ACLP II
ADVANCED ARIZONA CERTIFIED LANDSCAPE PROFESSIONAL

Irrigation Tech II

TROUBLESHOOTING IRRIGATION DESIGN

Purpose of Irrigation

- To deliver water to plants that would not naturally survive on rainfall alone
- Efficiently distribute water to plants that maintains plant health

The Art and Science of Water Management
Water management can be as simple as turning the water off, but maximizing the potential of a landscape while reducing its water use can be complex. The correct amount of water can be quantified — it is science-based. Proper management, however, is both a science and an art. A skilled water manager has in-depth knowledge of multiple disciplines and may utilize advanced technology to improve water use efficiency.

Design Integrity

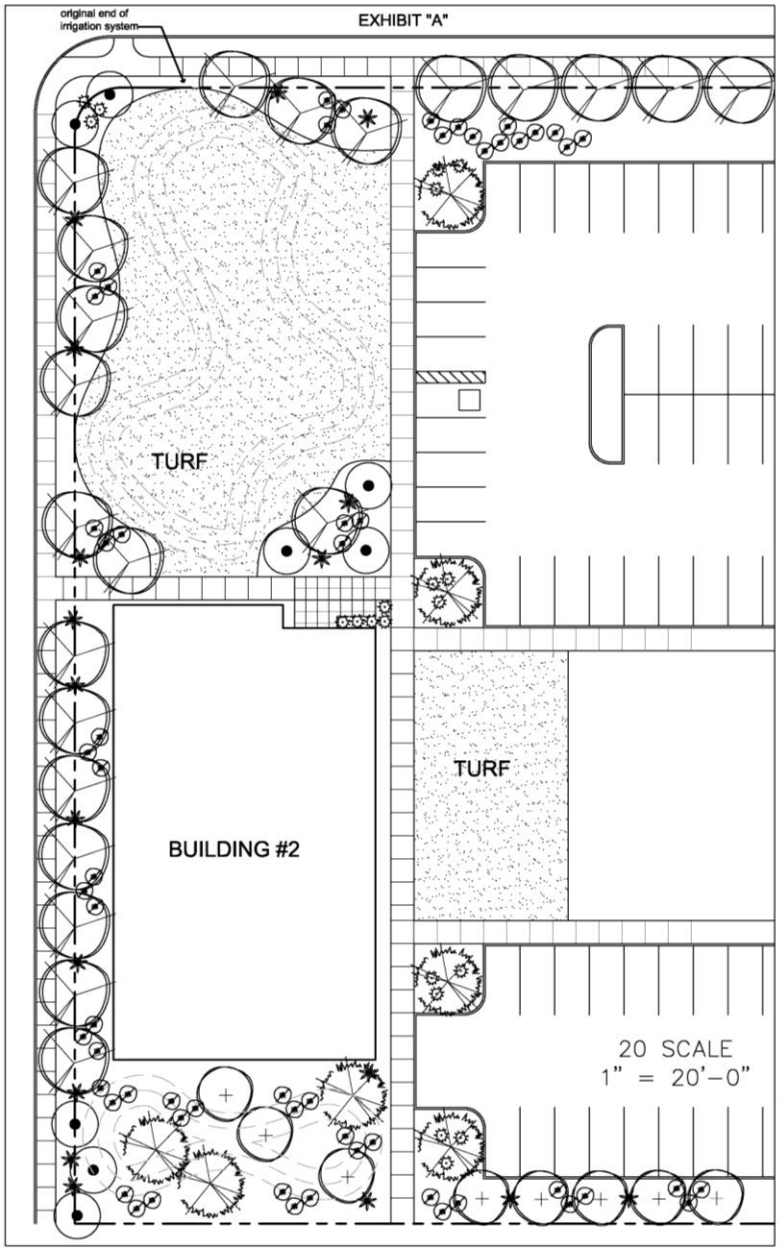
- Irrigation systems should be installed to efficiently deliver water to landscape
- Irrigation system should be installed according to irrigation design specifications
- Irrigation system should be managed to maintain a healthy and functional landscape while conserving and protecting water resources

Design Process

Primary Considerations

- Type of landscape i.e. emitter or turf, type of plant materials
- Available source of water i.e. domestic/reclaimed
- Pressure and line size available for system
- Existing and proposed grade on site
- Location of water and power on site
- Budget for installation and maintenance
- On site conditions – soil, hardscape, route for pipe runs and placement of equipment

