

# Basic Design Checklist

## for the design of a whole-farm irrigation system

When designing a whole-farm irrigation system it is usually worth engaging a professional certified irrigation designer to ensure the system will meet your requirements now and into the future.

When discussing the design components, it is useful to have a checklist that you can refer to. Some recommended design parameters include the following:

System capacity	<b>Sufficient capacity to meet the peak water requirement</b> of the crops grown (both sugarcane and any break crops), even in very dry seasons.
Pump efficiency	<b>Choose pumps</b> that can meet the system's requirements for pressure and flow rate. <b>Build in a 10 per cent buffer</b> to allow for wear over the life of the system.
Mainline pipe	<b>Use pipe of a class above</b> the design pressure. <b>Place thrust blocks</b> at the mainline and submain elbows and pipe ends. Include air release, pressure release and vacuum valves to minimise the effects of water hammer and field topography.
Variations in pressure	<b>Field topography</b> influences pressure within pipes. <b>Pressure along a lateral</b> should not be greater than 10 per cent of the desired operating pressure.
Pipe size	<b>Select pipes that have capacity</b> to accommodate water velocities between 0.6 and 2.0 metres per second (m/s).
Water distribution	<b>The system should aim for infield uniformity</b> that exceeds 85 per cent for fixed sprinkler and water winch systems, 90 per cent for centre pivots, lateral moves and booms, and 95 per cent for drip systems.
Soil type	<b>Application rate</b> should not exceed the soil's infiltration rate (to avoid run-off) and the amount applied should not exceed the soil's water holding capacity (to avoid deep drainage).
Water quality	<b>Organic and inorganic particulates</b> can clog nozzles and emitters. <b>The higher the water volume the less filtration is required.</b> For example, low pressure pivot requires filtration in the range of 500–3500 micron while drip irrigation systems require filtration in the range of 80–130 micron. <b>Integrate flushing lines or valves</b> into the design to allow the removal of sediment and foreign matter.



### Next Steps

When designing the irrigation system, give consideration to the possibility of future expansion. It may be worthwhile building in additional capacity if expansion is likely.

All systems require on-going monitoring and maintenance. Ensure that you are aware of, and follow, any requirements for servicing, flushing and monitoring for efficiency.

Engage with your productivity services and local irrigation specialists.