



An aerial photograph of a golf course. The foreground and middle ground are dominated by a large area of green grass with a grid of white lines, indicating extensive drainage work. A single, large, leafless tree stands prominently in the middle ground. In the background, there is a sand trap and a small stream or drainage ditch. The overall scene is set against a backdrop of dark, dense trees.

# Golf course drainage: Short term pain, long term gain

David Shelton describes the extensive drainage work that has been carried out at Loch Lomond Golf Club

**A framed certificate on the office wall informs visitors and staff alike that this golf course is rated in the top 100 best golf courses in the world.**

The rain gauge in the Met. Station outside records a total of two metres of precipitation a year. The waters of the loch to the east lap several fairways. The course hosts the annual Barclays Scottish Open Competition in the week before The Open Championship. Yes, this is Loch Lomond, famous the world over where the setting is superb and the course maintained to the very highest standards.

In years past the winter months were usually the wettest but more recently the rainfall pattern has been changing. In 2009, for example, the two wettest months were August and November with 345mm and 360mm of rain respectively. Conversely, precipitation in January 2010 was negligible. In

running alongside, was purchased; it was powered by one of the John Deere tractors fitted with creep gears.

Susan Rothwell has been on the staff since 2003 and is now Assistant Golf Course Superintendent. Responsible for the drainage operations she has an ochre problem to contend with! Where gravel has been used as a permeable back-fill in earlier drainage works the ochre has cemented this together, dramatically reducing its effectiveness. This problem has been overcome by using a free-draining medium-course sand from the Tillicoultry pit, 45 miles away.

Explaining the drainage techniques in detail Susan said 50 kilometres of piped drains have been installed on the fairways in phase one the laterals at 5 metre intervals. Due to the stones the bottom of the trenches were not smooth so prior to placing the 50mm and 100mm

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circumstances such as these, good course drainage is essential so how has this been tackled?

Initially, specialist sportsturf drainage contractors were employed to undertake some of the work. It was expensive for intensive drainage systems were required in view of the high rainfall, and the trench digging was hard on machinery due to the excessively stony sub-soil.

It was decided to undertake the drainage work in-house. The course is closed in the winter months and this would be an ideal time to carry out the work. The John Deere tractors are fitted with the widest of wide grassland tyres to minimise compaction problems and the course workshop, with Charles Johnson in charge, built a specialist trailer and trench back-filling equipment to install the permeable fill. A Shelton Supertrencher 560, with conveyor to elevate the arisings into a trailer

diameter pipes 25mm of gravel was placed in the trenches to give a smooth bed. Over the pipes the sand was placed in two, sometimes three passes with a tractor-mounted consolidating wheel used after each pass. In an ideal world kiln-dried sand would be preferable but cost prohibited its use. The final pass of sand is left slightly proud, using back-pack blowers any excess is removed and the grass ‘fluffed-up’ to hasten its growth.

A total of 74½ kilometres of phase two drainage with trenches dug 55mm wide and 225mm deep spaced at 1 metre intervals speed excess soil water to the piped system. The same Tillicoultry sand is used in back-filling these drainage channels, also.

In the winter of 2009-2010 the course at Loch Lomond had over 16 weeks of frosts – severe at times. On the fairways this frost penetrated





in excess of 400mm, in the rough less than half this. In mild winters it has not been possible to drain areas of excessively wet rough but with frost in the ground the opportunity was grasped to carry-out drainage works. The Shelton Supertrencher dug exceptionally neat trenches in the frozen ground, and wear on the tungsten carbide tipped cutters was not excessive. Susan succinctly summarised the operations; “short term pain, long term gain”.

Charles’ work entails keeping the golf course machinery in first class order. The Shelton Supertrencher has been used to install over 112 kilometres of drainage in hard rocky ground. He had had to change the drive shaft, the drive chain and sprockets, and the machine was now on its third elevator belt. A remarkable performance he considers in view of the conditions. Steel wash on the cutters is treated by building up with welding using a MIG welder. He had found this more cost-effective than hard-facing. The original digging wheel was still fitted due to the fact that the turbo bars and nut/bolt protecting blocks had been replaced at regular intervals.

The accompanying pictures show the exceptionally high standards of operations undertaken by the eight strong drainage team. In all but extreme weather conditions this course should be able to host the most prestigious competitions for the enjoyment of players and spectators alike.



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