ASIC 2016 – Northeast Regional Conference
Pay Me now or Pay Me Later
Challenges in Owner understanding how to ascertain true nature of costs at the beginning of the project generally lead to dissatisfaction at the end of the project in either the Owner, Vender, and/or the Manufacturer.

*Irrigation Consultant is not listed as being dissatisfied*
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Owner Dissatisfaction

- Irrigation system not reliable and/or under-performing
- The effects of “Value-Engineering”
- Additional restoration costs
- Earlier than anticipated costs due to failures in hardware
- Poor relationship with Contractor/Distributor and/or Manufacturer
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Contractor Dissatisfaction

- Did not make anticipated profit on job
- Poor reference upon completion
- Damaged relationship with Owner, Consultant and/or Vendor/Manufacturer
- Longer time to completion causing loss of future revenue
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Vender/Manufacturer Dissatisfaction

- Did not make anticipated profit on job
- Poor reference upon completion
- Damaged relationship with Owner and Consultant
- “Soft” costs of having to ensure Owner is “happy” with the system once Contractor is gone – feel the effects of budgets for long after the project is completed
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Budgeting Landmines effecting Actual Costs/Results

- Owner does not provide clear criterion to Consultant
- Owner cannot answer expected longevity question
- Ignoring the premise that Contractors/Suppliers need to make a reasonable profit
- Contingency is for once the digging starts
- “Value Engineering” is not a direct synonym for “reducing-costs”
In 2015, an irrigation upgrade is best thought of as an installing reliable cost-effective infrastructure that delivers water at constant pressure.
Establishing an understanding that there is balance between the system cost and longevity of the hardware.
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General Components of Irrigation System

- Central Irrigation Computer
- On-site control (Satellites/Decoders)
- Piping (Mainline and Laterals)
- Valves (Isolation and Drain)
- Wire (High Voltage, Communication, Field Control)
- Fittings and Restraints
- Sprinklers and Electric Valves
- Pumpstation, Wells, and Transfer Pumps
- Hard structure – Pumphouse, Intake, and Wet Well
- Weather Station and Sensors
- As Built/Baseplan Drawing
## Components of a System
### Possible Life-spans

<table>
<thead>
<tr>
<th>Expected # of Years</th>
<th>Item</th>
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<tbody>
<tr>
<td>2</td>
<td>Solar radiation and RH on WS</td>
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<tr>
<td>3</td>
<td>Central Support and Warranty Service</td>
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<tr>
<td>3-5*</td>
<td><strong>Irrigation Central Computer (OEM)</strong></td>
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<tr>
<td>5*</td>
<td><strong>comprehensive Base Plan/As-Built update</strong></td>
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<tr>
<td>5*</td>
<td>handheld radios</td>
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<td>10</td>
<td>central irrigation software package</td>
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<tr>
<td>10-15*</td>
<td>pump turbine removal and over-hall</td>
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<tr>
<td>12-20*</td>
<td>possible nozzle replacement</td>
</tr>
<tr>
<td>15-20*</td>
<td>rotor gear drive replacement</td>
</tr>
<tr>
<td>20-25</td>
<td>Satellite update and or replacement</td>
</tr>
<tr>
<td>30-35*</td>
<td>sprinkler body replacement</td>
</tr>
<tr>
<td>25-40*</td>
<td><strong>Lateral pipe (3&quot; and smaller) replacement</strong></td>
</tr>
<tr>
<td>25-40*</td>
<td>pump station replacement</td>
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</tbody>
</table>
What is considered excessive or “not in the our budget?”

50 year old fitting being “re-installed”!
Factors/Choices Effecting Cost vs. Reliability
Thrusting and Restraints Choices
Factors/Choices Effecting Cost and Life Expectancy

The Wide World of Valves

- Choose correct valve type (C515, C509, Resilient wedge, brass gate, swivel)
- Know the different type of valve connections (MJ, Push-on, PE HDPE)
- Use correct restraints with valves
- Make sure valves are supported
- Ensure valve is accessible
- Understand your water conditions
- Plan for phasing (type and location)
- Understand that with valves you get what you pay for
Factors/Choices Effecting Costs vs. Reliability
Examples of Valving Choices
Factors/Choices Effecting Cost vs. Reliability
Examples of Valving Choices
Factors/Choices Effecting Cost vs. Reliability
Examples of Valving Choices
Future of Mainline Valving Choices

While lighter, better corrosion protection, easier to install but do you get what you pay for?
Longevity vs Budget
Examples of Costly Decisions
Budgeting Strategy “Don't”
*Your only costing Yourself!*

