Pipe

Pipe is a conduit that is used to carry water.
Polyvinyl Chloride (PVC) Pipe Types:
- Schedule 80
- Schedule 40
- Class 200
- Class 315

Other Pipe Types:
- Type K Hard Copper
- Black Steel
Common Components of an Irrigation System

Pipe Runs:
- Mainline
- Submain
- Lateral
Common Components of an Irrigation System

Flow Sensor
A flow sensor is a small, mechanical device that measures the flow of water through a particular point in a pipe.
Common Components of an Irrigation System

Flow Monitor
The monitor is an instrument that is used to report the flow of water from an electronic signal that it receives from the flow sensor. This information is passed onto the Irrigation Controller.
Common Components of an Irrigation System

Pressure Regulators

A pressure regulator is a device used to reduce the inlet pressure of water in an irrigation pipe.
Common Components of an Irrigation System

**Pressure Regulator Types:**

- Pre-Set
- Adjustable
Common Components of an Irrigation System

- Pre-Set Regulator
- Schrader Valve
Common Components of an Irrigation System

Adjustable regulator
Common Components of an Irrigation System

Flush End Cap

A flush end cap is a mechanism located at the end of each lateral line and is used to manually flush each lateral line in the system.
Common Components of an Irrigation System

Methods of Delivery

There are 3 ways water is sent to where it's needed by a Sprinkler, Bubbler, and Drip Irrigation Systems.
Types of Irrigation Systems

Sprinkler

A sprinkler is a mechanical device that is used to spray water over turf and/or ground cover areas.
Types of Irrigation Systems

**Sprinkler Types:**
- Spray Head
- Gear-Driven Rotor
- Impact Sprinkler
Types of Irrigation Systems

Spray Head
Types of Irrigation Systems

Gear-Driven Rotor
Types of Irrigation Systems

Impact Sprinkler
Types of Irrigation Systems

*Bubbler Types:*

- Adjustable
- Pressure Compensating
Types of Irrigation Systems

**Bubbler**

Bubblers also apply water at exact locations, but do so at faster flow rates than emitters: bubblers deliver water in gallons per minute (GPM) as opposed to drip which is in gallons per hour (GPH).
Types of Irrigation Systems

Adjustable Bubbler
Types of Irrigation Systems

Pressure Compensating Bubbler
Types of Irrigation Systems

Drip

*Drip* Irrigation Systems apply water at precise locations with low pressure and flow rates to avoid ponding, puddling, or runoff.
Types of Irrigation Systems

ADOT Preference:

*Drip Irrigation* is the preferred method of irrigation for ADOT landscapes, because it applies water at a rate that is more efficient for a desert climate.
Drip Irrigation

• Construction Requirements

The inspector should inspect all components to ensure all are installed as specified on the details and in the Special Provisions and that everything is set to grade, as specified.
Drip Irrigation

Submittal Reviews

The contractor shall submit product in formation sheets of all material to be used for the irrigation system with the following items highlighted:

- Sizes
- Specifications
- Manufacturer Name
- Instructions
- Model Number
- Design Data
- Options Specified in Contract Documents
**Blue Stake**

*Blue Stake is a service that marks the locations of all public utilities. The contractor is required to Blue Stake a working area before construction starts.*
Drip Irrigation

DRIP SYSTEM LAYOUT
Inspector Should Verify -

• Pipe Trench Location
• Irrigation System Component Locations and Conflicts
• Drip Emitter Placement
• Drip Emission Points
DRIP EMITTERS
Drip Irrigation

- Trench and
- Pipe
Installation
SOLVENT WELDING
PRESSURE TESTING PIPE
Backflow Preventer Installation Inspection

1. The backflow preventer is located as close to the water meter as possible
2. The contractor shall not use potable water from a source before a BPU is installed and tested.
3. Testing of the BPU must take place at the site with the unit installed by a certified tester and at a minimum of once per year during maintenance.
4. The inspector is responsible to collect copies of the certified test results.
5. The inspector should always check a BPU that appears to be leaking. It will need to be repaired and re-tested.
6. Colder areas of the state require insulation of the BPU.
Drip Irrigation

- Isolation Valves
Drip Irrigation

- Remote Control Valves
Installation Details

• Component Installation Detail
  • Clearances both top and bottom
  • Gravel sumps underneath
  • Depth of sump
  • Pen-tite Sealer to protect wire connections
  • Ball valve for isolation
  • Height of valve box above finished grade
  • Correct identification tag
  • Schraeder valve has been installed
Drip Irrigation

- Controllers
Drip Irrigation

- Screen Filter
Drip Irrigation

- Pressure Regulators
Drip Irrigation

• Emitters
  An emitter is a device used to regulate the amount of water, in gallons per hour (GPH) that will be delivered to a specific plant.
Drip Irrigation

Emitter head variations
- Pressure Compensating
- Non-Pressure Compensating
Drip Irrigation

• **Pressure Compensating Emitters**
A pressure compensating emitter has the same output gallonage regardless of the inlet pressure. This means you are assured of the same output at both the beginning and end of the emitter lateral, with an inlet pressure range of 15 to 50 psi.
Drip Irrigation

Non Pressure Compensating Emitters

Non-pressure compensating emitters are emitters that, as the inlet pressure rises, the output gallonage also rises.
Drip Irrigation
Emitters

- Single Outlet
- Multi-Outlet
- In-line *Emitters*
- Micro-Spray
Drip Irrigation
Emitter Locations
EXERCISE 3

- Identify the items in the following photos
Drip Irrigation

• **Method of Measurement & Basis of Payment**
  
  – Each
  – Linear Foot
  – Lump Sum

  Paid in the same manner that they are measured.
Level One - Summary

• Irrigation Training, Level One:
  – How an irrigation system works
  – Components of an irrigation system, i.e., backflow preventer, low pressure/volume system and why we irrigation in the desert
  – How to inspect an ADOT drip irrigation system
  – Applicable sections of Construction Manual and Standard Specifications
Assessment
(Final Test)