First Steps in Assessing a New Property to Manage
Background

- Current Director of Water Management at DLC Resources
- Over 16 years of experience in the industry and has a strong background in irrigation design and water management for large-scale properties.
- Certifications include: Irrigation Association
  - CLWM, CID, CLIA, CIC
- U.S. Environmental Protection Agency WaterSense Partner, Tucor Factory Trained
Where do you start???
What’s the Goal?

The ability to provide:
The right amount of water at the right times for a healthy landscape. This is done through efficient irrigation application and proper water management.
How to meet the goal

The old adage.....You can’t manage what you can’t measure!
How to meet the goal

Create a foundation to manage and measure!

Mapping
- Irrigation components
- Landscape Area
- Water Source Mapping

Data collection
- Water bills
At the completion of project

You want to measure what you manage!

Usage Reports/Progress Reports/maintaining within a budget/great looking landscape

= PROOF OF VALUE
Where do you start???
Fact Gathering before kickoff

• As-buils, Construction Plans
• Any available maps
  – Google Earth
• Utility Bills
• Gate codes, Keys, combination locks
• Remote capability of existing controllers
Learn the Property

- Map Water Meter
Learn the Property

• Map and Quantify Major Components
Learn the Property

- Map and Quantify Major Components
## Map All Major Components

<table>
<thead>
<tr>
<th>Mapping (Major Components)</th>
<th>1 Water Source</th>
<th>2 Controllers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Potable Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a Water Meters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b Backflows</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-Potable/Reclaimed Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a Pump Station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b Isolation Valves</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controllers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a Standalone Controllers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b Cloud Based Controller</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c 2 Wire controller/Decoder System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d Central control system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weather Stations</td>
<td></td>
</tr>
</tbody>
</table>
Now that all major components are mapped

• Next Step
• Assess the functionality of the irrigation system
Irrigation Assessment

Organization is essential
Irrigation Assessment

Organization is essential
System Overview

1 – Water Source
2 – Controller
3 – Wiring
4 – Turf Valves
5 – Drip Valves
System Overview

Needs Assessment too!!!
Backbone Assessment

The Backbone of the system
- Includes everything upstream of the valve. It must all work otherwise #2 does not matter.

Downstream of the Valve
- Once the backbone of the system is solid and it all works, then downstream of the valve (#2) can be focused on. This relates to the efficiency of the system.
Backbone Assessment

• Water Source Assessment

Potable Water Source or Non-Potable
Backbone Assessment

Potable Water

– For each Water Meter, what is the Pressure and Meter Size?

This will help determine the potential of the irrigation system and will help with future trouble shooting.

– Is the water meter needle moving while the controller is off indicating problems?
Backbone Assessment

• Water Source Assessment

GPM FOR METER VS PSI

<table>
<thead>
<tr>
<th>SERVICE LINE SIZE</th>
<th>METER SIZE</th>
<th>GPM @ 40 PSI</th>
<th>GPM @ 50 PSI</th>
<th>GPM @ 60 PSI</th>
<th>GPM @ 70+ PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1&quot;</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>1 1/2&quot;</td>
<td>30</td>
<td>38</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>2&quot;</td>
<td>2&quot;</td>
<td>50</td>
<td>60</td>
<td>68</td>
<td>72</td>
</tr>
</tbody>
</table>

This is just a guide!
Backbone Assessment

- Non-Potable Water
- Who is responsible for assessing this?
Backbone Assessment

Non Potable Water

• In most cases, the pump station and water source (i.e. lake, wells, etc.) is not maintained by the landscape contractor.

However......

