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# The British Golf Greenkeeper

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### Front Cover Picture

RANSOMES new Motor 5/3 shows its paces in the Paddock at Kempton Park watched from the stand by Ransomes grass machinery distributors.

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# TEE SHOTS

We had some useful discussions with representatives of the New Zealand and Australian Greenkeeping Associations during February.

In Auckland we met Gordon West, President of the Auckland Golf Greenkeepers' Association and Denis Boylan, Secretary of the New Zealand Golf Greenkeeper's Association. New Zealand has its own Research Station and runs a Correspondence Course for young Greenkeepers.

The idea of international co-operation appeared generally acceptable and any help and information which this might bring would be welcomed.

The Auckland discussions were largely exploratory but education was agreed to be the first objective, aided by exchanges of apprentices, technical information and publications. Hospitality and travel assistance to greenkeepers visiting other countries would reinforce the scheme.

While in Auckland we visited the Middlemore Course of the Auckland Golf Club, the Grange Golf Course, where the party was joined by Mervyn Andresen, Sonny Kayes, and Sel Hattaway, and the new layout of the Remuera Golf Club.

In Melbourne we talked to Leslie Barlow of Woodlands G. C. Mordiac, south of Melbourne. He is President of the Victoria Curators' Association. He has recently been elected President of the Australian Turf Management Association which is composed of various State Associations. He too, was keen on the idea of international relationships and indeed, had been doing some work on the question himself. It was a similar story in Sydney where we met the President of the New South Wales Golf Greenkeepers' Association and also heard about arrangements they make for training in that State.

Ransomes arranged a day for Greenkeepers at the Foxhills Golf Club near Sydney and something like 150 turned up to hear the Lecture and see the Ransome film. Some of them made a 700 mile round trip to attend this function and certainly the hospitality was outstanding.

The American Golf Course Superintendents' Association is now contacting the remaining Greenkeeping Associations and all are invited to submit ideas and practical suggestions, as to how international relationships might be fostered.

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The British Golf Greenkeeper

# THE CONSTRUCTION OF ARTIFICIAL WATER HAZARDS

By: Howard Swan, M.Sc.

Why use artificial water on a golf course at all? Or I would prefer to put the question, Why not?

Firstly and most important, take the requirement of water conservation for use elsewhere on the course. We are all familiar now with the automatic watering systems for greens and tees, and in some cases for fairways also. Such a system obviously requires a source of water, which could be from elsewhere on the course or else via a mains supply. If one considers that it takes approximately 10,000 gallons of water for a six minute irrigation of a course each day and a mains supply would cost about 40p per 1000 gals (besides any connection charge) so a summer's watering might cost in the region of £700 per year. Quite a sum for supply alone! Obviously, many golf clubs may not have sufficient natural water inflow to maintain such an irrigation system, but many have, and there could be a considerable saving if a 'natural' system is adopted.

Secondly, the creation of artificial lakes does provide an alternative type of hazard to the sand trap, and is, if correctly positioned, a particularly attractive and pleasing part of any course. Many golfers may think that they have perfected their bunker play; it will take them considerably longer to play from water with any satisfaction! Additionally, and somewhat lightheartedly, it does provide the greenkeeping staff with an excellent source of balls for their own game. Seriously, artificial lakes really can

add a new dimension to a wide variety of holes on a course and present a great challenge to the player. The positioning of an artificial water hazard is vital to the course, and there are many aspects which must be considered before a choice of site can be made and construction can begin.

The architect must look first at the location of natural water courses on the proposed site, be they small or large ditches or streams; second at the inflow and outflow capacities of the ditches throughout the site; third their relation to the existing drainage system (if any) on the surrounding land.

Along with this consideration, he must visualise how one or more water hazards will fit in with his initial plans for the overall course layout. A suitable site for a lake may dictate the incorporation of a particular hole at that particular point on the course, and therefore will inevitably contribute towards the overall design.

