



Assist with pressurised irrigation operations

AHCIRG217

By the end of this topic, you should be able to:

- Prepare for work
- Install irrigation components
- Complete installation activities
- Carry out start up and shutdown procedures as directed
- Assist with system maintenance

What is an irrigation system?

- An irrigation system is a system of components which supplies and distributes water
 - Water supplies may include: Underground, mains and surface storage
- Systems range from manual operation and monitoring to fully automated with computer control and monitoring
 - Two basic types of irrigation controls are electric and hydraulic
 - Irrigation controllers most commonly set the following:
 - Start time of watering
 - Duration of watering
 - Frequency of watering

What is an irrigation system?

- A pressurised irrigation system consists of many components, including:

Equipment	Definition
Drip tape	Water distribution system that operates at very low pressure.
Emitter	Two main types: Allow water to seep into the root zone or direct water into the air. Includes pop-up sprinklers.
Filter	Removes debris from systems.
Fittings	Used to join pipes together. Poly fittings have barbed ends which are pushed into the pipes to connect them together.
Gate valve	Used primarily as a shut-off valve, as opposed to flow control.
Master valve	Ensures that at the end of the watering cycle the water is turned off at a central valve.
Pipe	Provides an outlet for water to travel through. Common types are poly and PVC.
Pump	Deliver waters to irrigation system.

What is an irrigation system?

- Common types of sprinklers include:

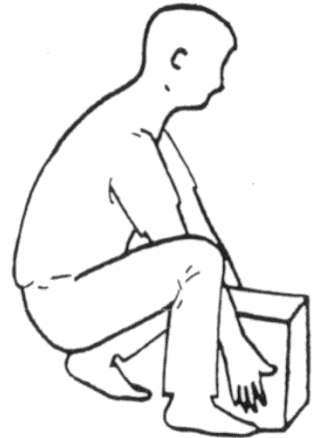
Pop-up sprinkler heads	Gear-driven rotors	Impact rotors
Typically used for residential and small commercial sprinkler systems.	Commonly used for medium to large scale sprinkler systems. Use nozzles and typically require less maintenance due to an enclosed body design.	Cover a large area in an arc pattern ranging from 40-360°. Often too noisy for residential sites.
		

- When setting up irrigation components, you should familiarise yourself with the task requirements:
 - The irrigation plan will determine the scope and requirements of an irrigation job, including:
 - Site location
 - Types and amounts of irrigation equipment required
 - Where existing plans and underground services are located
- Speak to your supervisor to confirm work instructions
 - Apply active listening when receiving instructions
 - Clarify any unclear instructions with your supervisor

- When setting up irrigation components, you should familiarise yourself with relevant workplace information:
 - Identify underground services for the site (e.g. from site plans, supervisor or contacting Dial Before You Dig)
 - For example: Telephone lines, gas, electrical, water, cable

- When setting up irrigation components, you should familiarise yourself with the work area:
 - Identify any WHS hazards and assess risks (e.g. underground services, manual handling injuries)
 - Identify environmental impacts (e.g. waterlogging, soil salination, ecological damage)
 - Report hazards to your supervisor within a timely fashion – especially emergency situations

- Be sure to follow appropriate manual handling procedures to avoid injury
- Ensure the following:
 - Neck is upright
 - Back has natural curve
 - Feet are flat and facing the load
 - Shoulders are level
 - Knees are bent
 - Hands have a good grip around the load



- When setting up irrigation components, you should arrange and select PPE, tools and equipment:
 - **PPE may include:** Gloves, goggles, gumboots, long sleeved shirt, long trousers, waders, wide brimmed hat, work boots
 - Ensure PPE fits correctly, as this is when it is most effective at providing protection
 - **Safety equipment may include:** Signage and barricades (e.g. safety cones, flagging tape/nets)
 - **Machinery, tools and equipment may include:** Broom, hammer, marking paint, mechanical trenching machine, pipe cutter, rake, rubber mallet, saw, spade, screwdriver, standard shovel, tape measure, thread seal tape, trenching shovel, trowel, wire strippers

Ensure they are appropriately selected, prepared and used for the task, following manufacturer recommendations and enterprise work procedures

- Materials, tools, equipment and machinery are selected according to the irrigation system design requirements
 - When parts and equipment are delivered to site, they should be checked according to the system drawings and specifications
- Check the water supply and ensure it is compatible with the specifications of the system
 - Determine the flow rate before installing irrigation to establish how many sprinklers you can install and what size pipes you should use

Flow rate is the rate at which water flows from a water source
→ $[\text{Quantity (Litres)} \times 60] \div \text{Time (seconds)}$
= Number of litres/minute (flow rate)

Installing irrigation components

- To assemble an irrigation system, undertake the following steps:
 - Lay out irrigation components to ensure:
 - All parts are accounted for
 - Parts are placed as per requirements
 - Trenches will be suitably sized
 - Mark trenches using paint or chalk
 - Excavate trenches to the required depth
 - Place pipes into the trenches and cut to required lengths
 - Glue fittings to the pipes

INSTALL IN THE DIRECTION OF FLOW

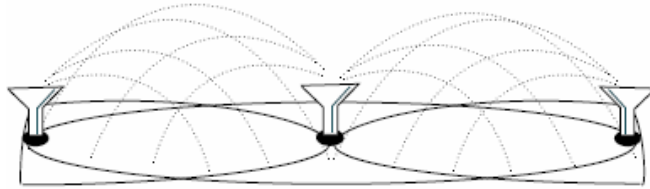
If you're doing a main line, start at the water connection. For the zones, start at the valves.
It's far easier to add pipelines, than it is to join two together, so work in one direction.

