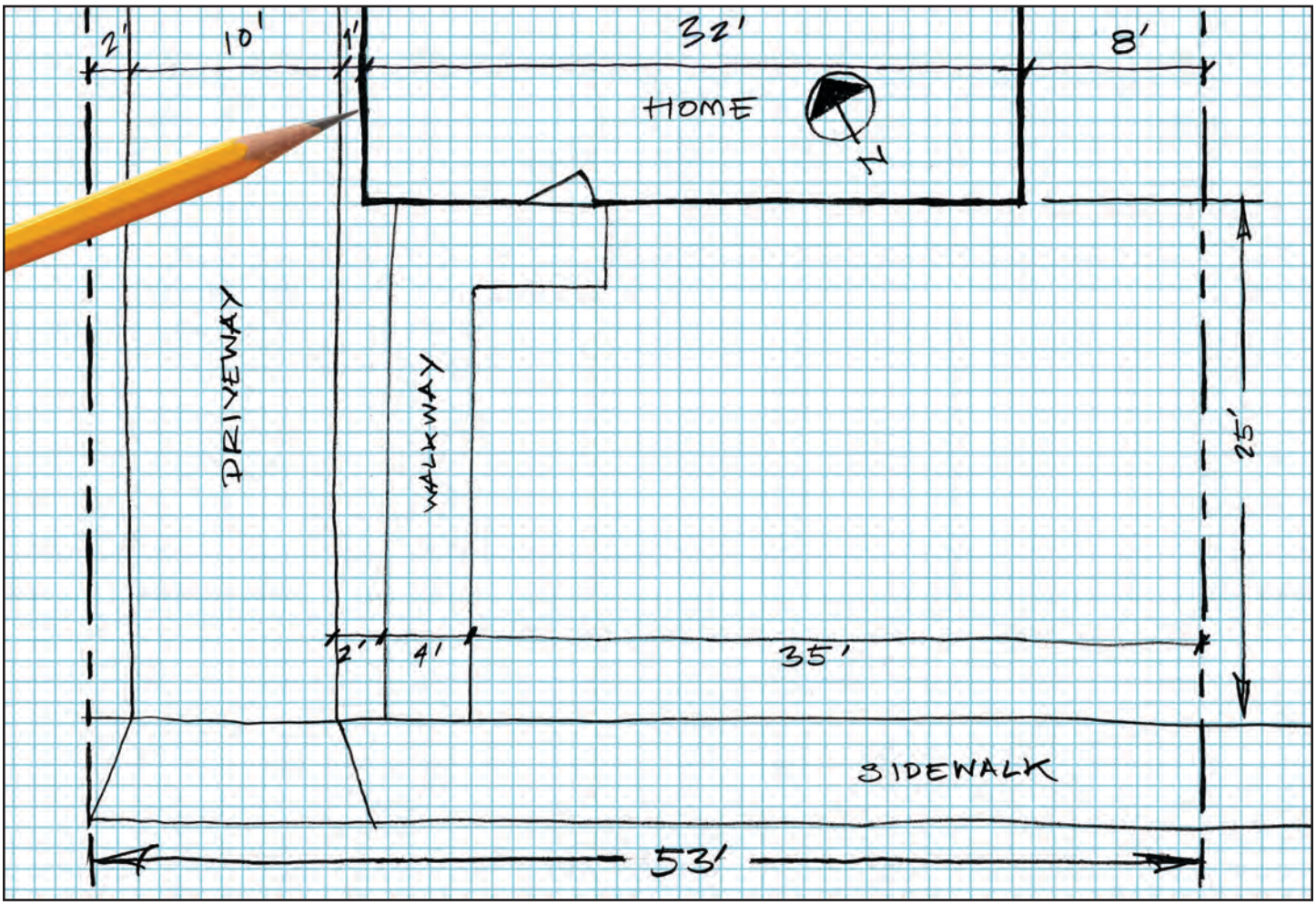
2 Heuchera maxima
Island Alum Root

3 Eriogonum grande var. rubescens
San Miguel Island Buckwheat

4 Verbena lilacina 'De la Mina'
Cedros Island Verbena

5 Galvezia speciosa 'Firecracker'
Island Bush Snapdragon

Start with a **Site Plan**



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Measure to Make Your Site Plan

Measure your site. Once you've got the dimensions, trace the lines cleanly on a sheet of grid paper. Make at least 10 copies that are dark enough to still see the grid. You will use each of these sheets to evaluate and plan the changes for each aspect of your landscape. **Our grass area above is 25' x 35' or 875 sq. ft.**

Depending upon the size of your property, most projects can use a 1/4" = 1' scale. Try using 1 box = 1 foot.

Mark the locations of trees and large shrubs you are unlikely to remove. Always use three reference points to triangulate the location of trees. Label any hard surfaces like driveways and walkways.

Take some photos and mark where they are located on your site plan. Use your smartphone or a compass to find North and also mark it on the plan.

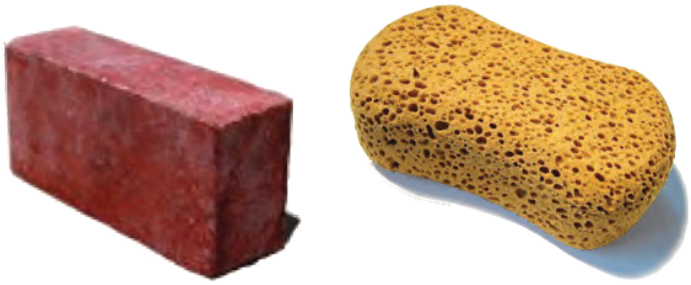
Mind The Foundation

Be sure to mark your doors, windows and footprint of your building on your plans. You will be grading the soil away from foundations and locating your mounded up berms and swales 5' - 10' away from the foundation of the buildings and 3' from edges of the walkways or neighbors.

Need help finding dimensions? *maps.google.com*

Look at Google Maps for help placing building and trees on your property. Just type in your address, zoom in, and use the Satellite view.

Test your soil

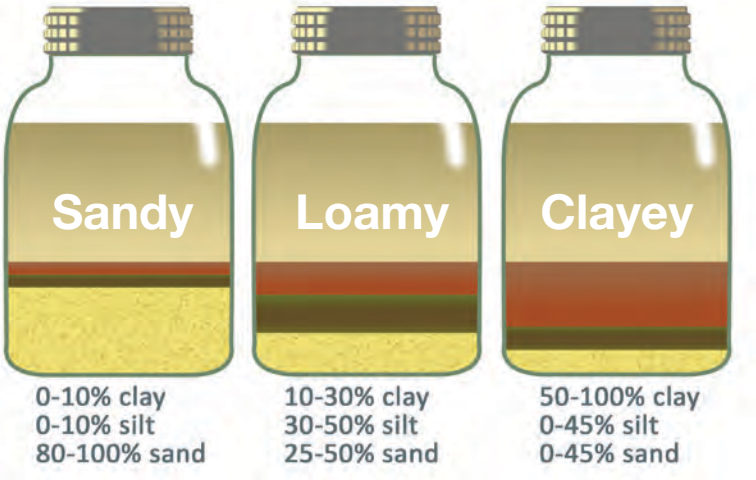


Is your soil a **Brick** or a **Sponge**?

If you have a brick you will need to take this into consideration when planning your contours. You will need to spend some time and effort to turn the soil back into a sponge. If the soil does not drain well, you will need to take special care when you plant that you do not drown your new plants.

We want to have soil in our landscape that can capture water and allow it to soak into the plant root zone within 24 - 48 hours. Building **healthy soil** therefore becomes important in our plan to capture rainwater and save it for a dry day, so you will need to follow the Soil Lasagna Recipe (*see pp. 39-40*).

Before we figure out how to grow better soil, we need to figure out what kind of soil we have. Sand, Silt and Clay, are the basic soil types. The smallest particles create clay soil and the largest make sandy soil, with loam (an even blend of sand, silt and clay) considered the "just right" medium. Professional designers will take soil samples and send them off to a lab for recommendations.



Which jar does your sample most look like?

For Example: If there are equal proportions of Sand and Silt, and very little Clay, then the proportions are something like 40% Sand and 40% Silt and 20% Clay.

Loam best describes the jar with 40% Sand, 40% Silt, and 20% Clay.

Your soil is Loam.

Percolation Test

You Will Need:



1. Dig a hole about 12" deep and 12" wide (that's a little larger than a 1 gal. plant container).
2. Fill the hole with water and wait. Note how long it takes to drain completely. This is necessary to completely saturate the soil.
3. Fill the hole all the way when all the water has drained out from first filling, and see how long it takes to drain out again.
4. Lay a stick or shovel handle across the hole and measure the distance from the top of the water to the stick each hour until it has drained completely.

Results:

>4" per hour - You have sand and need to add more organic matter to improve the soil *(see p. 63)*.

<1" per hour - You have a brick! Your soil needs some extra help so try sheet mulching (*see pp. 39-40*).

1" - 4" per hour - Congratulations! Your soil drains well!

You have a sponge!

Determine Soil Type Using A Jar Test

(This is fun to do with kids!)

You Will Need:

1 Qt. size glass container with lid

1 Cup of soil from the garden (Select one area per container, or take samples from several holes and blend them together.)

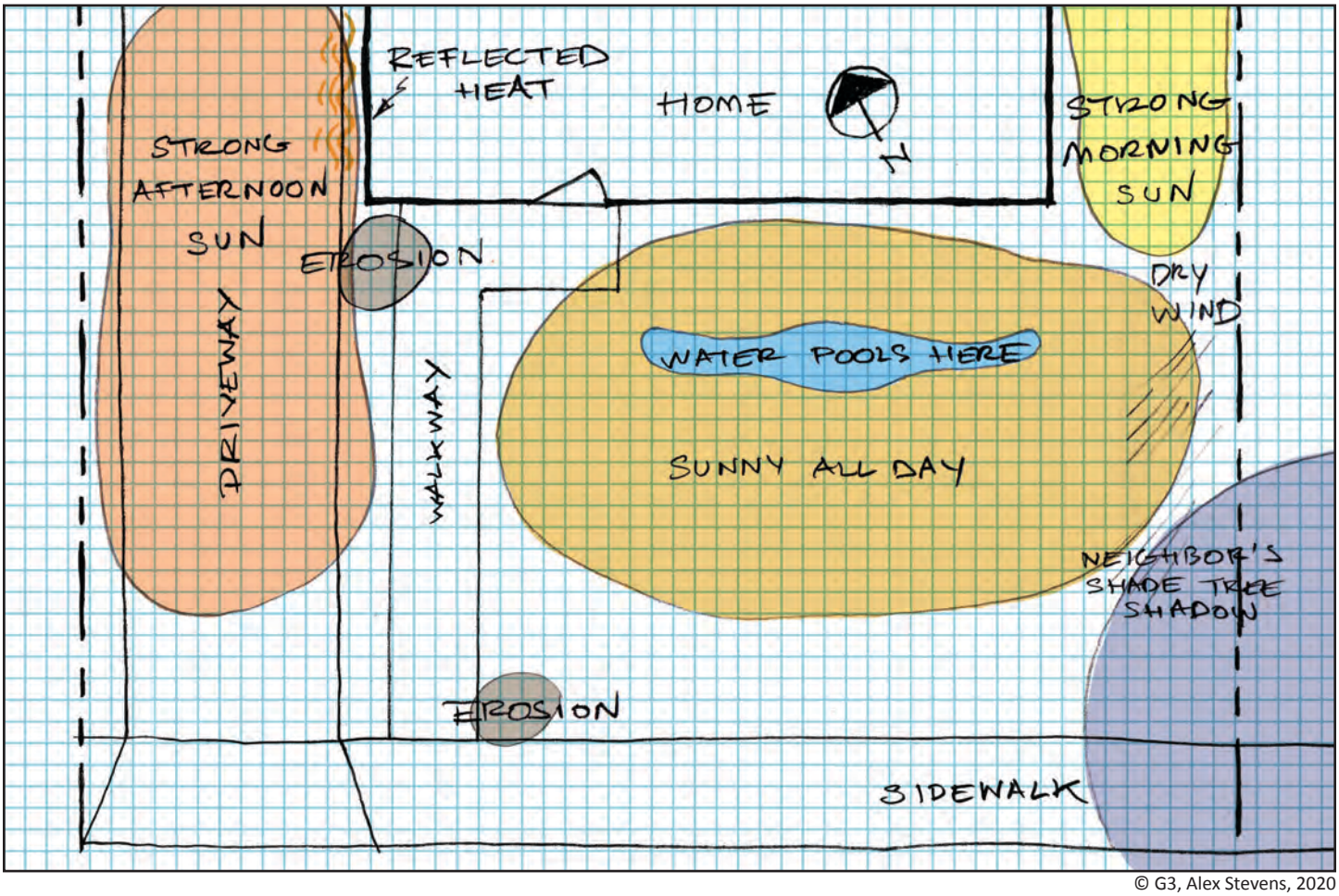
1 Teaspoon of alum (Find in baking section of grocery.)

3 Cups of distilled water

1. **Add soil, water, and alum together** in the glass container and shake until all solids are suspended.
2. **Place container on a shelf** and wait 24 hours.
3. **Wait another 24 hours**, if the container is still cloudy. After 48 hours, the layers should be settled: **Sand** on the bottom, **Silt** in the middle, and **Clay** on top.
4. **Measure the layers** in proportion to each other.
5. **Use the graphic** to determine the Soil Type based on the proportions of Sand, Silt or Clay.

Determine your Soil Type so that you can better program your "smart" irrigation controller and so you can select plants best adapted to your site.

Consider your **Microclimates**



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Microclimates are **Climate** factors **Particular** to your garden.

Every garden has areas where some plants will grow well and others will die. Structures, walls, fences, and other plants all can affect the amount of sun and shade in a garden. And every garden is completely different, even if it is located in the same general climate zone. There will be hills and hollows in your front yard that may collect cold air or, because your property is sloped, you don't get frost when your neighbors do.

Microclimates may differ significantly from the general climate of an area. You need to map these microclimates, and the first step is to walk around your property during the day and observe it more closely. Grab a chair, sit down outside, and start thinking about your design priorities.

Note Sun and Shade

Mark the areas that receive sun all day and areas that are shaded all or part of the day. Also note which areas receive only partial sun, maybe just a few hours of direct morning sun, mid-day or in late afternoon.

When you start choosing your plants, make sure to select those that are appropriate to your garden's sunlight patterns. Plants marked as "full sun" will not be happy in full shade or vice versa.

Are there other things you observe in your garden? Mark it on your Site Plan!

Plants Speak Latin

Did you know that many plants have the same common names? If you ask for a plant by their common name, you might end up with something completely different than what you want. The best way to order plants is to use the Latin botanical name; that way there is no miscommunication.

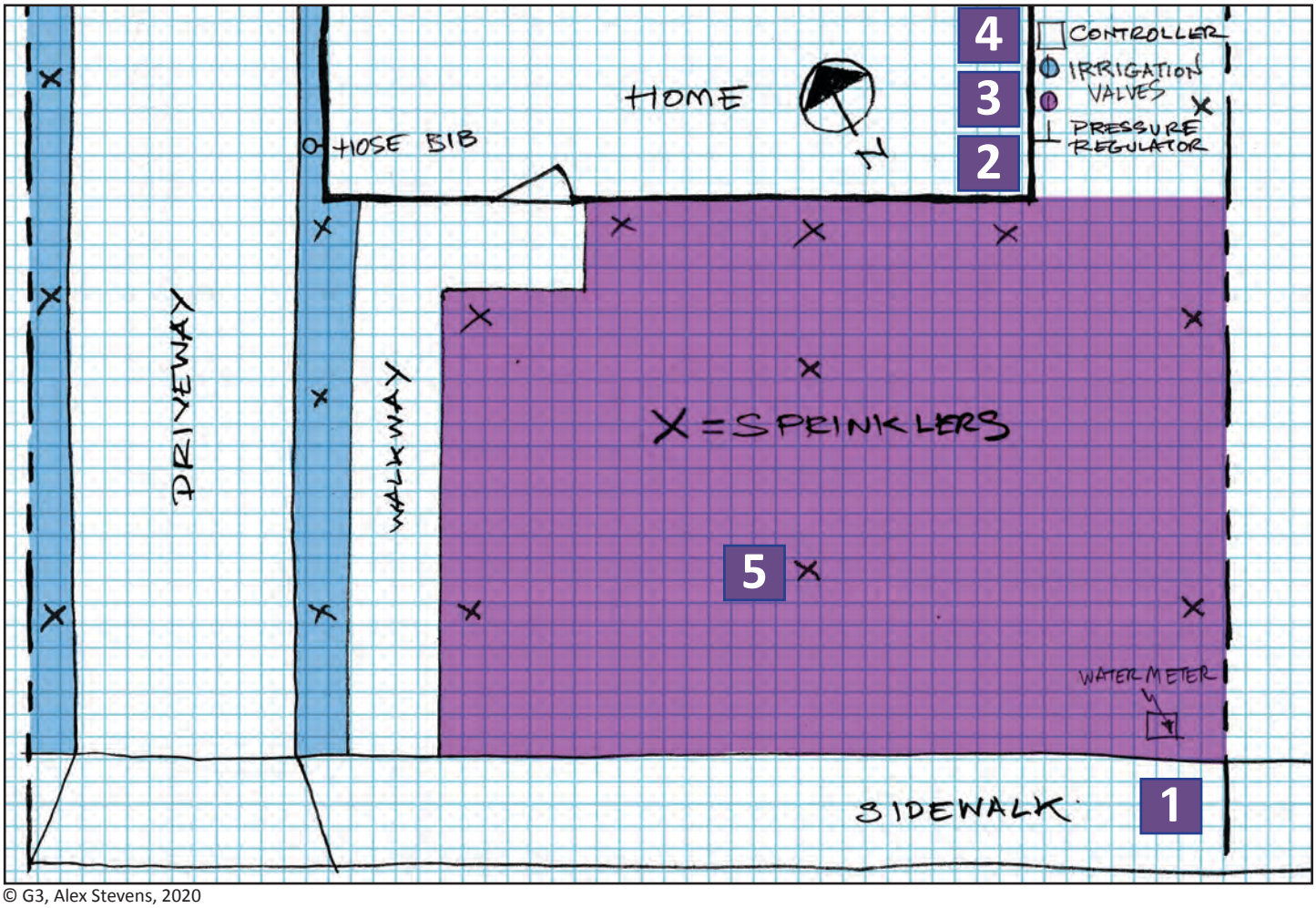
When you go to the nursery asking for plant identification, be sure to walk away with both the Latin name and the common name, so that you can conduct your research and be assured of selecting the right plant for the right place.

What About Plants You Keep?

Everyone has plants that are next to the grass area they are removing. Now is the time to decide which of these plants will work well in your new garden and which should be removed. If you don't know the name of the plant, take a photo and leaf/flower with a bit of stem attached to a local nursery to get some assistance.

Remember that trees and large shrubs that have been dependent upon the water you have been applying to your grass will now need a bit of extra love and care since you are removing the grass. Consider putting these plants on a separate hydrozone so they can get a little extra water (*see p. 35*).

Evaluate your **Existing Irrigation** layout



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Make A Plan of your spray irrigation system.

Start the discussion about whether or not to abandon your existing irrigation by mapping out the components of the system. If you have lawn, chances are that your existing irrigation is a spray sprinkler system with an automatic irrigation controller. When converting older spray systems to drip, pressure differentials may damage unseen lateral lines, causing difficult to find micro-leaks. **If you are renovating most of your landscape, be prepared to start from scratch rather than try to significantly alter the existing irrigation system.** This way you have an opportunity to use the latest technologies and proper design for your new garden. It is especially difficult to match existing irrigation to new plants grouped by water needs (*see p. 35*).

Locate all the sprinkler heads on your property and mark their locations on a copy of your Site Plan. Note where the water comes on to your property from the street (the water meter/main line), the location of your irrigation controller, and the location of the valves that control the various irrigation zones. Also, mark the location of hose bibs, shut off valves, and pressure regulators or backflow prevention devices.

Now color code the areas that spray with each valve so you easily can see the various zones you are dealing with for replacing plants and irrigation. Our front yard example (above) has two separate zones marked by two different colors.

Images provided courtesy of Rain Bird Corporation



Water meter



Pressure regulator



Irrigation valve



Irrigation controller



Spray sprinkler

Tips for Measuring Contours with a Bunyip

1. **Calculate the Depth and Contour** of your swale or the topography of your entire garden using the easy-to-make Bunyip **(mythical Australian water monster)** or water level. You will need:

- **Two** six foot (or more) lengths of 1" x 2" strips of pine wood.
- **Mark lines** on each of the strips, across one side in 1" intervals. Start with the 1" at the top and work your way down the stick.
- **Purchase 40'** of clear vinyl 5/8" diameter tubing .
- **Zip tie** the tubing in three places to the sides of the wood strips that have the markings on them.

2. **Use A Funnel** to get water into the tube or siphon water by submerging one end in a bucket and lowering the opposite end.

3. **Remove Air Bubbles** in the tubing before reading to get the most accurate level.

4. **Keep Your Thumb On Top** of the vinyl tubing when you are moving the sticks to keep the water from coming out.

6. **Establish Zero Elevation** as the point from which you will be calculating the difference in height of two points in the yard. Put a flag in this spot; all other measurements will be compared to this starting place.

