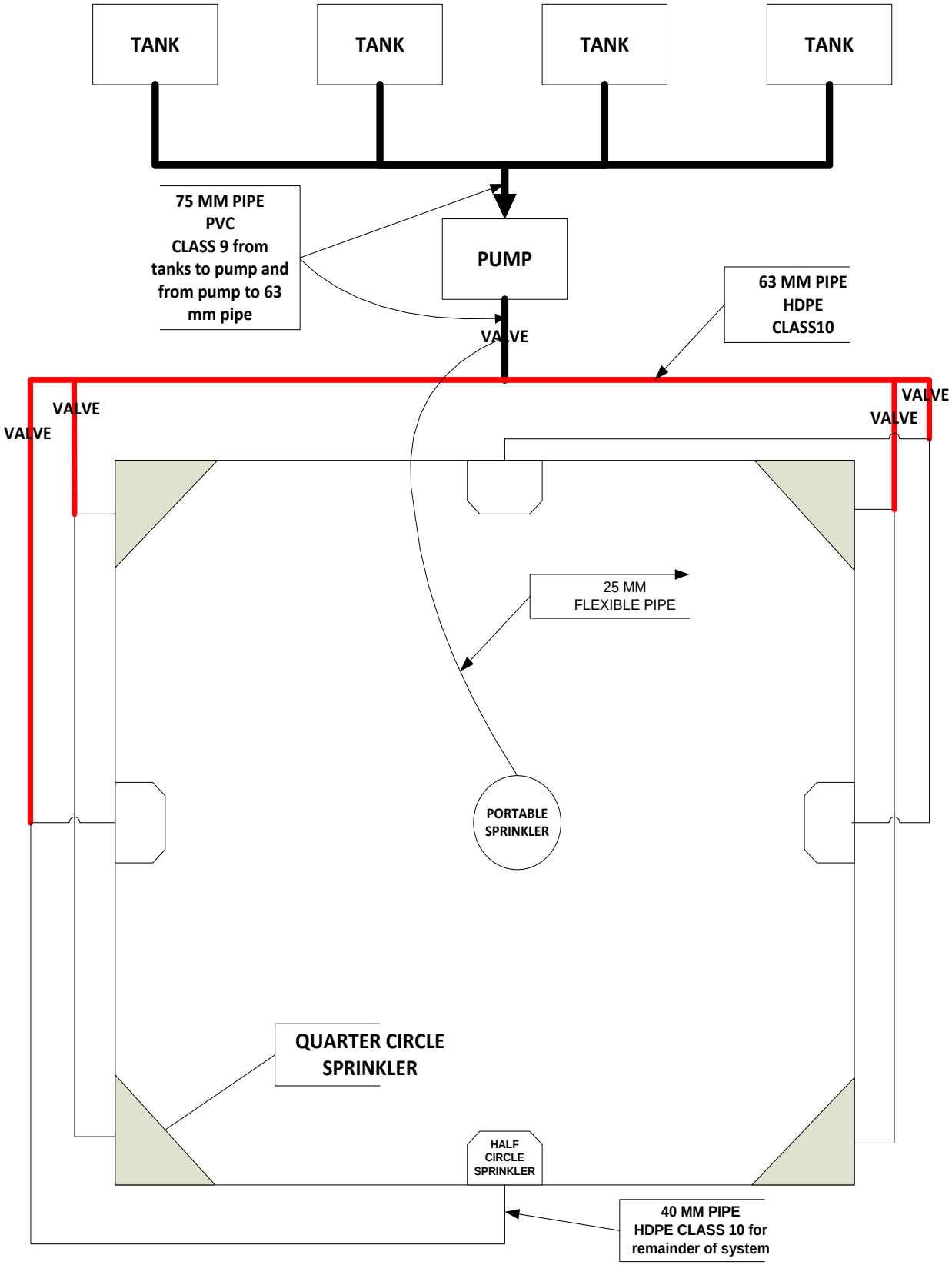
APRIL 2023 NEWSLETTER

Suggested Irrigation setup



This newsletter follows up the March 2023 Newsletter

Sprinklers

A Rainbird Flacon 6504 sprinkler using a No 14 nozzle (or equivalent) will emit approximately 60 litres of water per minute, and has a spray radius of 18.5 metres, when operating at a 5 bar (500 kPa) pressure.