Lets look at landscape plans



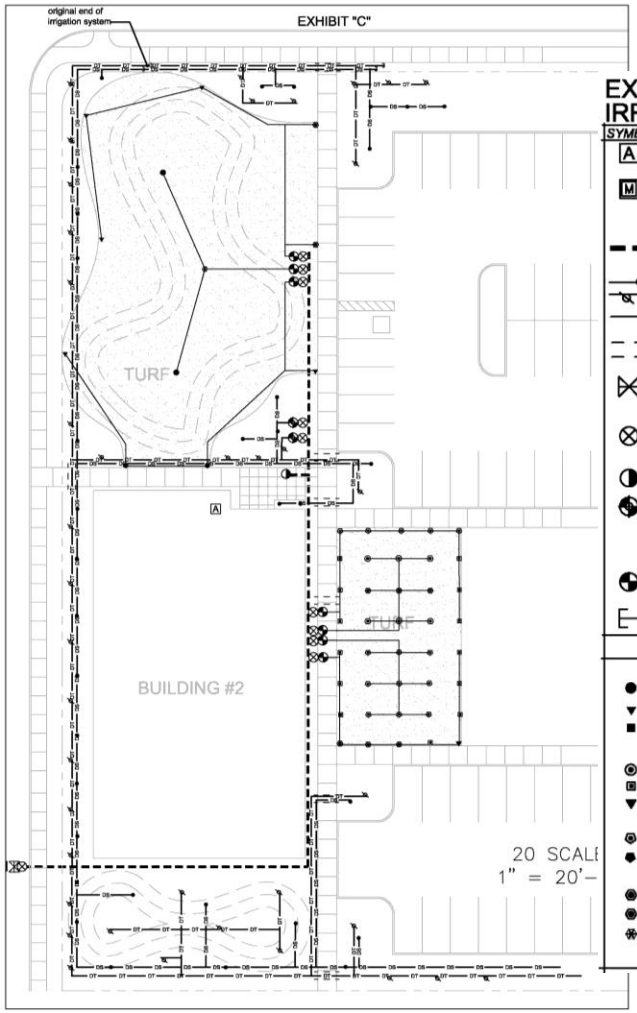


EXHIBIT "D"
IRRIGATION SCHEDULE

SYMBOL	DESCRIPTION
A	CONTROLLER: PEDESTAL MOUNTED.
M	1" WATER METER: FIELD VERIFY ACTUAL SIZE AND LOCATIONS PRIOR TO START OF CONSTRUCTION. PRESSURE AT POINT OF CONNECTION = 50 PSI
	SCH. 40 PVC: 1-1/2" MAINLINE
	1/2" POLY TUBE LATERAL
	1" CLASS 200 MIN PVC TURF LATERAL
	SLEEVES: UNDER PAVED AREAS FOR ALL IRRIGATION LINES.
	1" REDUCED PRESSURE BACKFLOW PREVENTOR: FEBCO MODEL 825 YA - SAME SIZE AS METER
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	QUICK COUPLER
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The Management-Maintenance Connection

- Proactive system maintenance will ensure the integrity of the irrigation system
- Adjustments and enhancements as the landscape matures, meeting the design intent for the landscape
- Maintenance and repairs shall be supported by site management objectives
- Qualified individuals should perform objectives