7. **Move B To Measure Height Difference** and you can see that the water eventually levels out. The difference between the reading on B and the reading on A is the change in height between these two points.

8. **Move A To Continue Mapping Slope or Topography** of the yard. The last side to move always stays in place as you work your way around the yard. Each new measurement of the difference between the level marks on the sticks is added or subtracted to the previous measurement to determine the TOTAL CHANGE FROM ZERO.

(Step 1) A - B = 0 Move B.

(Step 2) B - A = -8 This point is 8 inches lower than the starting point. Move A.

(Step 3) A - B = -10 This point is 18 inches lower than the starting point. 0-8-10 = 18

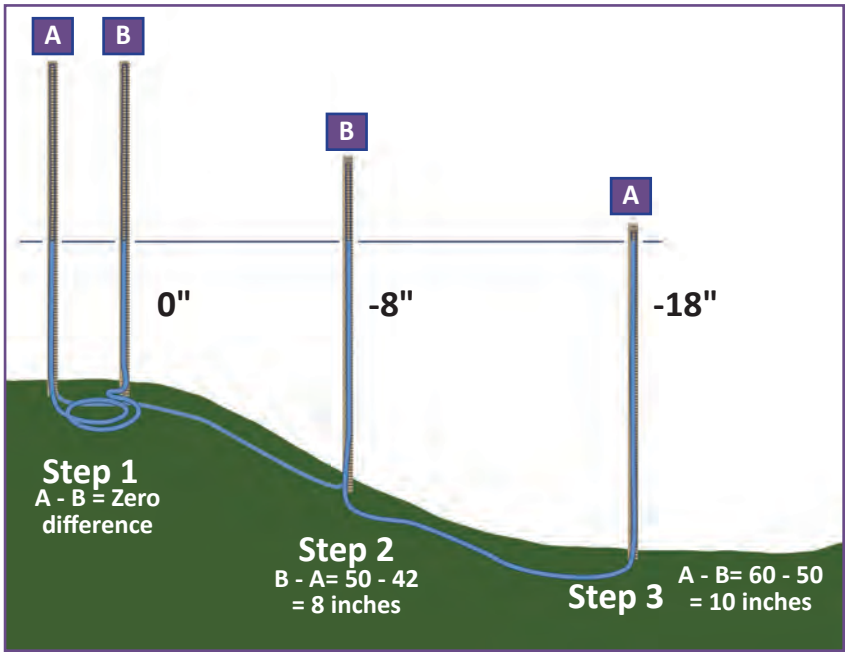
Make and **Use** a **Bunyip**



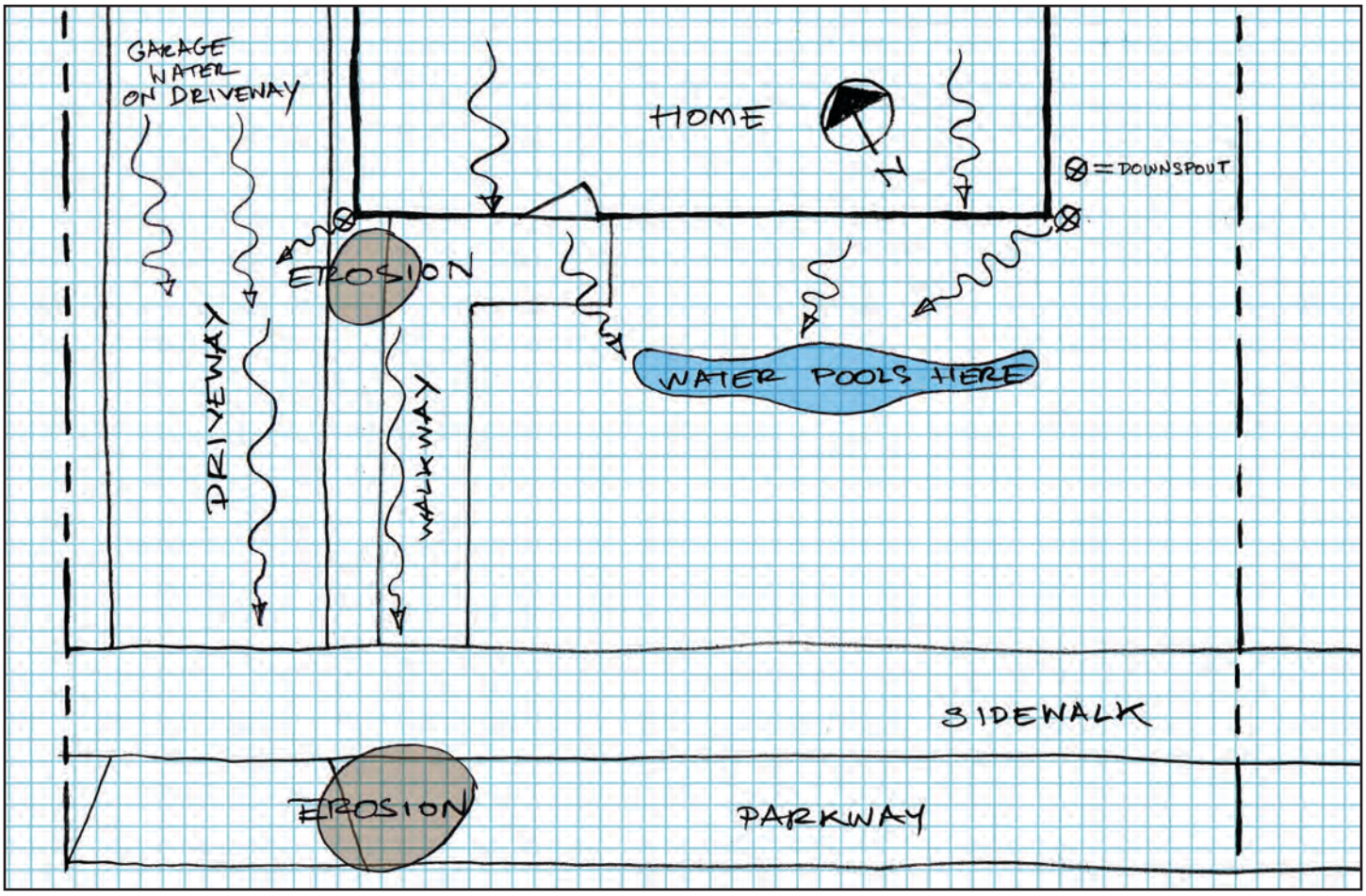
You Will Need: 6' ruler, 5/8" clear vinyl tubing, zip ties







Map your yard as a **Mini-Watershed**



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Your **Roof** is the **TOP** of the watershed.

Make a Copy of Your Site Plan and Label It "Water Plan"

Watch what happens to water as it comes off the roof of your home and moves across your property. Your roof is the **Top** of your mini-watershed and where the water finally runs off your property is the **Bottom**. Think about how you can capture water in between the top and bottom of your landscape.

Begin to separate out each area that deposits water into a downspout. Mark the location of each of your roof gutters and downspouts.

Once you know the total area of the roof, you can figure out the amount of rainfall that it generates (*see p. 27*).

- Do you have low spots in which water pools?
- Does water run off the property anywhere?
- Does water run onto the property from a neighbor or street?
- Do any buildings or any hard surfaces appear to be water damaged or eroded? If so, does it appear to be a result of rain, irrigation, or both?
- Turn on the irrigation for no more than 10 minutes and note whether there is pooling or runoff (*see p. 24*).
- What parts of the roof divert water into downspouts, and is the water being diverted into your landscape? Indicate the direction of the water with arrows as seen above.

Look for a place in the landscape where you can place a swale that covers approximately 150 sq. ft. for every 1,000 sq. ft. of roof.

Use a water level (bunyip) to determine the grade of the property, especially the grade change between the foundation of the residence and the beginning of the area where you want to place the swale (*see p. 25*).



see AFTER image on p.2

Capture **First Flush**

First Flush is the **First Inch of Rain** after a dry spell.

This is the most important water to capture in your landscape. The first rainfall washes away pollution that has gathered on hard surfaces during the dry spell, and it needs to be filtered by the healthy soil and root zones of plants before it goes anywhere else.

Calculate How Much Water Comes Off Your Roof

The shape of your roof doesn't matter in the calculation of water it produces. A pitched roof and a flat roof have the same footprint and the same amount of rain falls on the total roof area. Just measure the outside edges (the footprint) and calculate the square footage as you would any landscape area.

Area of a Rectangle = length of side A x length of side B

Some roofs are flat, and therefore easy to calculate. For complicated roofs, divide the area into squares and add up the area of each square.

Once you know the total area of the roof, you can figure out the amount of rainfall that it generates in gallons. 0.62 is a constant that converts square foot inches into gallons.

Rainfall (in Inches) x Roof Area Square Feet x 0.62 = Gallons of Rain Water From Your Roof

You can use these calculations to determine how much water comes off any hard surface (patio, driveway, sidewalk, etc.).



Artemesia Landscape Architecture



How Much water per downspout?

First figure out how much water is coming from the whole roof, and then divide the roof into sections and calculate the particular amounts falling from each downspout:
Rainfall (in Inches) x Roof Area Square Feet x 0.62 = Gallons of Rain Water From Your Roof

If your roof is 1,000 square feet (SF), here's how much water runs off it:

- 1"(rainfall) x 1,000 SF x 0.62 = 620 gallons
- 10" (typical coastal total rainfall) x 1,000 SF x 0.62 = 6,200 gallons
- 30" (typical foothills total rainfall) x 1,000 SF x 0.62 = 18,600 gallons

It adds up quickly, even in dry areas. Try to save as much as you can in your landscape sponge!

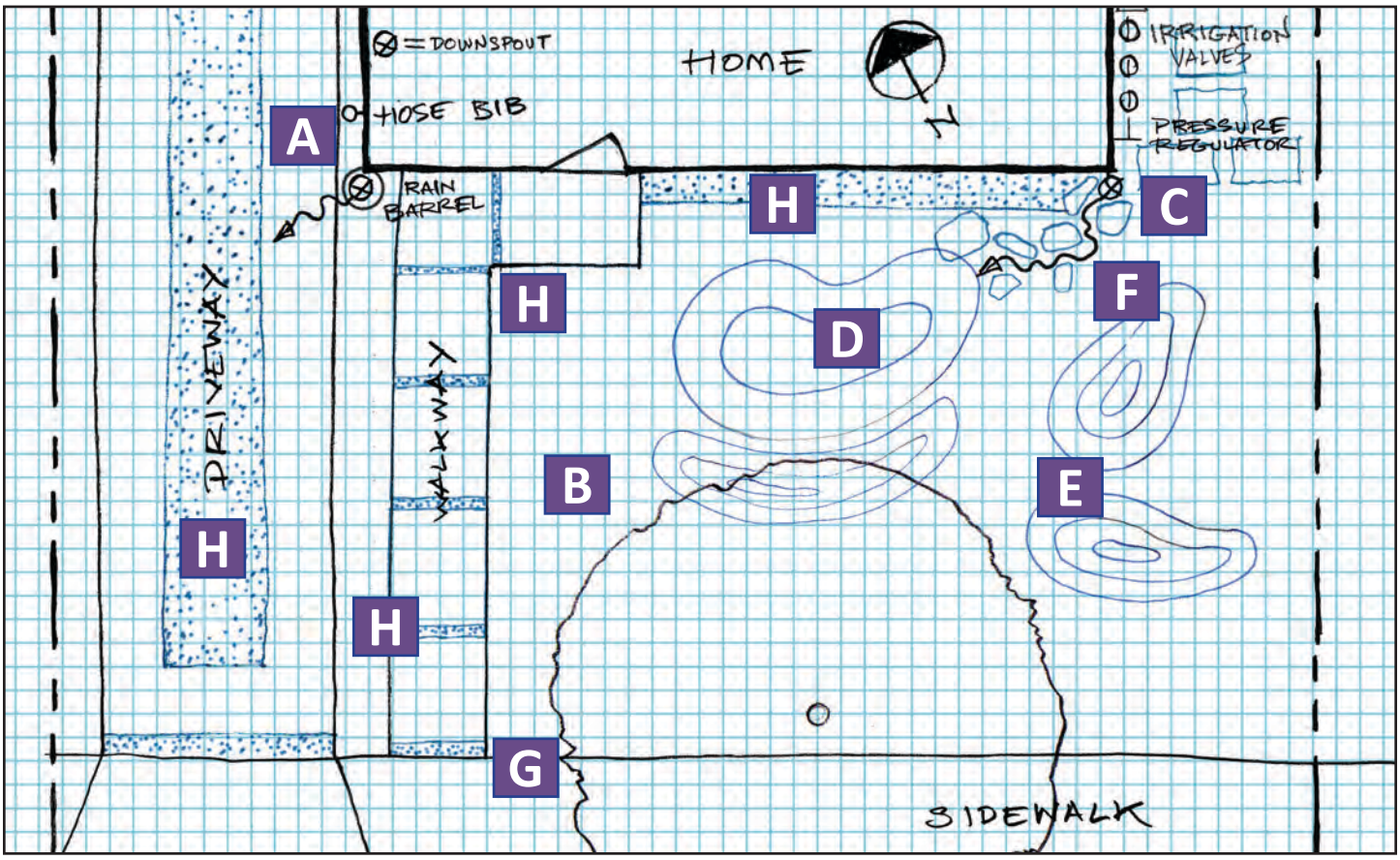
Imagine the water from your garage roof splits into two downspouts and Your Total Roof Area is 20' x 50' = 1,000 SF

If half of the water goes into each downspout, then the roof size for one downspout is: 1,000 SF ÷ 2 = 500 SF

Now calculate how much water that is in gallons from each inch of rain coming from one downspout:

1" x 500 SF x 0.62 = 310 gallons of water per inch of rain per downspout.

Plan to **Detain** the **Rain**



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A **Downspout Redirected Into Rain Barrel** and away from the foundation of the residence. Overflow from rainbarrel slows down into gravel in the middle of driveway.

B **Healthy Soil** is being created with Sheet Mulching using 4" - 6" of mixed leaf and bark tree trimmings covering the whole yard *(see p. 40)*.

C **Downspout Diverted Into A Catchbasin** which is connected by underground pipe into the swale area of the landscape. This should eliminate the pooling and erosion caused by the downspout.

D **A Slight Depression**, or swale, has been dug out in the middle of the yard in the area where water always pooled. This swale is only 6" - 12" deep in the middle and covers approximately 150 sq. ft. for every 1,000 sq. ft. of roof area *(see p. 42)*.

E **Relocate Soil As Berms** when digging out the swale and the driveway area. Relocated soil becomes raised or mounded areas (berms) on either side of the depressed area. The berms become places for plants that like fast drainage *(see p. 42)*.

F **Stones And Boulders**, most typically no more than 12" - 18" in diameter, are used to retain the edges of the swale and provide visual interest in the landscape.

G **Overflow** of excessive rain should be directed through the garden and out to the street, not on to neighboring properties.

H **Concrete Removed and Gravel Installed** in middle and end of driveway and across the front of the residence. The 18" wide gravel area reduces erosion under roofline. Horizontal cuts made in the walkway are filled with 1/4" - 1/2" crushed gravel. These are not eligible for a rebate.

Images © Pamela Berstler, 2020



Rain barrel with overflow into planter or permeable driveway



Sheet Mulch of leaf and wood tree trimmings builds healthy soil



Downspout diverted into swale area through catch-basin and underground pipe



Slight depression, berms, and boulders of a typical swale



Grow Living Soil

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OWL (Oxygen, Water and Life) makes **Living Soil**.

Living Soil is alive. A teaspoon of good garden soil contains billions of invisible bacteria, several yards of equally invisible fungal hyphae, several thousand protozoa and a few dozen beneficial nematodes. Microbes bind soil together and, when OWL is balanced, these billions of microbes can transform brick-like dirt into a healthy, living soil sponge.

Oxygen is needed by healthy plant roots and soil organisms. Healthy soil has lots of tiny, little pockets of air.

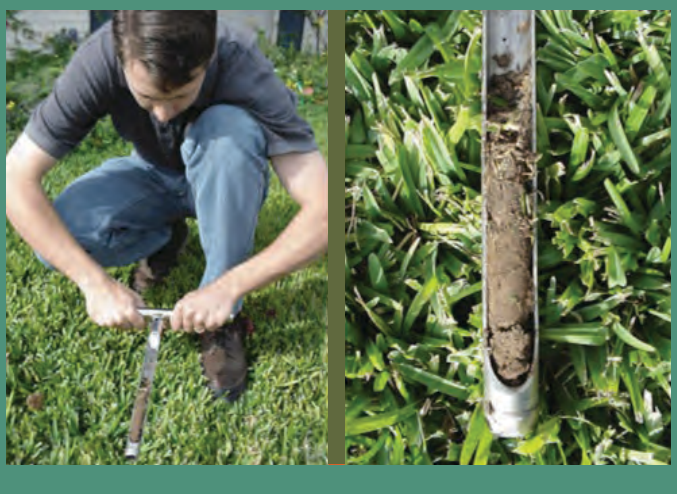
When soils are eroded, graded, or disturbed, their structure becomes compacted. Compaction is caused when the tiny air and water bubbles are squeezed out of the soil and the microbes are killed. Microbes can be killed by fertilizer and pesticide use or even heavy traffic (foot or vehicular).

Water is needed by both plants and microbes. But too much water in the soil will displace the oxygen, saturating the soil and creating an anaerobic condition. Pathogenic microbes prefer anaerobic soil, and if this condition persists, diseases may develop, thus endangering the health of your garden.

Water is constantly moving through the soil. Any water in the soil needs to be replenished as the plants use it, as it evaporates from the soil surface, and as gravity pulls it down past the root zone.

Life in the soil includes all of the bacteria, protozoa, nematodes, and fungi, the food they eat, the excretions they make, and the root systems they sustain. Adding good quality compost into the soil is the fastest method of incorporating living microbes.

Plants attract microbes to their roots by feeding them carbon. Bacteria and fungi hold the soil together with microscopic glues and binders. The microbes consume organic matter and are then consumed themselves by larger creatures (worms, ants, slugs, centipedes, insect larvae, etc.) In turn, these creatures are consumed by creatures further up the food chain. Carbon and other nutrients are cycled through these many life forms, creating healthy, living, well-structured soil, no matter what the soil type.



Use a Soil Probe

A soil probe allows you to determine a lot of information about your soil. It will come in handy when you are trying to figure out whether water is reaching the plant roots or even going too deep beyond the roots' reach.

Press the probe into the ground, twist and pull out to take a sample. Take multiple samples from around your garden. How deep are your plants' roots?

Use this kind of probe on a regular basis if you are maintaining lawn area. It is a quick tool for determining whether or not your irrigation schedule is providing enough water.

Purchase a soil probe online or at your local irrigation warehouse.

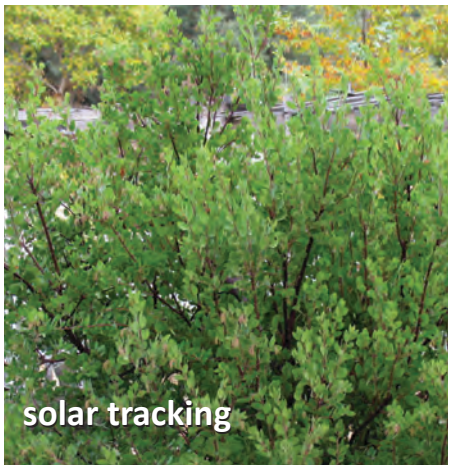


Flower to the People









California friendly plants have evolved over time to thrive in our unique and varied Mediterranean climate conditions, and are adapted to the hot and dry Southern California summers. By learning to recognize their adaptation tricks, you can identify climate-appropriate plants wherever you are. These four characteristics will allow you to find climate-appropriate plants in a crowded nursery.

Stiff or Leathery

These leaves hold on to water and stay evergreen for most of the year.

Silver or Hairy

Light colored leaves reflect sunlight, cooling the plant. Hairy back sides of leaves hold moisture longer, cooling them off.

Tiny or Little

Small leaves are like tiny solar panels that are easier to keep cool than one large hot surface.

Solar Tracking

Leaves that appear to be standing at attention, straight up and down in the middle of the day, are solar tracking. As the day progresses, or if you see the same plant in the early morning, you will find that the leaves are more horizontally oriented. This plant is moving its solar panels to minimize the hottest sun exposure. California native manzanitas (*Arctostaphylos*) are notorious for this adaptation.

How much **Water** does your garden **Need?**

Evapotranspiration (ET) is the key to watering plants.

