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Drought Tolerant Landscapes:

California's New Norm

Gardenworks Inc.

QUALITY LANDSCAPE DESIGN, CONSTRUCTION & MAINTENANCE

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UTILITIES DEPARTMENT CITY OF HEALDSBURG CALIFORNIA SINCE 1867

SMART LIVING

7 Principles of Drought Tolerant Landscaping

- ***Planning***
- ***Hydrozoning***
- ***Efficient Irrigation***
- ***Practical Turf Areas***
- ***Soil Improvement***
- ***Mulching***
- ***Maintenance and Management***

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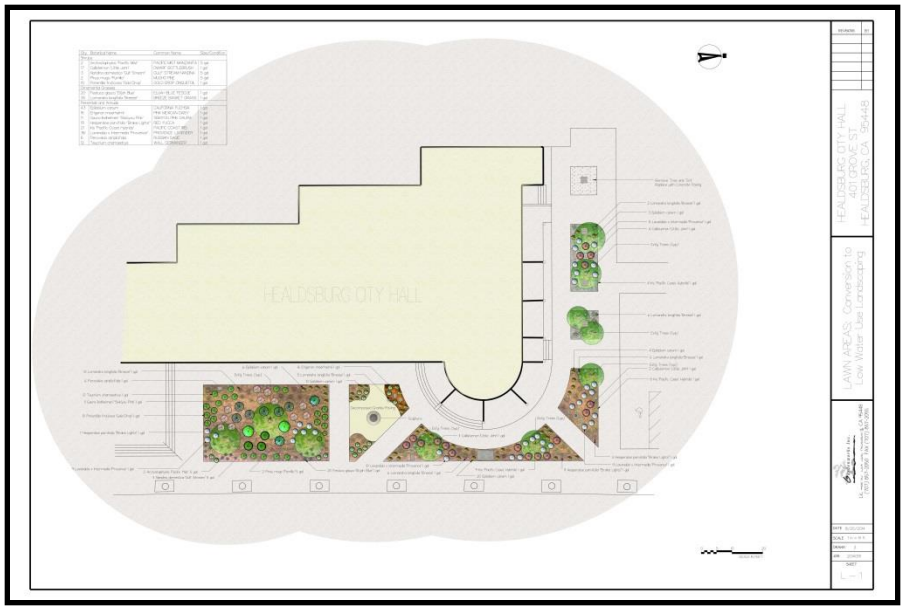
Planning: Make It Step #1



- **Goal: Reduce Water Use In the Landscape**
- **No Lawn *or* Practical Lawn**
- **Drought Tolerant Plants**
- **Drip/Low Volume Irrigation**
- **Mulch**

HEALDSBURG CITY HALL

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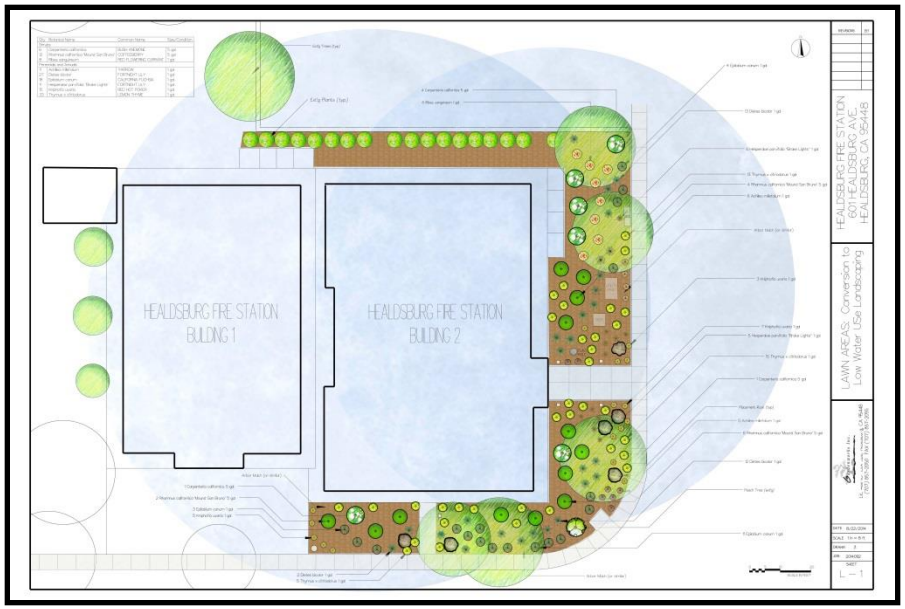