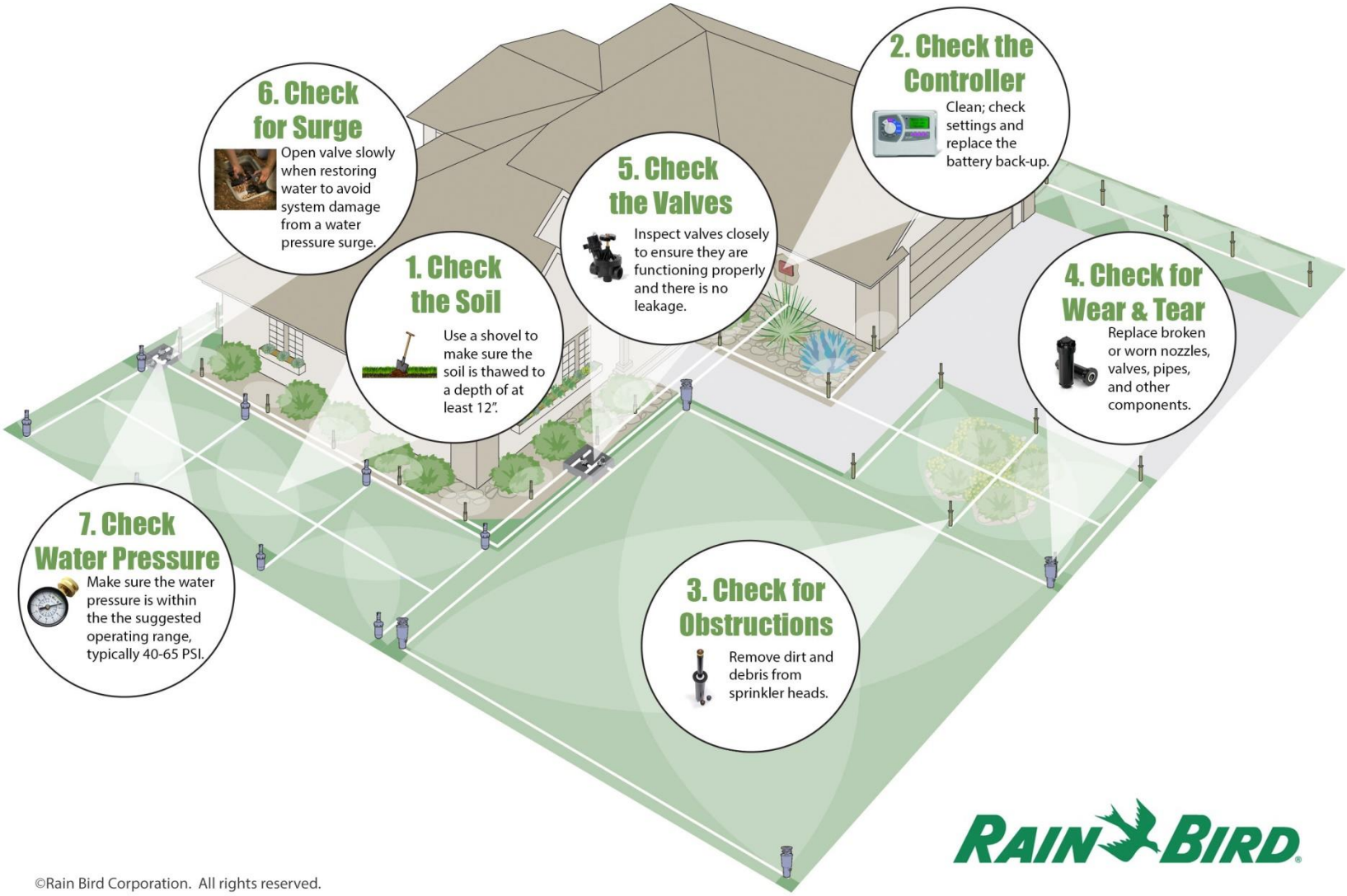
Irrigation.org

Joint Effort

- **Designer's responsibility**
  - property investigation
  - design a functional system
  - meet needs of both the plants and the client
- **Installer's responsibility**
  - install system as specified
  - address any design concerns early in the process
  - make adjustments to installation as required
- **Irrigation Tech's responsibility**
  - maintain the system
  - replace components with specified products as needed
  - closely monitor the water management to best meet the plant's health care needs

When the design doesn’t work

Ongoing Maintenance



CONTRACTOR CHECKLIST

INITIAL CONSULTATION:

- [ ] Pre-walkthrough interview of property owner to understand their needs and capture their observations
- [ ] Conduct a walkthrough looking for obvious issues in the landscape prior to activating any zones

SPRINKLERS:

- [ ] Spacing: Proper nozzles are installed; provide head-to-head coverage
- [ ] MPR: Nozzles in the sprinklers provide MPR or are zoned correctly to provide MPR
- [ ] Leakage/Wear: Inspected the seals and the nozzles for chipping, cracking, and breakage
- [ ] Clogs: Inspected nozzles and screens for clogs
- [ ] Adjustment: Proper orientation on landscape; no water on hardscape/building
- [ ] Nozzle size: Correct nozzle sizes are being used for the area
- [ ] Pressure: Proper for sprinkler/emitter/and valves
- [ ] Proper grade: Not too high or low
- [ ] Low Head Drainage: Check valve in head; in-line check valve
- [ ] Nozzle Performance: Even distribution; proper distance

VALVES:

- [ ] Point of Connection: Located and inspected
- [ ] Worn/Leaking Diaphragm: Inspected for proper closure
- [ ] Electrical Connections/Solenoid: Inspected connections and electrical components
- [ ] Proper Flow Control Setting: If needed, adjusted flow control to improve performance
- [ ] Manual Operation: Tested manual opening and closing abilities
- [ ] Automatic Operation: Tested electrical opening and closing abilities

CONTROLLER:

- [ ] Checked and adjusted run times
- [ ] Checked and adjusted start times
- [ ] Checked and adjusted water days
- [ ] Proper Manual Operation: Controller functioned in manual mode
- [ ] Proper Automatic Operation: Controller functioned in automatic mode
- [ ] Sensor Operation: Inspected location and proper connections

COMPANY INFORMATION:

WHAT HAPPENS WHEN INTEGRITY IS LOST?

