2025 NATIONAL CONFERENCE | SAVANNAH, GEORGIA

Navigating the ASLA Climate Action Plan

Promoting Beneficial Irrigation Practices

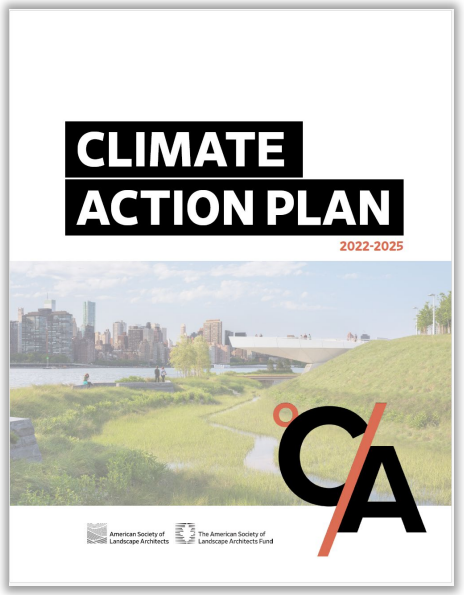
Introduction

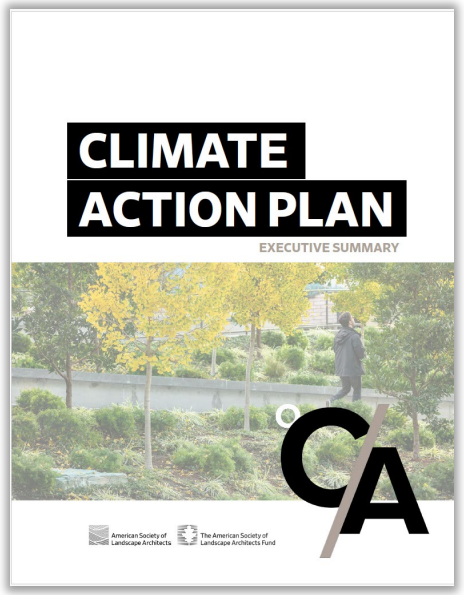
Bryce Carnehl, ASLA

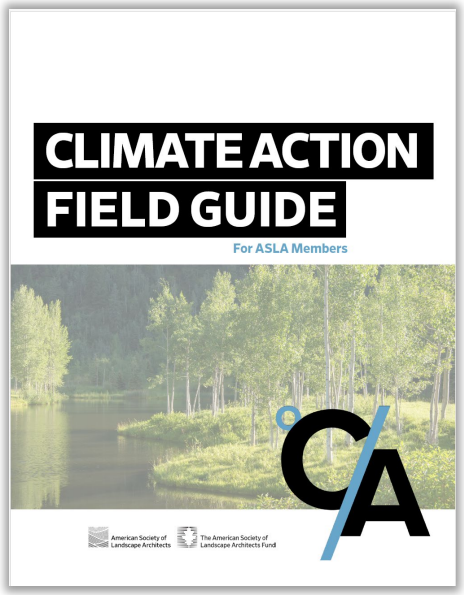
Hunter Industries

Stefan Bortak, ASLA, PLA, CPIC

bortak.design







ASIC

ASLA CAP Goal

Eliminate embedded carbon from the landscape process

ASLA CAP: Impacts to Irrigation

"Irrigation should be avoided or minimized to the greatest extent possible as moving water requires energy."

"Use rainwater where it falls to save energy in pumping and treating water, including passive irrigation and gravity driven systems."

Carbon in Irrigation?

Water Source

Water Conveyance

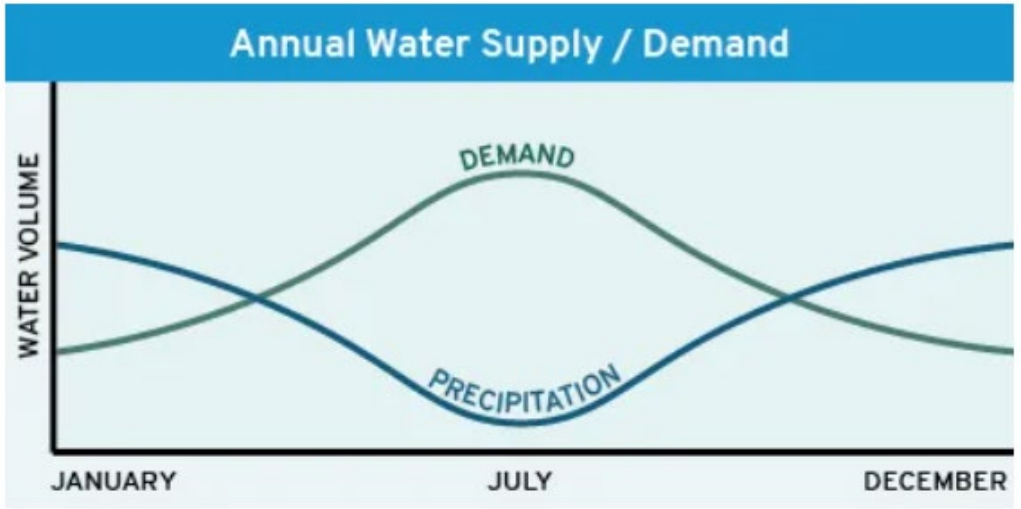
System Components

Risk of Replacement

How can an irrigation consultant help a landscape architect achieve their climate action goals?

Challenge the ‘Elimination’ Narrative

- Designing for worst-case scenarios.
- How much water does the landscape need?
- Does the landscape require supplemental rainfall (irrigation)?



Carbon Conversation: Water Source

Carbon Conversation: Water Source

Water Source Evaluation & Alternative Water Strategies

- Assessing available water sources
- Integrating rainwater, stormwater, and reclaimed water
- Regulatory and safety considerations
- Reduce energy use ► More efficient, less energy
- Passive irrigation:
  - Self watering systems, stored water, soil amendments

Carbon Impact: Water Source

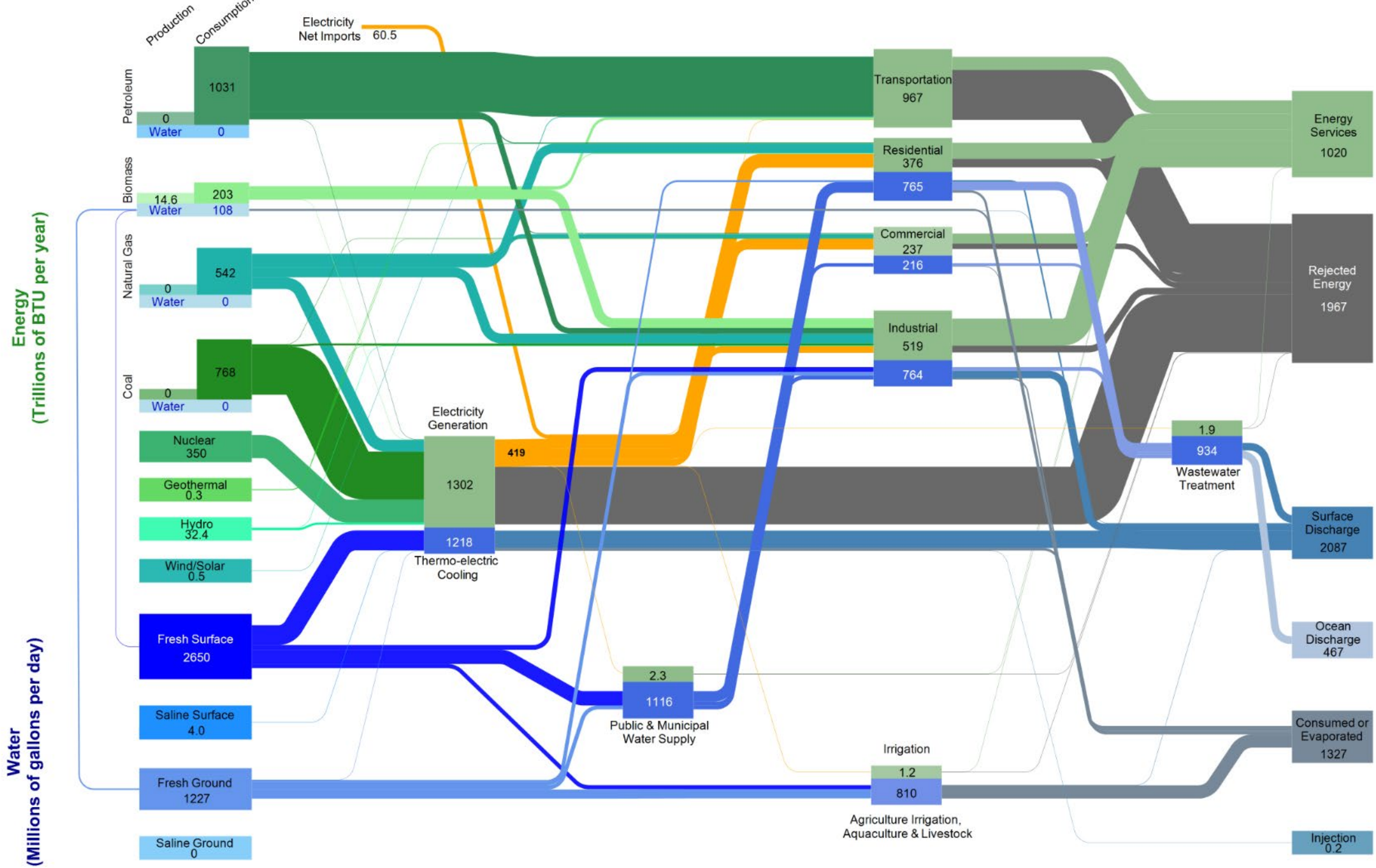
- Cost of Potable Water Increasing
- Harvesting Alternative Water
- Pollution of Surface Water (No BMPs)
- Invasive Species:
  - Mussels, Bryozoans, Snails
- Saltwater Intrusion
- Reclaimed Water

Carbon Impact: Water Conveyance

Carbon Impact: Water Conveyance

Adapting to changing environmental conditions

- Understanding the impact of climate change on water resources
- Strategies for drought-tolerant and climate-resilient irrigation systems
- Incorporating adaptive management practices into irrigation planning


Energy
(Trillions of BTU per year)
Water
(Millions of gallons per day)
Production
Consumption
Electricity
Net Imports 60.5
Petroleum
1031
0
Water 0
Biomass
14.6
203
Water 108
Natural Gas
542
0
Water 0
Coal
768
0
Water 0
Nuclear
350
Geothermal
0.3
Hydro
32.4
Wind/Solar
0.5
Fresh Surface
2650
Saline Surface
4.0
Fresh Ground
1227
Saline Ground
0
Electricity
Generation
1302
419
1218
Thermo-electric
Cooling
2.3
1116
Public & Municipal
Water Supply
Irrigation
1.2
810
Agriculture Irrigation,
Aquaculture & Livestock
Transportation
967
Residential
376
765
Commercial
237
216
Industrial
519
764
1.9
934
Wastewater
Treatment
Energy
Services
1020
Rejected
Energy
1967
Surface
Discharge
2087
Ocean
Discharge
467
Consumed or
Evaporated
1327
Injection
0.2

Carbon Impact: Water Conveyance

- Calculating the embedded carbon in moving water
- General pumping
- https://flowcharts.llnl.gov/commodities/energywater

Carbon Impact: Water Conveyance

Increase Irrigation Efficiency = **Decrease in Energy Consumption**

Carbon Impact: Water Conveyance

Efficient Irrigation System Design & Best Practices

- Matching irrigation method to site & plant needs
- Avoiding overspray and runoff
- Using technology-driven efficiency measures

Carbon Impact: Water Conveyance

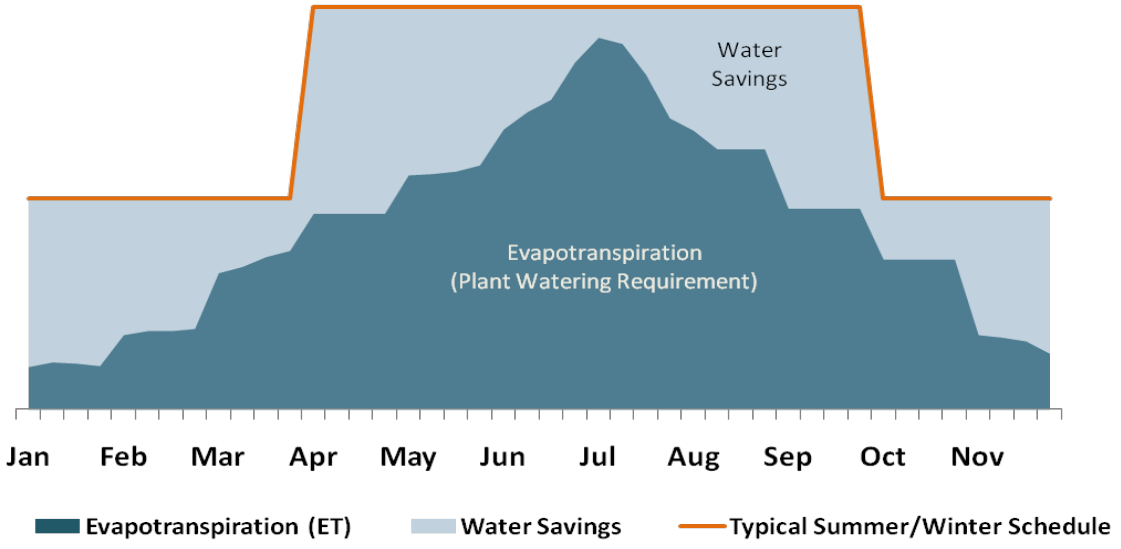
Pressure Management and System Performance