- Do not tell Contractor, Distributor, and/or any Vendor any budget expectations
- Do not forget who the Owner is purchasing the system from and its implication on budget
- Do not re-prioritize budget based “Other” influences
- Do not use neighbouring Club’s project costs act as benchmark of a valid quote or bid
- Do not “budget” based on playing multiple Contractors against each other at the same time
Actions that can ensure costs are accurately reflected

- Get price to install system at agreed upon criterion and then set budget
- Have clear understanding of how cost reductions affect longevity and performance
- Banish concept of “value engineering” from discussion
- Understand what a reasonable profit represent to all parties (see example next slide!)
<table>
<thead>
<tr>
<th>Material Location</th>
<th>Quantity</th>
<th>Item</th>
<th>Specification</th>
<th>Remarks</th>
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<tr>
<td>Valve 2 in forged carbon steel with flanged ends</td>
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Pay Me Now or Pay Me Later

Questions?
Brian Vinchesi

ASIC 2016 REGIONAL CONFERENCES
Southeast, Southwest, Northeast, & California
American Society of Irrigation Consultants
Pay Me Now
or Pay Me
……..Later?

or Forever?

Brian E. Vinchesi,  FASIC, EIT,
LEED-AP, CID, CIC, CLIA,
CGIA, CWM-L
ADDITIONAL COSTS

- Consultants tend to use better products that cost more money that many contractors and cost estimators miss.

- For example:
  - Pressure Regulation
  - Flow Control
  - Isolation
    - Mainline, Lateral, Valve
  - Quick Couplers
  - Single Strand Wire
WIRE CONNECTORS

- Lots of choices but are the choices all the same?
- UL 486D Listed

Not Enough/None

Too Many

Well........
VALVE BOXES

- Residential Grade
- Commercial Grade
- Plastic or Concrete
- Detection
- Bolt Down Covers
- Specialty Boxes
- H2O Loading
CONTROLLERS

- Conventional
  - Features
- Smart
  - Climate or Soil Moisture Based
- Costs
- Surge Protection Grounding
SOIL MOISTURE SENSORS

- Safety
  - Off Switch
  - Adjustable Moisture Level
- Monitor and Tracking
- Water Management
- LEED
Typically tree irrigation has been done with spray sprinklers or bubblers which use large amounts of water.

Drip rings have also been used.

Newer technologies include drip stakes which do a better job of applying water directly to the root ball at lower application rates.
DRIP IRRIGATION
UNDER PAVEMENT

- Drip tubing in aeration pipe
- Stakes zoned separately from future root propagation area
- Additional benefit of adding air and fertilizer
- No run-off
- Little impact on existing roots
- Rarely costed correctly
LEED

Can add considerable cost to the system for:

- Better products
- Smart Technology
- Higher Installation Costs
- Alternative water Supplies
- Logic
ODD SYSTEMS

Government

Synthetic
LARGE SYSTEMS

Larger systems require more expensive components:

- Material, Size, Life Expectancy, Installation

Installation Expertise
Alternatve water sources:

- Various sources:
  - Rainwater
  - Storm Water
  - Waste Treatment

- Need to minimize contaminants

- Treatment is Expensive!!

- A place that everyone likes to VE but not a place you can/should do it
TANKING

- A place to make lots errors
  - Sizing
  - Material
  - Installation
- Logic
TANKING COST!
Commercial irrigation system budgeting is usually done in a vacuum.

The cost estimator or General Contractor gives it a number based on square footage that is usually way too high or way too low.

Then when they get the pricing they wonder why the Contractor is so high.
A typical Contractor’s traditional practice is to use the cost of materials times a multiplier.

Higher end Contractors may look at actual material, labor, equipment and overhead costs.

Professional cost estimators have a tendency to use square footage rules but many don’t have a clue.
COSTS

- Use square foot pricing when no design

*Per Square Foot*
- Conventional $1.50
- More Intense $2.50
- Under Paver $3.00
- Green Roof $3.50

- Use material take offs with multiplier when have design

- Use sprinkler multiplier for golf plus all other costs
VALUE ENGINEERING

- **UGH!**
- Consultants hate it!
- Manufacturers hate it!
- Many Contractors embrace it or promote it.
- Owners’ don’t understand it!
  - “Include Nibco T-113 gate valves with Matco or equiv. (Sizes 1, 1 1/2, 2 only), after above reduction in valves.”

“I’m sending you this note to hopefully explain why the butt fused pipe that is spec’d for the irrigation mainline is unnecessary……….”