Landscape Specifications

Lets take a look at specs

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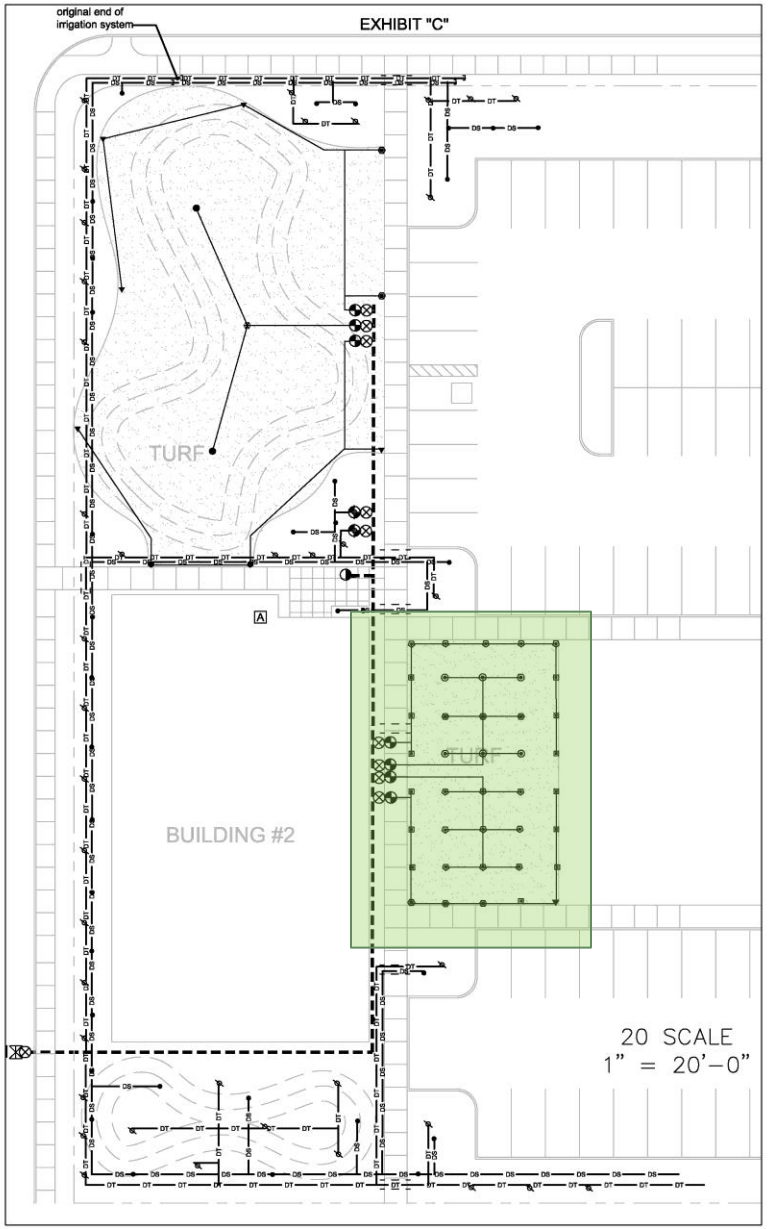