- Importance of pressure-regulated devices
- Designing for optimal performance
- Selecting the right valves and emitters
- EPA WaterSense Certified pressure regulated spray bodies

Carbon Impact: Water Conveyance

Smart Irrigation Controls & Real-Time System Management

- Beyond traditional clocks: Smart controllers
- Integrating sensors for data-driven decisions
- Remote monitoring and automation
- EPA WaterSense Certified Smart Controllers



Carbon Impact: Water Conveyance

Implementation, Training, & Validation

- Ensuring proper installation & performance
- Educating clients on long-term management
- Certified water efficiency programs

Carbon Impact: System Components

Carbon Impact: System Components

Recycled Material Inclusion

PVC Reduction

Environmental Product Declarations

Carbon Impact: Risk of Replacement

Carbon Impact: Risk of Replacement

Plant establishment

- Temporary Irrigation vs. Permanent Irrigation

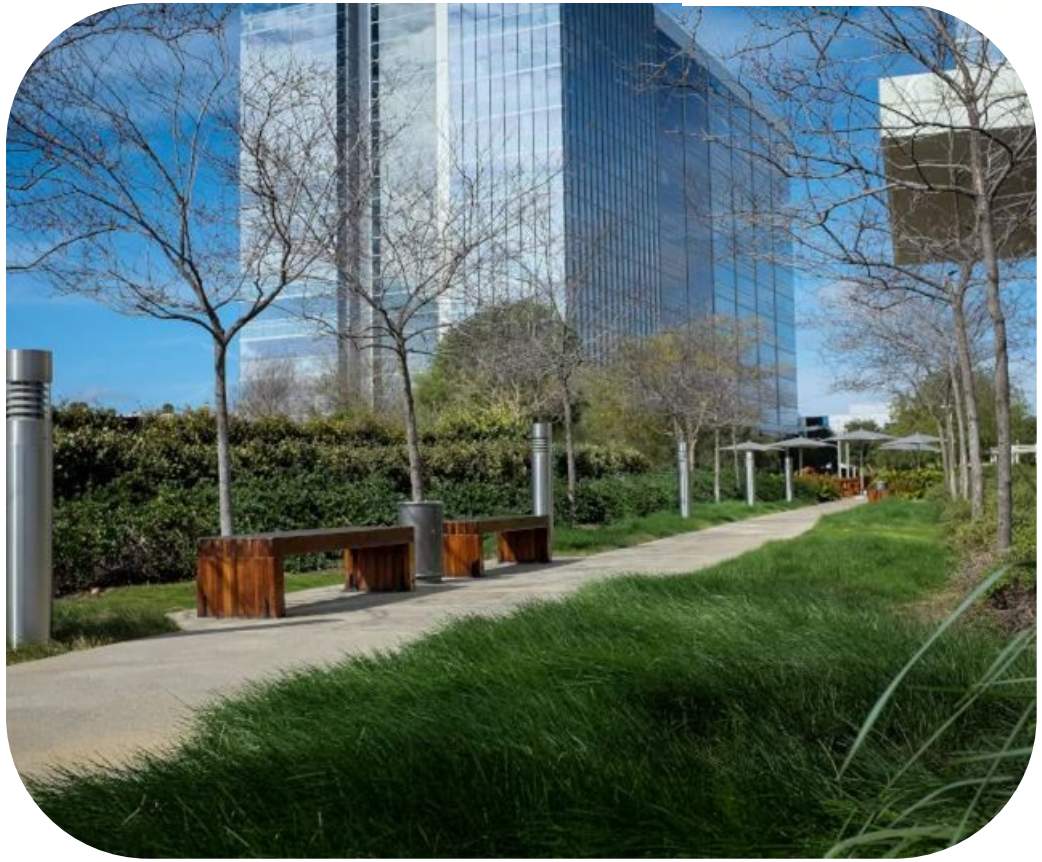
Landscape Insurance

- Extended periods of drought
- Fire suppression / protection

Carbon Impact: Risk of Replacement

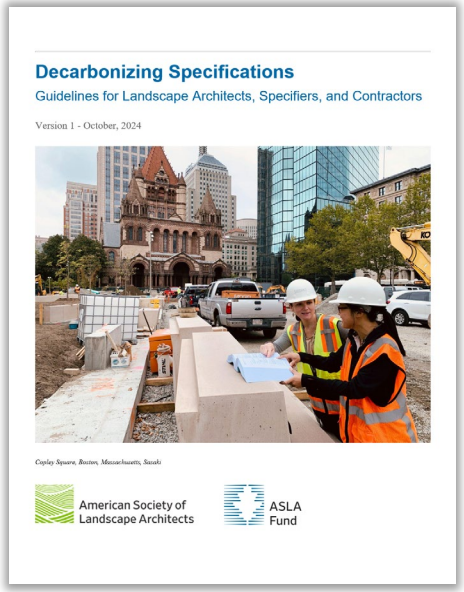
Long Lasting, Resilient System

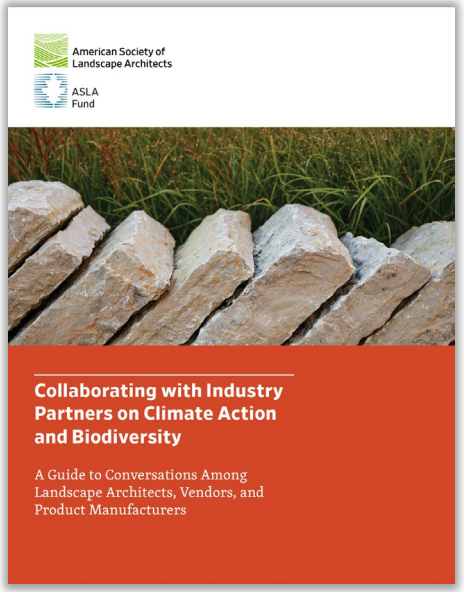
- Design with maintenance and management in mind
- Future Proofing
- Water Restrictions
- New Technology and Products



Advocate for the Beneficial Aspects of Irrigated Spaces

- Increased carbon sequestration
- Fire prevention
- Erosion control
- Trees and bioswales
- Increased eco-system services





Additional ASLA Resources

- Decarbonize Your Specifications
- Collaboration Guide

The Business Case for Climate Action Irrigation Consulting

- Why Clients Need this Expertise
- Reducing Operational Costs with Efficient Design
- How Consultants can Differentiate Themselves

Conclusion & Q&A

- Key takeaways for irrigation consultants
- Best practices and practical steps: value to irrigation consultant services
- Participate in Advocacy: Guide the standard which guides rules and legislation
  - ASIC Advocacy Committee
  - ASLA Water Conservation PPN
  - ASLA Climate Action Committee
- Open discussion and Q&A

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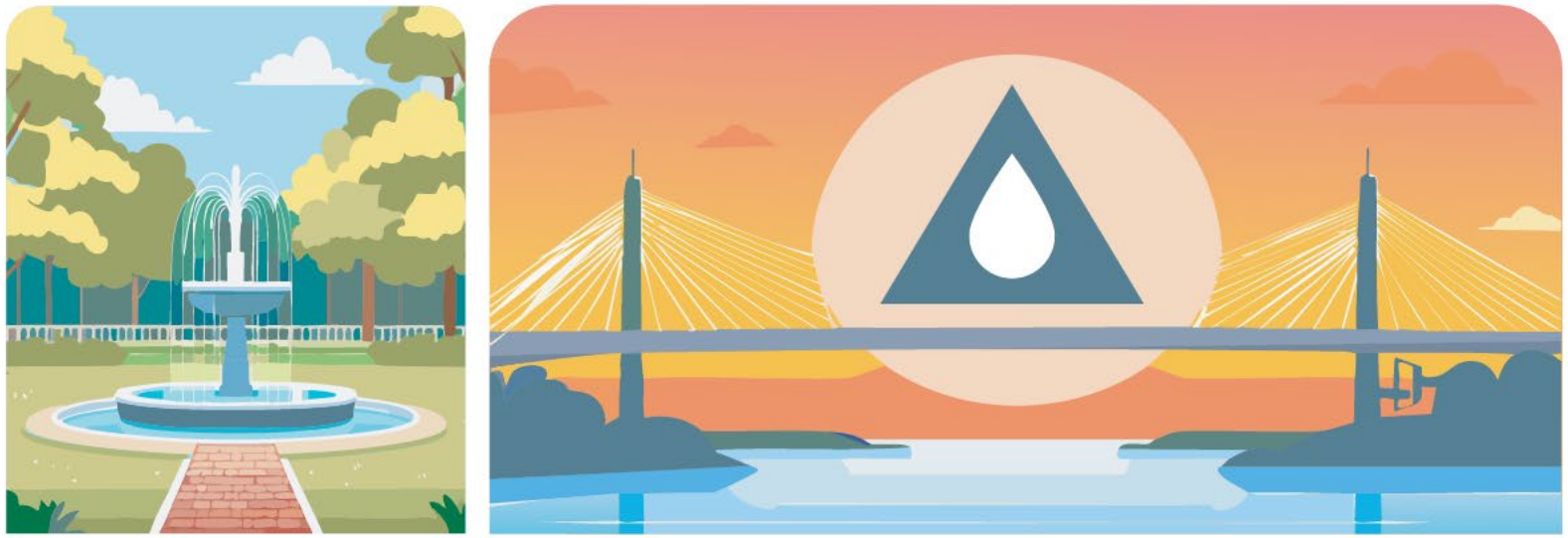
Lessons from the Field:
Triumphs & Failures



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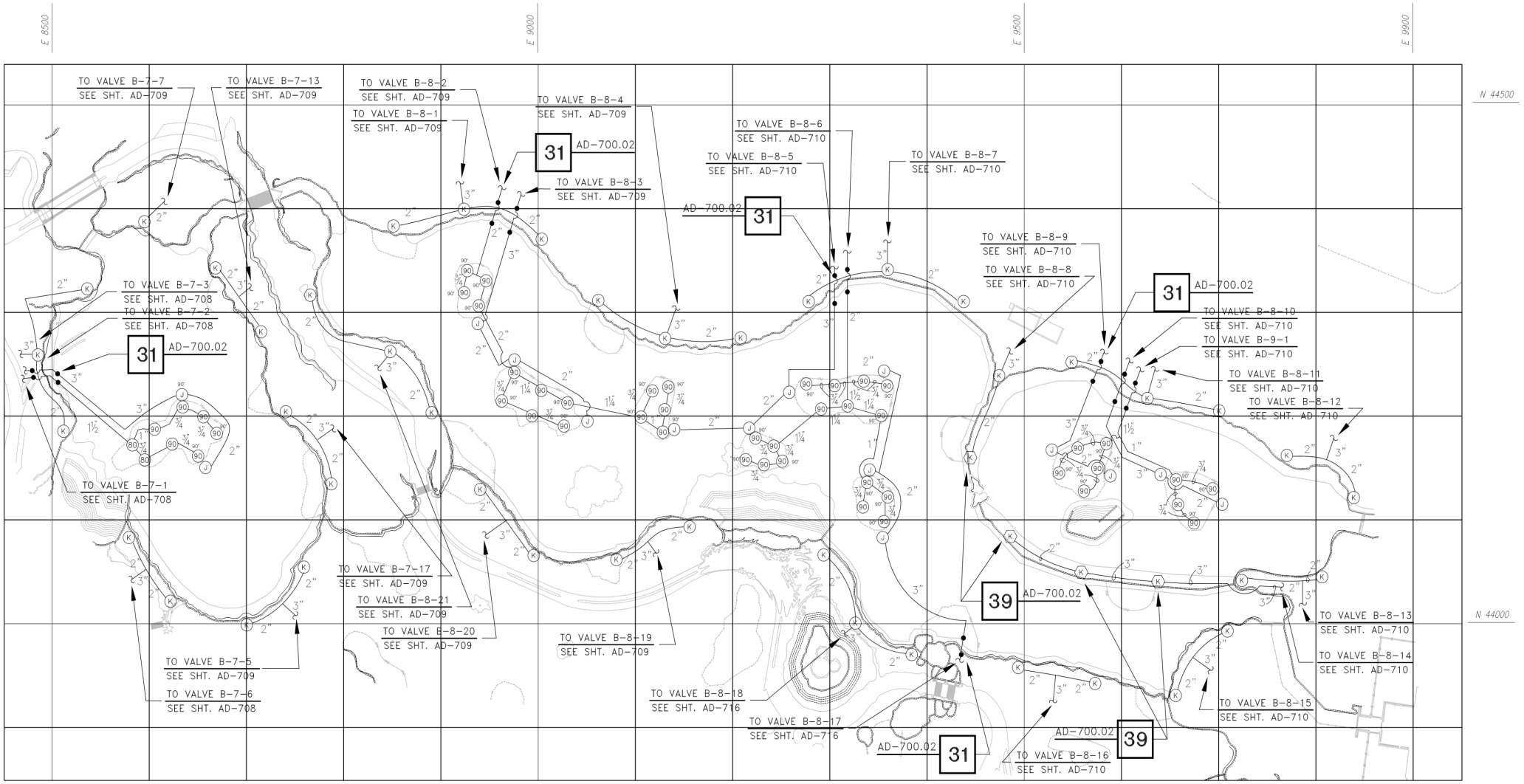
The Early Days