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HEALDSBURG FIRE STATION

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Planning: ***Decide To Save Water***

- **No Lawn *or* Practical Lawn**
- **Low Water Use Plants**
- **Drip/Low Volume Irrigation**
- **Mulch**

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Landscape Design

***Hardscapes*: Non Living Areas and Features**

- ***Patios, Paths, Water Features, Decks, Arbors, Pool***

***Softscapes*: Planting Areas**

- ***Lawn, Annual/Perennial Beds, Vegetable Garden, Trees, Shrubs, Ground Cover, Mulch***

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Landscape Design

Public Areas: Usually the Front Yard

- Should "Fit In" with Neighborhood
- Meets Community Standards (i.e. Street Trees)

Private Areas: Create Garden Rooms

- Dining/Entertaining, Outdoor Kitchen, Fire Pit
- Play Area (lawn), Veg Garden, Sitting Garden

Utility Areas: Out of Site

- Garbage Cans, Dog Run, Potting Shed, A/C
- Overflow Parking, Storage, Compost Bin

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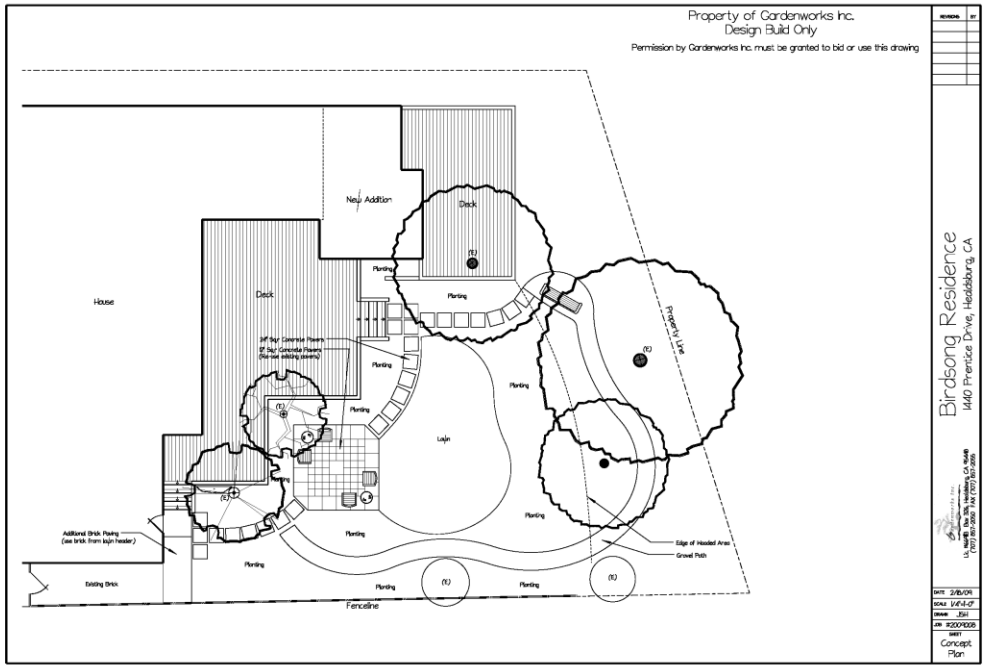
Landscape Design: Sketch/Draft Using



- Base Map to Scale
- <u>Bubble Concepts</u> for Specific Areas
- Determine Landscape Elements that Will Remain in Place
- Locate Existing Structures on Plan
- Explore Many Options

Begins With *Analysis*

What are the:

- **Existing Site Conditions**
- **Resources Available**
- **Desirable Outcomes**
- **Cost Benefits**

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Property Owner Perspectives

- ***What is the "Vision" - (Garden Theme)***
- ***Wish List***
- ***Focus on Using Landscape Water Efficiently***
- ***Support a Less Traditional Approach***
- ***Budget***