I have been in the irrigation industry for 18 years installing systems from a 20 head residential to a 1000 head plus commercial system drawn and spec’d by professional design firms and have never been asked to install butt fused pipe. The butt fused pipe option is rarely, if ever required for irrigation, at least in New England. So, the equipment and expertise is not necessary to be a successful irrigation contractor in New England.
The installer selected plays a large role in the long term costs of the irrigation system.

Many times specification installer qualifications are not enforced.

This is especially an issue with public work.

Submittals are a “sign” of what is to come.

Hard to assign a $ figure to poor installation.
OTHER COSTS

- Water
  - How much is saved or wasted?

- Energy
  - How much energy is being used?
  - Alternative water sources are energy inefficient in most cases.

- Maintenance
  - How much additional maintenance is required based on the materials selected and the design?
QUESTIONS

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Who’s on First?
Delineation of Trades
Jeff Bowman/Bob Dobson
Design/Coordination/Construction Gap

• The Responsibility and Limit of Work of the Irrigation Consultant and Irrigation Contractor
• MEP Role
• Plumbers and Electricians Role
• Architect and GC Role
• Who has jurisdiction?
Examples

• Commercial Buildings
• Green Roofs
• Green Walls/Interior Landscape
• Perimeter Landscape
• Pumping Systems
• Reclaimed Water
Commercial Buildings
Green Roofs
Green Walls
Other??
Perimeter Landscape
Irrigation Pump Systems
Generally Speaking

• Plumbing Work Stops 5-Feet From Exterior Wall
  – Extend beyond the perimeter drain
  – Perceived to be IAPMO jurisdiction from this point inward (into the building)

• All interior plumbing installed by plumber
  – Design by plumbing engineer with close consultation with irrigation consultant
Interior Pumps

• Interior irrigation pumps installed by plumbers and mechanical contractors (Procurement by Irrigation Contractor)
  – Design/specification by irrigation consultant with close consultation with plumbing and electrical engineers
  – MEP does not have the experience in living landscapes and soils
Rain Harvesting/Reclaimed Water

- Interior Storage Tank
- Roof Runoff
- HVAC Condensate
- 2018 Green Construction Code
  - No potable water for vegetative roofs (Model Code)
Rain Harvesting/Reclaimed Water
Rain Harvesting/Reclaimed Water

• Interior storage tank design recommended to be designed by the MEP Engineers
• Tank sizing by irrigation consultant based on landscape water demand and supply inputs provided by MEP Engineers.
• Best to have the MEP engineers take responsibility for backflow prevention and any primary water meters.

• Secondary irrigation/sub-meters specified by the irrigation consultant
  – Sub-meters often communicate directly with irrigation controllers and/or irrigation pump controls
  – LEED Requirements
Electrical

• Generally speaking (Massachusetts), all interior wiring conduits/routing by the electrical engineers/designers with input from the irrigation consultant
• Low voltage wiring within the building (in conduit) specified by irrigation consultant
• Plenum rated wire in some instances
• All interior 120-volt and above wiring by electrical engineers/designers
Electrical

• Irrigation consultant must know all electrical needs of his/her equipment for proper coordination with electrical designers:
  – Pump system power (phase, voltage and current demand)
  – Irrigation controller power
  – Irrigation controller low voltage wiring (two wire or individual station wiring) and the destination of all low voltage branch circuits
  – Ethernet
    • BAS/BMIS
  – Antennas
  – Rain/Weather Sensors
• One line diagram is recommended
Exceptions
Trade delineations vary by

- State
- Local jurisdiction
- Client
Consultant’s responsibility

• Who is to do what?
• Labor source
  – Open shop
  – Prevailing wage
  – Union
• Trades involved
• Permits required
Consultant’s responsibility
Contractor’s Responsibilities in Preparing Bid

– Read the specifications
Contractor’s Responsibilities in Preparing Bid

– Read the specifications
– Understanding labor source, what trades are involved and their requirements
– Notify consultant of any problems, errors or unreal expectations
Irrigation Contractor can be:

• Prime Contractor - General Contractor
• 1st Tier Sub to General Contractor
• 2nd Tier Sub to Site Contractor or Plumber
• 3rd Tier Sub to Landscaper Contractor
Contractor Responsibilities
Potential Trades Involved

- Surveyors
- Teamsters
- Operating Engineers
- Iron Workers
- Plumbers
- Electricians
- Laborers
- Masons
- Elevator Operators
- Others?
Potential Trades Involved
Potential Trades Involved
Gray Areas
Contractor's Responsibilities
After Award

- Business Agent
- Shop Stewart
- Foreman
- Journeyman
- Apprentice
Contractor's Responsibilities
After Award

• Business Agent
• Shop Stewart
• Foreman
• Journeyman
• Apprentice
Thank You!