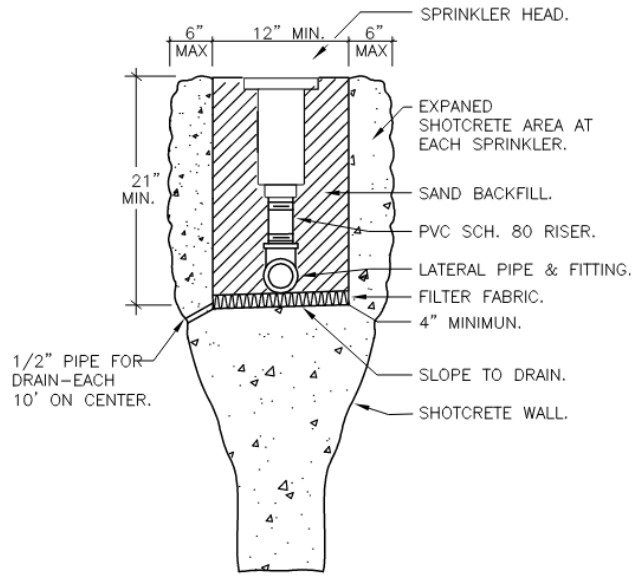
Lessons From The Field

The Elephants

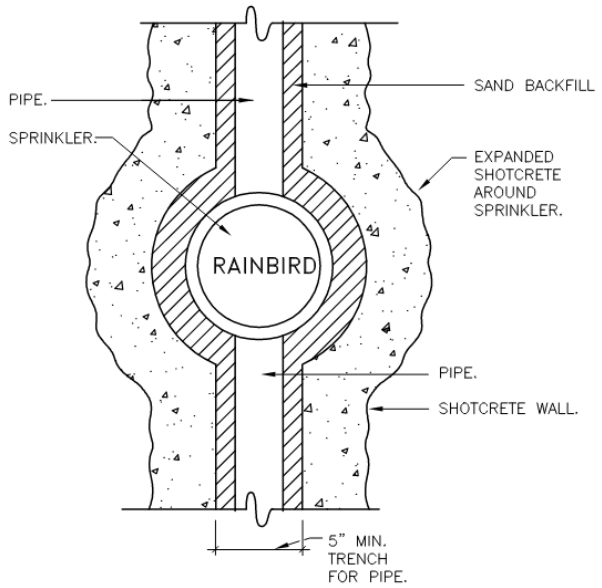


ELEPHANT CONTAINMENT AREA - BLOW-UP

The Elephants

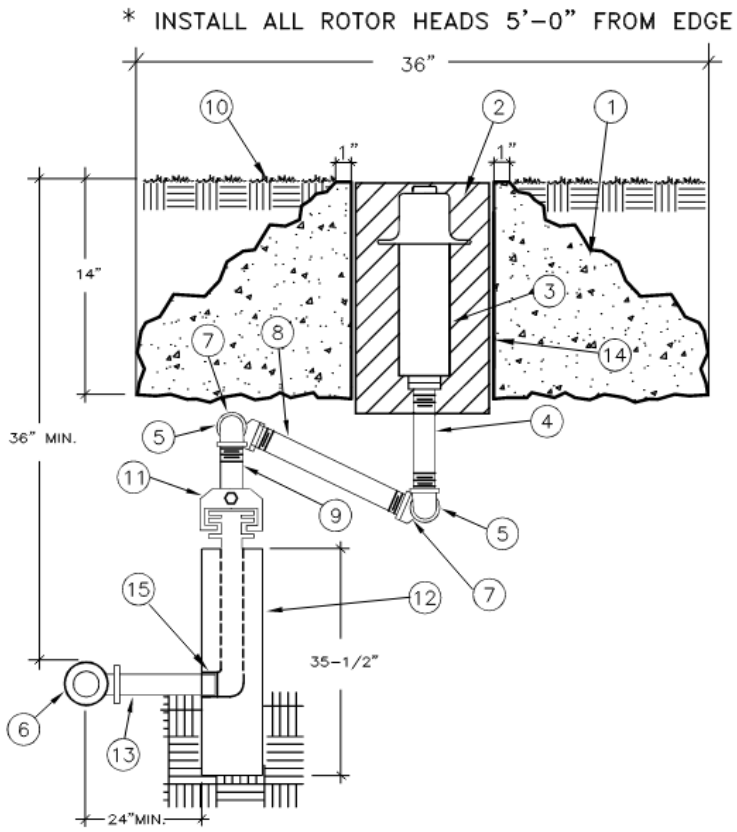


SPRINKLER HEAD IN SHOTCRETE WALL 39
SECTION VIEW
NTS
AD-700.05



SPRINKLER HEAD IN SHOTCRETE WALL 40
PLAN VIEW
NTS
AD-700.05

The Black Rhino

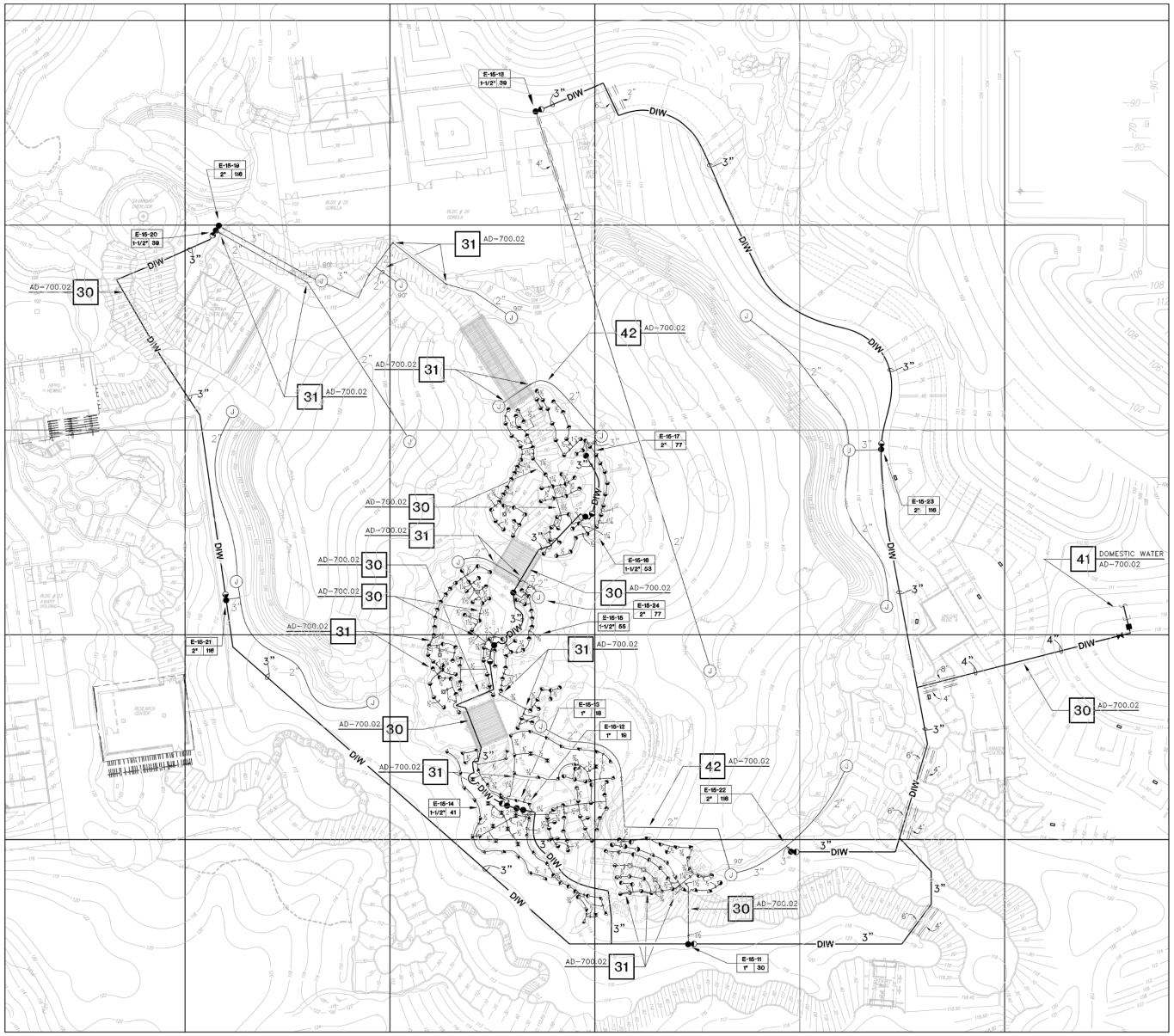


LEGEND

1. EARTH FORMED INTREGAL COLORED SHOTCRETE OR APPROVED COLORED CONCRETE AROUND EACH ROTOR. COORDINATE ALL WORK WITH GENERAL CONTRACTOR AND SHOTCRETE CONTRACTOR.
2. BACKFILL AROUND ROTOR HEAD WITH NATIVE SOIL..
3. SPECAIL ORDER TORO ROTOR HEAD.
4. PVC SCH. 80 NIPPLE – TBE 2" MINIMUM LENGTH.
5. PVC TxT 90 DEG. ELL.
6. LATERAL LINE PIPE AND FITTING.
7. PVC TxT 90 DEG. STREET ELL.
8. PVC SCH. 80 NIPPLE – 12" LONG.
9. 1" x 21" GALV. NIPPLE – THREAD ONE END.
10. FINISH GRADE.
11. CONCRETE RISER BASIN "C" CLAMP FOR CONNECTING GALV. RISER TO RISER BASIN.
12. CONCRETE RISER BASIN WITH BUILT-IN CHECK VALVE.
13. PVC SCHEDULE 40 PIPE.
14. 8" DIA. X 15" LONG PVC CLASS 200 PIPE.
15. PVC SLIP FITTING