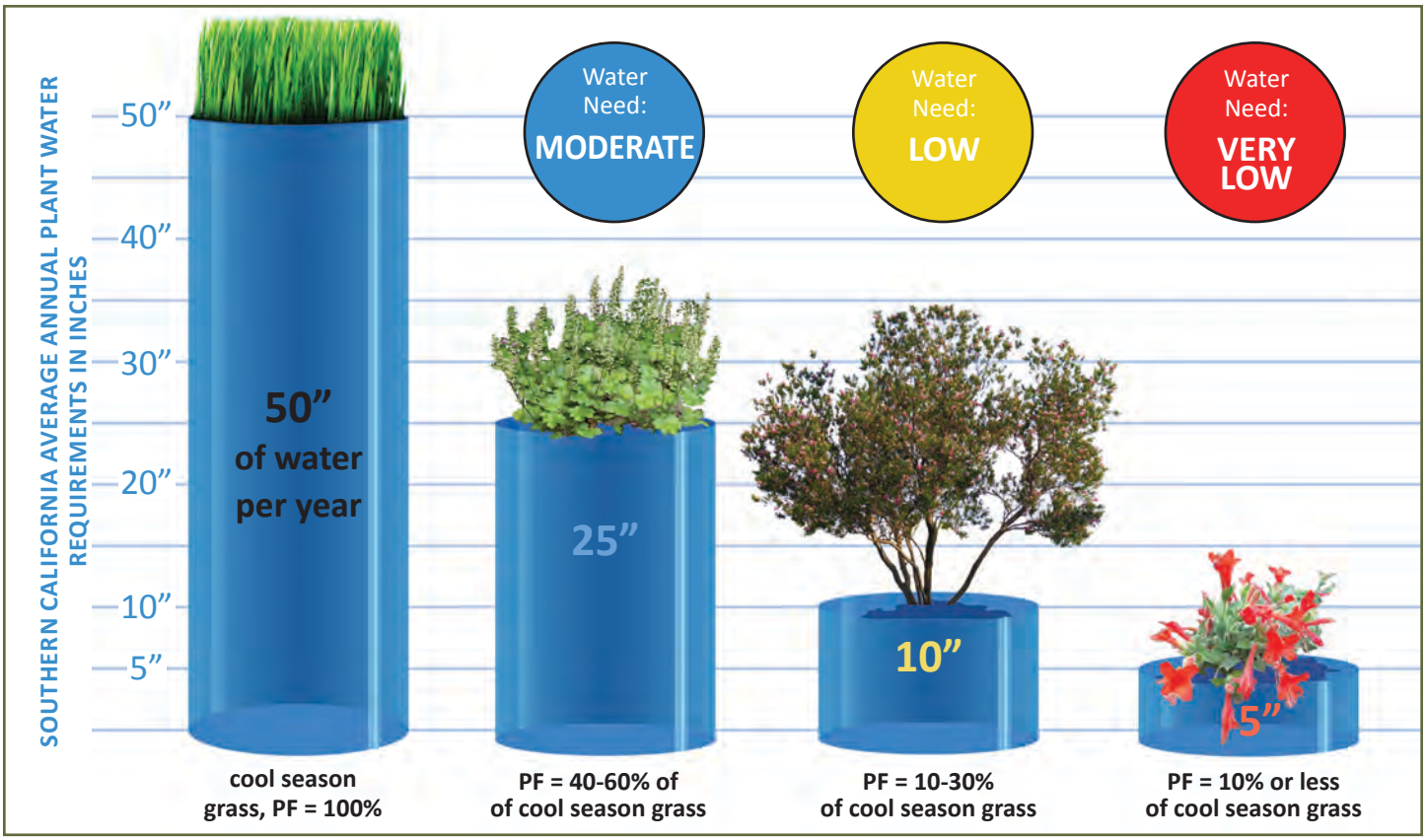
Evapotranspiration (ET) can be thought of as "reverse rain." ET measures the inches of water being transferred over some period of time from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration (sweat) from plants. ET is a quick way to explain environmental and climate conditions, especially solar radiation (sunshine or cloud cover). Many plants need more water in the summer, when the sun is high and days are long; winter days are shorter and often rainy or overcast, so many plants need less water.

ET therefore, explains how much water plants really need and when they need it; critical information for planning irrigation and managing the **Soil Moisture Account** (*see p. 65*).

Plant Factor (PF) describes the specific water need of each plant in your landscape. PF can be determined by gathering information about a plant and then comparing it to the amount of water needed by cool season grass growing in your climate zone. PF is expressed as a percentage of the water needed by cool season grass. Plant watering needs, include: **VERY LOW at 10%**, **LOW at 20%**, **MODERATE at 50%** and **HIGH at 100%** (cool season grass).

Landscape Water Need takes into consideration the effects of irrigation efficiency (IE Percentage) (*see p. 66*) and square feet of landscaped area (SF) to figure out how many gallons of water a particular landscape would require, given its climate zone (ET Inches) and plant selection (PF Percentage).

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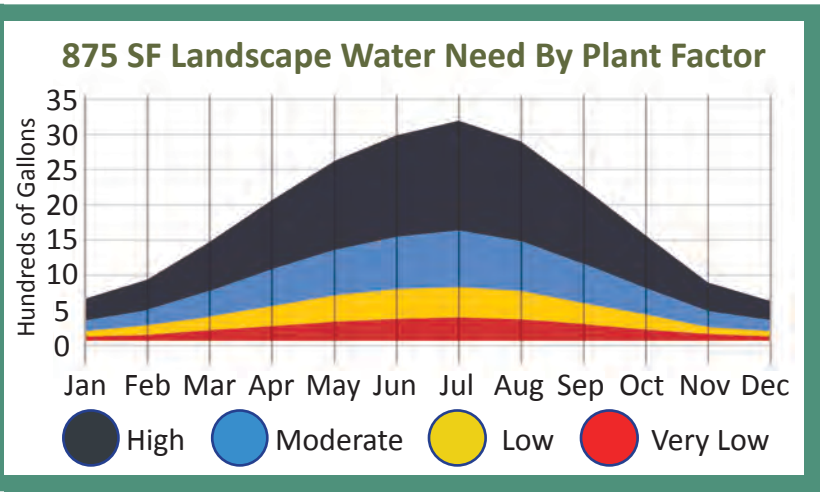


Reduce Landscape Water Need: Understand **ET**, **PF** and **IE**

Every plant choice gives us the opportunity to reduce the Landscape Water Need.

In our 875 SF Front Yard (*see p. 8*) replacing **HIGH Plant Factor** cool season grass with **VERY LOW Plant Factor**, climate-appropriate plants saves almost 32,000 gallons of water annually, before changing to drip irrigation for higher irrigation efficiency (IE) (*see p. 37*).

Converting to drip irrigation with a higher IE saves even more (up to 20%)!



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How much **Water** can your new garden **Save?**

Calculate your landscape watering need in **Gallons.**

Our Front Yard Landscape Water Need:

Our front yard is 875 Square Feet (Landscape SF). In order to calculate the Landscape Water Need, we will keep climate zone (ET Inches) and irrigation efficiency (IE Percentage) constant (*see p. 66*), but change the plant selections (PF Percentage). See how much water could be saved every year by switching from cool season grass and replacing the area with climate-appropriate **MODERATE**, **LOW**, or **VERY LOW** water requirement plants. **Improving IE to drip irrigation makes a BIG difference in water savings** (*see p. 66*).

Landscape SF = 875 Annual ET Inches = 45” Drip Irrigation Efficiency % = 90%
Landscape SF x ET Inches x Plant Factor % ÷ Irrigation Efficiency % x 0.62 = Landscape Water Need in Gallons

Grass Water Need: **HIGH**

HIGH Water Need
Plant Factor = 100% = 1.0

875 SF x 45” x **1.0** ÷ 0.90 x 0.62 =
27,125 Gallons Annually

New Front Yard Water Need: **MODERATE**

MODERATE Water Need
Plant Factor = 50% = 0.50

875 SF x 45” x **0.50** ÷ 0.90 x 0.62 =
13,563 Gallons Annually

In our 875 SF Front Yard, replacing cool season grass with **MODERATE** climate-appropriate plants saves 13,562 gallons of water annually, without changing our irrigation efficiency assumptions, and using drip irrigation.

Stout Design Build, Inc.



Urbafloria



LOW Water Need Plant Factor = 20% = 0.20

875 SF x 45” x **0.20** ÷ 0.90 x 0.62 =
5,425 Gallons Annually

Replacing cool season grass with **LOW** Water Need plants saves 21,700 gallons of water annually, without changing irrigation assumptions.

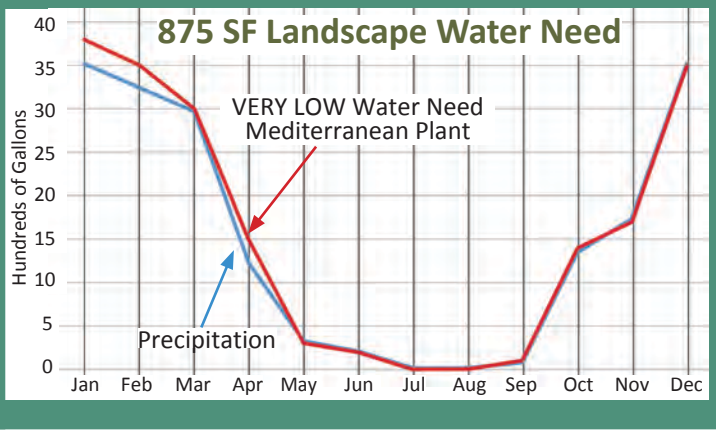
VERY LOW Water Need Plant Factor = 10% = 0.10

875 SF x 45” x **0.10** ÷ 0.90 x 0.62 =
2,713 Gallons Annually

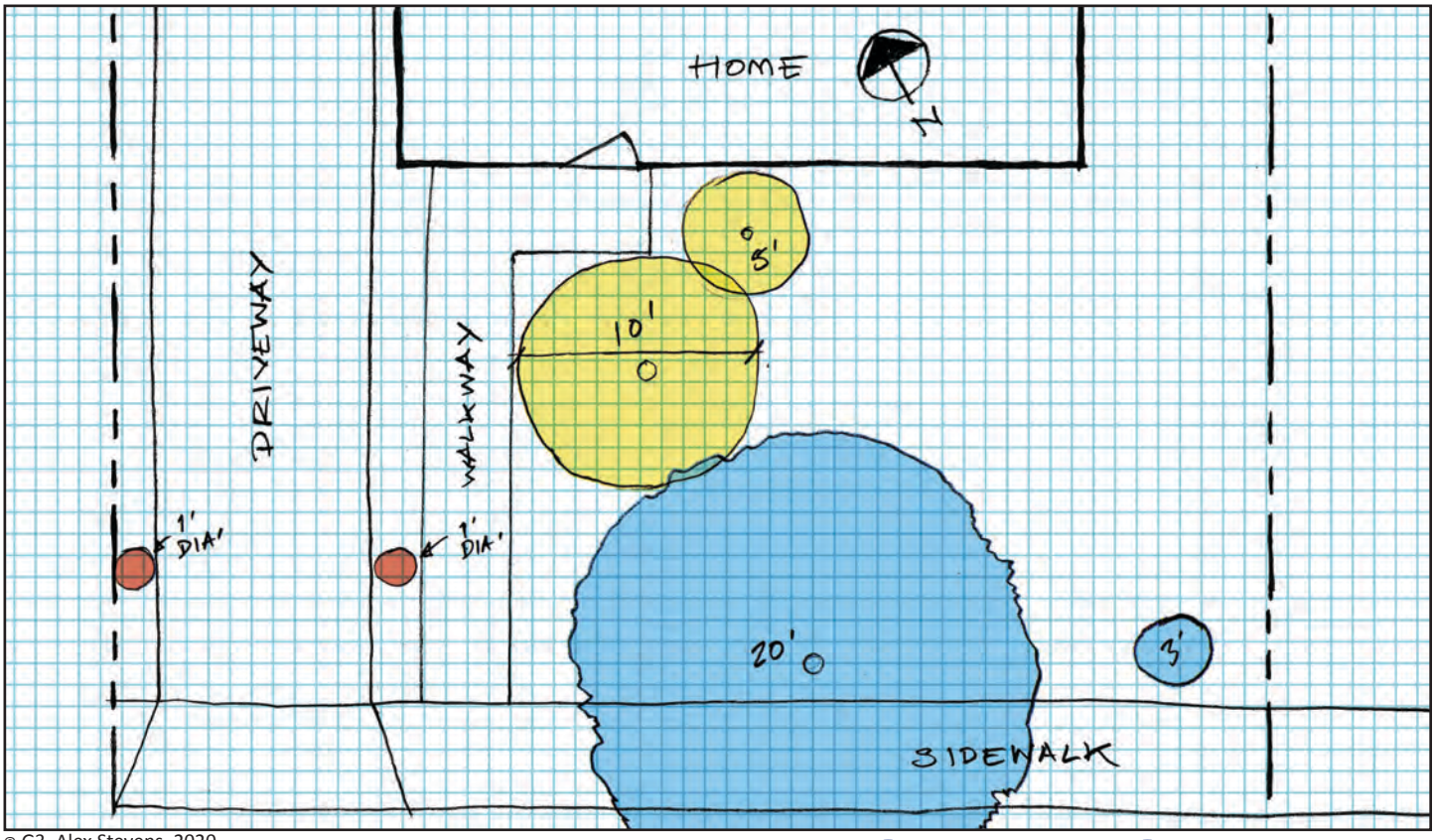
Replacing cool season grass with **VERY LOW** Water Need plants saves 24,412 gallons of water annually, without changing irrigation assumptions.

Sleep in summer, Grow in winter: Mediterranean climate-appropriate plants

Since many climate-appropriate plants from Mediterranean climates have **MODERATE**, **LOW** or **VERY LOW** water needs, planting them saves water when compared to cool season grass. However, most of these plants don’t want water in the summertime when they are dormant; they want water in the winter, when they can grow their roots in cool soil using rainwater. Irrigation needs can be reduced by directing rain-water to the garden from the roof and other surfaces in the winter months. But beware the dry winter -- these plants will need supplemental irrigation in winter if they are to survive the following summer.



Make a **Hydrozoned** planting plan



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A Guide to Plant Water Needs **Moderate** **Low** **Very Low**

(*see p. 31*):

Group Plants by **Water Needs** and plan ahead for **Maturity**.

Proper plant placement, considering mature plant size, should limit the need for future pruning and reduce the amount of maintenance required in the long run. Natural forms are encouraged for habitat value, but fire prevention does require pruning and removal of dead, diseased, damaged and deranged plant material.

Scale Your Plants for Maturity

Make circles on your plan the size of the plant at maturity using a 1/4" = 1' scale (each box = 1').

Practice using colored paper to indicate the water needs of the plants. It will make it easier to lay out the planting plan in irrigation zones if you easily can move around the paper circles.

See on the plan how big the (MODERATE water use) 20' wide canopy trees will be at maturity. Will this change the microclimates in the future? Think ahead if your new trees will cover a whole yard that's now sunny.

Play By The Hydrozone Rules

- Plants with similar cultural and water requirements should be planted together in order to irrigate them efficiently.
- Consider the soil, water needs, sun/shade and temperature requirements for each hydrozone.
- Each hydozone should be watered by a separate irrigation valve.
- Do not mix plants with different water requirements in the same hydrozone.
- Do not mix different irrigation types in the same hydrozone.
- The irrigation of each hydrozone should have matched precipitation (every nozzle needs to emit the same gallons per hour for drip).

Root depth matters

Make notes about the root depth of the plants when you are placing them on your plan. Trees, with their deep roots, will be irrigated less frequently, but for a longer time. Groundcovers with shallower roots will require more frequent watering. **Keep trees and groundcovers on separate hydrozones.**

Small plants are mighty

Once planted in a properly prepared bed, and watered wisely, small plants establish themselves more vigorously than plants raised in larger containers. But just because you've selected small plants, doesn't mean you need to buy more than the space allows when those plants reach maturity!

Go with the **Low Flow**: Drip Irrigation

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places emitters into blank tubing.

This type of drip irrigation works best for random patterns that require snaking tubing around plants or avoiding hardscaped areas.

Be sure to keep all the emitters on one valve zone at the same GPH discharge rate. Emitters typically range between 0.5 GPH and 2.0 GPH.

If you have selected 0.5 GPH emitters and your plant requires 2.0 GPH, then you add three additional emitters for a total of 4 emitters to achieve the required flow rate.

If plants are spaced very far apart, and weeds are a concern, then use on-line emitters.

Image courtesy of Rain Bird Corporation



emitters are built into the tubing itself.

This type of drip irrigation works best for large groundcover areas, uniform planter areas, and when assembled into a grid pattern.

The technology keeps root intrusion from occurring into the line. All of the emitters in the tubing discharge at the same rate and are pressure compensating. Thus, the emitters do not irrigate until the entire line is filled with water, guaranteeing uniform distribution.

In the very early establishment of the garden, there may be more weeding to be done with this system because water is emitted throughout the line, regardless of whether or not there is a plant desiring the water.

Drip Irrigation delivers water directly to roots.

Installations of subsurface (or under at least 3 inches of mulch) systems may be the most efficient way to irrigate nearly every type of garden area. In order to qualify for the rebate, spray irrigation systems must be converted to water efficient mp rotors, micro-spray, drip irrigation, or eliminated completely. Since drip irrigation is covered with soil or mulch, water does not evaporate as quickly as it might if it were applied at the surface by spray. The tubing is flexible, so it can be made to accommodate a wide variety of irregularly shaped areas or rectangular areas when laid in a grid pattern.

Gallons Per Hour (GPH) Drip systems apply water in GPH. They need to run for longer periods of time than spray systems. However, the actual run time must always account for how fast water is applied (precipitation rate) and eliminating runoff (*see p. 66*).

Challenges include the possibility that drip systems could apply water too quickly for the soil to absorb, so careful consideration is required especially when dripline grids are installed (*see p. 35*). Drip irrigation operates most efficiently at low pressure (between 15 and 30 psi). Optimal performance requires the use of pressure regulation and a filtering system to keep the emitters from becoming clogged. Most low flow valves have pressure reduction and filtration included, so replace all valves that are not specified for low flow systems.

What is a Tattle-Tale?



Screw a white cap (replacing the nozzle) on to the pop-up riser of one sprinkler head on each line when converting to drip.

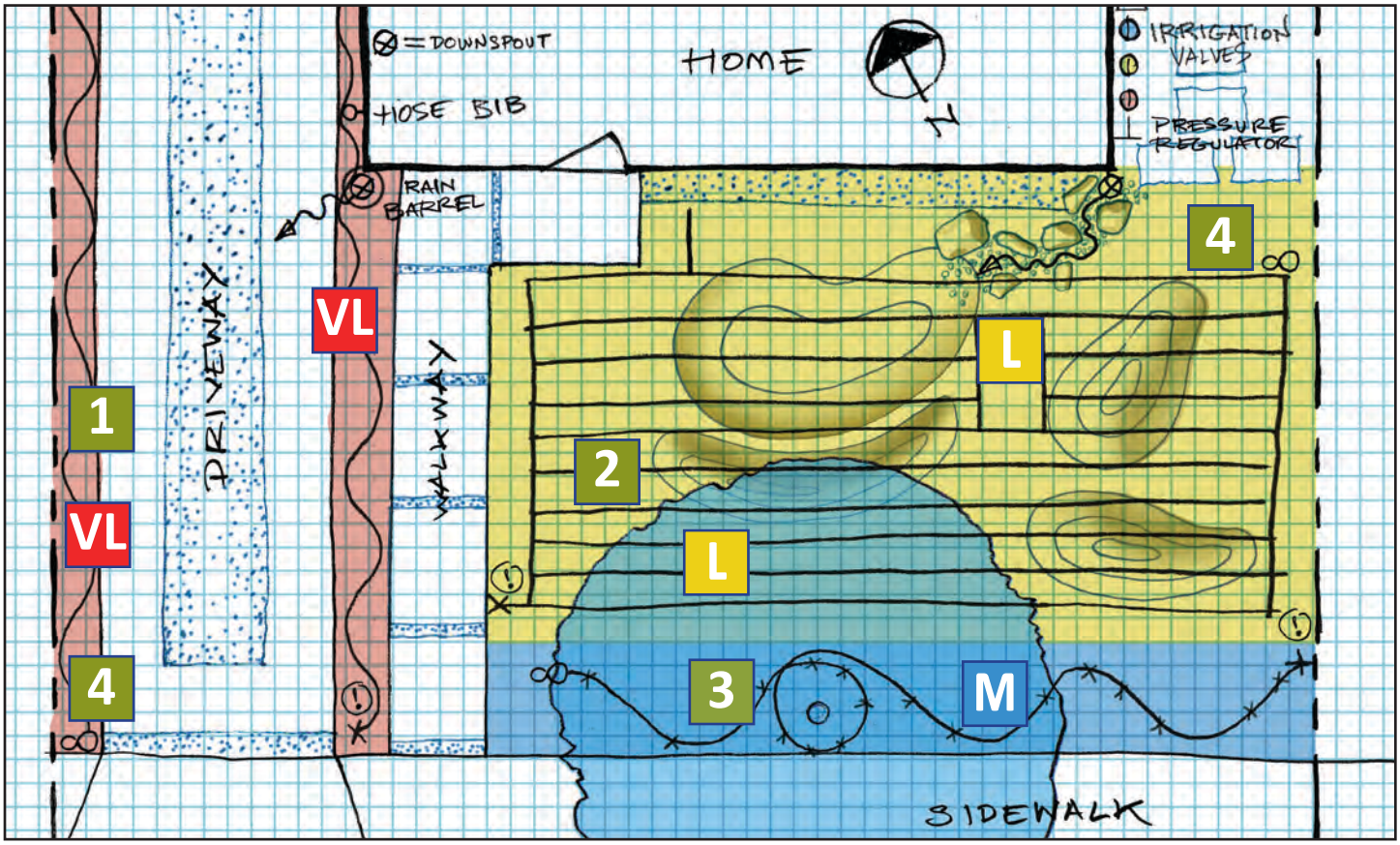
When the drip irrigation is running below the mulch, the tattle-tale will pop up and let you know that the irrigation is on.

What is a Low Flow Valve?



