Drainage - The controlled release of water

by

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It is not by accident that the majority of British golf courses of high repute are on natural deposits of sand. There are a number of reasons, but one major one is a priority requirement for good drainage. All sands drain well, although natural deposits vary in their coarseness, angularity and degree to which the sand has been sorted into particles of similar size. It is the dune sand upon which most of our foremost seaside golf courses are constructed which shows a high degree of uniformity in particle size and degree of sorting.

Dune sand is a fine sand blown a short distance inland off the beach by strong sea breezes and thus separated from the coarser particles which cannot be transported. It is also cleaned of particles of very fine sand and silt which are carried further inland by the wind. Dune sand is therefore a clean, wind-sorted sand which contains particles within a quite narrow size range. For example a typical dune sand would contain around 90 per cent of its particles in the size range 0·15 – 0·45 mms. There are various sand deposits sorted to a greater or lesser degree by wind or water, however, I have drawn particular attention to dune sand because both theoretically and in practice it is a suitable material for golf green construction.

Pure sand does, however, have its drawbacks. It may be subject to drought depending on the depth of sand and nature of the sub-stratum as well as weather conditions. It is also nutritionally a poor medium for grass growth. With modern irrigation facilities drought need not be a problem on a golf green; nevertheless leaching losses of plant nutrients are high and fertilizer use inefficient. The limitations inherent in sand deposits can be overcome to a substantial degree if golf green drainage is approached as a matter, not simply of getting rid of water, but of controlling its release.

To achieve satisfactory water control it is necessary to have an impermeable base to the green and to have stringent control over the depths and combinations of materials in the construction. Water flow from the construction can be controlled to maintain a fixed water-table height and, should irrigation be necessary, this can be achieved by backflow of water from the drain outlet, i.e. sub-irrigation. Whereas golf green construction by this technique has been developing steadily over the last five years or so in the U.S.A., little, if any, progress has been made in Britain. In fact, the only pure sand construction of which I am aware, having the facility for water-table control and sub-irrigation, is an experimental five-a-side soccer pitch built to our specifications at the Cardiff College of Education.

Surprisingly enough this prototype construction was formulated as a natural development of our detailed analysis of drainage problems on top-class soccer and rugby grounds in Britain. We have met problems, as might be expected, nevertheless we are confident that this experimental pitch will be a key factor in providing sound data for future sand-based constructions in golf and bowls as well as soccer and rugby. It would be interesting if a major future development in golf green construction in Britain were to stem from a resolve to overcome drainage problems on intensively used soccer and rugby pitches. Particularly since the construction referred to incorporates the very common golf course material, dune sand, as a key constituent.