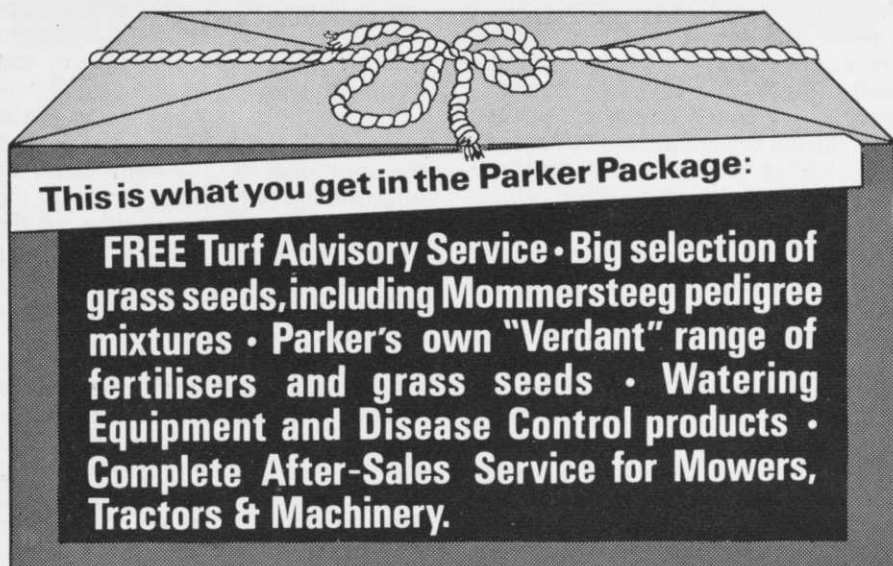
Then he must look at the proposals for land drainage and irrigation for the total golf course development. Is the lake to be positioned in such a place as to be a good outfall for fairway drains or will it impede their discharge? It is obviously essential that any surface water is drained adequately from the site, and a well-positioned lake can help in this respect and also be maintained in water level by this outfall. Also, it may be possible to use the lake as a reservoir for irrigation should the location be such that the economics



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of pumping are not too restrictive. It is unlikely that one could find such an ideal lake position to fulfil all these considerations on every site, but careful consideration of a location is obviously important.

Turning towards the practical side of these hazards, we find essentially three types of construction.

The first is the simplest and cheapest and this is the unlined lake. This type of construction would be related to an existing water course, which is able to maintain a permanent inflow or water in sufficient proportions to fulfil any irrigation requirements, and also an impermeable subsoil. It is a simple method of enlarging a section of stream or ditch to a pleasing irregular shape of a size between 1000—4000 sq. yds., and to a depth of no more than 4-5 feet. Just deep enough to deter the avid golfer from wading in to retrieve his ball!! We were fortunate enough to be able to construct two lakes of this type recently at Ely City Golf Club in nearby Cambridgeshire. The position chosen for the lakes was in an area where the water table was high, and with a combination of a large inflow of water from existing ditches and an impervious subsoil, no lining membrane was necessary. In fact, we found that we were able to maintain a capacity of 200,000 gals. throughout a summer, and a full daily programme of greens irrigation only lowered the water level by 2" and this was quickly replenished.

The second type of lake construction includes the installation of a Butyl or ruberoid lining on the base and walls of the lake to form a water tight seal. The lining is thick and elastic to some degree. It is essentially tailored to a particular size of lake and is laid as one sheet, being held in a trench at the perimeter which is backfilled with soil. Butyl lining is particularly suitable for lakes in which a high quality preparation of

the base is not possible, either because of underwater springs or particularly wet underfoot conditions. It is an immensely strong fabrication and the makers claim a long life span under even the most extreme conditions.

An alternative lining to Butyl is polythene sheeting. This is the type with which I have had most experience and I should like to go into the methods involved in its use. The polythene membrane which we normally use is of a 1000 gauge and combines a fairly strong character with a certain degree of pliability whichever is preferred.

The initial step in construction is the excavation of the lake to the desired contours by bulk earth moving machinery. The subsoil removed here can be utilised elsewhere in the construction of greens and tees etc. (a saving here). After the lake has been roughly contoured to the desired shape, it is necessary to trim and carry out the final shaping with a smaller machine to leave the base and walls in a smooth formation. Before the lining is laid, a small amount of handwork is required to rake over the surface to remove any small flints, stones etc., which could damage the lining. In addition, it is often good practice to blind the raked surface with a little sand to prevent any possible puncturing.

A narrow trench is then excavated around the perimeter of the lake, 12" wide and 12" deep, some 24" from the edge of the lake. This will act as an anchoring trench for the polythene itself.

The lake is now ready to receive the polythene sheeting. This comes from the manufacturer in rolls and is therefore laid in strips from trench to trench. The laying is quite a sophisticated process and we employ a specialist firm to carry this out for us. Each lining strip is joined to the next with double-sided bitumastic

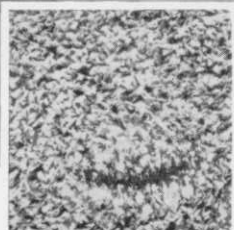




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