Irrigation valves are designed to work within a certain pressure range (pounds per square inch or psi) and flow range (gallons per minute or GPM). If you redesign your system and use drip irrigation, the flow through the valve may be so low that your existing valve will not operate effectively and may get stuck in the “open” position, wasting water. If you currently have flow lower than 5 GPM per valve, look for valves specifically marked as "Low Flow (Pressure) Valve" to replace them.

Match **Irrigation** to new **Hydrozones**



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Adjust Valve Zones to Hydrozones.

Which sprinkler heads go on at the same time and what kind of plant material are they irrigating? Get ready to make changes to your irrigation system in order to accommodate both the new grading and the new plants you are introducing into your garden. In our example garden, we have three different hydrozones.

VL **VERY LOW** water use plants in the strips along the driveway will have **in-line drip irrigation in a random pattern** around each plant. Each drip emitter is 1 GPH.

L **LOW** water use plants in front yard dry creek and berm areas will have an **in-line drip irrigation line in a grid pattern**; the grid pattern is better for situations where you want to achieve a more uniform wetting pattern that works especially well with groundcovers and high-density mixed planting. Each drip emitter is 1 GPH, spaced 18" apart, in rows spaced 18" apart.

M **MODERATE** water use plants along the sidewalk will have an **on-line or "point source" drip irrigation line in a random pattern** around each plant; note that the tree gets special attention with an extra ring to accommodate its expected growth. Each drip emitter placed in the blank tubing is 1 GPH.

END FIGURE "8" FLUSH-OUT VALVE

TATTLE TALE (*see p. 34*)

ON-LINE DRIP LINE (*see p. 34*)

IN-LINE DRIP LINE (*see p. 34*)

MULCH OR GRAVEL

Images courtesy of Rain Bird Corporation



On-line drip emitter inserted into blank tubing



In-line drip grid emitters are built into tubing



Tree drip ring needs to expand as tree grows



Dripline end figure 8 can double as a flush-out valve

Convert **Spray** to **Drip**

Now you are ready to **Irrigate** your landscape.

If you are renovating most of your landscape, or your irrigation system is older than 5 years and was not installed by an irrigation professional, be prepared to start from scratch rather than try to convert from spray to drip. For those newer spray systems, a conversion to drip irrigation is possible using a kit that replaces the sprinkler body.



You Will Need:

- Tools: trenching shovel, hand trowel, pliers
- Sprinkler caps
- Sprinkler Retrofit Kit
- Compression tees and elbows
- Rolls of drip tubing (1/2" blank or with in-line emitters)
- "U" soil staples
- 1 GPH pressure compensating emitters for on-line, tubing punch













Images courtesy of City of Santa Monica

If You Get Stuck An irrigation system designer or licensed landscape contractor can help you design and then install the new drip system. You will need to seek the help of a licensed plumber or landscape contractor to convert the typical irrigation valves suitable for spray to low flow valves designed for drip. Consult professional assistance if you must install a backflow prevention device to keep water that has already gone into the landscape from passing back into the household or city water system.

Sprinklers to Drip Retrofit in Ten Steps

1. **Warm Tubing In Sun** to make it easier to handle. Use 1/2 inch drip tubing either with the emitters built into the tubing or blank so on-line emitters may be added later. Each emitter should not exceed 2 gallons per hour (GPH).
2. **Turn On system.** Mark each sprinkler with a flag. Then identify which sprinkler is the last to receive water on the line. Place 1 additional flag at that one (2 flags total).
3. **Convert Last Sprinkler** on the line (2 flags) to Tattletale (*see p. 34*).
4. **Choose a Conveniently Located Sprinkler** to install the drip retrofit kit. Place 2 additional flags at this one for a total of 3 flags. Often a drip grid is best run off a corner sprinkler (*see p. 35*).
5. **Unscrew the Top** of the sprinkler in Step 4 (3 flags). Remove the insides of the sprinkler.
6. **Replace With the Retrofit Kit**, elbow, and a compression tee and adaptor. Note: You may need to replace the entire sprinkler head with parts provided in your kit.
7. **Cap Other Sprinklers** as you find them;
   - For Rain Bird and Hunter sprinklers, unscrew the tops and replace with the Rain Bird caps.
   - For Toro sprinklers, use Toro caps.
   - For all other brands, you'll need to remove the sprinklers and install PVC caps on the riser.
8. **Push Drip Tubing Into Compression Tee** on both sides. Maximum of 100 feet of tubing with 1 GPH emitters per sprinkler head retrofit and 300 feet of tubing with 1 GPH emitters per valve.
9. **Make a Grid** with the drip tubing using elbow compression fittings to make the 90° turns. For trees, wrap a drip line around the entire tree but leave at least 12" from the trunk.
10. **Replace Existing Sprinkler Valve** with a low flow antisiphon valve and install. Anti-siphon valves are not necessary if a master backflow device currently exists.

Lawn: Cut It out or Cook It down?



grows best in cooler periods of the year.

This grass requires water in the hot summer or it will die.

Typically these grasses grow as bunch grasses and propagate by seed or weak stolons. Cool season grasses are smothered easily by sheet mulching with 4" - 6" of mulch.

Varieties include: Bent Grass (*Agrostis*), Fescue varieties (*Festuca varieties*,) Kentucky Bluegrass (*Poa pratensis*), Perennial Ryegrass *(Lolium perenne*).

Cool season grass needs more water than warm season grass and is considered a HIGH water use plant.



grows best in warmer periods of the year.

This grass hits its stride when temperatures exceed 80°F, but will go dormant (golden brown) in the winter time when rainy and cool.

Typically these grasses grow from sturdy rhizomes extending deep underground. Warm season grasses require physical removal and/or intensive sheet mulching using at least 6” - 12” of mulch.

Varieties include Bermuda Grass (*Cynodon dactylan*), Blue Grama *(Bouteloua gracilis*), Buffalo Grass (*Buchloe dactyloides*), St. Augustine Grass (S*tenotaphrum secundatum*), Zoysia, and Seashore Paspalum.

Warm season grass is a MODERATE water use plant.



if you have cool season grass.

If your lawn is a cool season turf, you can leave it in place and sheet mulch following the Soil Lasagna Recipe (*see pp. 39-40*) to cook your grass away. **This might take up to four months to complete.** If you want to speed things up a bit, cut out the grass with a sod cutter and then sheet mulch to restore your soil.

Rent a Sod Cutter

Most large box stores or hardware stores have sod cutters available for rent. Sod cutters are heavy equipment and may need a truck for delivery.



if you have warm season grass.

If you have any combination of the warm season grasses, you have a bigger project ahead of you. You’ll need to remove the grass, as much of the roots as you can, and perhaps even the top few inches of soil as you try to get rid of the roots.

The best way to do this is with a sod cutter. A sod cutter, dumpster to remove the cut sod, and other equipment can be rented. Once you’ve cut it out and disposed of it properly, you can get cooking using the Soil Lasagna Recipe to build the healthy soil. **If you cut out the sod, you can plant as soon as you finish contouring and sheet mulching! No need to wait.**

Prepare for Success

If you are ready to transform your water-guzzling grass into healthy soil, just follow along with the recipe for Sheet Mulching, a.k.a. "Soil Lasagna" (*see pp. 39-40*), and you will have delicious soil in no time. Here are some things to consider as you plan your grass removal process. **Remember to check the rebate requirements to make sure your project is eligible. Be sure to reserve your rebate BEFORE removing grass.**

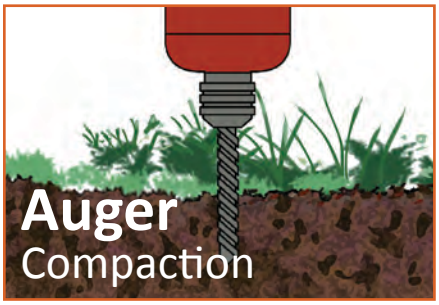


Grass should be living until you remove it. You want to be able to work with the microbes in the soil, and they need water to stay alive. Also, it will be easier to remove grass that is fresh and moist than it will be to try to find the weeds you missed in a clump of dry dead grass.

Keep irrigating lawn until the day before you are ready to sod cut or sheet mulch the grass away.



Weeds are encouraged to grow right through plastic weed cloth because soil building is kept from happening when the organic matter from fallen leaves and mulch doesn't touch the soil to begin decomposing. Paper is the only weed barrier needed to keep sunlight from germinating seeds in the soil. Over the course of a few months, the paper breaks down and turn into soil. On steep hillsides, coir mat or compost blankets may be used for stabilization, but always with the objective of complete decomposition within a specified period of time (*see p. 57*).



Use an 18" long x 5/8" diameter masonry drill bit with a hand drill to make targeted holes in compacted soils. Drill holes throughout the compacted area, and keep them at least 12" apart on center. Follow this hole-making with good compost or worm castings, and thoroughly water in everything.



Use a Site Plan to figure out how much area of grass you are removing. Now you will have to do the calculations for compost, paper and mulch (*see p. 63*).

You will need the following, if you are going to do Sheet Mulching (*see pp. 39-40*):

1. 1" of compost
2. 4" – 6" of mulch over the whole area
3. Rolls of painters' paper or cardboard with 6" overlaps

RULE OF THUMB: Multiply the Square Footage of the area by 1.25 to determine the total amount of paper you will need. This multiplier allows you to overlap the paper by at least 6" on all sides to make sure that no sunlight gets in.

Compaction Kills Plants



The bigger the equipment for removing the turf, the more the soil beneath is compacted. Try to only use hand powered or walk-behind equipment rather than a bobcat or other scraper.

Call **Dig Alert** (811)



Hitting a gas line or water main is no laughing matter! Call at least two days before digging so marks can be made to avoid underground cables, water lines, gas lines and sewer pipes. Be careful when digging around irrigation lines; they can be as shallow as 4" below the surface. Have some irrigation repair materials on hand to be able to fix a leak if you break one.

Till Can Kill



Tilling soil breaks up and kills soil microbes so you are pretty much guaranteed to have weeds pop up afterward. If you have to till, follow up right away with compost or sheet mulching.



Lose your lawn and Build Healthy Soil

© Pamela Berstler 2020

Stout Design Build, Inc.

Build healthy soil with **Sheet Mulching** (aka Soil Lasagna).

We call this process Sheet Mulching, or **Soil Lasagna,** because it boosts microbes so much, they actually cook down the organic matter and start eating up the grass as food. Once you've made the Soil Lasagna, all you need to do is keep the system wet so the microbes can stay awake and cooking. How long this will take depends upon the kind of grass you have (*see p. 38*). When you're ready, just dig a hole right into it, cutting through paper/cardboard (if it's still there) and plant into the healthy soil beneath.



You Will Need:

Shovels and Rakes
Bins for removed grass and soil
Landscape flags
Compost, Worm Castings, or Compost Tea
Wheelbarrow(s)
Mulch
Painters' Paper or big sheets of Cardboard
Hose with shut off nozzle at end
Water (LOTS!)

Secure Your Permits

Call DIG ALERT (8-1-1) at least two days in advance of digging. Soil removal and large-scale drainage or grading may require permits from your City.

Rent A Dumpster

For every 1,000 sq. ft. of turf removed you will need 1 low-boy (10 yard capacity) dumpster. A permit from the City is required to put a dumpster on the street.

1 After you have checked for permits and any other local restrictions, deal with the lawn you have. If it's cool season, mow it to about 1/2" height, say goodbye and soak it thoroughly with water. Then go to #3. If you want to cut out cool season grass, go to #2.

2 If you have warm season grass, rent a sod cutter and remove the grass and 2-3" of roots beneath. The result is that you will be removing up to 6" of grass and soil. Unfortunately, this must be hauled away, so you will need to get a permit and rent a dumpster.

3 Flag your sprinkler heads so you can find them and cap or convert them to drip irrigation later (*see p. 36*).









4 Dig a trench 8-12" deep (about 1 shovel depth) and at least 10-24" wide (the wider the better) around all hard surfaces and 6" deep along building foundations. **Before moving on, complete your contouring for rainwater absorption and retention.** *(see p. 41).*

5 Add a (1/2" to 1" deep) layer of compost on top of the graded soil. Alternatively, use humates, a sort of freeze-dried compost available at some landscape supply stores, or spray with compost or worm tea. You are adding good instant food and some beneficial microbes to the soil!

6 Water everything well. Wake up, microbes and get the party started!

7 Roll out painters' paper, cardboard or other paper. Overlap at the seams by at least 6". No naked soil!









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8 On the hardscape edges, make a "burrito" by A) overlapping the edge of the hardscape by 10" - 12" with paper and covering the trench with mulch, and then B) folding back the paper and covering it with mulch to keep grass from re-sprouting immediately.

9 The paper is watered again and add another layer of compost here, if you'd like. Rake a thick blanket 4-6" deep of finely chopped mixed leaf and wood mulch over the paper or compost.

10 Water the mulch thoroughly. This mulch layer will absorb more water than you ever thought possible to become soaked through. Don't despair; just keep watering!

11 Plant right through the layers. The longer you wait to plant, the tastier the lasagna will be for the new plants, but you can plant right away if you removed the grass. **If you kept your cool season grass in place, count on waiting 3-4 months before planting.**

12 Step back and admire your work! Have a glass of lemonade too; you earned it!



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Contours for **Rain Capture**

Every garden can become a **Sponge.**

Many front yards are just flat lawn, but this space could be a last chance to capture and filter your seasonal rain before it runs into the storm drain and right into creeks, rivers and eventually, the ocean! By contouring the land to hold on to at least the first inch of rain after a dry period (known as First Flush), we create landscapes that are far more interesting than flat expanses of lawn, and provide an opportunity to create conditions for some of California's most interesting native plants.

Meet your **Contour** (aka Swale!) Sounds fancy, but really, it's very simple. Your Contour is just a little soil basin to slow, spread, and sink the first inch of rain water from your roof into the plants in your front yard. Direct your downspouts into the depression. Your soil and plants will thank you! There are two main components of this watershed wise landscape: **Basins** & **Berms**. **Boulders** are optional, and a lot of people like the look of them. If you don't like the rock, skip them and just add mulch.



© Pamela Berstler, 2020

Basins and Swales are shallow depressions, or channels no more than 6"–24" deep, on gently sloped or nearly flat landscapes that move water around over short distances. The plants in and around the depressions capture and sink small volumes of surface water. Small, shallow depressions (6"- 12") are best used in clay soil areas, while sandy soils may accommodate the deeper (up to 24") depressions. Channels can be filled with mulch, planted (vegetated swales), and/or lined with rocks and small boulders to resemble natural water features.

Berms are mounds of raised soil, usually planted, that can border basins and swales or be used alone. Berms help contain and move water around, increasing the holding capacity of basins and swales, and providing good drainage for certain plants.

Boulders may be used to retain small berms or edges of swales and to create "dry creekbed" interest in the landscape.



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No Flat Yards

Native Plants OK With Wet Feet (Basin Swale Plants)



1 Anemopsis californica
Yerba Mansa



2 Juncus patens
California Wiregrass



3 Clinopodium douglasii
Yerba Buena

Swale Plants Are Special. These basin plants like wet feet and can be completely submerged in rain water and still survive the region's hot dry summers without extra water. They're sort of plant Super Heroes that way!

Native Plants That Prefer Dry Feet (Berm Plants)



1 Epilobium canum
'Everett's Choice'
Everett's California Fuchsia



2 Salvia leucophylla
'Point Sal Spreader'
Point Sal Purple Sage



3 Bouteloua gracilis
'Blonde Ambition'
Blonde Ambition Blue Grama

© Meiko Watkins, 2018

Berm Plants Like It Dry. On the mounded side berms, choose plants that like their feet drier. Plants from the chaparral community are great choices here. Throughout the entire landscape, make sure to mulch at least 3" deep around all the plants (though not right up against the trunks), including those in the bottom of the swale.

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Contour Your Garden in Eight Easy Steps

1. Make Your Site Plan and note where rain falls and flows. Look for an open, mostly flat low spot to direct water towards in the front yard, or anywhere with the center at least 10' away from the house foundation and 3' away from the sidewalk and neighbors (*see pp. 21,26*).

2. Lay Out Your Low Spots. Spread out a garden hose to outline the shape. The area must be basically flat or slightly bowl-like, and not sloping back toward the house. Be careful around trees. Don't put your contours under a mature tree or disturb any big roots. Remove all plants (including grass) from the area and start digging.

Do not dig without calling 8-1-1- DIG ALERT!

3. Do A Percolation Test. If you have compaction, try to break through it with a shovel or a pitchfork (*see p. 22*).

4. Dig A Basin that is between 6" and 12" deep at the center. Slope the sides gently to make a sloping bowl, not a cylinder. **For every 1,000 sq. ft. of roof area, plan on creating a basin covering 150 sq. ft., and six inches deep** (*see p. 41*).

5. Mound Extra Soil around the bowl to increase capacity. At the bottom of the basin, put down at least an inch of high quality compost or worm castings to activate your soil.

6. Direct Downspouts Into The Basin area, moving the rainwater through gravel lined ditches or aboveground drainage pipes. Also, make an overflow path so extra water has a direct channel away from your house (*see p. 28*).

7. Plan For Overflow that isn't directed onto your neighbor's property; overflow always should be directed from your property into the street (*see p. 41*).

8. The Basin Will Fill Up when it rains, creating a temporary pond until the water soaks into your soil. All the water should be gone in 24 hours.

TAKE ACTION if your basin is slow draining!

If water in your basin is not gone within 48 to 72 hours maximum, then auger the basin to eliminate compaction (*see p. 38*). Add worm castings when it has drained. Whenever you disturb the soil, be sure to reapply compost.

Tips for Eliminating Erosion

1. **Calculate Your Slope** for terracing using stakes, string and a measuring tape.

- **Place** two stakes in the ground - one at the top of the slope and one at the bottom.
- **Take** a 5’ to 20’ long string and wrap it around both stakes, pulling it taut.
- **Attach** a **line level** to the middle of the string and allow it to hang down beneath the string.
- **Determine** the **Rise** of the Slope by measuring the distance between the ground and the string on **Stake A** on the lower part of the slope, and doing the same on **Stake B** on the upper part of the slope.
- **Subtract** the **Stake B** distance from **Stake A** distance. This is the **Rise** of the slope.
- **Determine** the **Run** of the Slope by measuring the length of the string between the stakes.
- **Divide** the **Rise** by the **Run** and multiply by 100 to determine the percent of slope.

2. **Make and Use a Bunyip** to calculate the slope (*see p. 25*).

3. **Think About Irrigation** before doing any hillside work. Drip tubing is ideal for sloped areas, especially for wider-spaced shrubs and trees. Pressure compensating emitters should be used for all irrigation (*see p. 34*).

4. **Apply Water In Short Durations** so that it can be fully absorbed into the soil between application times. This is called Cycling and Soaking (*see p. 66*).

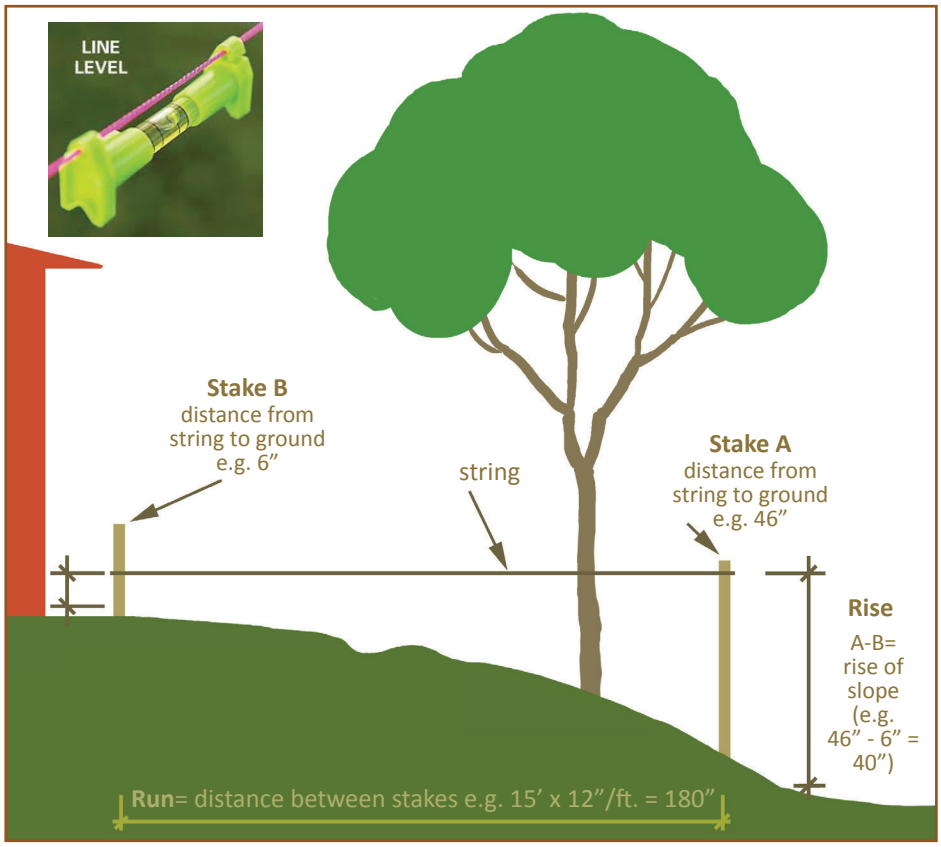
5. **Separate Irrigation Valves For Top and Bottom** of the slope, and place irrigation emitters above the plant basins. Check Valves should be placed on the lower emitters of all spray systems to avoid low point runoff.