SPECIAL DESIGNATED ANIMAL CONTAINMENT
SPRINKLER RISER ASSEMBLY
NTS
24
AD-700.04

The Gorillas



GORILLA CONTAINMENT AREA - BLOW-UP

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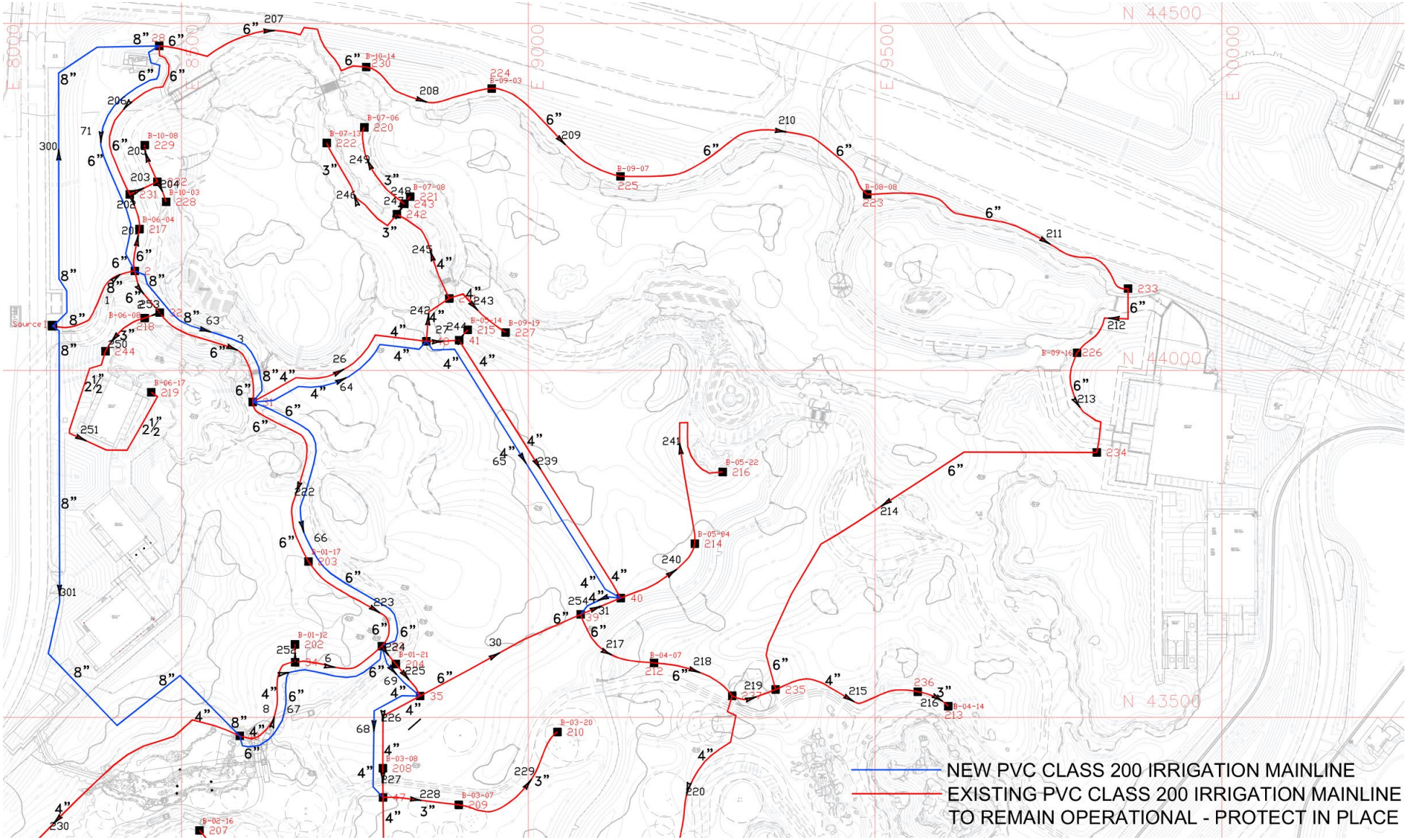
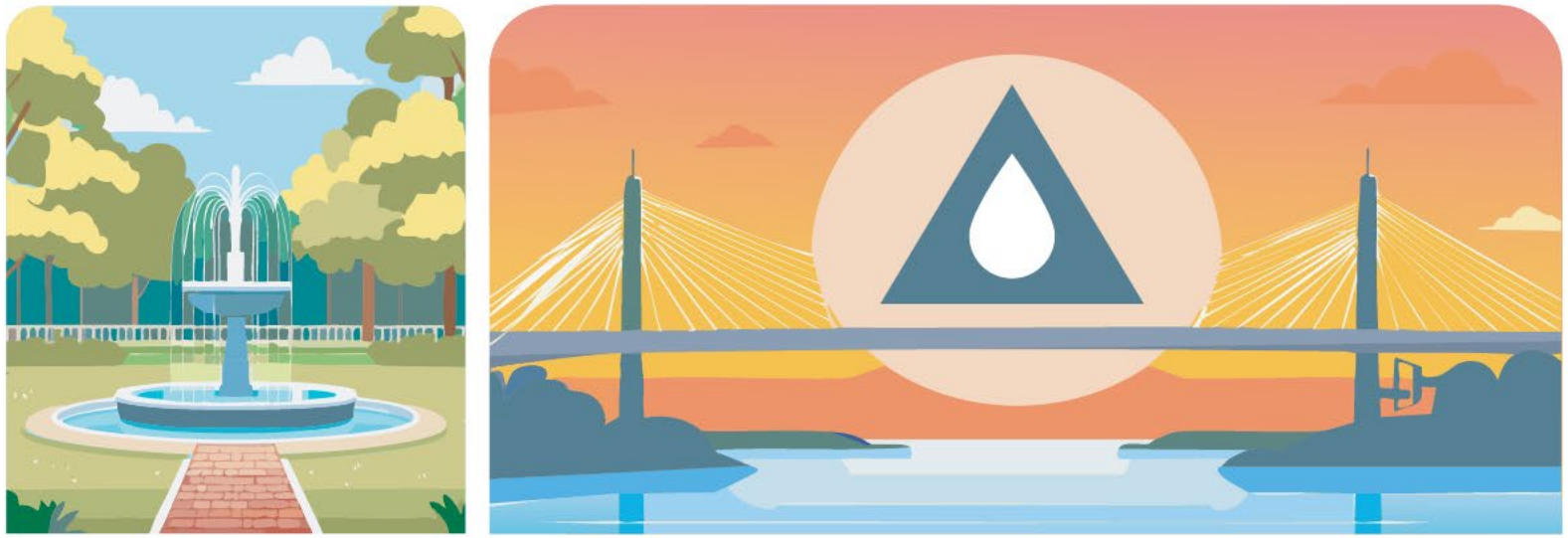
Oh, by the way…

Lessons From The Field

Nighttime Safari





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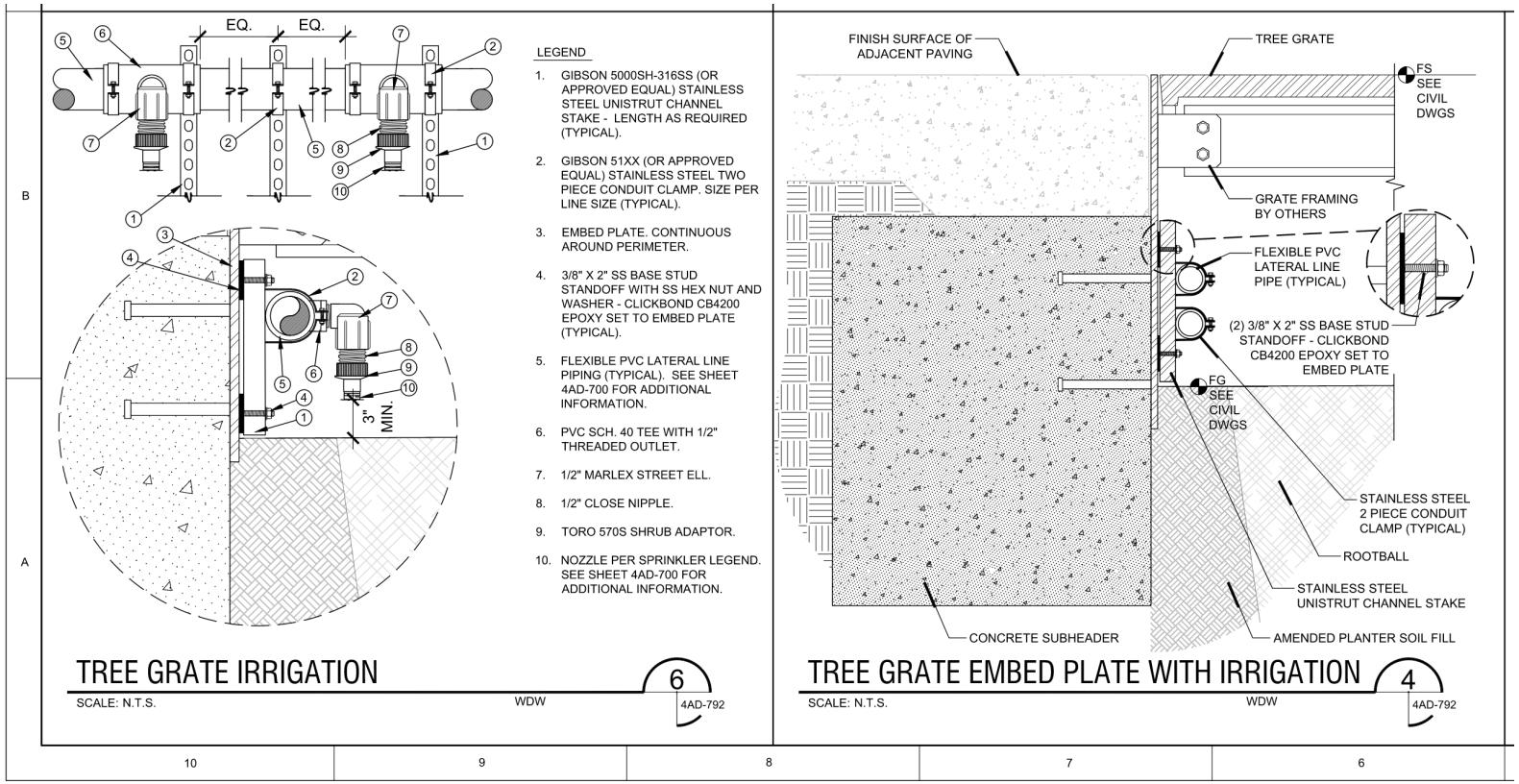
Sometimes it’s so Simple

Lessons From The Field

Curved Tree Well

Curved Tree Well



Curved Tree Well

Many times, in our respective roles we have to deal with issues that arise during the construction phase of a project. What we thought might work on paper falls apart in the field. We rarely hear about the successes or when a new design works perfectly in practice.

In this case though I couldn't be happier with how the irrigation for the sycamores in the south arc turned out. It is exactly what we intended, will be easy to maintain and have significant longevity. These are going to be happy Sycamores!

Thank you!

TOM WYATT
Manager, *WDW Horticulture*

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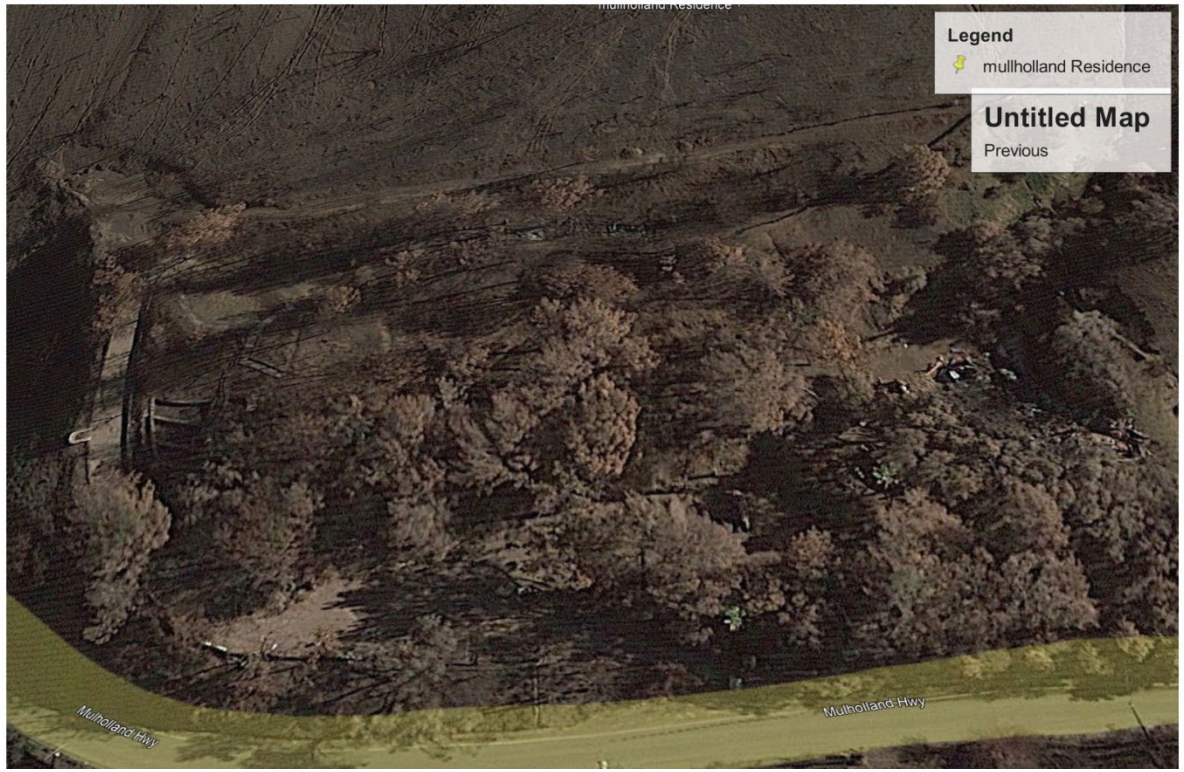
Post Fire Reclamation

On Grade Fire Resistant System

Post Woolsey Fire Condition

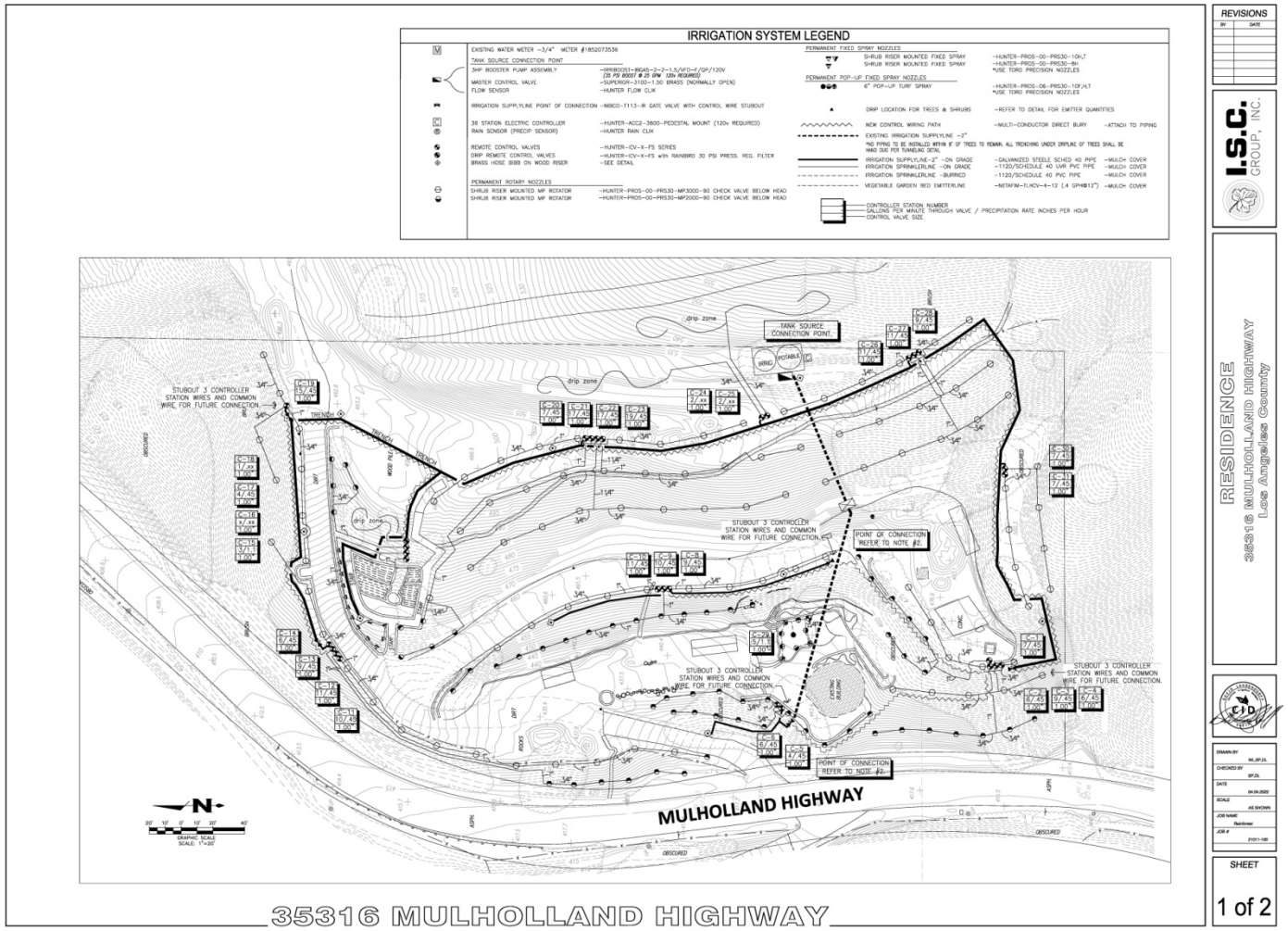
November 2018



Healing


Untitled Map
Current
Legend
mullholland Residence
Mulholland Hwy
Mulholland Hwy

Design for Fire Resistance



Triumphs:
- OnGrade Galvanized Pipe System
- Installers willing to do the work
- Pump for as few zones as possible
- Minimal plastic or PVC per Owner requrements
- Integrating with initial Owner installed equipment.

