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Golf Course Construction, since the turn of the century, has seen numerous changes. Where once the natural terrain dictated the flow through the course, the bringing into use of land for golf courses where there was no visible layout has forced its creation. The use of an increasing range of heavy earth moving equipment has now made that possible, turning flat waste or poor farmland into attractive parkland sites where many imitations of the original home of golf can be produced.

Not only imitations, but through the skills of the designer and architect, rolling fairways, elevated tees and greens as well as attractive water course and hewn from the land to produce new courses stamped with their own unique style. None of this would have been possible without the earth moving equipment, bulldozers, graders, stone rakers, mechanical shovels and diggers at the disposal of the constructor.

The new course at West Hove is a case in point. Because the family owners of the club sold out to Wimpey, it seemed the members would not have a course to play but through the energetic activities of Frank Shannon and Bernard Barker, the chairman of the new course committee, land was bought alongside the old course and plans were passed for a construction.

The new West Hove 18 hole course will open next year, but not before many associated with the club will play a last nostalgic round prior to the tearing up of the fairways. West Hove’s lease from Wimpeys runs out in January next year and a month later the clubhouse should be completed. It will cost around £400,000.

The Squier 40 has been developed for automatic, one-man clearance of stones, rocks and trash in the preparation of golf courses, site clearance and general landscaping. Driven by a 60hp (45kw) tractor equipped with one hydraulic circuit and P.T.O. the Squier 40 takes up about six inches of cultivated soil over a cleaning trace which returns the fine soil to the ground and retains stones, clods, rocks and trash in a one cubic metre hopper. Various sizes of trace are available to determine the size of stones to be retained. Once the hopper is full, the operator can off-load at the side of the site or into a depression simply by operating one hydraulic lever. This tilts the box upwards and backwards to a height of 1.25m. Depth of work is controlled by two pneumatic tyred front wheels. Length of the Squier 40 is 4m, working width 1.5m and weight, unladen, 1800kgs.

The Squier 40 is manufactured by Key Agricultural Ltd, Peterborough and incorporates several components common to their KeyAg Squier range of stone and clod separating equipment. Basic price is around £12,500.
Raymond L Brown (Construction) Ltd, are based at Ringwood in Hampshire and undertake a variety of contracts involving bulk earthmoving throughout Southern England. The large plant fleet includes specialised equipment designed to work on extremely soft ground, and all items of plant can be hired or contracted. Among recent or current contracts is the construction of lakes and hills for a new golf course at Wisley in Surrey, and extension of the golf course at Moors Valley Country Park in Dorset and earthworks and preparation work for an all weather horse racing track at Lingfield Park, Sussex.

In recent years the compact tractor has been a popular answer to many problems on the golf course. These light weight tractors, which normally have 4wd, have revolutionized ideas for greens and fairways maintenance. However, tractors on their own are of little use and so a range of equipment has been designed to suit. One part of this range is made by Lewis Equipment who have spent the last 10 years manufacturing diggers and loaders to suit all makes and sizes of compact tractors. The reason for their popularity has been the design, enabling equipment to be taken off the tractor and replaced with, for example, a mower, in less than 5 minutes. For larger tractors a 3 point linkage digger is available, enabling maintenance to be done on ditches of up to 9' deep. This machine is half the weight of most conventional diggers, an advantage on any course.

Manor Excavators also produce a range of quality. British mini excavators for a golf course looking for a highly mobile and efficient digger at low cost. Twelve models complete the Micron, (below) Gopher and 5 Star ranges. New in 1989 are the power drive Micron 680 and more powerful Micron 720, plus the 5 Star 4x4 all of which have added a degree of mobility not previously achieved with this type of machine.

Operation of all excavators in the Manor range is through twin 'joystick' levers which control all boom and dipper functions. Speed and direction on power drive models are governed by separate levers acting on hydrostatic drive motors.

All models are available with either petrol or diesel and an extensive selection of buckets and ancillaries. Manor mini diggers are ruggedly designed for working in arduous conditions and on any ground. They are ideal for working on tight sites where large machines just cannot be used.
Dear Sir,

I have read with interest Jim Arthur's article in your November/December issue commenting on the R & A's recent publication "The Demand for Golf". Having been closely involved with the production of that document I would like, if I may, to make a few points in the hope of clarifying some of the issues as I see them.

I must emphasise to any readers who do not already know, that information on the usage or potential throughput of existing golf courses is extremely difficult to come by, and in many cases impossible in the short term, since most members' clubs do not keep or calculate such figures. As members' clubs still account for three out of four courses, the traditional way of relating supply and demand - i.e., how does "production capacity" compare with "market demand" - was not open to us and we therefore decided on an alternative yardstick, relating the number of holes available in each main statistical region to the population of each. Although this is a very rough and ready guide, it does at least give a first indication, region by region, of the differing degrees to which people have the opportunity (or more relevantly don't have the opportunity) to play golf. Mr Arthur is quite right to point out that some regions have large seasonal demands from tourists and holidaymakers, which is not reflected in such figures, and of course, the counties round big conurbations, particularly London, have to provide more than the average number of courses per 100,000 population if the inhabitants of the big cities are to have adequate opportunities to play. Nevertheless, I believe that the great amount of discussion and interest which has already surfaced as a result of these rough figures will encourage much more accurate examination at local level of the state of affairs and of practical ways in which shortfalls can be alleviated.