• Water quality directly impacts the irrigation system performance and quality of landscape.
Backbone Assessment

Non Potable Water

- Work with the community on getting an assessment completed on all aspects of the Water Quality and Pump station.
- The result of the assessment should include recommendations to fix all aspects.
Backbone Assessment

Non Potable Water
This includes assessing:

• Water Quality
• Pump Station
• Fertigation System
• Acid Injector
• Fertigation
Backbone Assessment

Does it connect???
Backbone Assessment

• Communication Assessment
  – Could include:
    • Cell cards
    • Modems
    • 2 wire communication line/phone line
    • Radios
    • Computers/hardware components
    • Unpaid dues!
  – Get the vendors involved to help the assessment if there are communication problems
Backbone Assessment

• Controller Assessment
  – Make & Model
  – 2 wire system or conventional?
  – How many stations are hooked up?
  – Are there sensors installed and functioning?
    • Rain Sensor
    • Flow Sensor
  – Controller Map or Station Legend?
  – Correct Date and Time
  – Is controller grounded?
Backbone Assessment

- Wiring Assessment
Backbone Assessment

- Conventional Wire
Backbone Assessment

• Conventional Wire Assessment
  – Controller Diagnostics
  – Continuity test (from the controller)
    • Good (20 – 60 ohms)
      – Rainbird = 33 ohms
      – Irritrol (economy valve)= 21 ohms
      – Hunter = 24 ohms
    • Short (20 and under)
    • Open (60 and over)
  – Document the # of station Wires
  – Flow Check (with a remote)
Backbone Assessment

- Two Wire System
Backbone Assessment

- Two Wire Assessment
  - Controller Diagnostics
  - Flow Check (with a remote)
  - Asbuilts???
Backbone Assessment

- Locate/map all the valves
  - Consider locating the turf valves first.
    - Turf uses 5x-10x more water than DG
    - Expectation for turf is that it is wall to wall green
    - In many communities Turf is king!

Goal is to make sure the turf valves operate without problems
Backbone Assessment

• Each valve box should be opened and inspected.
Backbone Assessment

- Each valve box should be opened and inspected.
Backbone Assessment

• Each valve box should be opened and inspected.
Backbone Assessment

• Each valve box should be opened and inspected.
Backbone Assessment

Root Intrusion
Backbone Assessment
Backbone Assessment

Stuck valve or Downstream Issues???
Backbone Assessment

What's wrong with this valve?
Backbone Assessment

What's wrong with this valve?

Nothing!!!
Backbone Assessment

• At the completion of inspection
  – Christy Tags in the valve box?
    • If not, mark with a sharpie.
  – All valve/electrical issues documented
  – Plain and simple.....Does the valve operate?
Zone Mapping

1. Consider rewiring for easier system checks?
2. Map the zones
Program for the Current Season

- Identifying Leaks with Drip
  - Smaller systems- physically inspect
  - Large Systems- run drip during daytime
Backbone Assessment

1: Backbone

2
Downstream Assessment

Complete

2
Turf Irrigation Inspection

Even water application is essential to proper water management of turf which is achieved by having a system with a high efficiency rating (Distribution Uniformity).

A Well Balanced System!!!
Turf Irrigation Inspection

Distribution Uniformity – Poor Uniformity
(difficult to manage, results in excessive water use)

Wet areas!

Dry areas!
Turf Irrigation Inspection

Causes to an “Imbalanced System”

Low Head – Notice green ring

Grass taller than spray

Leaning Heads
Turf Irrigation Inspection

Causes to an “Imbalanced System”

• Mismatched Nozzles
Turf Irrigation Inspection

Causes to an “Imbalanced System”

- Nozzles Fanned Down
Drip Irrigation Inspection

Drip Valve

- Is the Drip Filter installed and serviceable?
- Is there a pressure regulator?
- Are Wire connections correct?
Emitter Considerations

- Is the layout consistent from zone to zone?
  - Emitter count per plant
  - Location of emitters ok?
  - Is shrub valve separate from trees and if not, have the emitters been compensated?
  - Can trees be capped?
Drip Irrigation Inspection

Polyethylene (Poly)

Polyvinyl Chloride (PVC)

Piping Considerations

- Flush Caps
- PSI
- Acceptable Pipe Size