Failures:
- PreConstruction Meeting did not happen.
- Allowing Owner's Representative too much installation oversight
- Value Engineering and RFI protocols not followed
- Chasing functionality issues that were being caused by existing conditions
  (Manufacturer support allowing for elevated troubleshooting)

Lessons and Application

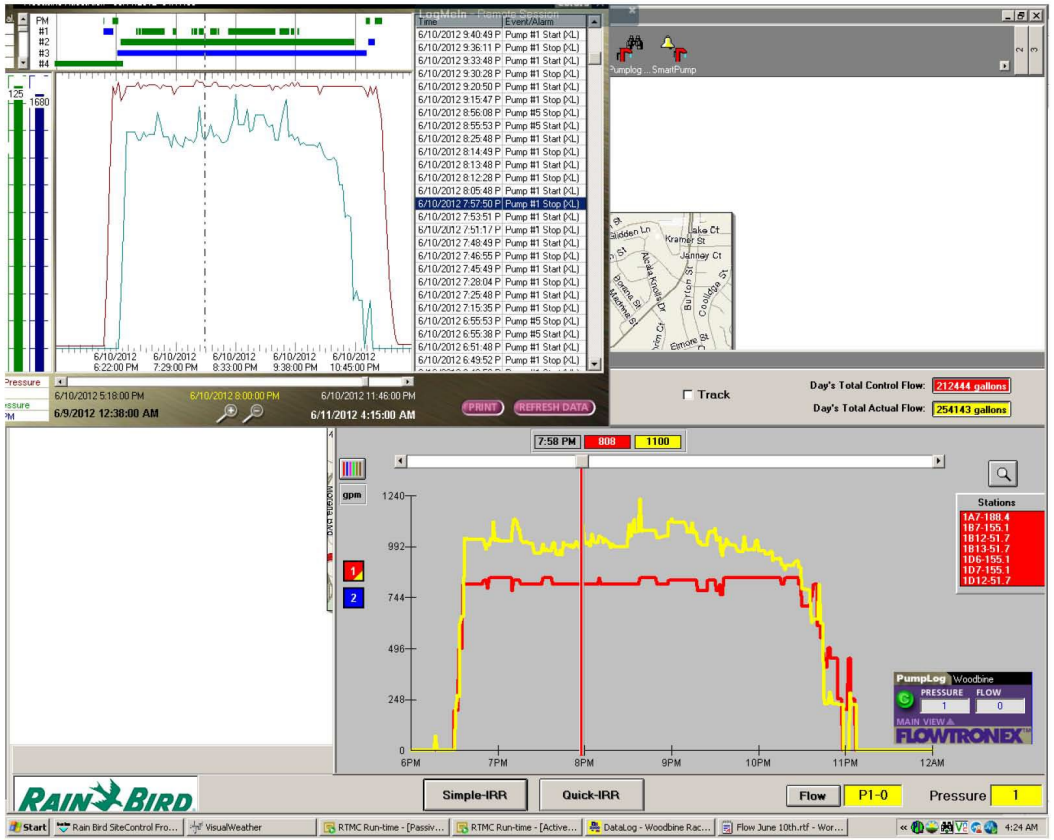
-Working with Owners Specifically

*Assumptions about standard protocols
RFIs & Submittals
*Meetings and Oversight are not negotiable.

In general industry wide I am finding a gap between Design Intent and adoption of newer technologies, equipment and conservation driven management.
Value engineering, substitutions, immediate erosion of the system due to parts being swapped (nozzles), not activating sensors Master valves, etc.

How do we encourage valuing the Design?

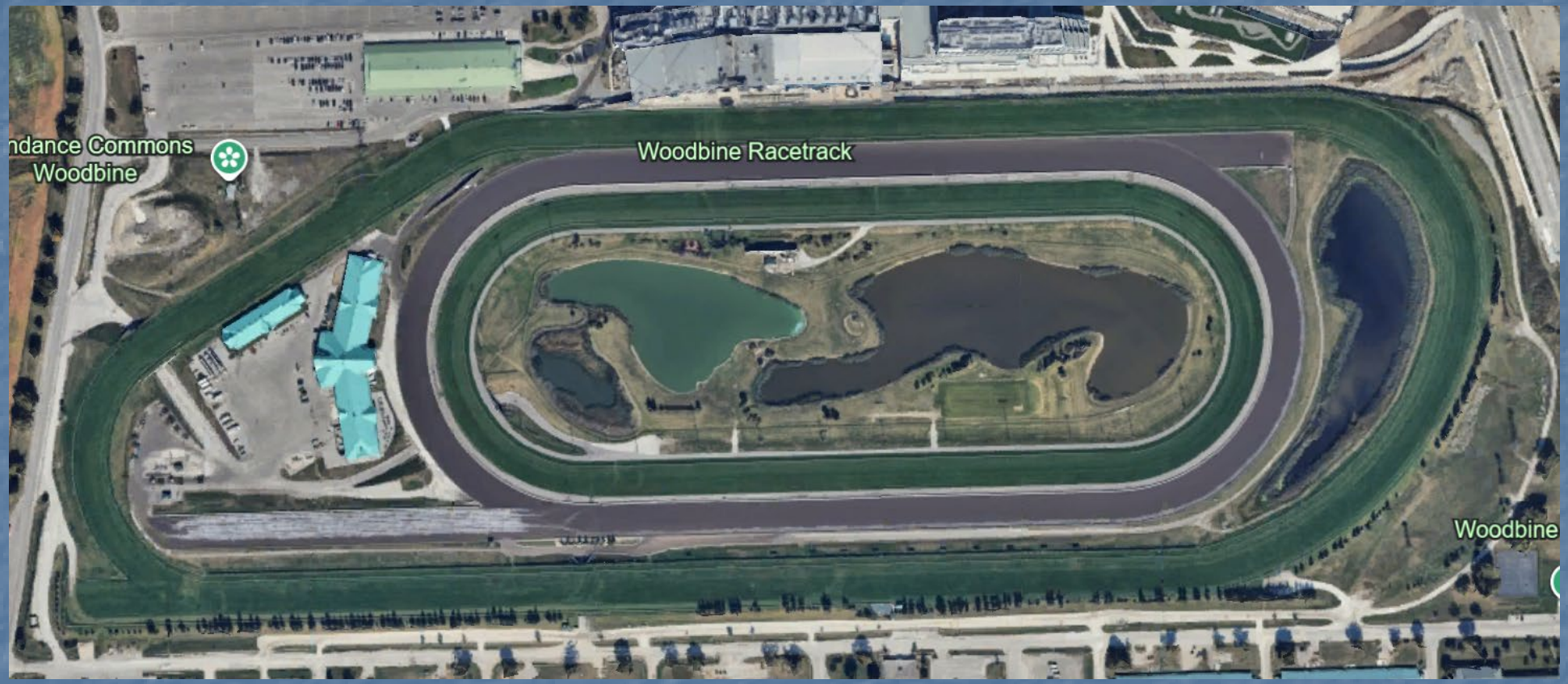
Lessons from the Field: Triumphs and Failures



Initial Mandate (eventual Absolute): Improve Track Consistency

Replacement plan for existing DR series sprinklers to improve distribution and provide more consistent irrigation applications

Woodbine Racetrack 2025



Initial Steps and Actions to Improve Track Consistency

- Maintain consistent pressure (ongoing)
- Reduce immense labour component required for daily irrigation allowing for site specific adjustments
- Improve fitting quality with simultaneously reducing stress fatigue on existing piping infrastructure to improve daily operation
- Maximize product awareness and migrate irrigation to targeted applications

Focus on Irrigation System as "Infrastructure"

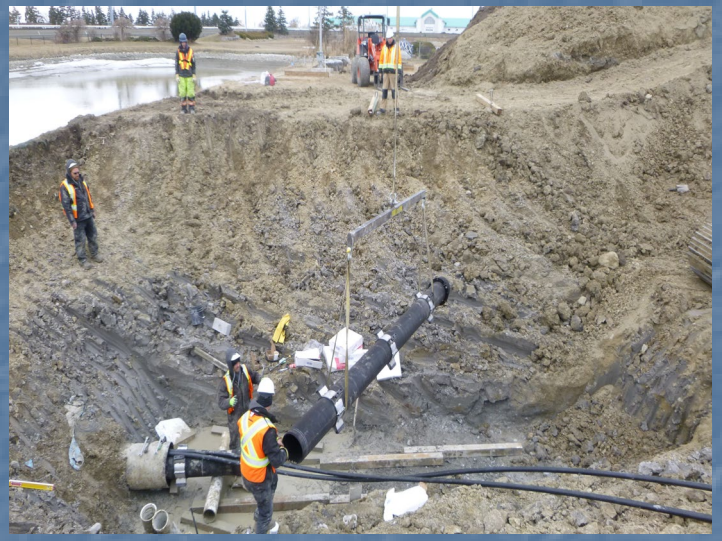
- Increased lifespan of system
- Improved daily performance and reliability
- Reduced downtime during peak irrigation timeframes
- Reduction in high-cost repairs
- Less disruption to Turf and Track

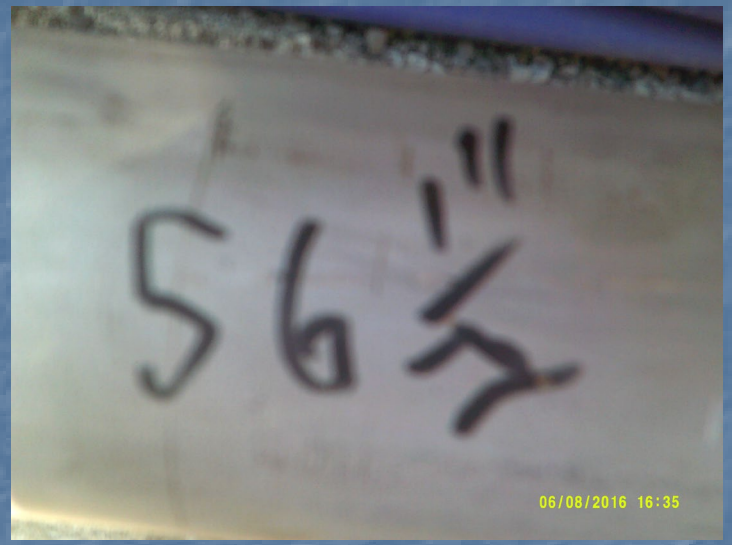
Failure was Continuously Deferring Costs