6. **Capture On Contour** using very shallow mulch-filled or planted basins to slow, spread and sink rainwater and any irrigation runoff to nourish the hillside root systems (*see p. 57*).

7. **Pathways For Maintenance** make it easier to walk around on the hillside after plants are established. Try to create at least 18” wide footpaths or stepping stones that can be incorporated into rainwater capture.

8. **Natural Form Plants**, correctly spaced when planted, keep maintenance to a minimum.

Contour **Hillsides** with **Caution**



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Rise of Slope = **Stake A** - **Stake B** = 46”- 6” = 40”
Run of Slope = 180”
Slope Percentage is Rise Divided by Run Multiplied by 100 or **40” ÷ 180” x 100 = 22%**





Plant with **Confidence**

Now you are ready to **Install** plants!

It's almost as easy as digging a hole, but a little extra love will help. By following these simple steps, you will get your plants' roots growing properly, quickly spreading into the living soil and making friends with the other drought tolerant plants. Strong roots make strong plants, and this is especially important in dry environments.

You Will Need:

- Tools: shovel, hand trowel, hose
- Plants
- Compost
- Mulch

Add these to your list for more advanced planting:

- Mycorrhizae
- Fish Emulsion or Water Soluble Humates

"Hey, where's the fertilizer?" you may ask. **California friendly plants don't want nutrient rich (i.e. fertilized) soil, so don't use it!**

All photos © Paul Herzog, 2020













What's with all the **Water**?

Drainage. If the water does not drain within an hour or so, it's probably not a good place to plant a climate-appropriate plant until you fix the compaction.

Awaken Microbes. By watering so thoroughly, you are waking up any microbes that might be in the surrounding soil.

Plant Shock. The major reason plants suffer from planting shock is that the dry soil around the new plants wicks water away from their rootball, sending the plant into shock from which they never recover. By watering the surrounding soil, you reduce the probability of plant shock.

Successful Planting in Ten Easy Steps

1. **Dig A Hole!** Don't dig it any deeper than the rootball of the plant. Do dig at least a little bit wider than the plant to loosen the surrounding soil. If you accidentally dig too deep, be sure to put the soil back in and tamp it down firmly before moving on, to give your plant a solid base.

2. **Throw In Some Compost** or worm castings no more than 1" deep - along the bottom of the hole. Never put mulch in a hole! And don't bother with fertilizers either.

3. **Fill The Hole With Water TWICE**, and allow it to drain completely each time. This will take a long time, unless your soil is really sandy. Start digging the next hole, or take a break.

4. **Submerge The Rootball** in a bucket of water until air bubbles stop bubbling up. Keep the plant in its container but it's ok if you take it out - just be careful with the delicate roots.

5. **Consider Adding Fish Emulsion** or soluble humate to the water (follow label directions). Dust the rootball with a mycorrhizae inoculant (only if the plants are woody, so don't bother with the ornamental grasses).

6. **Place Plant In Hole**, make sure the root collar (that's where the roots join the stem or trunk) is a bit (1/2" - 1") higher than the surrounding soil/ existing grade. This is super important because we don't want the plant to get choked by the surrounding soil.

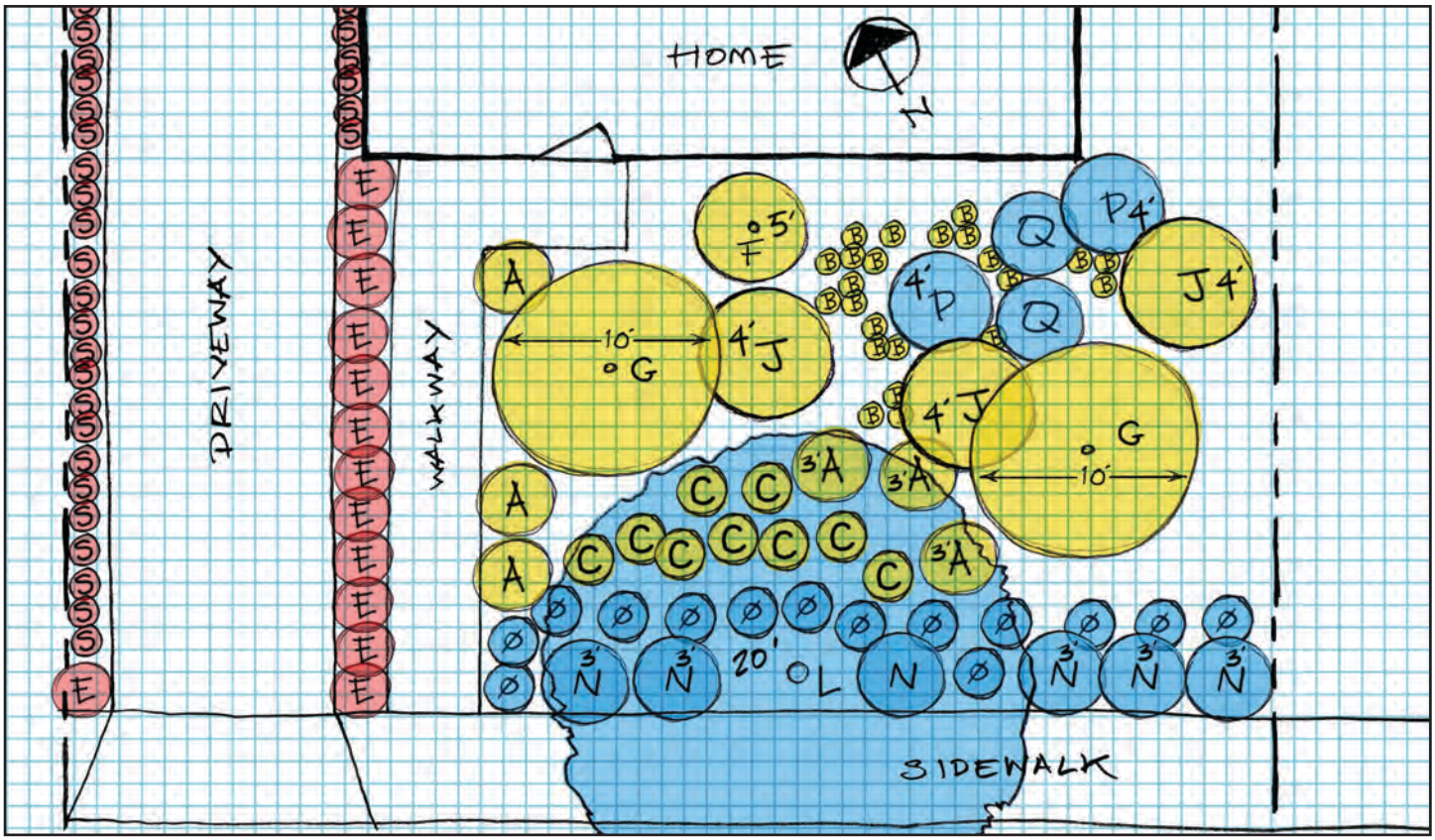
7. **Fill The Hole With Water** one more time (this time with the plant in it) and let it drain completely.

8. **Now Fill The Hole With The Soil** you dug out (not with fancy potting soil!), making sure the soil slopes away from the root collar. Tamp the soil down (use your feet, but be gentle) so the plant doesn't move around.

9. **Don't Create A Bowl** around the plant. Really! Your plant doesn't need it and it might make a moat that would drown your climate-appropriate plant.

10. **Water The Soil All Around The Plant** one more time, and deeply. And have a drink yourself!

Make your **Garden Planting Plan**



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Qty.	Symbol	Form	P	Botanical (Latin) Name	Common Name	Plant Factor	Sun	Dimension H' x W'	D/E/S	Flower Color
6	A	Groundcover	x	Achillea millefolium	Common yarrow	L	F	2' x 3'	S	various
23	B	Grass		Carex pansa	California meadow sedge	M/L	F	1' x 1'	E	wheat
9	C	Grass		Carex tumulicola	Foothill sedge	L	F/PS	1' x 2'	E	cream, rust
13	E	Perennial	x	Erigeron glaucus	Seaside daisy	L/VL	F/PS	1' x 2'	E	lavender, yellow
1	F	Groundcover	x	Salvia 'Bee's Bliss'	Bee's Bliss sage	L	F/PS	2' x 5'	S	pink, lavender
2	G	Perennial	x	Solidago velutina ssp. californica	California goldenrod	L	F/S	5' x 10'+	E	yellow
3	J	Perennial	x	Verbena bonariensis	Purpletop vervain	L	F	4' x 3'	E	purple
1	L	Tree/Shrub	x	Cercis canadensis 'Forest Pansy'	Forest Pansy redbud	M	F	20' x 25'	D	purple
6	N	Perennial	x	Iris douglasiana	Douglas iris	M/L	F/S	2' x 3'	E	various
14	O	Perennial	x	Geranium sanguineum	Bloody cranesbill	M	F/S	2' x 3'	S	fuchsia pink
2	P	Perennial	x	Pacific Coast iris	Pacific Coast iris hybrids	M/L	PS	2' x 1'	E	various
2	Q	Perennial		Juncus patens / Juncus effusus	California wiregrass	M	F/PS	3' x 3'	E	brown
31	S	Grass		Festuca idahoensis	Idaho fescue	VL	F	1.5' x 1'	E	wheat

Plan for Planting. Start with a copy of your **Microclimates Maps** (*see p. 24*). Begin the plant design process by selecting the right plant for the right place in your garden. Use the Plant List above to practice matching plants with the conditions, and represent the plants with circles the appropriate size and color reflecting water requirements. This is the foundation of your Plant Shopping List (*see p. 69).* It's just a paper plan, so move things around! Experiment! Then move on to the **Example Plans** *(p. 52)*.

1. Take into consideration microclimates and select plants that need Full Sun, Part Shade or Shade as appropriate.
2. Consider Plant Factors - Low or Very Low plants on berms and Moderate plants in the swales.
3. Consider the height, width and root depth of each plant.
4. What form of plant do you desire - Grass or Groundcover, Vine, Shrub, Perennial, or Tree?
5. Once you've drawn your plan, count the number of plants you will need to order and mark them in the Quantity box.

Use these **Example Plans**

On the following pages, we have included garden plan examples of **Front** and **Back** yards in the North and South coast climates as well as for Inland areas. A **Master Plant List** has been provided that you can use to substitute for the plants suggested on each of the plans *(see p.)*. For example, take note of the plant number on the plan **(1-17)** and consult the **Master Plant List** for alternative selections.

Example Plan A



The **Planting Plans** take into consideration the regional climate, such as Coastal or Inland, the microclimates on the particular property, and the proposed contouring such as berms and basins *(see p.41)* substituted using the Master List.

The **Contouring** and **Hydrozone Plans** show how rainwater generated from the roofs of the buildings will be captured and held on the property for the benefit of the plants, and how the plants need to be hydrozoned efficiently.



1 **Blue** for **MODERATE** water use,

2 **Yellow** for **LOW** water use, and

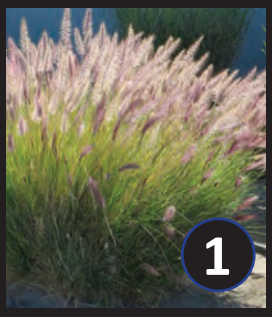
3 **Red** for **VERY LOW** water use.

The **Butterfly** icon indicates plants that support the life cycle of pollinators, butterflies and other insects.

Wherever we have provided plant selections, we identify them by their water requirements by placing their identification numbers on a colored background. You can use this color coding to help you group plants by their water requirements in your new landscape, making it easier to irrigate them properly.

Don't plant a Pest

Remove These Invasive Plant Pests



1 Pennisetum setaceum
African Fountain Grass



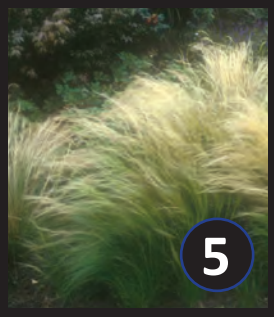
2 Vinca major
Periwinkle



3 Cotoneaster
Cotoneaster



4 Cytisus scoparius
Scotch Broom



5 Nassella tenuissima
Mexican Feather Grass

Some exotic plants such as these and species of *Pyracantha*, Algerian ivy (*Hedera algeriensis*), and privet *(Ligustrum*) can be innocently planted without realizing they end up beyond the far reaches of our gardens when birds, wind or water carry them to areas where they are difficult to control.

Their spreading and greedy behavior can take over native habitats, inhibiting areas for all to enjoy. Few of these species offer any benefits to the local animals and insects. Invasive species and species that act like invasives should be removed from your gardens, removed from nursery stock and should not be planted in the first place.

Plant These Well Behaved Alternatives Instead

Benefits Pollinators



1 Melica imperfecta
Small Flowered Melica



2 Campanula poscharskyana
Serbian Bellflower



3 Heteromeles arbutifolia
Toyon / Christmas Berry



4 Peritoma arborea
Bladderpod



5 Stipa cernua
Nodding Needlegrass

PlantRight *www.plantright.org*

Since 2005, PlantRight has been working with California's nursery industry to stop the sale of horticultural invasive plants in ways that are good for business and the environment. PlantRight unites leaders from California's nursery and landscape industries, conservation groups, academia, and government agencies in a voluntary, science-based, and collaborative way. PlantRight's Plant List, identifying the highest priority invasive garden plants, is the cornerstone of the program. For each plant on the invasive plant list, PlantRight suggests several non-invasive alternatives. Retailer partners pledge not to sell any plants on the Plant List, and any plants added to the list in the future. To track its progress and inform the plant list, PlantRight conducts a survey of retail nurseries throughout the state. PlantRight also has a Continuing Education program available for free to anyone who wants to learn about horticultural invasive plants.

California Native Plant Society (CNPS) *cnps.org* *www.calscape.org*

Our gardens play an important role in local ecosystems. The plants we choose for our gardens have the power to support pollinators, build wildlife corridors, and restore our natural landscapes. ***Calscape.org***, is a tool CNPS has developed that makes it easier for gardeners to create thriving, natural gardens and avoid invasive plants. Use it to discover which plants are native to your location and to search by water requirements, blooming season, pollinator habitat and more. You also can build custom plant lists and find nearby nurseries who carry the plants you want. In addition to online resources, CNPS has 35 local chapters statewide that host native plant sales, garden tours, field trips, and expert talks.

Use this **Project Plant List**

Sym	Form	Botanical (Latin) Name	Common Name	H x W	Sun	D/E/S	Native	P	Flower Color
1	tree	Arbutus 'Marina' (multi)	Strawberry tree	25-50' x 25-40'	FS	E			pink
1	tree	Chilopsis linearis 'Art's Seedless'	Desert willow	25' x 25'	FS	D			pink-rose
1	tree	Geijera parviflora	Australian willow	20-30' x 15-20'	FS	E			none
2	shrub	Arctostaphylos 'Howard McMinn'	Manzanita	7-10' x 7-10'	FS	E	X		light pink
2	tree	Bauhinia Lunarioides	Anacacho orchid tree	12' x 10'	PS	E			white pink
2	shrub	Grevillea 'Long John'	Long John grevillea	8-10' x 8-12'	FS	E			rose pink
3	shrub	Heteromeles arbutifolia	Toyon	6-10' x 6-8'	FS/PS	E	X	X	white
3	shrub	Rhamnus alaternus 'John Edwards'	Italian buckthorn	15' x 6'	FS/PS	E			Insignificant
3	shrub	Prunus ilicifolia ssp. lyonii	Catalina cherry	15' x 10'	FS/PS	E	X	X	white
4	succulent	Agave 'Blue Flame'	Blue flame agave	2-3' x spreads	FS	E			white
4	succulent	Agave 'Blue Glow'	Blue glow agave	1-2' x 2-3'	FS	E			rarely
4	succulent	Aloe vanbalenii	Aloe	1-2' x 3-4'	FS/PS/S	E			yellow orange
5	perennial	Achillea millefolium 'Paprika' or 'Moonshine'	Yarrow	1-2' x 2-3'	FS/PS	E	X	X	red or yellow
5	succulent	Aeonium urbicum 'Salad Bowl'	Salad bowl	1-2' x clumping	FS/S	E			yellow
5	perennial	Penstemon heterophyllus 'Margarita BOP'	Penstemon	2' x 2'	FS	S	X	X	blue violet
6	perennial	Galvezia speciosa	Island snapdragon	2.5' x 4'	FS/S	E	X	X	red
6	perennial	Salvia clevlandii 'Winifred Gilman'	Blue sage	3' x 3'	FS	E	X	X	blue violet
6	perennial	Salvia leucantha 'Santa Barbara'	Mexican bush sage	2-3' x 2-4'	FS	E		X	purple
7	grass	Bouteloua gracilis 'Blonde Ambition'	Blue gramma	1-2' x 1-2'	FS	D	X	X	reddish purple
7	grass	Muhlenbergia capillaris	Muhly grass	2-3' x 2-3'	FS/PS	E			rose mauve
7	grass	Aristida purpurea	Purple three-awn	2-3' x 1-2'	FS/PS	S	X	X	purple
8	succulent	Sedum angelina	Stonecrop	4-6" x 8"	PS/S	E			yellow
8	succulent	Senecio serpens	Blue chalk sticks	1' x 2-3'	FS	E			white
8	succulent	Cisanthe grandiflora	Rock purslane	1' x 3'	FS	E			purple
9	perennial	Anemopsis californica	yerba mansa	1' x 2'	FS/PS	S	X	X	Cream
9	bulb	Zephyranthes candida	White rain lily	1' x 1-2'	FS/S	E			white
9	perennial	Iris douglasiana	Douglas iris	2' x 3'	FS/PS	S	X	X	various
10	grass	Carex tumulicola	Berkeley sedge	1-2' x 1-2'	FS/S	E	X	X	insignificant
10	grass	Lomandra longifolia 'Breeze'	Spiny-headed mat rush	2-3' x 2-4'	FS/PS	E			yellow
11	succulent	Bulbine frutescens	Bulbine	1-2' x 4'	FS/PS	E			orange
11	succulent	Portulacaria afra 'Prostrate form'	Prostrate elephant's food	1-2' x 4-6'	FS/S	E			lavender
11	perennial	Salvia 'Bee's Bliss'	Sage	1-2' x 6'	FS	E	X	X	lavender
12	groundcover	Dymondia margaretae	Silver carpet	<1' x spreads	FS/PS	E	X		yellow
12	groundcover	Phyla nodiflora	Frogfruit	3-6" x 3-6"	FS	E	X	X	lilac
13	shrub	Frangula californica 'Eve Case'	Coffee berry	4' x 4'	FS/S	E	X	X	greenish white
13	shrub	Frangula californica 'Mound San Bruno'	Coffee berry	4-6' x 4-6'	FS/S	E	X	X	greenish white
13	shrub	Ribes viburnifolium	Catalina perfume	3-6' x 4-6'	FS/S	E	X	X	rose pink
14	groundcover	Fragaria chiloensis	Beach strawberry	6-8" x spreads	PS/S	E	X	X	white
15	shrub	Ceanothus 'Concha'	California lilac	6-8' x 6-8'	FS/PS	E	X	X	dark blue
15	shrub	Leucophyllum frutescens 'Compacta'	Compact Texas ranger	4-6' x 5'	FS	E	X	X	dark pink
16	perennial	Epilobium canum ssp canum	California fuchsia	<1' x 3-4'	FS	S	X	X	orange red
16	perennial	Asteriscus maritimus	Gold coin daisy	<1' x 3-4'	FS	E			yellow
16	low shrub	Teucrium Cossonii	Majorcan teucrium	<1' x 3'	FS	S			purple
17	succulent	Hesperaloe parviflora 'Brakelights'	Hesperaloe	2-3' x 2-3'	FS	E		X	rose
17	perennial	Sphaeralcea ambigua	Red desert mallow	2-3' x 2-3'	FS	E	X	X	red

Plant List Key

Form:	Water Use:	Sun:	P:	D/E/S:	Notes:
Natural shape taken by the plant	**M=Moderate** **L=Low** **VL = Very Low**	**FS**=Full **PS**=Part Shade **S**=Shade	Plant supports life cycle of pollinators, butterflies and insects	**D**=Deciduous, **E**=Evergreen, **S**=Semi-Deciduous	Section of the book where you can read more about this plant

Introducing **The Plants**



Arbutus marina



Chilopsis linearis



Geijera parviflora



Arctostaphylos 'Howard McMinn'



Bauhinia lunariodes



Grevillea 'Long John'



Heteromeles arbutifolia



Rhamnus alaternus 'John Edwards'



Prunus ilicifolia ssp. lyonii



Agave 'Blue Flame'



Agave 'Blue Glow'



Aloe vanbalenii



Achillea millefolium



Aeonium urbicum 'Salad Bowl'



Penstemon heterophyllus



Galvezia speciosa



Salvia clevelandii 'Winifred Gilman'



Salvia leucantha 'Santa Barbara'



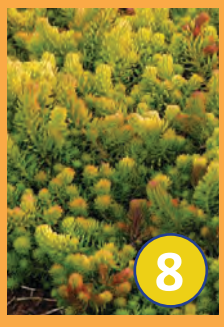
Bouteloua gracilis 'Blonde Ambition'