Turf/Lawn Areas

GOAL: Create Practical Turf Areas

**** Water Conserving Landscapes Can Contain Appropriately Used Lawn***

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Turf/Lawn Areas

- Are *Controversial*
- Inputs vs. Benefits
- How Much More Water Does It Take To Water Lawns Than Drought Tolerant Plants?
- Let's List Pros/Cons

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Turf/Lawn Areas – Let's Talk Numbers

- **Turfgrass = .80 ET to 1.00 ET = *High Water Use***
- **.40 ET to .70 ET = *Medium Water Use***
- **.25 ET to .35 ET = *Low Water Use***
- **New CA Standard = .55 ET**

Turf/Lawn Areas

- Higher Water Use
- Inputs vs. Benefits
- Educate Yourself About Pros and Cons
- Can Be Irrigated Efficiently

Site Analysis: Assets and Liabilities

<u>80% of problems are soil related</u>

- **Understand Infiltration Rate**
- **Understand Percolation Rate**

Soil Basics For Sonoma County

- Clay Loam
- Compacted
- pH Slightly Acid
- Nitrogen Always Deficient
- P – K + micros usually Okay
- Typically Need to Add Organic Matter

Soils: Usually Need Upgrading

- Type Of Soil – Sand, Loam, Clay
- Compaction Issues
- Available Depth To Plant In
- Organic Content
- Ph
- Nutrient Levels
- Microbial Activity

Soil Preparation

A Healthy Soil:

- Stores Water And Nutrients
- Provides Anchoring For Roots
- Allows For Water To Move Through
- Filters Pollutants
- Resists Pest

Soil Preparation

- Remove And Store Topsoil If Necessary
- Soil Test Before Amending
- Protect Areas To Be Planted From Compaction
- Avoid Working Soils If Too Wet
- Storm Water Protection Plan (SWPP)

Soil Preparation

- Amend Soils to Depth of Planting
- No More Than 20% OM
- Industry Standard – 6 cy/1000 Sq. Ft.
- Compost, Nitrolized Sawdust
- Work Around Hardscape Areas
- Rip Soil to Relieve Compaction

Sheet Mulch

Can Help:

- **Suppress Weed Growth**
- **Improve Nutrient and Water Retention in Soil**
- **Encourage Favorable Microbial Activity in Soil**
- **Improve and Enhance Soil Structure**
- **Improve Plant Vigor and Health**

Sheet Mulch Process

- **Lightly Scarify Soil Surface**
- **Rake off Rocks 1” or Larger**
- **Install Cardboard or Paper Sheet Mulch – Overlap Edges 6”-12”**
- **Install Compost Mulch: 3”- 6” thick**
- **Thoroughly Wet Compost and Cardboard**
- **Install Landscape Mulch After Planting: 3” thick**

Planting in Sheet Mulch

- **Dig Holes for Plants 1.5X Width of Root Ball and No Deeper than Depth of Root Ball**
- **Loosen Roots of Plants Before Planting and Place 2” Higher than Finish Grade**
- **Water In Thoroughly**
- **Install Drip Irrigation**
- **Install Organic Landscape Mulch: 3” Layer**

Grading and Drainage

- Slope Away From Buildings
- Slope for Hardscapes = 1/8” to 1/4”per Foot
- Keep Water on Site
- Avoid Low Spots and Ponding
- Learn Where Water Goes

Grading and Drainage

- Solid/Downspout Drains
- French Drains
- Area Drains
- Storm Water Drains
- Swales
- Retention Basins/Rain Gardens
- Dry Wells

Irrigation

- Greatest Water Saving Potential
- Use of Hydrozones
- High Volume vs. Low Volume
- Water Budgeting
- Technology Driven
- Requires Proper Management

Water Saving Potential

- **The Average Property Owner Overwaters: *130% - 300% of Actual Plant Needs***
- **Efficiency Includes Design, Maintenance and Management**
- **Learning Curve is Steep to Achieve Full Potential for Water Savings**

Hydrozoning

Basically **– Grouping Plants With Similar Water Needs Together:**

- **Selecting Appropriate Plants**
- **Irrigating According to Those Needs**
- **Allows for Varying Site Factors**