Scenario #1

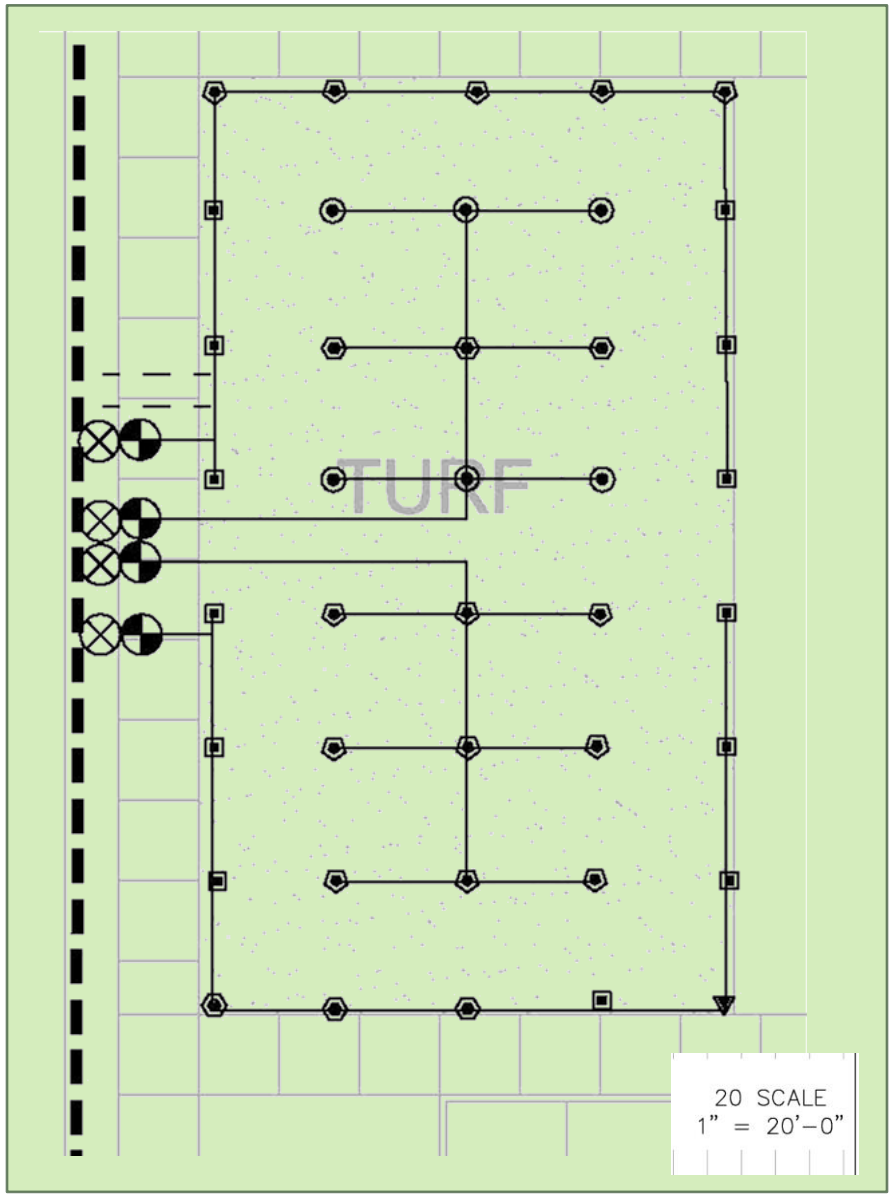
Installation Date: July 2011

For the last five years, various landscape maintenance companies have performed head replacements and made repairs as needed. Currently there is a mix of various rotors and pop-ups. After maintaining the property for two weeks and investigating the irrigation system, you know something is not right. Some areas of the turf look great, while other areas are often soggy or are just not growing.

Assignment #1

Determine:

- Why you are seeing these varying turf conditions
- Offer possible solutions for this problem



