



Steve Cherry, Course Manager at Silverstone



Silverstone Golf Club

Solving water shortages

As more drought orders come into force never has water storage been such a vital issue - where every drop of water counts. Maureen Keepin reports...

As most of the earth is covered by water - more than 70 per cent - and the UK is wetter than most countries, we would not expect a dramatic problem to arise with regard to supply.

But with only one per cent of this resource readily accessible, global warming, climatic changes, increased use of water, more housing, no notable increase in reservoirs, no grand plan and water companies losing a staggering 3.6 billion litres of water each day through leaks - water management is a serious issue which needs to be addressed. In these critical times, ponds, lakes and reservoirs come into their own.

SEEKING SOLUTIONS

Collecting water from the golf course during wetter periods, for use in the drier times, is an extremely sound proposition for most clubs. Serious and expensive damage can occur very quickly if grass roots are unable to obtain sufficient water to make up for transpiration losses and the grass becomes stressed.

Basically the scheme involves collecting ground water and surface water run-off, channelling this into a piped drainage system and feeding that into a storage reservoir in the ground - which need or need not be lined.

"Everyone ought to be investigating this now, as there are planning issues which need to be overcome to build these resources," says Nigel Wyatt, Contracts Director for irrigation, drainage and water management specialist MJ Abbott.

"Time is of the essence and the requirements are different for every club."

Determining the amount of water you need to store is critical. If a drought order hits in July, clubs will need to store enough water for August to September. If the drought order comes into force in March, they will need sufficient water for the whole season.

As a general rule, when planning water storage requirements, clubs should allow for one inch (30mm) of water over a given area per week.

THE REMEDIES

Designing and planning water storage facilities can be carried out by experienced contractors who will take into account ecological and aesthetic issues. This ensures the functional requirement is met and that the project enhances the environment.

Gravity pipework alone is unlikely to be sufficient to take the water to the right place, so generally water will need to go through pumping systems into a series of reservoirs.

"The Belfry is a good example of this," says Nigel.

Water management was a prime concern when improvements were carried out to the Brabazon Course for the Ryder Cup. No summer abstraction of water is allowed, so a large quantity of water is required to be stored over

the winter. The irrigation storage reservoir at The Belfry, already one of the largest of its kind in this country, was extended to accommodate the storage of 15million gallons of water.

HOLDING WATER

Where feature lakes are installed they need to retain their water levels to be aesthetically pleasing, so the amount of water available for use should only be the top 200-400mm in depth. It is crucial they are kept free from a build-up of vegetation and weeds. Aeration helps with this, as it stimulates aerobic digestion.

For this reason, a preferred option is the construction of a reservoir within an area out of play - conditional on planning from the local authority. Generally the most economic solution is the method of cutting and filling. The first operation is the removal of the topsoil over the area of the site and then excavation of the subsoil can be carried out. On a level site it is possible to excavate the centre and place the fill to form banks and surrounds. Key to the success of this is ensuring compaction of the fill material within the bank.

LINING LAKES

There are two possible options for lining lakes and reservoirs. If the indigenous subsoil is clay, it may be possible to puddle this to form an impermeable layer. However, if the subsoil itself is permeable it will be necessary to install a man-made lining system.

Typically a geotextile underlay is used over the subsoil surface, followed by a polyethylene lining system. This lining system is sandwiched by another layer of geotextile and secured around the perimeter of the reservoir by a key trench. The final operation is to spread a protective layer of topsoil at a minimum depth of 150mm over the geotextile. This acts to protect it and enables growth of indigenous plant species.

"We can no longer take water for granted," says Nigel.

"Creating or increasing on-site water storage facilities is a sound solution more and more clubs are implementing."

So, what measures are clubs taking?



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At the Old Gorse GC in Oadby, near Leicester, attention has turned to reclaiming a lake, which dates back to 1961. Strategically sited at the side of the 16th green, this is now silted up and has large trees growing in it - but at the time had a capacity of 250,000 gallons.

"Water at the moment is a top priority," says Course Manager, Frank Kempster.

"We are not restricted at the moment, but we cannot be complacent."