Hydrozoning

- Areas of Routine Irrigation – Every 2 - 4 days
- Areas of Reduced Irrigation – every 4 -14 days
- Areas of Limited Irrigation – During Dry Spells Once Plants Established
- Areas That are Non- Irrigated

Basic Programming: Current Thinking

- Sets Up Watering Intervals
- Sets up Times to Water
- Sets Duration of Watering
- Sets Cycles of Watering
- Sets Control to Prevent Watering in wet conditions
- Sets Watering Budget

Irrigation System Components

- Water Meter
- Backflow Prevention Device
- Controller/Controller Wire
- Rain Shut Off Device
- Mainline
- Valves (RCV's)
- Lateral Lines
- Sprinklers/Emitters
- "Chase Pipes"

Water Meters: What do the Numbers Mean?

Cu ft measurement (cf):

- One sweep around face = 7.48 gallons or 1 cu ft

  White numbers = hundreds of cu ft (ccf or hcf)

Gallon measurement

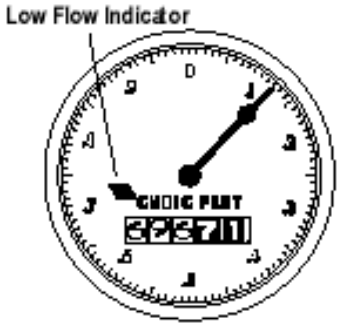
- One sweep around the face = 10 gallons

  White numbers = 1,000 gal

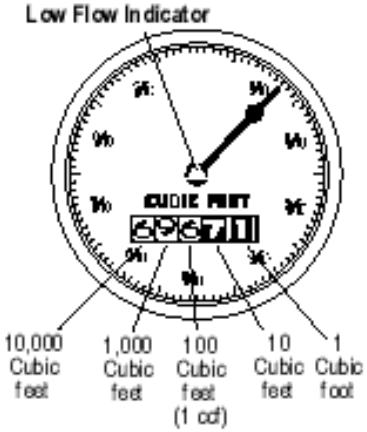
Look for flow detection triangle

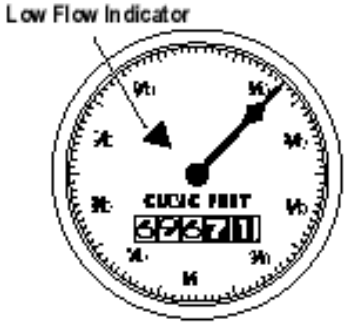
Water meters in ccfs (hcfs)

If you have a fractional meter it will look like this



If you have a decimal meter it will look like this





How to read a 100 cu ft meter:

- 7.48 gallons = 1 cubic foot
- 748 gallons = 100 cubic feet
- The Higher the Flow the Shorter the Run Time

One sweep around the face is equal to 7.48 gallons or 1 cubic foot

Spray Irrigation:

Usually Used For Lawns, Annual Color, Groundcover

- High Flow (Sprays, Impacts, Rotors)
- Low Flow (Rotator Nozzles, Precision Sprays, Mini- Sprays
- The Higher The Flow The Shorter The Run Time

Good To Know Operating Parameters

- Optimum Operating Pressure And Flow
- Type Of Arc Or Throw, Adjust Able Or Fixed

Spray Irrigation:

Output Measured by Precipitation Rate and Distribution Rate

- **Precipitation Rate is How Much water is released Over a Period of Time – Inches per Hour**
- **Distribution Uniformity is how evenly the Water is Applied – as a percentage of equivalent Rain Fall**

What is My Precipitation Rate?

- An Actual Test is the Best Method to Determine
- Catalogue Values Can Get You Close
- Spray Type Systems are Roughly 1.8”/Hour
- Rotors are roughly 0.7”/Hour
- Rotating Nozzles are roughly 0.4”/hour

Of the List above Which Type Will need the Longest Run Time?

Which Outputs the Most Water?

Why is Distribution Uniformity Important?

- An Actual Test is the Best Method to Determine
- Pinpoints Weakness in Sprinkler Coverage
- By definition - creates the Need to Overwater
- Industry Standard is roughly 45 – 65%
- A Good DU is Anything above 70%

Why Does a Low DU Result in Overwatering?