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Landscape Specifications

Lets take a look at specs again

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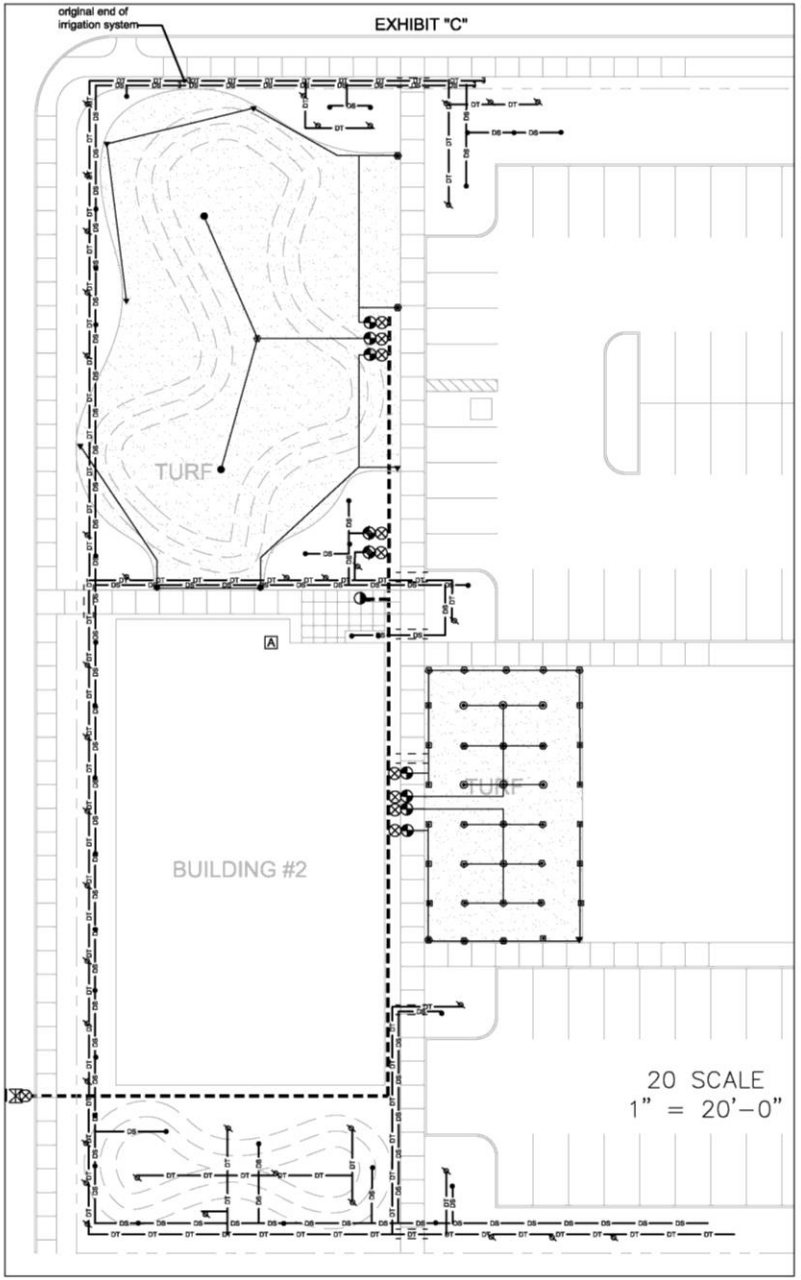
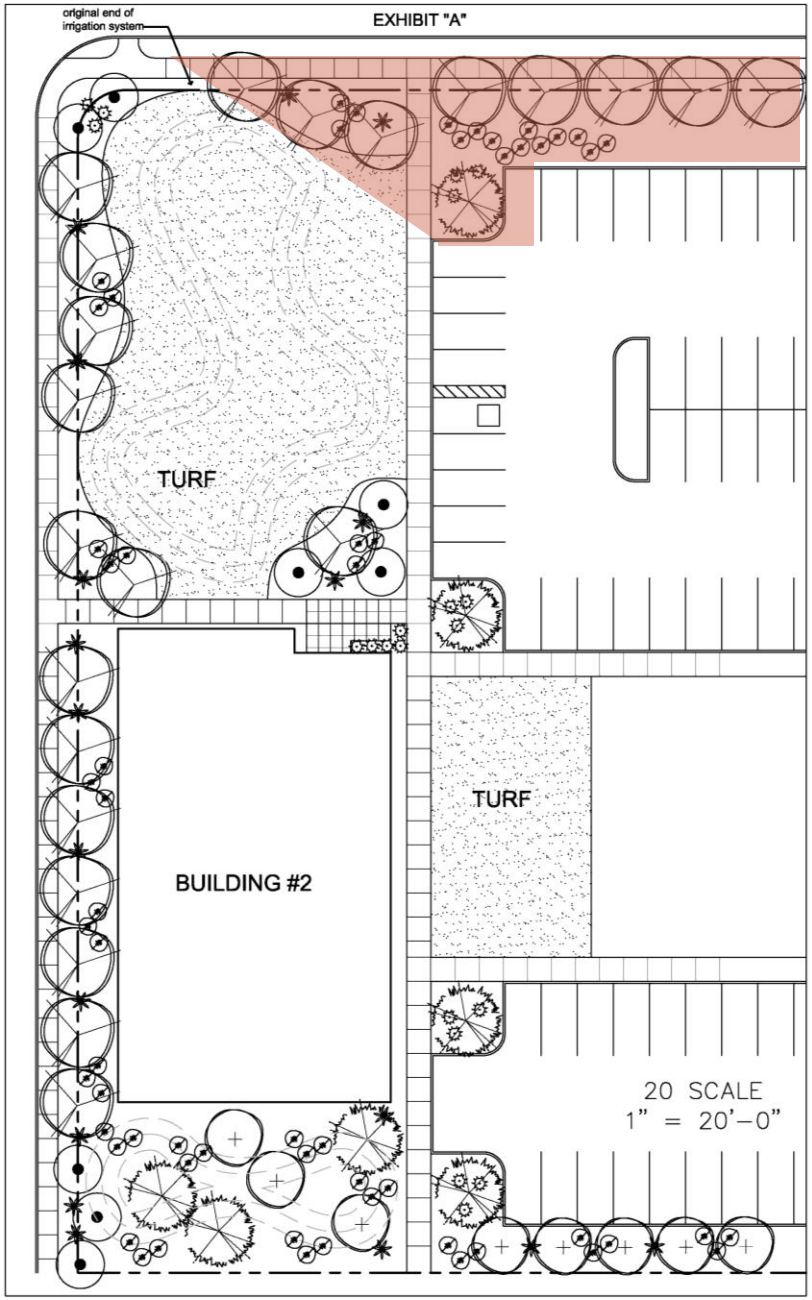


Scenario #2

Drip System

Installation Date: July 2001

A few years after installation, the property owner wanted to add a few more trees and plants to the northeastern side of the property, along the road. The last landscape maintenance company extended the irrigation line from the end cap (labeled 'original end of line' on plans). Trees in the newly installed area have not grown, in fact, they are yellowing, show dwarfed foliage and appear stressed.