Using 4 such sprinklers setup for a half circle spray pattern set permanently at the midpoint of the greens banks, and 4 sprinklers set up for a quarter circle set permanently at the four corners of the green will act as the basis of a good irrigation system.

In order to emit the same quantity of water the sprinklers set up with the half circle will need to run twice as long as the sprinkler set up with the quarter circle.

This set up will need to be supplemented with a portable sprinkler placed on a stand in the centre of the green. This should be set up with a full circle spray pattern. This movable sprinkler should be a Rainbird 30H with a 3/16 and a 1/8 20-degree (NIC 3/16 inch x 1/8 inch 20-degree low angle) nozzle (or equivalent), with a spray radius of approximately 16 metres. This will emit approximately 45 litres of water per minute.

Using this set up a watering run time of:

- ¼ circle sprinklers 23 minutes
- ½ circle sprinklers 46 minutes
- Full circle sprinkle (centre of green) 69 minutes

will result in a total of 15 mm of water to be applied to the green. During the summer months it is recommended that the green is watered twice weekly.

Pumps

It is important to ensure that the pump selected for irrigation use is able to provide sufficient pressure to allow for a flow of up to **300 litres per minute at a discharge pressure of at least 5.5 bar** (as in the attached drawing, thus giving a minimum pressure of 5 bar at each sprinkler head).

Tanks

The ideal tank capacity should be a minimum capacity of 20,000 litres of water.

Pipework and Valves

In order maximise efficiency it is recommended that 75 mm PVC Class 9 plastic pipe is used from the tanks to the pump. This will allow for 300 litres of water per minute (5 litres per second) to be passed. The velocity at this rate of flow is about 1.35 metres per second. This length of suction piping should be kept to a minimum to avoid upstream vacuum conditions as the tanks drain – to avoid “cavitation” in the pumps.

However, it must be remembered that with any such system there will be a loss of pressure (and flow rate) at the end of the line. For a line length of 100 metres this pressure loss will be about 0.27 bar when using the 75 mm Class 9 PVC pipework.

From the 75 mm pipe to the first sprinklers, a 63mm Class 10 HDPE pipe is recommended. The pressure loss using this pipe is about 0.1 bar over a forty (40) metre length. The 40 mm HDPE pipe will have a pressure loss 0.2 bar over a similar length (40 metres).

Inserting a 40 mm solenoid valve into a circuit will add an additional pressure loss of about 0.15 bar.

With reference to the drawing above, the 75 mm pipe enters the pump from the tanks, and leaves the pump until it feeds the 63 mm HDPE Class 10 pipe. The 63 mm pipe is then used up to the first sprinkler in each of the lines either side of the green, and thereafter, the 40 mm Class 10 pipe is used to the remaining sprinkler in each line.

It should also be noted that a pressure drop of 0.10 of a bar will be experienced in the 63 mm pipework, and through the 40 mm pipework the pressure drop is about 0.2 of a bar.

The total loss of pressure in the whole system can be summarised as follows:

Pump and main line	0.27 bar
63 mm pipework	0.10 bar
40 mm pipework	0.20 bar
Valves	0.15 bar

giving a total loss of 0.72 of a bar for the whole system.

As the sprinklers require a 5 bar operating pressure, the pump will need to produce a water output at about 300 litres per minute at approximately 5.7 bar (this based on the tanks standing at the same level as the greens). If, however the tanks are standing 10 metres below green level then pump pressure will have to be higher at 6.7 bar to take into account difference in levels.

A Foras Model MN 32-200 A 7.5 kW, 400 Volt, 3-phase pump will give the required 300 litres per minute at a 5.5 bar pressure