What is A Well Designed Spray System?

- Operates At The Optimum Pressure Needed For Type Of Sprinkler Used By Using The Correct Number Of Valves Or Zones
- Utilizes Sprinklers With Matched Precipitation Rates
- Provides For Better Than Head To Head Coverage
- All Sprinklers Have Check Valves To Prevent Weeping In Low Areas
- Allows For Multiple Cycling To Prevent Run Off
- Allows For Adjustments

Drip Irrigation

- Water Savings Potential
- Low Flow/Low Volume
- Typically Surface Run
- Easily Repaired
- Plan To Expand (Leave Yourself Room)
- Pin Point Delivery
- Reduced Weed Population
- Long Run Times
- Typically Filtered

Water Budgeting

- Establishes Appropriate Amount of Irrigation Water Needed
- Based Upon – Plant Types, Climate, Size of Landscape
- Must Have Process to Measure, Monitor and Adjust

Plant Selection: *N*eeds to *K*now

- Soil Type
- Exposure
- Water Needs (Hydrozone)
- Mature Size
- Function To Serve
- Characteristics
- Pest/Disease Potential
- Invasiveness
- Restrictions – Invasive Plants

Mulch

Definition: ***The Addition Of A Material (Usually Organic) Placed On Top Of The Soil And Between New Or Existing Plants.***

Examples:

- **Compost**
- **Arbor Mulch**
- **Gravel**
- **Shredded Redwood Bark**
- **Mixed Fir Bark**
- **Walk On Fir Bark**
- **Wood Chips**

Mulching Helps

- Slow Evaporation
- Reduce Or At Least Slow Down Weed Growth
- Water Infiltrate Better
- Some Nutrient Release
- Soils Absorb And Retain Water
- Introduce Beneficial Microbes

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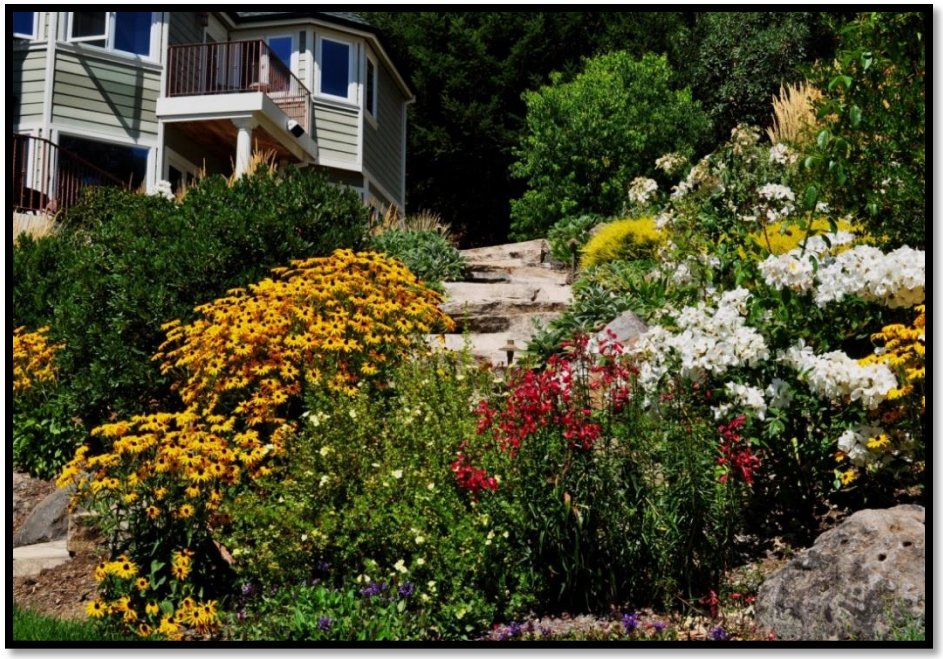

- Improve the Soil
- ***Right Plant in the Right Place***
- Limit the Size of Turf
- Control Weeds
- Upgrade/Install/Manage An Efficient Irrigation System
- Water Deeply
- Mulch
- Ongoing Maintenance