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Water Conservation Projects

Reducing Irrigation Water Use By Design

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I. INTRODUCTION

- *MANY FACILITIES HAVE A LOT OF TURF GRASS WITH POOR IRRIGATION SYSTEMS*
- *DEFINE PROJECT GOALS & DESIGN PARAMETERS*
- *CONDUCT FIELD WORK TO BECOME FAMILIAR WITH THE SITE*
- *IDENTIFY INNOVATIVE DESIGN SOLUTIONS TO ACHIEVE PROJECT GOALS*

II. WATER SAVING OPPORTUNITIES

1. LANDSCAPE WATER DEMAND
2. PLANT SUITABILITY & SUSTAINABILITY
3. IRRIGATION SYSTEM EFFICIENCY
4. IRRIGATION WATER SOURCE

“In arid locations, irrigation water use can be as much as 60% - 90% of the total water use for a facility”



II. WATER SAVING OPPORTUNITIES

- *LANDSCAPE WATER DEMAND – Minimum amount of water req'd for a healthy plant (varies by species).*
 - *DETERMINE WATER DEMAND FOR EXIST. LANDSCAPES (HIGH / MOD / LOW)*
 - *IDENTIFY AREAS TO LOWER EXIST. WATER DEMAND*
 - *REPLACE TURF GRASS WITH XERISCAPING*
 - *REPLACE COOL SEASON TURF WITH DROUGHT TOLERANT TURF*
 - *REPLACE TURF GRASS WITH ARTIFICIAL TURF*
 - *REPLACE HIGH WATER USE PLANTS WITH LOW WATER USE PLANTS*

II. WATER SAVING OPPORTUNITIES

“REDUCING THE EXISTING WATER DEMAND REPRESENTS THE GREATEST POTENTIAL TO REDUCE WATER USE, HOWEVER IT TYPICALLY HAS THE HIGHEST IMPLEMENTATION COST”



WEST HILLS COLLEGE – XERISCAPE



TULARE PUBLIC LIBRARY – LEED GOLD

II. WATER SAVING OPPORTUNITIES

1. LANDSCAPE WATER DEMAND
2. **PLANT SUITABILITY & SUSTAINABILITY**
3. IRRIGATION SYSTEM EFFICIENCY
4. IRRIGATION WATER SOURCE

“All plants have preferences, just like people – some like full sun, others prefer shade, so its important to put plants in their preferred location”



II. WATER SAVING OPPORTUNITIES

- *PLANT SUITABILITY & SUSTAINABILITY – Proper placement of plants on the site will determine the sustainability of a landscape.*
 - *CLIMATE ZONE – Plants must be compatible with weather conditions*
 - *MICROCLIMATES – Match plant preferences to site microclimates*
 - *HYDROZONES – Group plants with similar water needs on the same station*
 - *LANDSCAPE MOUNDING – Makes efficient irrigation practices more difficult*

II. WATER SAVING OPPORTUNITIES

“HYDROZONES WITH PLANTS OF DIFFERENT WATER DEMANDS AND LANDSCAPE MOUNDING MAKE EFFICIENT IRRIGATION OF A FACILITY MORE DIFFICULT”



HYDROZONE W/ MIXED WATER NEEDS



MOUND WITH FAILED PLANTING

II. WATER SAVING OPPORTUNITIES

1. *LANDSCAPE WATER DEMAND*
2. *PLANT SUITABILITY & SUSTAINABILITY*
3. **IRRIGATION SYSTEM EFFICIENCY**
4. *IRRIGATION WATER SOURCE*

“New irrigation technologies and products make an overall irrigation efficiency of 70% - 90% possible”