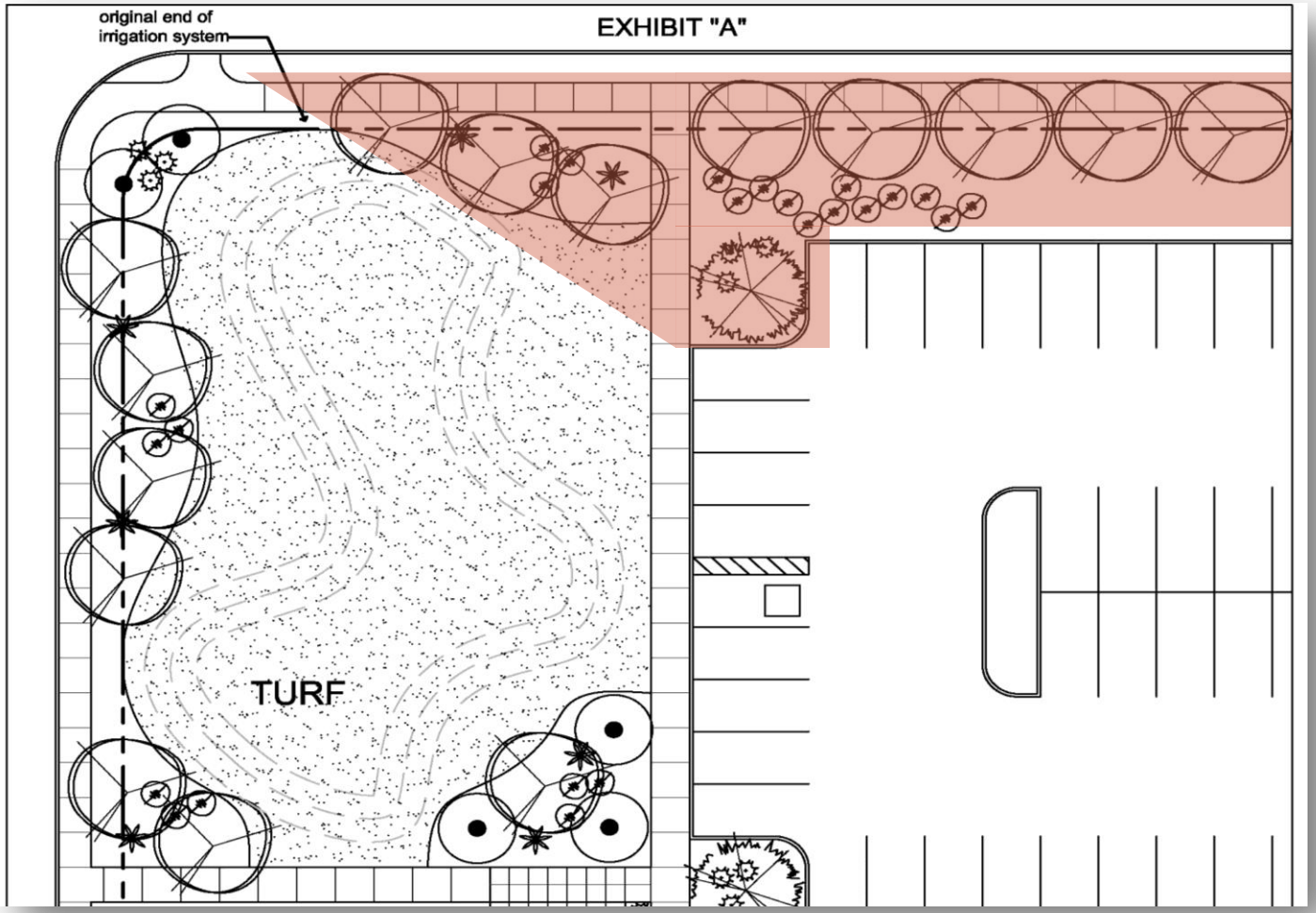


Assignment #2

Determine:

- Why trees are stressed
- Offer possible solutions and share with the other teams

What are your options for correcting this situation?

