GOLF COURSE ARCHITECTURE

THE GLOBAL JOURNAL OF GOLF DESIGN AND DEVELOPMENT

ISSUE 38 **OCTOBER 2014**

OPINION

Growing grass in the desert

Dubai-based architect Peter Harradine discusses how courses in the Arabian Gulf deal with water issues

Irrigation is as old as Arabia, as is the science of agriculture. The stockpiles of wheat, discovered along with the treasures of Tutankhamen were undoubtedly grown under irrigation.

The importance of irrigation to any development in the Arabian Gulf, stems from the fact that the rainfall is neither sufficient, nor regular enough to support greenery. The rain that does fall is generally confined to rocky mountains. It is only once the rain has accumulated over millions of years to form underground lakes, possible desert springs, and sometimes rivers, that it becomes useful for any kind of growing purposes.

Some of the water is derived from the water table (usually brackish) which in most cases is the product of years of rainfall. Another source is treated sewage effluent, which is the product of two costly processes, desalination and effluent treatment.

Unfortunately, the capital cost of an irrigation system main line and pump complex is inversely proportional to the time allocated for system operation. The longer the time, the lower the costs. This means that the costs of irrigation on golf courses is quite high due to the limited time allowed. The recent scramble to create a green Arabia is notable for its irrigation disasters and successes.

The problem stems, not so much from the rather extreme environment, but from the multitude of otherwise rational professionals who see in the unstructured atmosphere of the Middle East, a chance to try their hand at something new. The environment is very unforgiving of the amateur.

The prime offender is the electro-mechanical consulting engineer, who assumes that irrigation is just a cheap form of fire protection. Perhaps the only similarity between a fire protection and an irrigation system is that by the time a design error is discovered it is usually too late.

The civil engineer on the other hand belonging to a more conservative discipline, naturally plays things very safe. Pipeline flows will seldom exceed 1 ft/sec, standard valve chambers could easily double as nuclear shelters, and of course epoxy coating is specified for everything.

Peter Harradine (pictured with son Michael) has extensive experience of designing golf in desert conditions

There are also some original thinkers amongst the agricultural engineers. After the involved theoretical calculations to determine the ideal soil mix, the next problem to be solved is the peak daily water application rate. The estimation for this figure is generally inversely proportional to the time remaining for project completion.

Occasionally, in the height of summer, problems develop in the treatment plant, and the loading on the filters is so great that they have to be cleaned manually. There was a successful system in Dubai where the well-trained foreman discovered that by removing the filter element completely, he would not have to clean the screens anymore. It took six months to repair the damage caused by that innovation.

Irrigation in the Middle East is not particularly different from irrigation anywhere else, except for the fact that the water is often quite saline, and the systems have to be designed to deliver more water with better coverage and to operate successfully throughout the almost continuous irrigation season. It is therefore imperative that a responsible designer should have water economy at the front of his mind.