



Swanston Golf: Alternative Irrigation Supply

INTRODUCTION: Swanston Golf Club is located in the Pentland Hills, approximately eight km south of Edinburgh's city centre. The club first opened in 1927 and, for its first eighty years consisted of an 18-hole hillside course and small clubhouse. Major renovations, which were begun in 2006 and completed in 2009, included the construction of a new, more spacious clubhouse, the addition of a shorter 9-hole par 3 course aimed at beginner golfers, a driving range and golf academy. A major overhaul of the existing 18-hole course involved the replacement of seven of the existing holes with newly constructed ones, six of which were built on adjacent lower-lying farm land.

THE ISSUE

During the design stage, water supply to the clubhouse and the course was given special consideration due to the predicted increasing mains supply costs and changes in climate affecting the management of the course. With the help of expert consultants, a more sustainable and cost effective solution was sought.

THE SOLUTION

In addition to the public mains supply for the clubhouse, Swanston currently has three distinct natural sources from which it acquires water. Historically these water sources fed the Fairmilehead Public Water Treatment Works that supplied the south of Edinburgh residents and businesses.

Prior to the recent renovations only one of these sources, the Hare Burn, was used and then only minimally. The original course on the hillside was never outfitted with a mechanical irrigation system. Instead Greenkeepers took water from the Hare Burn to irrigate greens and tees, a practice which was performed either by hand-sprinkling or with a hose.

The circumstances for the six new lower holes are quite different. Water was required during the new turf grow in period and this portion of the course does have an automated mechanical irrigation system. This is supplied by two 60m³ tanks that store water abstracted from an underground spring.

Like the original course only the greens and tees are irrigated when necessary and this occurs at night to minimise evaporation losses.

The tanks are incorporated into the hillside and fed by a small pumping station immediately adjacent to the first hole.

The spring flows into a newly created pond which overflows into the main Swanston Burn, and later flows into the Lothian Burn. Whilst the Swanston Burn is not used for irrigation purposes it nonetheless plays an interesting role in the club's recent renovation project.

AT A GLANCE...

>> During the course redesign in 2006-9, Swanston installed an irrigation system that is fed by abstracted groundwater; ensuring they have a sustainable supply that is not dependent on mains water alone.

>> While the installation and pumping costs is a long term investment for the club, the reduction in overall operating costs is proving to be a cost effective way of irrigating the course.

>> The system is also helping with course drainage and has created new watercourse and pond habitats.

During the excavation of the land for the new holes, an old triangular clay drain was unearthed, channeling water to the Swanston Burn which, like the Hare Burn, originates in the hills above the course. The decision was made to remove the piping and allow the water to flow in a meandering open channel above ground in an effort to add character to the course's landscape and increase biodiversity by creating a more natural watercourse feature. Currently it enters the course through a pipe housed under a bridge near the first tee. This open channel, surrounded by grass buffer zones, along with increased rough grassland helps with course drainage and means the likelihood of flooding in the lower part of the course and the area adjacent to the Edinburgh City Bypass motorway is reduced.

As part of a renewable energy supply for the clubhouse a ground source heat pump system has been installed. Water abstracted from the ground is heated naturally and the heat energy is then used to supply the main club house under floor heating system. The overflow water from this system is used to flush the toilets and for the showers. In addition, the irrigation supply tanks are also supplemented by this overflow to top them up when required if the spring supply is low.

OUTCOMES

In Scotland, any business such as Swanston Golf that abstracts water from surface or groundwater sources requires to register with the Scottish Environment Protection Agency (SEPA) under the Controlled Activities Regulations (CAR) Scotland 2011.

Without having a previous mains irrigation system as a comparison, potential savings can only be estimated. From pump meter readings it is estimated on average the club uses 496m³ abstracted water for irrigation.

Mains water costs £0.77 / m³ (Scottish Water Business Stream 2011) therefore the club are saving an estimated £382 in water volumetric costs alone per year. They are also making significant savings as they are not paying wastewater charges for the course irrigation as it doesn't go to public sewer or fixed (standing charges) for both which could push savings into the thousands.



Pumping station



Open drainage to new pond

NEXT STEPS

The club may decide in the future to pump stored irrigation water to the older, upper 12 holes. The club also intends to investigate the possibility of reducing their clubhouse mains water usage further by treating the groundwater supply themselves to drinking water standards. This will involve a filtration and UV treatment facility.

It is also possible that the abstracted water can be used to supply the associated office buildings that the owners sublet, the maintenance facility and the golf academy buildings.

FIND OUT MORE

If your club would like to promote its business success story or require support in this area, please contact your Club Development Officer or Environment Manager Carolyn Hedley c.hedley@scottishgolf.org

This case study was produced with support from