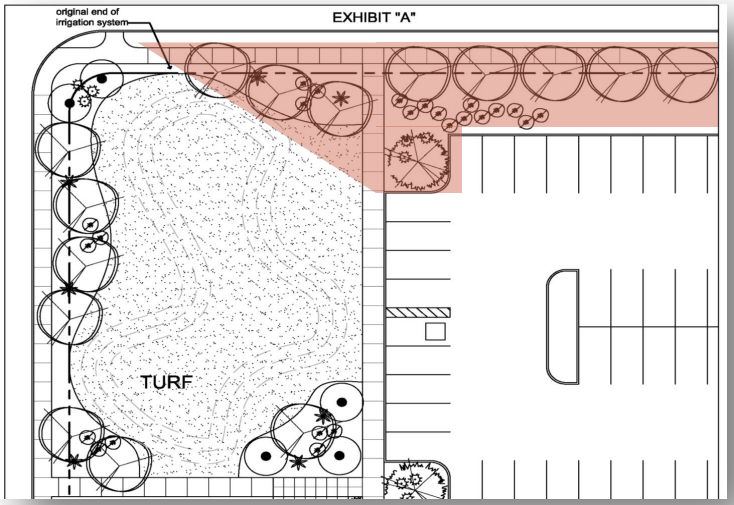


What are your options for correcting this situation?

Evaluate Site Conditions:

Irrigation System

- Lack of water reaching new plantings due to:
  - Size and length of pipe
  - Inadequate pressure for the run length of pipe
  - Capacity for pipe/valve is reached due to number of plants already on system
  - Arrangement of system i.e. trees and shrubs on same valve causing system to be in excess of capacity
  - Damage to pipe (pinch) along the run which affects flow through the pipe
  - Malfunctioning or undersized valve
  - Improperly operating or programmed controller
  - There is a break or leak in the pipe
  - Emitters are open too much (if adjustable) or are missing



Site/Microclimate Conditions

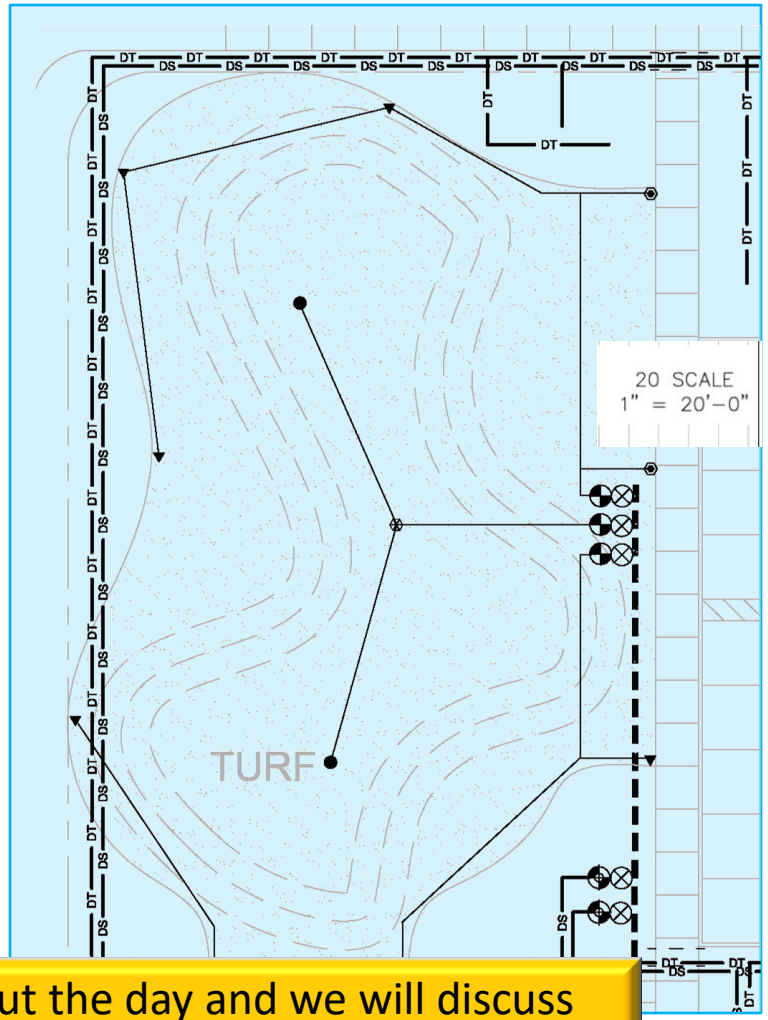
- Soil condition
- Slopes on site affect water flow
- Changes by others contractors which may have affected the irrigation system
- Appropriate conditions (light, shade, temperature, reflectivity) for plants added

After determining your recommendation, discuss how different options may be influenced by your client's budget.

Scenario & Assignment #3: *Homework*

Turf Retention:

1. Please select the appropriate sprinkler heads for this area, using the provided Toro product guide.
2. Explain why you made this selection of nozzle type.



Work on your answer throughout the day and we will discuss your recommendations at the end of the day with the class.

Special Thanks To:

- Kim Kleski, Kleski & Associates
- Brian Whitcher, The Toro Company
- Scott Cosgrove, Desert Classic
- Janet Waibel, Waibel & Associates Landscape Architecture

Who collaborated to make this class possible.