- Irrigation systems may encounter a range of issues, such as:
 - No water
 - Check that the main water valve is turned on
 - There may be debris clogging the system (e.g. at valve, sprinkler, or filters)
 - Water leaks
 - Leaks along the mainline often occur around the control valves
 - Pipes may be broken, cracked or damaged
 - There may be debris clogging the system (e.g. at valve, sprinkler, or filters)

Report identified problems and anomalies to your supervisor

- Irrigation systems will have specified start-up procedures outlined in the operations manual
- The general process for starting up an irrigation system is as follows:
 - Conduct a pre-start inspection
 - Inspect the pump is properly primed
 - Close the delivery valve
 - Ensure the pump is running smoothly
 - Open the delivery valve

- Some tips for using an irrigation system:
 - Ensure that sprays are placed so that the water from one spray touches the head of the next spray – known as 'head to head'



- You should monitor irrigation times to deliver sufficient volume
 - Winter months require less watering than summer months
 - Observe signs of over-watering, such as: Brown or yellow leaves, fungal growth, root rot
 - Observe signs of under-watering/stress, such as: Brown or yellow leaves, less growth/reduction in leaf size, loss of flowers and fruit, wilting and/or death

- Irrigation systems will have specified shut-down procedures outlined in the operations manual
- Consider whether you need to shut down the system for the end of the day or the end of the season

End of day	End of season
• Flush treatment systems to ensure material does not solidify and block emitters • Turn off the main water supply to the system, ensuring that components are free of water • Run the timer/controller through its normal watering cycle then turn the controller off	• Shut off the main valve • Open all manual drain lines • Relieve pressure on valves • Use compressed air to blow the system out (if possible)

- Some tips for maintaining an irrigation system:
 - Carry out maintenance according to a schedule
 - Inspect the irrigated area for flooding
 - This may be caused by 'low-head drainage' (where the area isn't completely flat) and may be addressed by fitting valves to emitters
 - You may be required to regulate an irrigation system more than once to maintain correct operating pressure and water flow
 - If similar components in a system are starting to break down, you should consider replacing them all rather than repairing them

Items that are commonly replaced due to wear or blockage include:

Drip line tapes
Emitters
Filters
Outlets
Pump screens
Sprinklers
Strainers

- To maintain pop-up sprinklers, complete the following:
 - Remove nozzle and insert flushing cap
 - Dig a hole around the sprinkler to provide working room
 - Unscrew pop-up and unscrew riser
 - Turn on the system to flush pipes
 - Reattach riser
 - Open flushing driver and flush system again
 - Replace filter
 - Clean and reattach nozzle

- To repair a poly pipe, complete the following:
 - Isolate the system
 - Locate the hole in the pipe
 - Dig a hole around the pipe to provide working room
 - Cut out the damaged section of pipe
 - Reconnect the cut pipes using joiners and clamps/clips
 - Test joint for leaks

- Between seasons, a range of problems may affect a pressured irrigation system, including:
 - Damage to poly pipe or sprinklers
 - Mulch and vegetation covering sprinklers and valve boxes
 - Ants and dirt blocking sprinkler heads
- As part of pre-season checks, you will rectify such problems
 - Cleaning filters using chlorine
 - Removing mulch using gardening gloves
 - Trimming small branches and weeds using secateurs

- To reduce the amount of work required at a pre-season check, you should maintain the system post-season.
- This may include tasks such as:
 - Flushing the system
 - Cleaning the system
 - Closing down the system
 - Undertaking required repairs and other maintenance/service/replacements

- As part of clean-up processes, you should:
 - Maintain, clean and store tools and equipment according to manufacturer's specifications
 - Store tools in a dry, sheltered environment
 - Place tools in racks for easy location and safety
 - Store similar tools together for easy access
 - Dispose of materials that cannot be reused or recycled
 - Ensure you implement environmentally safe practices, following Safety Data Sheet (SDS) requirements
 - Record and report work outcomes to your supervisor

- Any faulty items should be reported to your supervisor
 - Follow the 'Stop, Tag, Report, Record' (STRR) approach:
 - Stop using the equipment
 - Tag the faulty equipment
 - Report the faulty equipment to your supervisor
 - Record the details of the fault