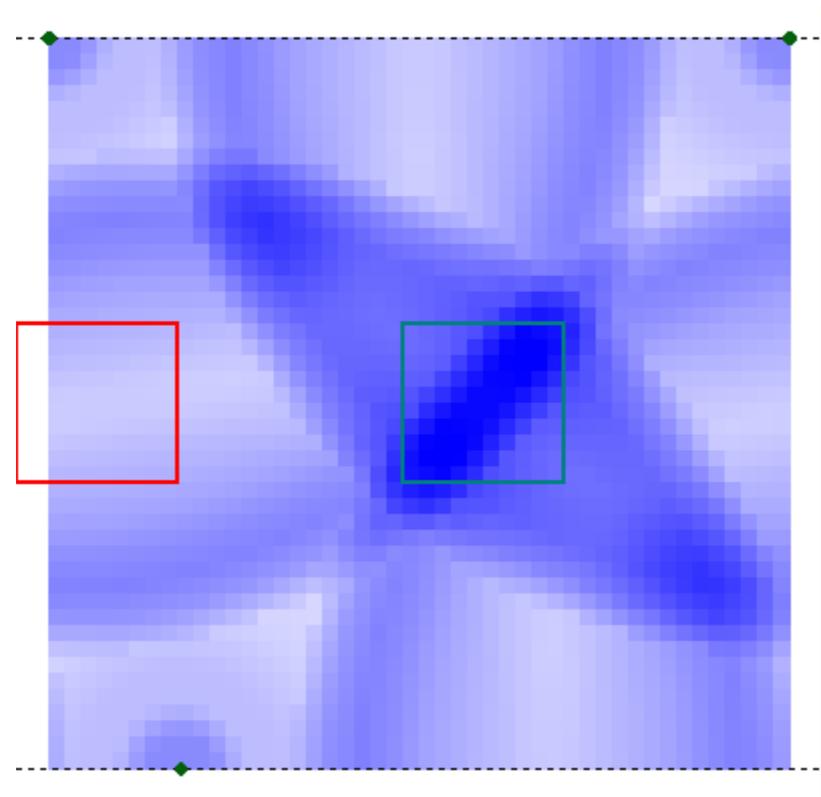
II. WATER SAVING OPPORTUNITIES

“BUCKET TEST IS A USEFUL TOOL TO DETERMINE IRRIGATION EFFICIENCIES FOR SMALLER SITES”



II. WATER SAVING OPPORTUNITIES

*“COMPUTER SIMULATIONS
CAN SAVE TIME AND
MONEY TO ESTIMATE THE
IRRIGATION EFFICIENCIES
FOR LARGER SITES”*



*DENSOGRAM – SIMULATED SPRINKLER
PATTERN: $DU = 0.56$ (POOR)*

II. WATER SAVING OPPORTUNITIES

- *IRRIGATION SYSTEM EFFICIENCY – Its not uncommon for existing irrigation systems to be less than 50% efficient.*
 - *DISTRIBUTION UNIFORMITY (DU) – Measure of irrigation efficiency*
 - *MATCHED PRECIPITATION RATES – Helps improve irrigation efficiencies*
 - *FIXED SPRAY SPRINKLERS – Typically 50% efficient, however 72% efficiencies possible*
 - *ROTOR SPRINKLERS – Typically 70% - 80% efficient, however 85% efficiencies possible*
 - *DRIP IRRIGATION – High efficiencies, but requires more maintenance and is less sustainable*
 - *LOW FLOW BUBBLERS – High efficiencies without the difficulties of drip irrigation*

II. WATER SAVING OPPORTUNITIES

- *IRRIGATION SYSTEM EFFICIENCY (cont'd) –*
 - *IRRIGATION WATER PRESSURE – Proper water pressure is essential*
 - *REDUCE / ELIMINATE RUNOFF – Runoff equals wasted water*
 - *ET BASED CONTROLLERS – These are essential to save water*
 - *CENTRAL COMPUTER CONTROL SYSTEM – A must for large sites*
 - *WATER METERS & BACKFLOW PREVENTION DEVICES – Critical to document and track success with water saving measures and to protect public health.*

II. WATER SAVING OPPORTUNITIES

WATER WASTING CONDITIONS



*LOW WATER PRESSURE RESULTS IN
POOR IRRIGATION EFFICIENCIES*



RUNOFF = WASTED WATER

II. WATER SAVING OPPORTUNITIES

1. *LANDSCAPE WATER DEMAND*
2. *PLANT SUITABILITY & SUSTAINABILITY*
3. *IRRIGATION SYSTEM EFFICIENCY*
4. **IRRIGATION WATER SOURCE**

“If we can replace a potable water irrigation source with a non-potable source, we can save a lot of water”



II. WATER SAVING OPPORTUNITIES

- *IRRIGATION WATER SOURCE – Its worth the effort to investigate if a non potable water source can be identified or developed to replace an existing potable water irrigation source.*
 - THIS COULD RESULT IN A 100% SAVINGS OF POTABLE WATER
 - NON POTABLE WATER SOURCES ARE OFTEN LESS EXPENSIVE
 - BEWARE THAT POOR WATER QUALITY OR CONTAMINANTS WON'T CREATE COSTLY PROBLEMS



III. INTEGRATED PROJECT PLANNING & IRRIGATION SYSTEM MANAGEMENT

1. *IRRIGATION SYSTEM MANAGEMENT*
2. *INTEGRATED PROJECT APPROACH*

*“It’s important to remember, fancy
equipment does not save water,
People Save Water”*



III. INTEGRATED PROJECT PLANNING & IRRIGATION SYSTEM MANAGEMENT

- *IRRIGATION MANAGEMENT – Fine tuning of the irrigation system is essential to the success of the project.*
 - *EDUCATION OF DECISION MAKERS AND FACILITY USERS*
 - *FIELD OBSERVATIONS*
 - *PROGRAMMING ADJUSTMENTS*

III. INTEGRATED PROJECT PLANNING & IRRIGATION SYSTEM MANAGEMENT

- *INTEGRATED APPROACH – Involve everyone who will play a part in the project planning, design, construction and ultimate management of the new irrigation system. Everyone has a voice and buys into the project goals. Everyone is a stake holder to realize the project goals.*

IV. PROJECT RESULTS

**WHEN YOU
SAVE WATER –
YOU SAVE
MONEY !**



THANK YOU !



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