Lesson Learnt: Built to Last

Lesson Learnt: Built to Last

Lesson Learnt: Built to Last





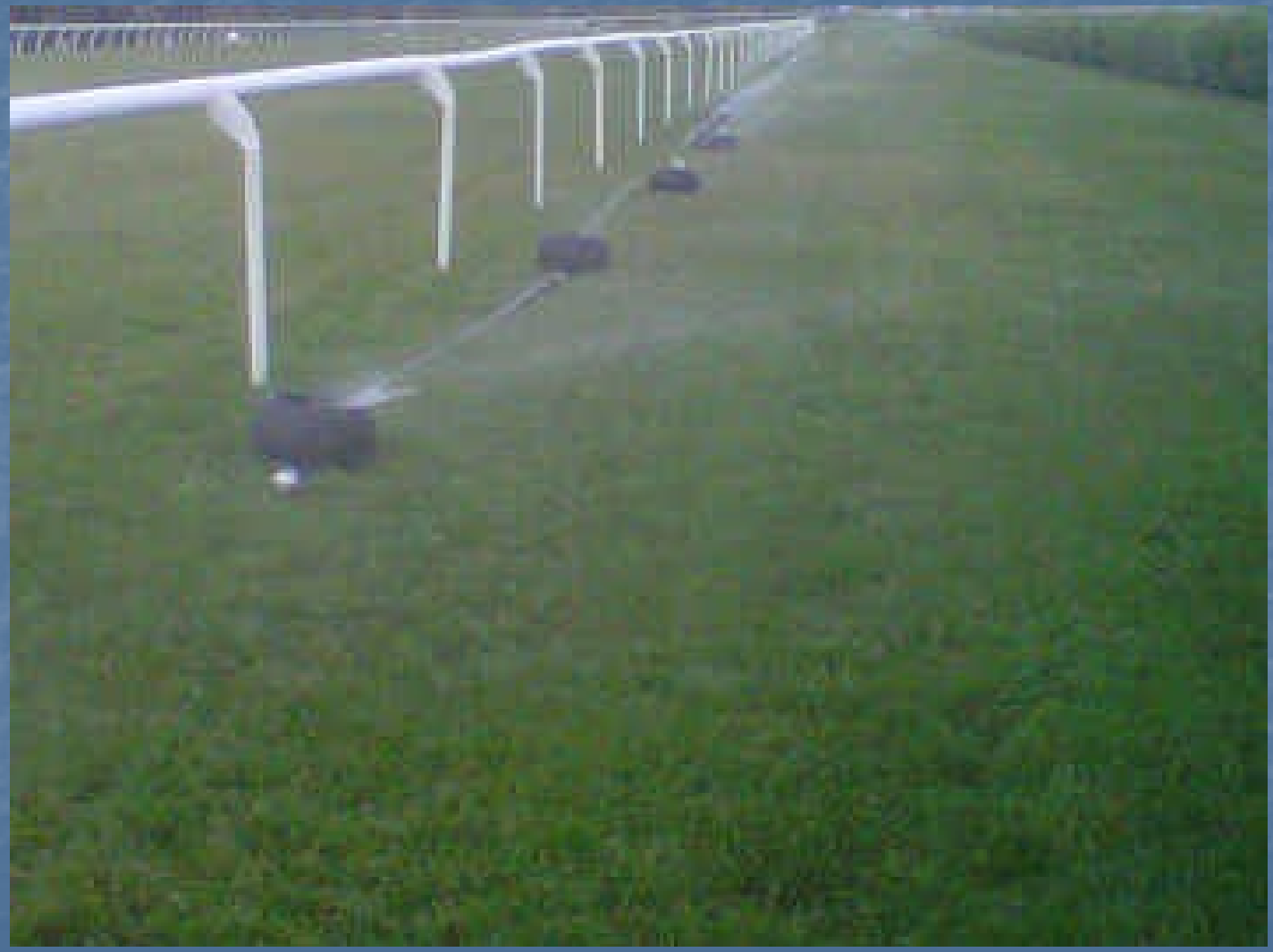
Infrastructure upgrades require planning for longevity as much as performance!

Woodbine – Removable Cannon

Woodbine – Low Volume Rail RB 351 Sprinklers

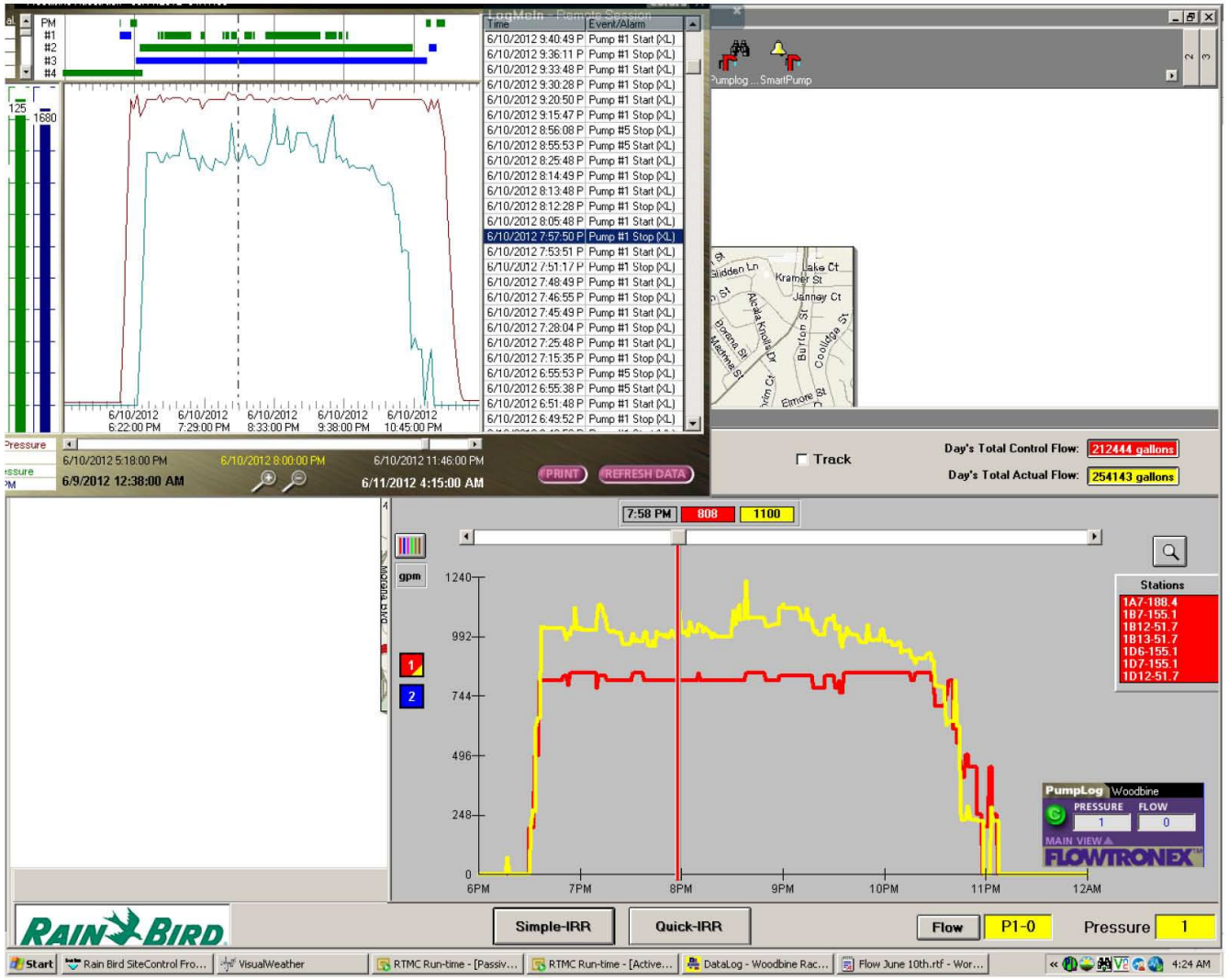
Woodbine – Low Volume Rail RB 351 Sprinklers

Woodbine – Movable Pod Irrigation



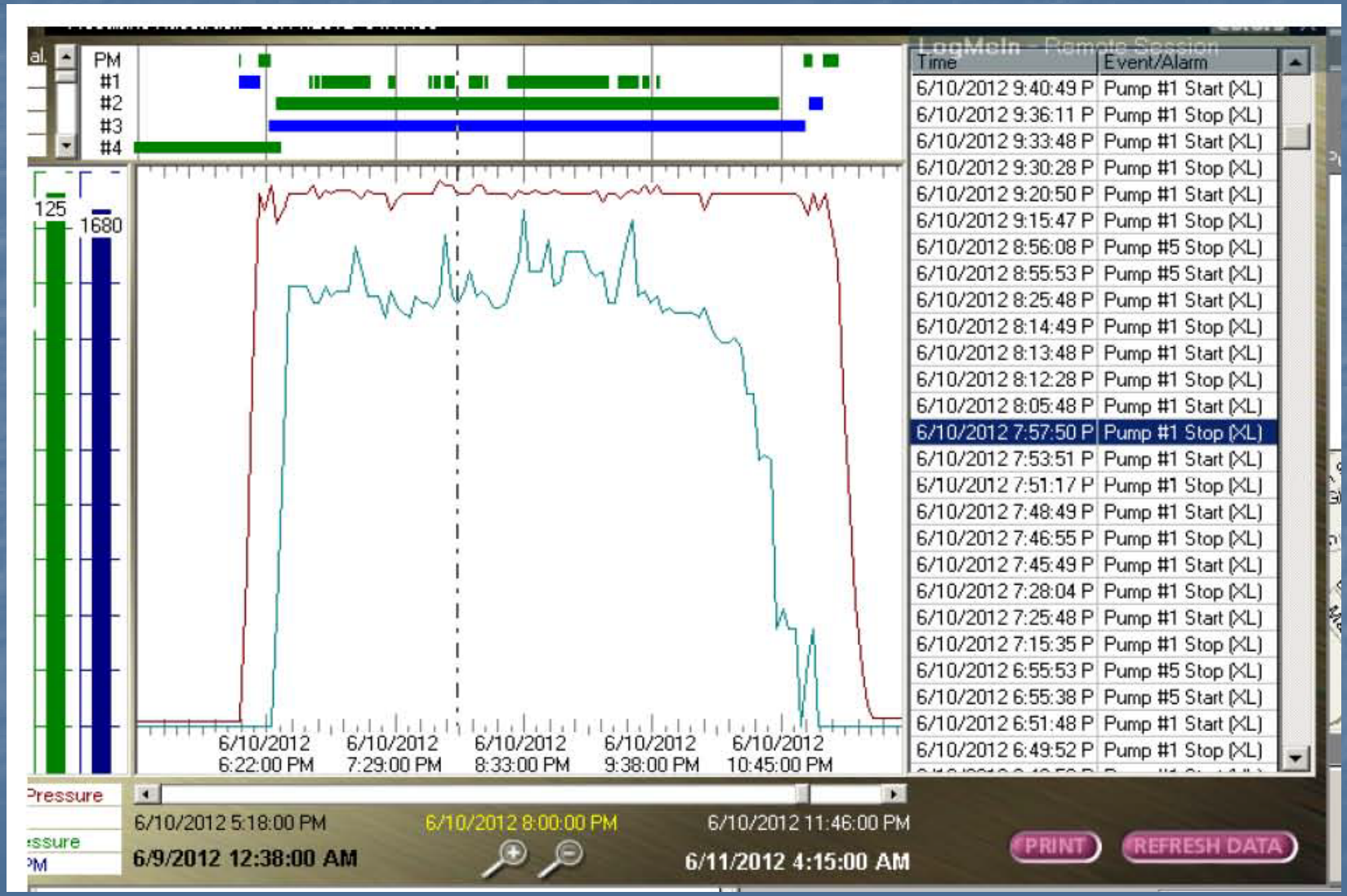
Woodbine – Movable Pod Irrigation

Woodbine Automatic Irrigation June 10/2012



Woodbine Automatic Irrigation June 10/2012

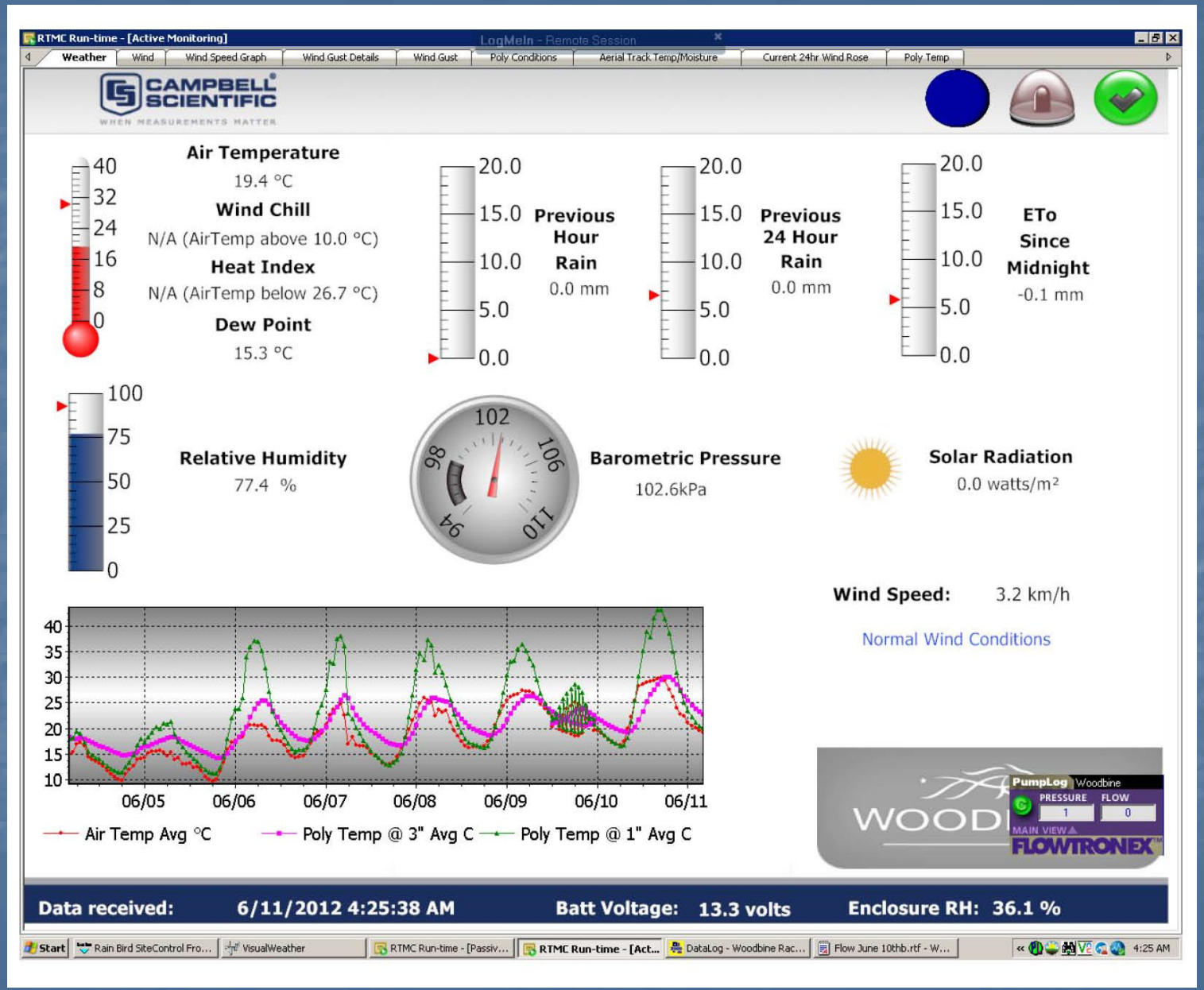
Woodbine Automatic Irrigation June 10/2012