At the time the reservoir was built, every green had its own hydrant and to water the course hosepipes were connected to these, with free standing sprinklers.

"It was in 1972 we decided to go on to an automatic system and initially the plan was to fill a holding tank from the reservoir," he says.

"We found we were watering more and the diesel pump just could not transfer enough water into the holding tank to water the greens at night.

"As a result, in 1973 we went on to mains."

To water more efficiently, a new irrigation system was installed in the winter of 2005, together with a new mains supply.

Looking back, Frank realises he and many others were quite naive about irrigation systems.

"Too much irrigation was being carried out then and the greens were watered for 45 minutes each," he says. "Now with the new system the most we apply is eight to 10 minutes and only on certain greens."

Within the next five years the club is looking at cleaning out the lake, which has a clay base, and increasing its size. They are also considering whether it would be beneficial to have the lake lined.

A third of the golf course drainage currently goes into this lake together with all run-off from the A6, which passes in front of the club.

"When we do get a wet winter, if we excavate sufficiently, we will have good storage capacity. "Our aim is to make mains our back-up, rather than the sole source."

Proposals are to make a special feature of the lake, by bringing the water closer to the green and planting it up to attract wildlife.

Willow trees at the side of the green are being thinned, with three to be taken out this winter.

Frank's father was Head Greenkeeper at the club from 1959 to 1969 and it was after this, in the 1970s, when there was a period the club did not make any major investments. "Now we are having to play catch up, as there are more than 12 golf clubs within a 10 mile radius, so it is a very competitive market," he says. "Every endeavour is being made to improve player enjoyment and this will certainly be enhanced by bringing the lake back as a major feature."

Over at the Silverstone GC in Buckinghamshire, two new holes, bringing the course up to 20, will have their part to play in addressing drought issues.

"This will give us greater flexibility and keep playing conditions high," says Steve Cherry, Course Manager. "We can switch the course around if areas do get stressed by drought conditions."



Plans are to play the new holes May through to October and then rest and refresh them by going back to the original holes.

On the water front, three reservoirs and a borehole supply their water needs. With a current total capacity of 250,000 gallons of water, the club is looking to extend this towards the end of the year.

"Two smaller reservoirs are sited down in the lowest part of the course and our main reservoir, which holds 150,000 gallons, is at the top," says Steve.

The electronic pump feeds water up to the top reservoir which is always kept topped up by the smaller lakes. "Down the bottom the level of water has dropped by eight feet, so if we do get another three weeks of dry weather there could be a problem," commented Steve. A 47 metres deep borehole is also used to supply water, but if extraction is constant for more than one month this supply is drastically reduced.

Currently the club is in the process of installing irrigation to the tees, which means extra water will be required to service them.

"Our plan is to double the capacity of the bottom reservoirs, making them a more interesting feature of the course, as they run alongside the 14th and 16th holes."

To achieve better feeds into the lakes, wider channels are currently being created.

Recognising the importance of addressing all water issues, Steve will also be implementing an overseeding programme this autumn, using more drought resistant Top Green cultivars.

"We have been looking at the best mixture to use on our course with seed agent Rigby Taylor," he says. "Golfers want to play 365 days of the year, so the formulation will help retain good grass cover in all weather conditions."

With water shortages continuing, there is a real urgency for clubs to create long-term water plans - and fully justify the water they use for irrigation by keeping records of how much they apply, when, where and why.

WATER-SAVING WAYS

- Draw up a schedule to identify areas requiring water.
- Confine irrigation to crucial areas of play.
- Train staff to work on increasing levels of awareness of water efficiency.
- Regularly check irrigation systems for leaks.
- Inspect sprinkler nozzles to ensure they operate properly.
- Upgrade, replace or computerise your irrigation system and use weather station for greatest efficiency.
- Water at night or early in the morning, when it is not windy.
- Use more drought tolerant turfgrass species and wetting agents.
- Encourage rooting and do not cut grass too short during period of good root growth.
- Sharpen mower blades regularly to keep grass healthier and reduce its need for fertilisers and water.
- Mulch any landscaped areas and use drought tolerant plants.
- Use wash-down systems which recycle water.