Muhlenbergia capillaris



Aristida purpurea



Sedum angelina



Senecio serpens



Cisanthe grandiflora

Introducing **The Plants**



Anemopsis californica



Zephyranthes candida



Iris douglasiana



Carex tumulicola



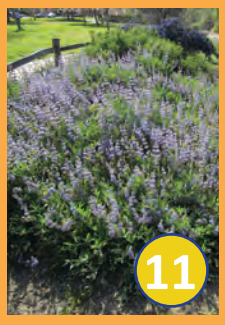
Lomandra longifolia ‘Breeze’



Bulbine frutescens



Portulacaria afra ‘Prostrate form’



Salvia ‘Bee’s Bliss’



Dymondia margaretae



Phyla nodiflora



Frangula ‘Eve Case’



Frangula californica ‘Mound San Bruno’



Ribes viburnifolium



Fragaria chiloensis



Ceanothus concha



Leucophyllum frutescens ‘Compacta’



Epilobium canum spp canum



Asteriscus maritimus



Teucrium cossonii



Hesperaloe parviflora ‘Brakelights’



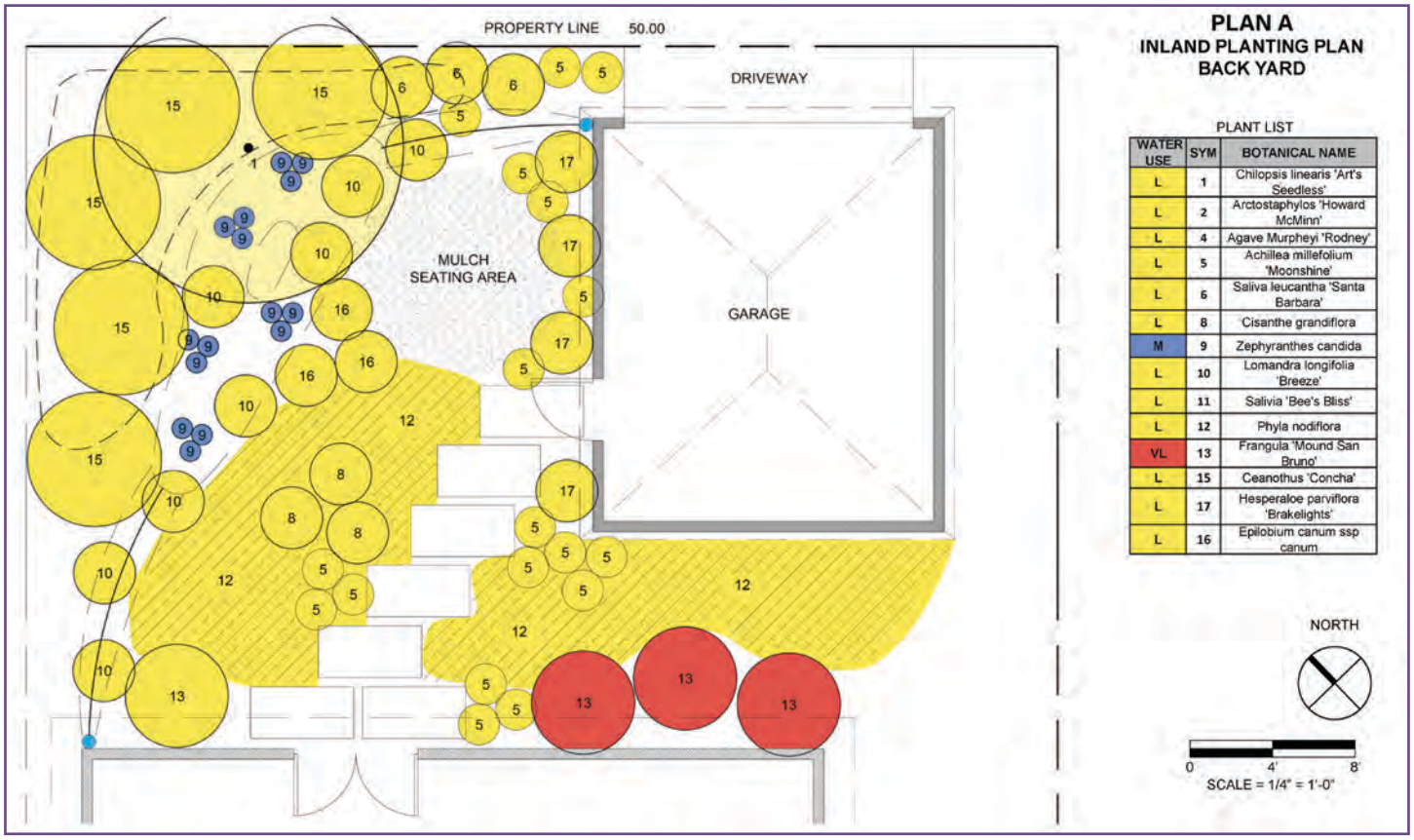
Sphaeralcea ambigua

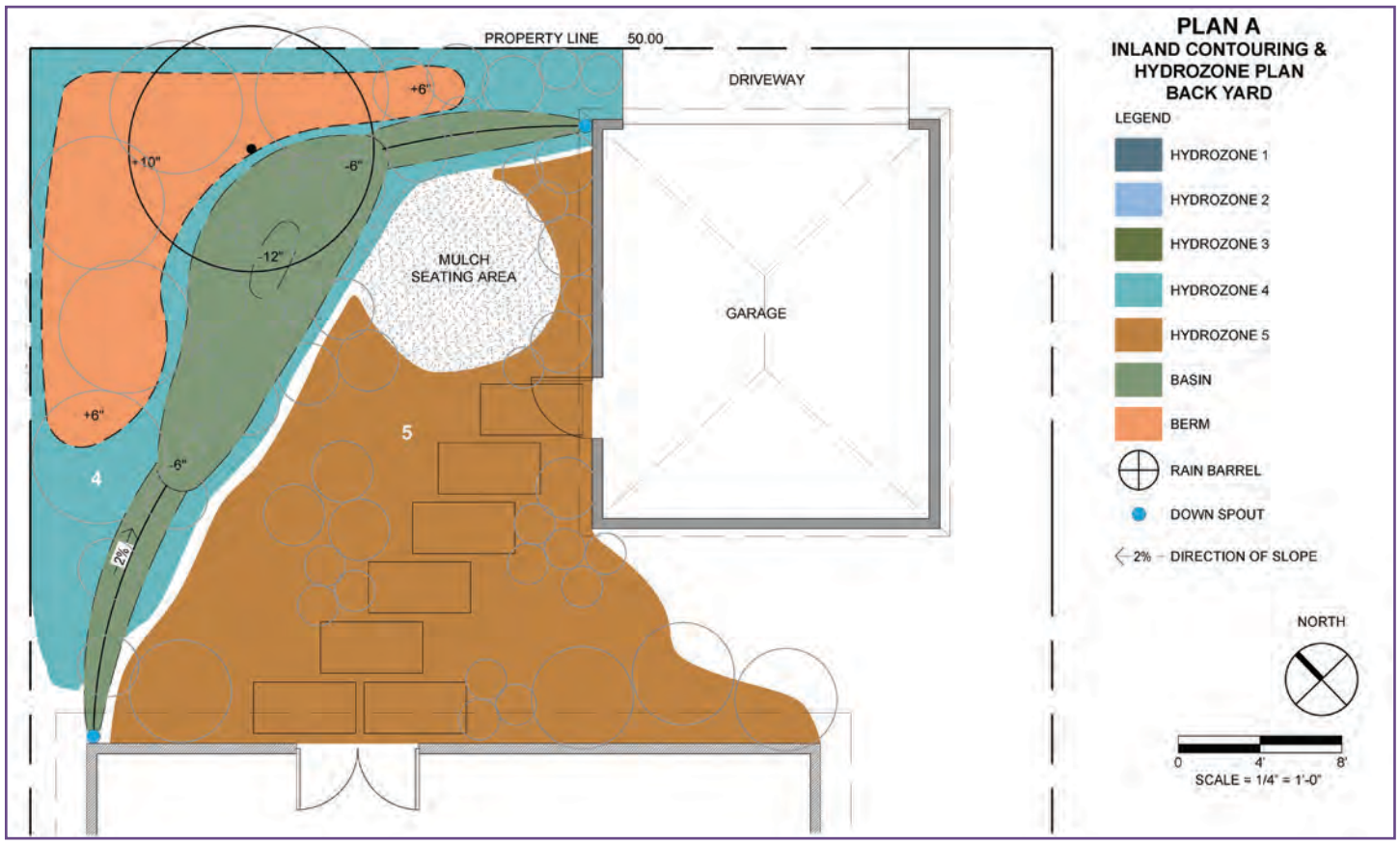
Plan A-Inland Planting Plan Front Yard





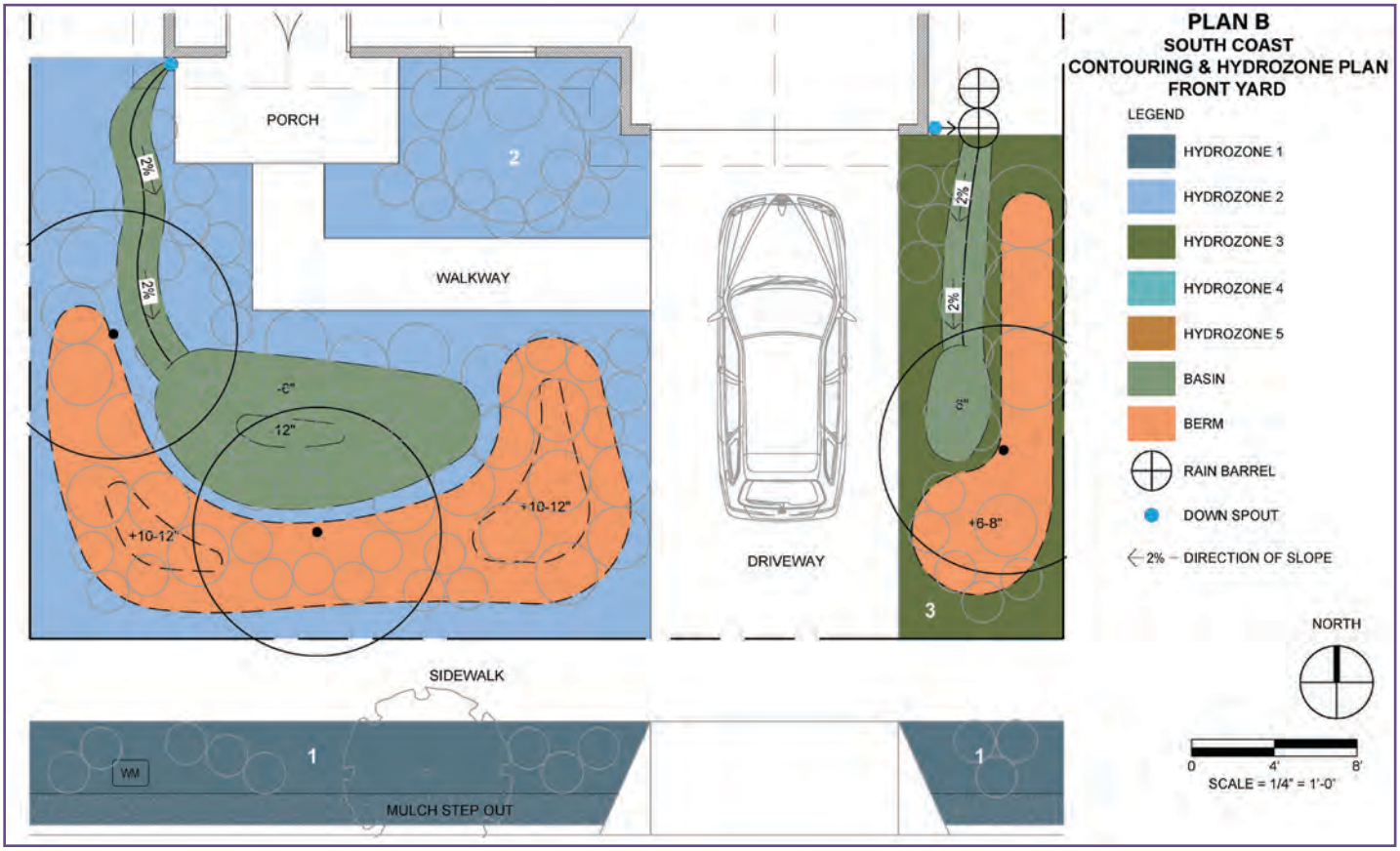
Plan A-**Inland Planting Plan Back Yard**



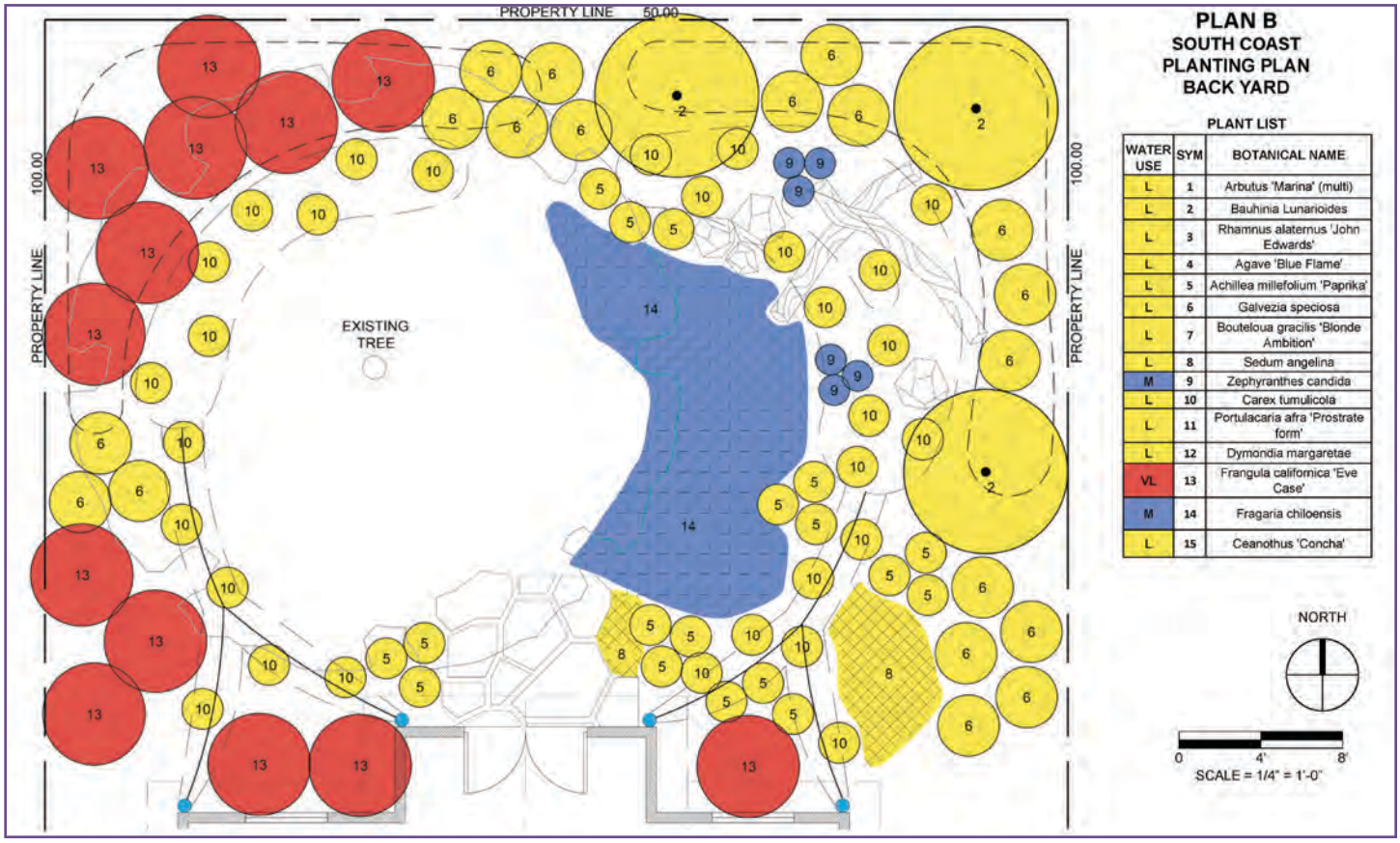


Plan B-South Coast Planting Plan Front Yard

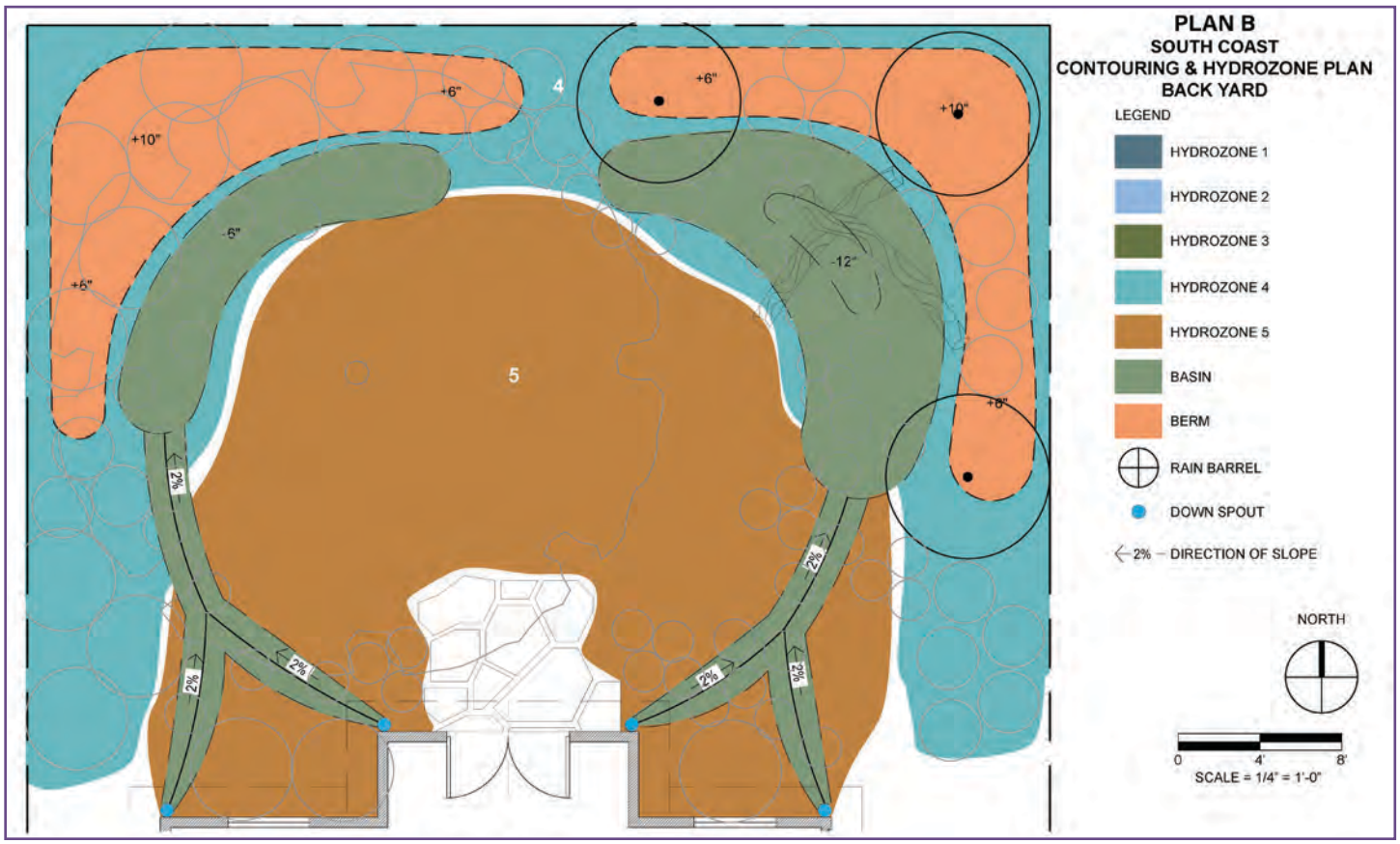




Plan B-South Coast Planting Plan Back Yard



WATER USE	SYM	BOTANICAL NAME
L	1	Arbutus 'Marina' (multi)
L	2	Bauhinia Lunarioides
L	3	Rhamnus alaternus 'John Edwards'
L	4	Agave 'Blue Flame'
L	5	Achillea millefolium 'Paprika'
L	6	Galvezia speciosa
L	7	Bouteloua gracilis 'Blonde Ambition'
L	8	Sedum angelina
M	9	Zephyranthes candida
L	10	Carex tumulicola
L	11	Portulacaria afra 'Prostrate form'
L	12	Dymondia margaretae
VL	13	Frangula californica 'Eve Case'
M	14	Fragaria chiloensis
L	15	Ceanothus 'Concha'