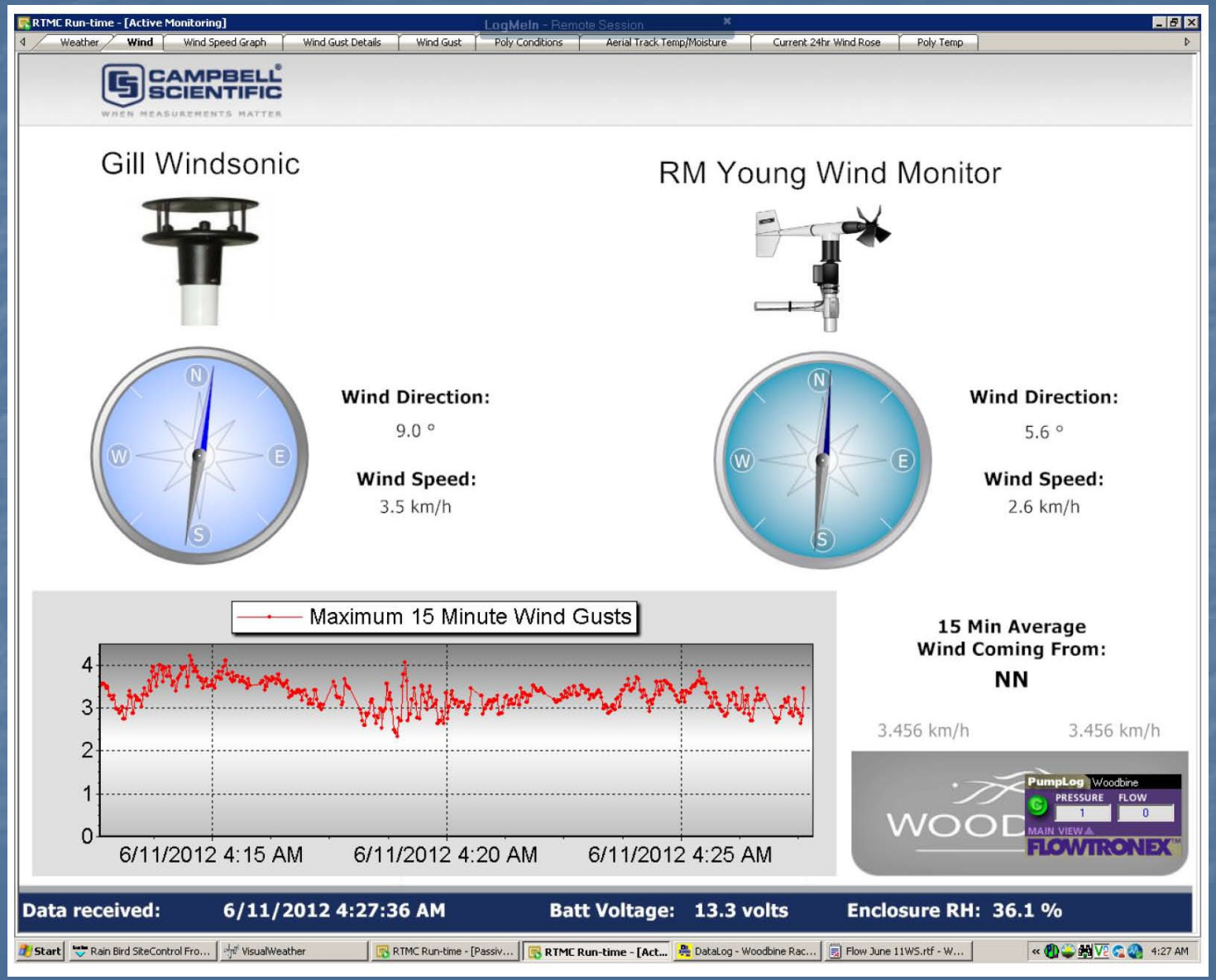
Woodbine Soil Moisture after irrigation June 10/2012

Woodbine – Weather Station Integration

Woodbine – Weather Station Integration



Woodbine – Weather Station Integration

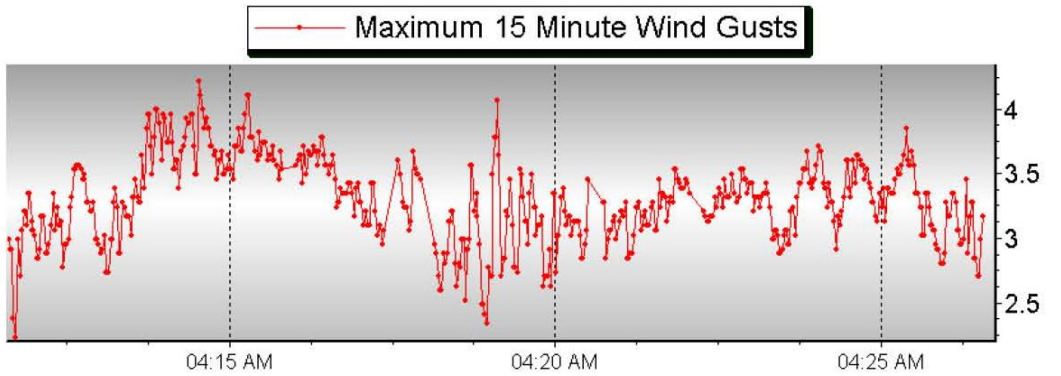


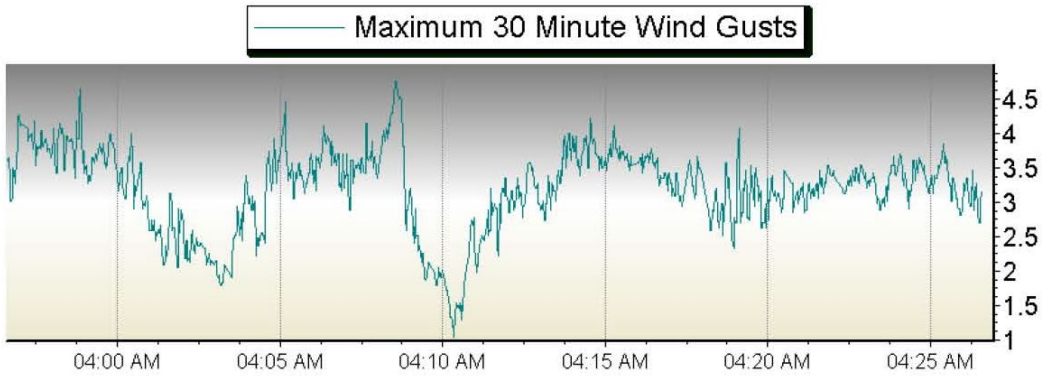
RTMC Run-time - [Active Monitoring]

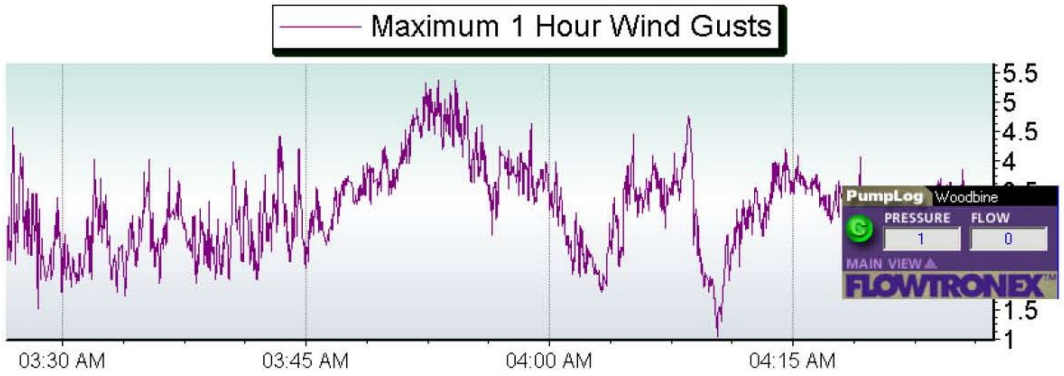
LogMeIn - Remote Session

Weather | Wind | Wind Speed Graph | **Wind Gust Details** | Wind Gust | Poly Conditions | Aerial Track Temp/Moisture | Current 24hr Wind Rose | Poly Temp

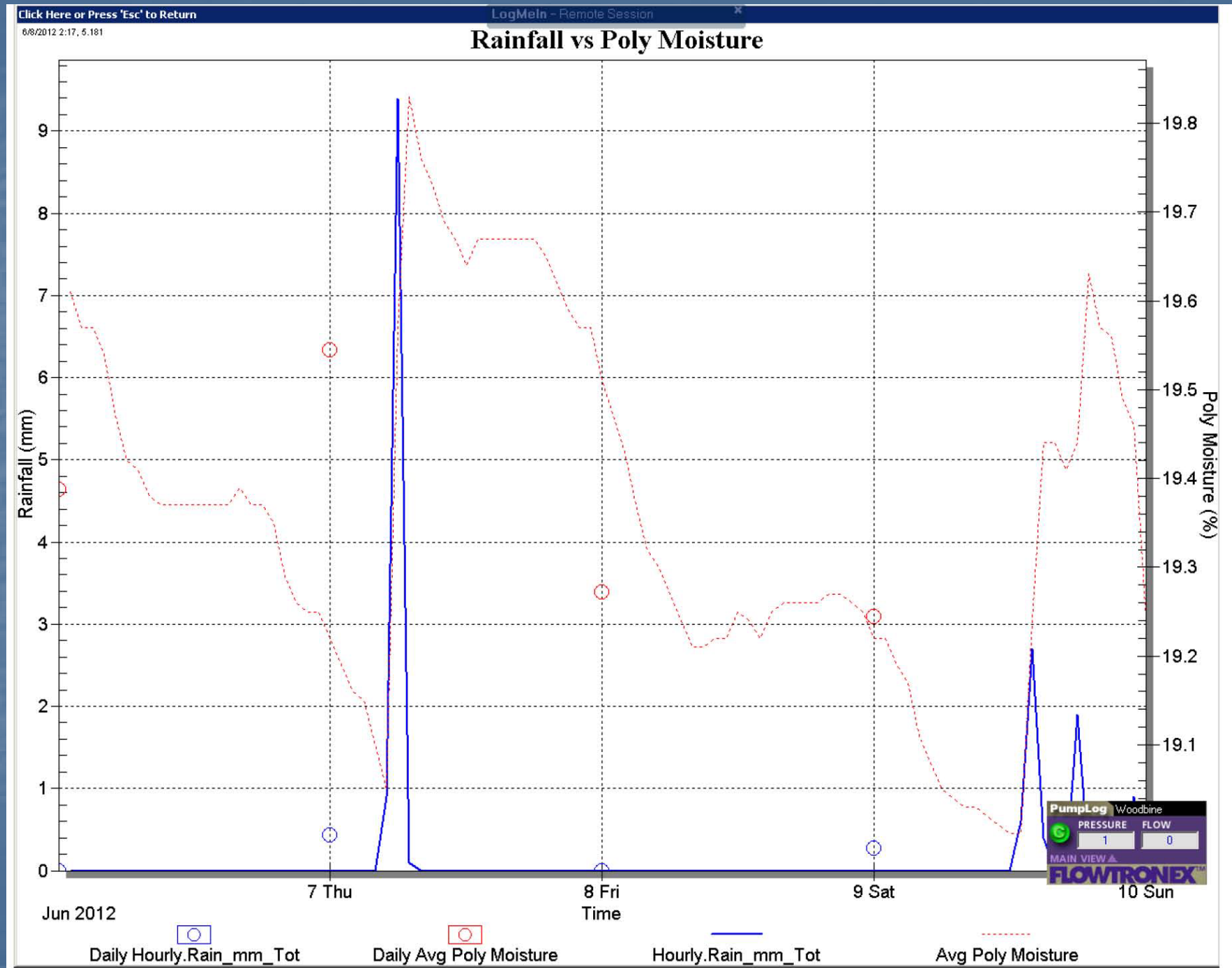
Timestamp	Gill WS km/hr
06/11 04:26:34 AM	3.17
06/11 04:26:32 AM	2.99
06/11 04:26:31 AM	2.70
06/11 04:26:29 AM	2.70
06/11 04:26:27 AM	2.84
06/11 04:26:26 AM	2.84
06/11 04:26:25 AM	3.28
06/11 04:26:24 AM	3.28
06/11 04:26:22 AM	3.17
06/11 04:26:20 AM	2.88
06/11 04:26:18 AM	3.46
06/11 04:26:16 AM	2.99
06/11 04:26:14 AM	2.95
06/11 04:26:13 AM	2.95
06/11 04:26:11 AM	3.06
06/11 04:26:10 AM	3.06
06/11 04:26:09 AM	3.28
06/11 04:26:07 AM	3.35
06/11 04:26:06 AM	3.35
06/11 04:26:03 AM	3.17
06/11 04:26:02 AM	3.17
06/11 04:26:00 AM	3.28
06/11 04:25:59 AM	2.88
06/11 04:25:57 AM	2.81
06/11 04:25:55 AM	2.81
06/11 04:25:53 AM	2.92
06/11 04:25:52 AM	2.92
06/11 04:25:50 AM	2.95
06/11 04:25:49 AM	3.06
06/11 04:25:48 AM	3.06
06/11 04:25:47 AM	3.10
06/11 04:25:46 AM	3.10
06/11 04:25:45 AM	3.24
06/11 04:25:43 AM	3.35
06/11 04:25:42 AM	3.35
06/11 04:25:41 AM	3.35