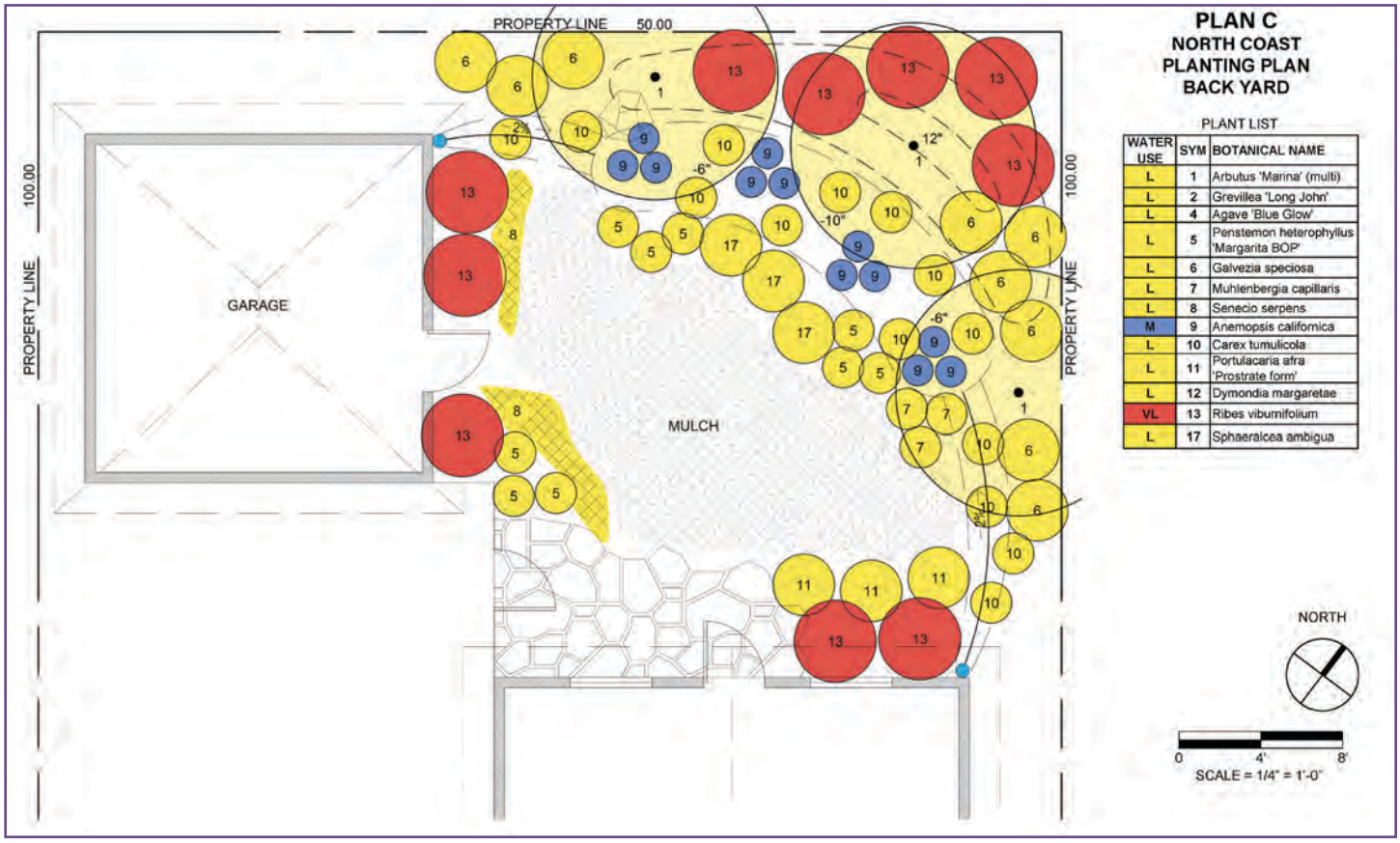


Plan C-North Coast Planting Plan Front Yard



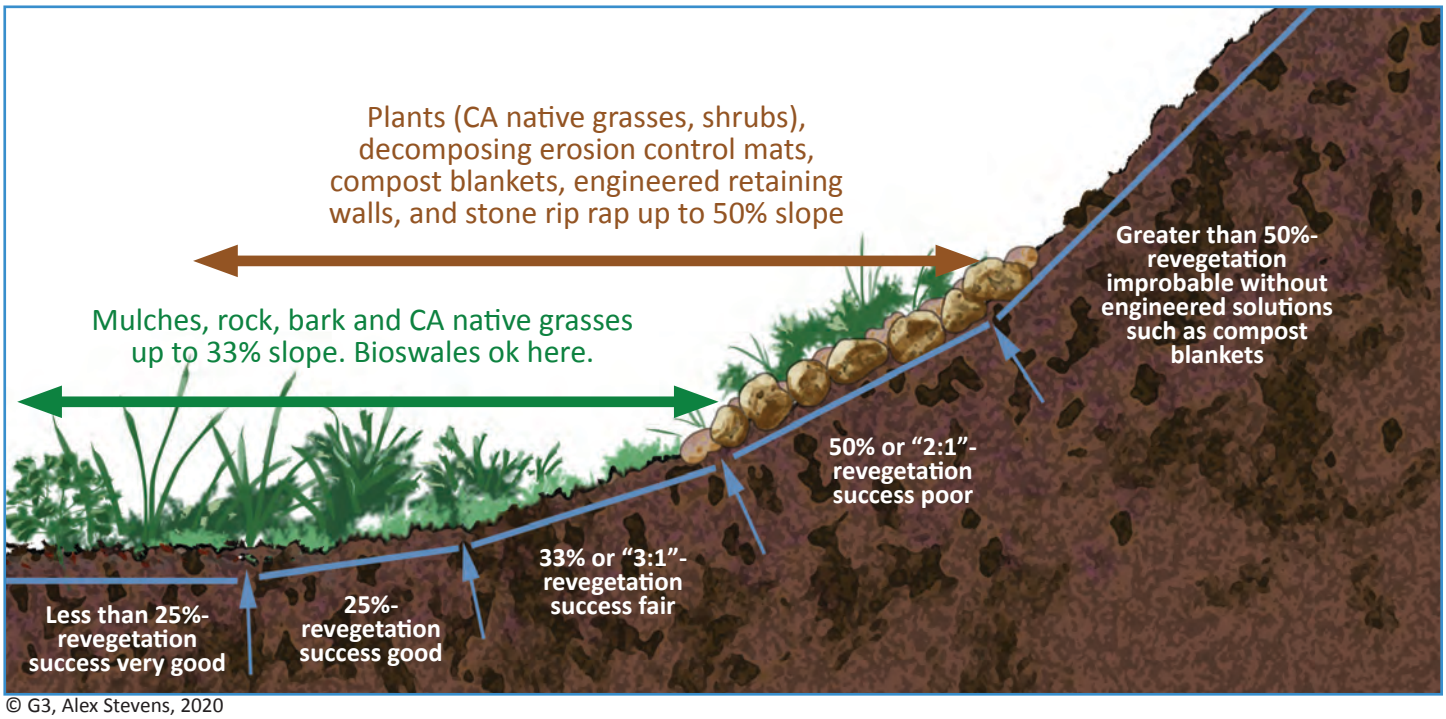


Plan C-North Coast Planting Plan Back Yard





Slopes and Hillsides are special



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Hardy Hillside Holders

Benefits Pollinators











1 Simmondsia chinensis
Jojoba, Goatnut

2 Ceanothus 'Yankee Point'
California Lilac

3 Isomeris arborea
Bladderpod

4 Dalea frutescens
Black Dalea

5 Baccharis pilularis 'Pigeon Point'
Coyote Bush

Plan for Stabilization

Working on a slope or hillside should be a collaborative process in which you should seek the advice of a licensed civil engineer, landscape architect, or other professional before grading and capturing rainwater on existing hillsides. Get to know your soil type (*see p. 22)* and slope percentage (*see p. 43*) before moving forward with any disturbance.

Whenever possible, do not disturb canyon hillsides. Select low water use plants, trees, deep-rooted native plant species, and climate-appropriate plants with strong root structures for disturbed or built slopes and hillsides, as these root systems can help hold soil together.

If your slope is gentle, 3:1 or less (33% grade) coarse compost and mulch can be applied directly to hillside and slope surfaces, providing surface protection from the force of falling rain and shading exposed soils. With occasional irrigation, mulch will "knit" together.

Compost blankets are a kind of erosion control mat applied to the soil surface to protect and preserve it, and can be used either alone or with other organic engineered material with biodegradable grids for stabilization that will degrade into soil within a year or two. Compost mats allow water to penetrate through to underlying soils while retaining loose soil and debris and preventing erosion. You can plant right through them or use pre-seeded products. Compost blankets can be found at specialized landscape products distributors.

Consider working with an irrigation design professional to design and install your irrigation system. Runoff, erosion and efficient deep watering are important issues to keep in mind always, but especially on hillsides. Contouring across the slope can help slow, spread and sink rainwater into the planted areas and goes a long way toward reducing or eliminating any potential runoff from irrigation during dry months (*see p. 43*).

Fire is a **Real** and constant **Threat**



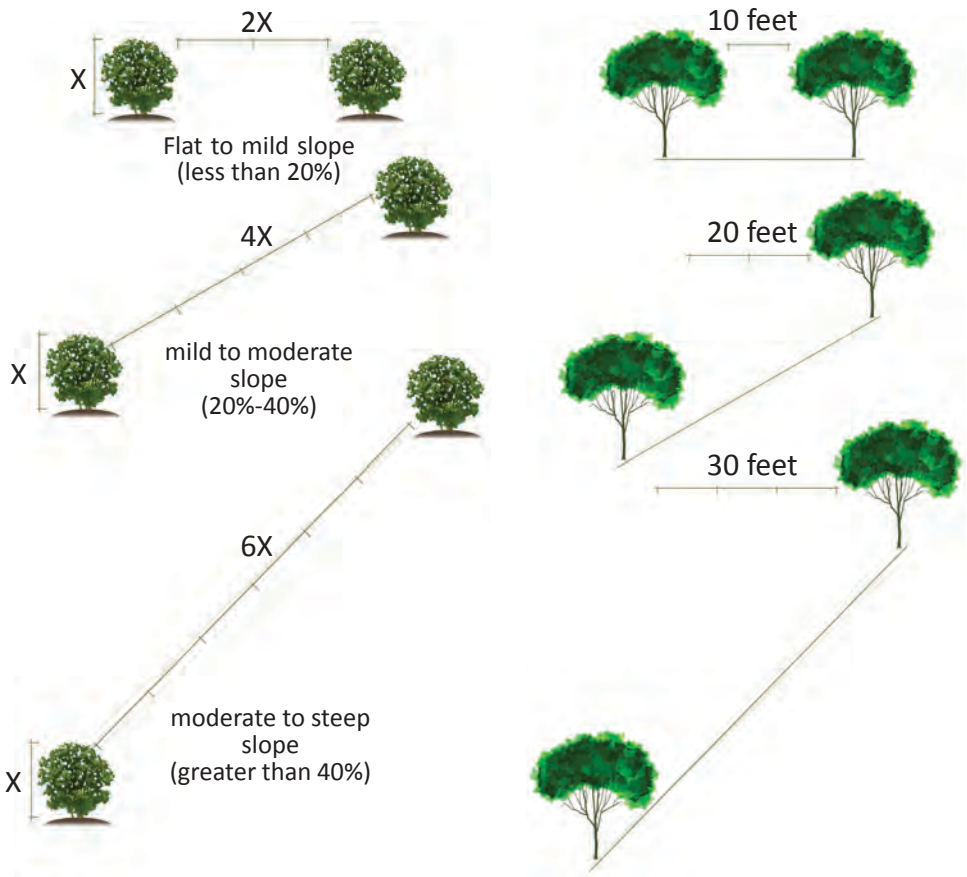
© G3, Alex Stevens, 2020

Your Plan Can Save Lives. This is especially true in canyons and wildland-urban interface areas commonly found in Southern California. Plant selection, design and consistent maintenance all must be in accordance with regional fire safety guidelines.

Landscapes should resist ignition and provide 35 ft. of actively maintained defensible space around structures and access zones (**Zone 1**), maximizing fire prevention and also allowing for access by fire crews, if necessary. Cut or remove grasses and weeds to less than 3 ft. in height, remove dead and dying vegetation, and maintain proper vertical and horizontal spacing on large shrubs and trees.

Beyond Zone 1, the landscape should reduce the chance of potential airborne embers through careful thinning of native vegetation for another 65 ft., or greater if located on an uphill slope (**Zone 2**).

Spacing Landscaping Plants for Fire Resistance



Six Fire-Safe Practices

1. Fire Safe Zones should be created with stone, masonry walls, and gravel and other permeable pathways and patios. Think about placement of fire-resistant hedges or screens to catch embers. Retaining walls on terraced areas disrupt airflow, creating wind "eddies" that may keep embers away from structures.

2. Keep Wood Mulch Away From Structures and replace with gravel, broken concrete, or other permeable, non-flammable surface, that doesn't jeopardize wood siding or foundation sills.

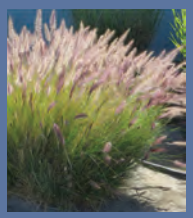
3. Keep Roofs and Gutters Debris Free and keep vegetation away from vents or eaves or from under or near decks and siding.

4. Choose "Living" Wood Mulch that is either well composted or has a good mix of green leaf and small brown woodchip material and is smaller than 1-1/2". Avoid large wood chips, pine needles, rubber, and shredded "gorilla hair" type mulches, which smolder and produce huge flames.

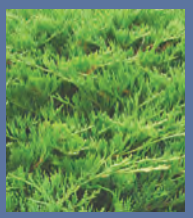
5. Create Vertical Spacing between shrubs and the lowest branches of trees, limbing up trees at least 10' from the ground or 3x the height of the nearest shrubs.

6. Avoid Invasive Plants, especially grasses and groundcovers, which contribute to fire risk by spreading the fire from woody plant to woody plant. **Remove these plants from your garden (***see p. 47***)!**

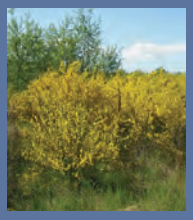
Avoid and Remove The Fire Prone Four:



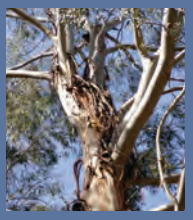
Pennisetum setaceum
African Fountain Grass



Juniperus ssp.
Juniper (various)



Cytisus scoparius
Scotch Broom



Eucalyptus ssp.
Eucalyptus (various)

Use this **Project Checklist**

Prepare to work pp. 1-4

- ☐ Clean up Your Property
  - Remove trash and debris, weeds, dead plants
- ☐ Orient Yourself
  - **Check with socalwatersmart.com for rebate eligibility**
  - Check with City if permits are required, and secure them if needed
  - Find out if you are in a hillside grading area or special viewshed
  - Confirm fire regulations in your area
- ☐ Make a List of Things You Want In Your New Landscape
  - Think about how much maintenance you want to do
  - Consider how much rainwater you want to catch in barrels or cisterns
  - Determine how much of your property you want to change – and how much lawn to remove

Plan before digging pp. 21-28

Do you need design help?

Walk around and take photos (for BEFORE)

- ☐ Make a Site Plan
  - Take measurements
  - Make a Microclimate Plan
- ☐ WaterPlan
  - Do roof area calculations
  - Note location of downspouts
  - Calculate water available from each downspout
- ☐ Grading Plan For Capturing Rainwater
  - Look at slope of the site
  - Plan for where to stockpile topsoil if project is large
  - Identify trees to be protected during construction
- ☐ Test Soil Type
  - Percolation Test – Brick or Sponge?
  - Jar Test - Sand, Silt or Clay?
- ☐ Make an Existing Irrigation System Plan
  - Run irrigation and make immediate adjustments
  - Determine whether or not you will abandon the irrigation or convert spray to drip
  - Adjust controller program time to eliminate runoff (cycle and soak)
- ☐ Do Some Shopping and Research
  - Source rain chains, rainbarrels and cisterns
  - Source mulch and compost
  - Go to nurseries for plants and watch for native plant sales
  - Install gutters, if you want to harvest more water

APPLY FOR YOUR REBATE AND GET PRE-APPROVAL BEFORE YOU BEGIN WORK!

Notes

Use this **Project Checklist**

Design for plants pp. 29-36

What do you want in your yard?

Follow guidelines for hillside planting

Ask for help at a nursery or native plant sale

- ☐ Make A Planting Plan
  - Assign Plant Factors to existing material
  - Research native plant communities for your area
  - Consider butterflies and pollinators
  - Where are the swales and berms (wet and dry feet!)?
  - Add in edibles and fruit trees
  - Select one or two shade trees
  - Check *www.plantright.org* for the BAD GUYS
  - Scale plants for maturity
  - Hydrozone

Begin your project installation pp. 37-44

Do you need construction/installation help?

CALL 8-1-1 BEFORE BEGINNING WORK

- ☐ Make Calls to Order Equipment, Material, Deliveries
  - Rent a sod cutter and dumpster, if necessary
  - Order organic matter for the soil
  - Select boulders and gravel for creek beds, if you like that look
  - Order catch basins or piping for irrigation and drainage
  - Deliver rain barrels and cisterns
- ☐ Stockpile Soil and Protect Trees
  - Protect trees from construction damage (limbs and roots)
  - Remove plants that are not wanted
- ☐ Change Existing Hardscape to Make It More Permeable
- ☐ Remove Grass and Build Soil With Soil Lasagna
  - Continue to water your lawn up to two days before removal
  - Remove your turf without chemicals through Sheet Mulching
- ☐ Contour Site For Rain
  - Contour soil to hold onto First Flush (first inch of rain)
  - Remember 150 sq. ft. of area, six inches deep for every 1,000 sq. ft. of roof
  - Do not remove soil; use it to create your contours
  - Add organic matter to the soil
  - Install catch basins, drainage pipe and sleeves under hardscape
- ☐ Repair Irrigation
  - Identify or move future drip irrigation points of connection
  - Replace valves for low pressure valves
  - Install pressure regulator, flow meter, or landscape sub-meter
  - Install low-head check valves on slopes and grade changes
- ☐ Capture Rainwater
  - Lay out plan using flour, chalk or builder's inverted spray paint
  - Install boulders and materials for creek beds or swales
  - Install rain barrel or cisterns

Notes

Use this **Project Checklist**

Install new plants pp. 44-62

Compare Planting Plan with Existing Irrigation Plan

Fall is the best time to get free rain irrigation!

Order or purchase plants and gather materials necessary for planting

☐ Lay Out Planting Plan
- Lay out your Planting Plan using flour or chalk
- Make your "in field" adjustments
- Install your plants into the Soil Lasagna
- Be sure to respect correct plant placement for mature size
- If drainage is poor, auger holes and wait to complete
- Thoroughly and completely water holes, plants, and surrounding soil

Upgrade and adjust new irrigation pp. 34-36

Consider hand watering until landscape is established (1-2 dry seasons)

☐ Accommodate the Planting Plan
- Convert spray head sprinklers to drip or install new drip lines
- Cap all unused spray head sprinklers
- Install tattle-tale flush assemblies
- Install end caps on the drip zones
- Create an "as built" drawing of the new irrigation layout
- Install a weather-based irrigation controller

Establish and steward new landscape pp. 63-68

☐ Complete Irrigation Installation
- Irrigation for establishment is best used during fall, winter and spring months if rainfall is limited
- Adjust irrigation to eliminate runoff
- Regularly flush drip irrigation lines, especially during the first year
- Seasonally adjust automatic irrigation schedule
- Reduce in fall; turn it off in winter!
- Move drip irrigation and add emitters as the tree grows in order to maintain the wetting zone at the outside edge of the tree's canopy (dripline)

☐ Maintain Living Soil and Plants
- Maintain 3" of living mulch and add more annually (more mulch, fewer weeds)
- Practice Integrated Pest Management

☐ Maintain Rainwater Capture Systems
- Make sure gutters are not clogged
- Clean rainbarrels/cisterns and clean out catch basins
- Make sure mosquito screen is not ripped
- Flush pipes
- Remove debris from swales, especially at inlets/outlets

Notes

You're ready to **Shop!**

My Shopping List

My Garden Microclimate Notes

My Supply Stores & Nurseries

name	size	quantity
trees		
shrubs		
perennials		
hedge		
ground cover		
other plants		

Keep adding **Compost** and **Mulch**





Compost looks like soil. You cannot tell what it once was. That is because it is food scraps, landscape debris and/or manure from livestock, or biosolids (human manure) and other organic matter that already has been mostly consumed and completely decomposed by microorganisms. Good compost brings the elements of healthy soil - oxygen, water and life - in one package.

How to Use Compost. Compost can be store-bought or homemade. When compost looks like soil, it can be worked directly into the soil. The more coarse or visible the bits of the compost are, the more likely it is to be used as mulch on top of the soil rather than as an incorporated amendment.

Compost works its magic in several ways. First, the compost itself contains particles that improve soil structure. Next, as compost decomposes in soil it encourages microbes to start the formation of healthy soil aggregates. These resulting aggregates are composed of existing soil particles and decomposed organic matter, which combine to create a more stable and better functioning soil structure like a sponge.

Mulch is organic material that covers soil and looks like the recycled debris that it is. Mulch can be made from organic debris such as not-quite-completely-decomposed compost, grass clippings, leaf litter, and shredded wood trimmings.

Mulch protects soil and plant roots from temperature change, keeps moisture in by slowing evaporation from the surface of the soil and keeps weeds from sprouting by reducing sunlight penetration to the soil surface.

How to Use Mulch. Mulch always stays on top of the soil, and is never worked in. Recycled organic debris is the most effective type of mulch, because it builds soil structure over time and provides a durable, protective surface barrier. The smaller the debris and the more mixed leaves with wood chips, the faster it decomposes. When building soil, small and mixed is best. Don't bother with inorganic mulches like rubber, gravel, or decomposed granite in planted areas. These are only applicable in pathways or gathering areas; they don't help grow good soil.

Need help buying amendment? *www.buy-compost.com*

MAKE IT
Less than 5 Cubic Feet



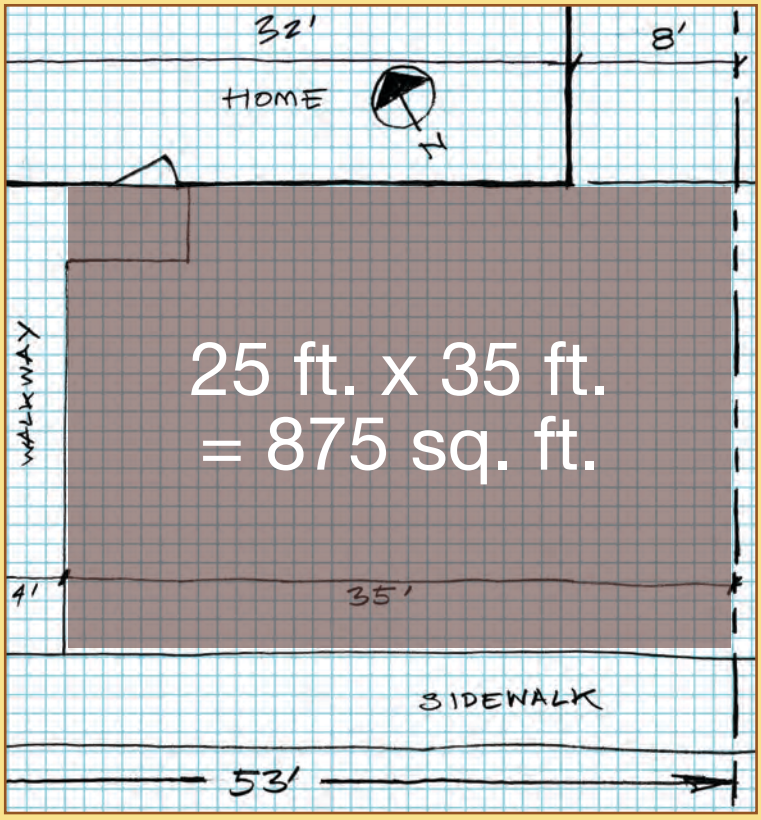
BUY IT IN BAGS
Between 5 and 25 Cubic Feet



BUY IT IN BULK
More than 25 Cubic Feet or 1 Cubic Yard



How much **Mulch** does your garden **Need?**



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Add Organic Matter

Add 1-3" of compost to improve the water holding capacity of soil by 30%.

Place 4-6" of mulch on top of the soil to hold in moisture and keep down weeds when planting, and maintain 3" of mulch on beds at all times thereafter.

Keep mulch at least 1-6" away from the stems of plants.

Calculate the Material Requirement

Start with the **Square Footage (SF)** of space to be covered and figure out how much you will need for **1 inch of material.**

SF x 1 inch ÷ 12" = Cubic Feet (CF) of material needed. (Dividing by 12" turns your inch of amendment into feet of amendment.)

If you need less than 20 CF of material, you can probably make it in a compost pile or purchase it in bags.

If you need more than 25 CF of material, you must convert your materials to Cubic Yards, because you are going to have to have it all delivered in bulk.

CF ÷ 27 = Cubic Yards (CY).
So, 25 CF ÷ 27 = about 1 CY of material needed.

Applied to Our Site Front Yard:

875 SF x 1" ÷ 12" = 73 CF for each 1" of mulch.

If you need 3", you multiply the amount needed for one inch by 3 and if you need 6", you multiply the one inch total by 6.

We need 3" of mulch = 73 CF x 3" = 219 CF

For our front yard, that is 219 CF ÷ 27 = about 8 CY of mulch. That sounds like a lot of material! It looks like we will have to buy it in bulk (*see p. 62*).

Avoid These Mulches Around Plants!

While these mulches are commercially available, and some are organic materials, they are not recommended. For example, dyed mulches are composed primarily of recycled wood materials such as treated or painted furniture or wood pallets. Shredded redwood or cedar present significant fire hazards. Gravel and rubber are not eligible for the rebate, do not decompose to feed the soil microbes, and raise the temperature of the entire landscape.


"gorilla hair" shredded wood


dyed wood


dyed wood


gravel


rubber



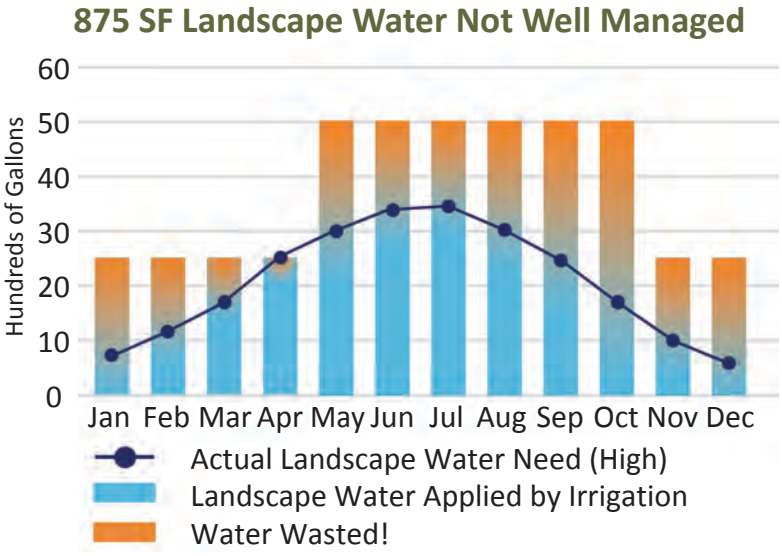
Stout Design Build, Inc.

Balance your soil Moisture account.

The objective of managing water wisely in the landscape is to keep just the right balance of oxygen and water so that plants look great, stay healthy, and the soil microbes are kept awake cycling nutrients. When oxygen and water are in balance within the soil, the amount of water that is lost through evapotranspiration (ET) is just like writing a check for water out of the soil bank account (*see p. 32*).

Rain and irrigation deposit water into the soil checking account. The trick is to make sure not to apply more water than is needed in dry months, and to hold on to rainwater in the wet months. Most people apply more irrigation water than their landscape really needs. The amount of wasted water can be greatly reduced by closely managing/adjusting the landscape water applied through irrigation.

How do we tell when the account is depleted? Smart irrigation controllers and landscape professionals are able to calculate this OR you can rely on using a soil moisture probe or even probing with your fingers.





Wet or Dry?

Use "digital" technology! Soil may appear dry on the surface, stick your finger into the soil and make sure it's wet below. If it's wet up to your second knuckle, it doesn't need any more water, so wait another day or two. Alternatively, if you use a soil probe, you can feel the moisture in the soil and make a determination yourself. You can look at plant health to determine water need, but sometimes overwatering and underwatering will produce similar symptoms in plants.

Underwatering Symptoms

- Soil is bone dry
- Older leaves turn yellow or brown or drop
- Leaves are wilted
- Leaves curl and become brittle
- Stunted growth
- Plant is dead!

Overwatering Symptoms

- Soil is constantly saturated
- Leaves turn a lighter shade of green or turn yellow
- Young shoots are wilted
- Leaves are green yet brittle
- Algae and mushrooms are present
- Growth is excessive or stunted
- Plant is dead!

Plan for **Zero Runoff** (even after converting to Drip)

Keep Water in the root zone.

Just because your new sustainable landscape has a more efficient irrigation system doesn't mean that the rest of your property should not benefit from the same principles. Observe the irrigation while running and check to make sure that no water is flowing onto sidewalks, patios or walkways. If the water is being applied too fast for the soil to absorb, runoff will occur whether you irrigate using spray or drip. Puddling and pooling also may be an indication that water is applied too fast or too often. Repairs to broken pipes, drip lines, and emitters should be made immediately, or the system should be turned off until repairs can be made. The optimal time to water is in the late evening and very early morning.

look for WaterSense Meets EPA Criteria

Install a "Smart" Irrigation Controller that automatically adjusts irrigation schedules in response to changing site and/or weather conditions; most of these interface with mobile devices and computers, so you can change the programs in your pajamas. ET (Evapotranspiration) controllers monitor weather conditions and Soil Moisture Sensors directly sample moisture in the soil profile. When selecting a controller, look for brands with the EPA WaterSense® label.

Cycle and Soak Programming eliminates water runoff. Observe how quickly runoff occurs when you are running your irrigation. This is the MAXIMUM run time for your irrigation controller in this hydrozone. So, to cycle and soak your irrigation, you divide up the total minutes required by the hydrozone into blocks of time no longer than the observed runoff time and allow a 30 minute rest period in between the irrigation cycles. **For example, if we need 30 minutes of water in a certain hydrozone, but we observe runoff after 10 minutes, break down the 30 minute total into three 10 minute cycles with 30 minutes between each cycle.**

Hand Watering is especially good for getting a garden established when you are going to want to spend more time looking at the plants to make sure nothing is amiss. During establishment you may need to water more frequently because roots are only 4"-10" deep on a newly-planted one gallon plant. (That's why it's great to try to plant during the rainy season!) Be sure to use a hose shutoff so that you are not inadvertently wasting and spraying water into the street.

Really look at your plants. Are they appearing droopy or sad? Is the soil very dry? If so, then give the plants a good drink and watch. Don't water more than two days in a row, and let the soil partially dry out before watering again. Remember the symptoms of overwatering and underwatering are very similar *(see p. 64).*



Hose Shutoff Nozzle

After the first year or two, once your plants are settled, your sustainable garden should not need water more than once or twice a month, if at all. If you are at the coast, you may be able to eliminate regular irrigation altogether after establishment.

Pressure Regulation either for the whole house, or at each irrigation valve for each zone, eliminates excess pressure, and allows the irrigation system to run more efficiently. With drip systems, pressure regulation is essential, because drip lines operate best at very low pressure.

What Is Irrigation Efficiency (IE)?

Irrigation Efficiency describes how well your irrigation system is delivering water to the plants you are intending to irrigate. Since no mechanical system could be 100% efficient, the IE of any particular irrigation system will always be less than 100%. A well maintained spray system may achieve 70% IE, while a drip system could be as high as 90% IE.

Since there are many inter-connected mechanical parts of a system, there are lots of ways your irrigation can become inefficient and begin applying water in places that are not beneficial to your landscape. IE depends upon four key elements:

1. Design of your system reflects the best components for the specific conditions of your site.
2. Installation of the system uniformly distributes the water to the plants in the landscape.
3. Management of the system correctly balances the soil moisture account.
4. Maintenance adjustments and repairs are made frequently.

Tips for Eliminating Runoff: Drip or Spray

In general, several things can be done to minimize runoff due to irrigation. These include:

1. Convert spray systems to drip irrigation with the lower precipitation rates, pressure regulation, and a filter (*see p. 37*).
2. Make sure to have check valves in all hillside and low point spray systems.
3. Do not install spray irrigation in areas that are too narrow for spray (10' wide or narrower).
4. Move spray heads 24 inches from any buildings or hard and impermeable surfaces.
5. Cycle and Soak irrigation run times.
6. Be sure to follow organic maintenance practices to keep your soil spongy.



Congratulations! Your beautiful new garden is now installed. Your garden is alive (more alive now than ever) and it will need some tending to thrive. A newly planted garden requires some extra time and special attention to bring it to its full potential. Even after establishment, there is no such thing as a zero maintenance garden, so keep your eyes open and stay involved.

Add Organics. As mulch breaks down, add more! The easiest way to do this is to use falling leaves from your trees. A leaf-covered garden is a healthy garden! You can brush them off patios, walkways and stairs right onto the existing mulch. No falling leaves? You can get more mulch from your local composting facility, or order it from a local nursery or building supply yard. Remember to "chop it and drop it" when pruning.

Weed. You are going to have to weed, especially after the winter rains, and especially in the first year or two. Even with a thick layer of mulch, you may still have some weeds popping up. Be sure to eliminate them regularly, and then feed your soil some compost to improve the root systems of the plants. Consider cutting weeds down to the soil level rather than pulling out roots and disturbing the soil.

Water. Especially during the winters of the first two years after planting, you need to give your plants a little extra water. Not too much! Remember, these plants (and your soil) will be healthier, live longer, and grow stronger if you give them just enough water.

Prune. Get a good pair of hand clippers, gently prune trees, perennials, and grasses as needed. Mow your natural lawn annually after it has self-seeded to keep it clean and walkable. Don't mow it too short - look up the grasses and/or sedges that you used and follow growers' directions.

Maintain For Rain. Check downspout connections and overflows annually to make sure they're working properly. If you don't have gutters and downspouts, make sure there are no areas of erosion around your house. Consider adding a rain chain and small bit of gutter if you need to direct water away from a highly eroded area. Loosen your soil if it's become compacted. Remove and relocate extra soil or silt that's built up, and add mulch if needed.

Harvest. Fruits, vegetables, seeds and flowers - it's up to you to pick them when they're ready, before the birds and other creatures get them. If you have stiff competition in your neighborhood, invest in some bird netting or lightweight mesh bags and wrap your trees, vines, shrubs or the fruit itself a week or two before it's ready to harvest. Be sure to clean up and compost fallen fruit to limit pests.

Integrated Pest Management (IPM). A few aphids or caterpillars will feed the birds, but a massive infestation requires immediate action on your part. Remove diseased plant material and don't put it in your compost pile. Wash off unwanted insects with your hose. If they come back try spraying them with a mixture of mild dish soap and water, or with compost tea. Spread worm castings and mulch.

Go Out and Have Fun! By spending time relaxing and playing in your garden you will be more aware of how it's growing, how it changes, and what it needs.

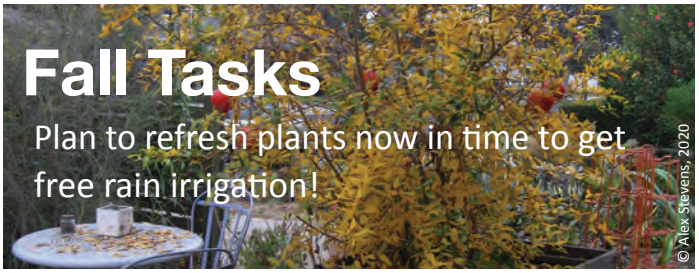


Maintain Lawn Organically

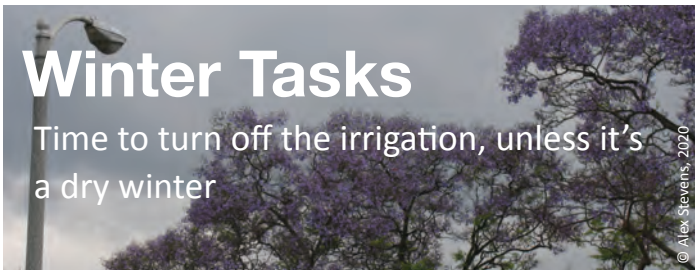
If you decide to keep your grass, follow these guidelines to maintain it organically so that it will play nicely with the rest of your watershed wise landscape.

- Aerate and de-thatch annually
- Topdress annually with 1/8" - 1/4" good well-decomposed compost or worm castings
- Manage your irrigation
- Mow less frequently
- Maintain 3" - 4" height on cool season grass and 1-1/2" to 2" height on warm season grass
- Grass-cycle every time you mow or use a mulching mower
- Do not allow seed heads to form on the grass (remove if they do)
- Consider over-seeding with clover to turn it into a "Natural Lawn"
- Eliminate chemical inputs

Use this **Maintenance Checklist**



- ☐ General Landscape Management
  - Review plant health and investigate reasons for observed decline
  - Weed and deadhead flowers as needed
  - Stake trees: add new or make adjustments
- ☐ Maintain Rainwater Capture Systems
  - Make sure gutters and downspouts are not clogged
  - Clean rain barrels/cisterns and clean out catch basins
  - Drill holes in bottoms of catch basins, if standing water
  - Make sure mosquito screens are not ripped or loose
  - Flush pipes
  - Remove debris from swales, especially at inlets/outlets
  - Refurbish berms and basins as needed
- ☐ Add Compost or Worm Castings
  - De-compact or aerate areas around trees/large shrubs and add worm castings/compost
- ☐ Replenish Mulch
  - Maintain 3” if established garden, 4” - 6” if still getting established
- ☐ Late Fall Pruning (Chop and Drop)
  - Cut back ornamental grasses (once a year for deciduous, less often for evergreen)
  - Cut back young salvias (sages) by 1/3
  - Cut back perennials and pinch back non-woody shrubs and perennials
- ☐ Irrigation Checkup
  - Turn on each valve to check for problems and make repairs
  - Open manual flush valves and flush
  - Clean irrigation filters
  - Adjust controller - reduce time



- ☐ General Landscape Management
  - Review plant health and investigate reasons for observed decline
  - Weed and deadhead flowers as needed
  - Stake trees: add new or make adjustments
- ☐ Pruning (Chop and Drop)
  - Prune dead, diseased, damaged, and deranged branches of trees and large shrubs
  - Cut back perennials and pinch back non-woody shrubs and perennials
- ☐ Still Time to Plant (but not in wet soil!)
- ☐ Irrigation Checkup
  - Turn on each valve to check for problems and make repairs
  - Manually run irrigation if the weather has been very dry



- ☐ General Landscape Management
  - Review plant health and investigate reasons for observed decline
  - Weed and deadhead flowers as needed
- ☐ Replenish Mulch
  - Maintain 3” if established garden, 4” - 6” if still getting established
- ☐ Irrigation Checkup
  - Turn on each valve to check for problems and make repairs
  - Open flush valves and flush
  - Clean irrigation filters
  - Seasonally adjust automatic irrigation schedule
  - Move drip irrigation and add emitters as the tree grows in order to maintain the wetting zone at the outside edge of the tree’s canopy (dripline)



- ☐ General Landscape Management
  - Review plant health and investigate reasons for observed decline
  - Weed and deadhead flowers as needed
- ☐ Irrigation Checkup
  - Turn on each valve to check for problems and make repairs
  - Return irrigation controller to summer program

Landscape with a **Professional**



Assessment Organizations including site assessment and testing, various measuring services, surveyors, soil testing services and even Google Maps are available to help. Property measuring and surveying companies can develop more detailed plans with elevations, sighting of trees and landscape amenities, irrigation, etc. If you get out into the yard with a measuring tape and the guidelines we've put into this book, you should be able to make a serviceable site plan to scale.

Planning and Design professionals can help you develop a working plan and budget for your landscape. The plan should include drawings, a list of resources, and an outline of the techniques to be used to implement the plan. Licensed landscape architects and licensed landscape contractors can assist you in developing a plan and budget. Landscape designers also can help you create a conceptual design. Working with a licensed professional (architect, landscape architect, landscape contractor or civil engineer) is recommended if you have hillsides and slopes or complicated structures. *www.apldca.org; www.asla.org; www.asce.org*

Landscape Installation and Construction professionals are licensed landscape contractors who specialize in building landscapes, and are able to work on all aspects of the sustainable landscape plan. If you are handy, and feel comfortable with the techniques outlined in this book, there is no reason why you cannot install your own garden, especially knowing that if you get stuck you can call upon the expertise of a landscape professional. Find licensed contractors at the California Landscape Contractors Association (CLCA). *www.clca.org*

Certified Arborists are specialists trained in the art and science of planting, caring for, and maintaining individual trees. Arborists are knowledgeable about the needs of trees and are trained and equipped to provide proper care. Find tree consultants at the American Society of Consulting Arborists (ASCA). *www.asca-consultants.org*

Rainwater Catchment specialists include people certified by the American Rainwater Catchment Systems Association (ARCSA) to design and install rainwater capture systems. These professionals can bring a lot of specific expertise to your project, particularly if it involves the installation of an active capture system such as a cistern. *www.arcsa.org*

Greywater Action can assist you on an as-needed basis if you are attempting a DIY renovation. Their expertise is in the design and installation of laundry-to-landscape greywater systems. *www.greywateraction.org*

Irrigation Systems Consultants include people who have been certified by an EPA WaterSense® labeled certifying organization to provide irrigation system auditing, design, and maintenance. These professionals can bring specific expertise on improving the efficiency of irrigation systems. *www.irrigation.org*

QWEL certified landscapers have knowledge in water efficient and sustainable landscape practices, including water management and preservation of other valuable resources. *www.qwel.net*

Watershed Wise Landscape Professionals are people who are certified to provide site evaluation and consulting on using the watershed approach to landscaping in design, construction, and maintenance. *www.greengardensgroup.com*

Plant Selection specialists include your local retail nursery and garden center, native plant societies, Master Gardeners, and professional gardeners. The best plant selector, however, is you! Do the homework to select plants that are both climate-appropriate and locally native to your place, and you will be rewarded with a better understanding and appreciation of your garden as it evolves over time. Plus, you can advise your friends on their plant selections!

Maintenance of sustainable landscapes requires an understanding of the watershed approach to landscaping and water management. While there will be less mowing of lawns and blowing of leaves, there will be more fine pruning, irrigation flushing and tuning, cleaning and checking rain barrels and other water retention devices and soil building. Maintenance people should demonstrate an ability to think critically, be open to the techniques and ideas outlined in these guidelines and understand how to implement IPM, mulching, basic irrigation tune-ups, and native plant husbandry.





Stout Design Build, Inc.



Urban Water Group, Inc.



Flower to the People, Inc.



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