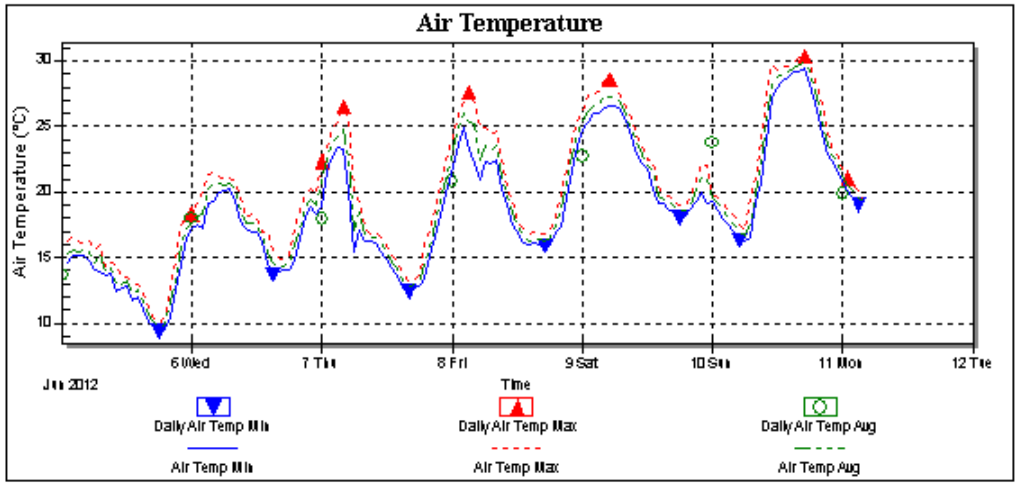
Start | Rain Bird SiteControl Fro... | VisualWeather | RTMC Run-time - [Passiv... | RTMC Run-time - [Act... | DataLog - Woodbine Rac... | Flow June 11weather.rtf... | 4:26 AM


Click Here or Press 'Esc' to Return
LogMeIn - Remote Session
6/8/2012 2:17, 5.181
Rainfall vs Poly Moisture
Rainfall (mm)
Poly Moisture (%)
0
1
2
3
4
5
6
7
8
9
19.1
19.2
19.3
19.4
19.5
19.6
19.7
19.8
7 Thu
8 Fri
9 Sat
10 Sun
Jun 2012
Time
PumpLog Woodbine
PRESSURE
FLOW
1
0
MAIN VIEW
FLOWTRONEX
Daily Hourly.Rain_mm_Tot
Daily Avg Poly Moisture
Hourly.Rain_mm_Tot
Avg Poly Moisture

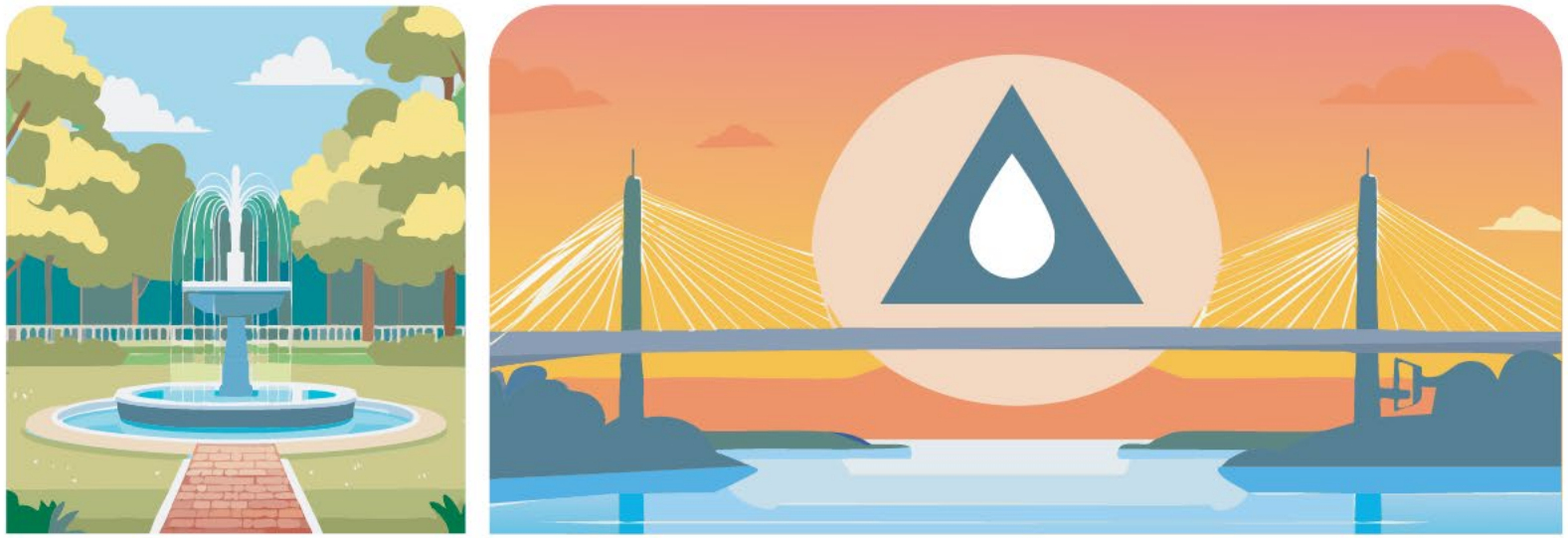
Woodbine – Weather Station Integration

Weather Station: Woodbine

Location: East End Poly Track
Report Type: 7 Day
Created: Monday, June 11, 2012 4:39 AM
Report Period: Tuesday, June 05, 2012 - Monday, June 11, 2012



Date	Air Temp Min (°C)	Air Temp Max (°C)	Air Temp Avg (°C)
6/5/2012	9.46	18.34	13.65
6/6/2012	13.74	22.32	18.00
6/7/2012	12.39	26.47	17.88
6/8/2012	15.91	27.60	20.80
6/9/2012	18.05	28.55	22.69
6/10/2012	16.33	30.35	23.74
6/11/2012	19.04	21.10	19.85
Low	9.46	18.34	13.65
High	19.04	30.35	23.74
Average	14.99	24.96	19.52
Std Dev	3.10	4.09	3.14



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Training Insights & Field Demos:

Bridging Strategy with Practice

INTRODUCTION

- As Irrigation Consultants we are all well versed in the theory of irrigation design. We know how to layout sprinklers and calculate friction losses and velocities in our head - while we are sleeping.
- We can go on a site and tell when sprinkler spacings are incorrect, the wrong nozzles are installed or a product was substituted or the installation not per the Specifications and Drawings.
- Unless we have had practical Contractor or installation experience, we are less knowledgeable about how things should be installed, especially once in the ground.

INTRODUCTION (cont.)

- Today, we will have four hands on practical presentations/demonstrations on different aspects of commonly installed mechanical components used in irrigation systems.
- Although some of this will be “means and methods” which we cannot dictate, the presentations will provide you with a better understanding of how the processes are undertaken and improve your ability to:
  - Properly specify
  - Require appropriate testing
  - Recognize proper versus improper installation/procedures

TOPICS

- Pre-Construction Ground Surveys (Inside)
  - Advantages of performing a pre-construction grounding survey prior to the start of an irrigation project
  - Serge Gauthier, Global Specifications Manager, Rain Bird
- Wire Connectors
  - Slicing do’s and do not’s
  - Explaining the characteristics of new and old wire connectors
  - Jimmy White Sales and Marketing Director, Regency Wire & Cable
  - Duane Smith, Innovator

TOPICS (cont.)

- HDPE Welding
  - Butt fusion welding demonstration
  - Lindsay Graham, Director of Irrigation Sales, ISCO
- Electrical Control Panels
  - Explanation of components and their purpose
  - Electrical safety and hazards
  - John Murtaugh, Vice President – Water Products, MCI Flowtronex and Water Equipment Technologies

PROCESS

- You have all been “randomly” assigned a number from 1 to 3 on the back of your badge. That’s your group.
- Following the grounding presentation indoors, we will break up into those groups, outside in Madison Square.
- Each group will spend approximately 20 minutes at each presenters station before moving on to the next. You will be signaled by the sound of the bell when it is time to rotate. Start:
  - Group #1 – Wire Connectors
  - Group #2 – HDPE Welding
  - Group #3 - Electrical Safety and Hazards

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Pre-Construction Grounding Surveys

The CliffsNotes version!

PCGS – What are they?

- These are grounding surveys conducted before the actual project starts.

- Not to be confused with testing resistance at grounding locations after install.

PCGS – Why conduct them?

- The intent of this practice is to:
  - Soil conductivity is nearly impossible to predict
  - Helps in selecting the best grounding method.
  - Prevention of Extras.
  - Blanket grounding recommendations may be inadequate

PCGS – When conduct them?

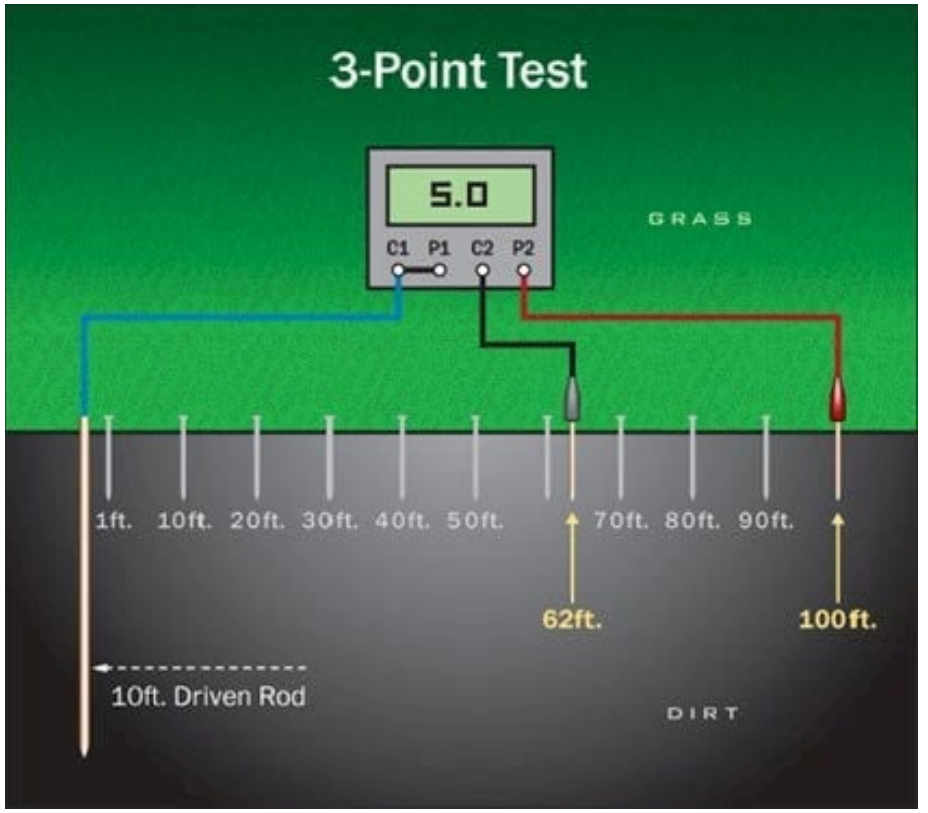
- The sooner the better!
  - Before the main project starts - allows to clarify the preferred grounding method.
  - After contractor selection
  - Helps predict seasonal variances

PCGS – Where?

- 3 - 4 sites
- Represents overall condition of the site
- Location that could be incorporated into your design?
- Irrigated or non-irrigated area?

PCGS – How?

- Tests must be done using a fall-of-potential meter
- A “clamp meter” style unit cannot be used
- Best to test after some time (1-2 weeks after install)



PCGS – In your Specifications?

- Should be considered a “Best Practice”
- Represents overall condition of the site
- Location that could be incorporated into your design?
- Irrigated or non-irrigated area?

“A pre-installation grounding survey shall be conducted by the contractor right after the project is awarded. This survey shall be done at least 4 weeks prior to the start of construction. The location of the test sites (3-4) will be determined by the consultant. The test results of the resistance-to-ground conducted by a three-point fall-of-potential ground testing unit shall include what type of grounding electrode (including dimensions) was used for each location.”