I would be less than honest if I did not say that I expect some of the local solutions which result will not meet with Mr Arthur's unlettered endorsement! For one is dying of thirst even a sip of somewhat murky water may be irresistible. Indeed, it is not necessarily for those of us who are lucky enough to enjoy excellent established courses to condemn others if they settle for something less. After all the condition of the "browns" in some tropical countries used to be almost as much a matter for discussion as poa annua now is in the Northern Countries. But they had golf instead of no golf and developed their social facilities round the course and got handicaps and won tournaments and so on. If you have to settle for half a loaf instead of no bread surely it is up to the master chefs to show how the best pitta can be made with the ingredients available, at a picnic which the natives can afford. If the best minds concentrate on the problem and come up with a value-for-money recipe for simple courses - not perfect courses - surely there could then be the possibility of training more of the designers of new proprietary courses in the basic fundamentals, so that they do indeed get things right first time. If we wait for the day when all courses will have been designed by qualified architects, may we not be overtaken by events?

There are so many issues raised in Mr Arthur's interesting and provocative article that I obviously cannot respond to them here but I would just like to make a final point about the proposed National Development Council which I believe is the nub of the whole report. I well understand Mr Arthur's concern that such a body could become a forum where vested interests could be advanced. Personally, I would imagine it would have to be made clear from the start to all involved that that was "not allowed" and the decision from the chair would have to be final. No doubt the R & A has enough long "spoons" available to sup with anyone! And, of course, more seriously, if there is good regular staff work from a disinterested full-time team, the pushing of particular interests should not be "worth the candle".

Graham Hurst
Glebe Consultants

Dear Sir,

May I first of all congratulate Jim Arthur on his excellently poignant article on the subject of "The Demand for Golf." It is all too easy to criticise any survey or to state that demand will not grow on a straight line graph, but facts are facts and at the present time demand for golf exceeds the supply of adequate facilities.

Some three years ago the EGU Secretariat concluded that 500 courses were needed. At the time the telephones were ringing on a regular basis and callers were obviously in need of help.

As a direct result the EGU Golf Development Committee was formed with the specific intention of providing advice in connection with the wide range of enquiries. At all times it was the intention to make sure that any development was supervised by the real professionals. The members of the Committee have considerable experience in the field of development and if they don't know something they know a man who does.

To be brief, since the early days we have invested money to ensure that the service we offer is a "professional" service, although fees are not charged. We called a meeting of all interested parties, including the architects, constructors, nature conservation personnel and at the meeting it was agreed that golf development should be coordinated by the EGU.

Mr Hurst's point that Golf Development should be in the hands of a full time group of professionals, is in our view wrong. We do not feel there is a need to create yet another body, for our organisation was in the field early and as a result has gained valuable experience and expertise. In fact some of the problems mentioned by Mr Arthur are now no longer problems in England.

The R & A meeting is valuable and certainly needed if only to put on record exactly what the EGU is doing and how it has learned from experience.

Keith Wright
Secretary, English Golf Union

In response to Jim Arthur's article 'the Demand for Golf' and his reservations on the formation of a National Golf Development Council another correspondent has sent us the following extract from a recent issue of the American publication 'Executive Golfer'

"The National Golf Foundation is playing a very dangerous game with its hype on golf! Would you believe there are over 23 million golfers in America? No way! The National Golf Foundation not only wants us to believe that, but it projects 30 million golfers by 1999, a net gain of one million golfers each year for the next 10 years. Even Barnum and Bailey would be impressed with the magnitude of this kind of hype.

The NGF is well-intentioned, but it is play-
FROM THE FAIRWAY

ing a very dangerous game and could seriously wound the golf industry. I wonder if they thought about that. Major firms such as Mercedes-Benz, the National Multiple Sclerosis Society, some leading golf manufacturers, golf resorts and golf communities are beginning to believe it. The danger is in the fact that they are making huge capital investments to meet the demands of those projections. What happens if there is no such growth? Take the extravagant claim of 23 million golfers in America today. Where does the NGF get these figures? Simple arithmetic will show you it's impossible! To illustrate my point, let's use the NGF figures of 23 million (using round numbers) and 13,000 golf courses in America. By dividing 13,000 into 23 million each course would have an average membership of 1,770. When you consider the fact that almost 50% of America's golf courses are nine-holers, and that the average membership of a fine private country club is approximately 400, then simple arithmetic makes a figure of 23 million golfers in America hard to digest. A key factor is the definition of a golfer. To me, a golfer is someone who plays at least 16 rounds per year. That would be one round each warm weekend in the cold belt. Executive Golfer is a member of the BGF and I hope this column will not lead to its expulsion. The NGF is important to the golf industry and is blessed with a high-skilled Board of Directors. The Board approves research funding and then can only listen to the results. But, after almost a year of hype, someone has to blow the whistle on those wild projections.

Dr. Joseph Beditz is the NGF President and we'll gladly offer all the space he needs in Executive Golfer to clarify and justify his projections to our readers. 23 million? 30 million? C'mon!

Dear Sir,

It was with great interest that I read the exchange on irrigation between Peter Wisbey and Tim Arthur in the September issue. Being at the back end of Africa we only get our 'Golf Course' two to three months later. As we are close to the equator in Zimbabwe with seasonal rainfall (Nov/March) and high average temperatures (28°C Summer/21°C Winter) with our relative humidity depending on rainfall varying from 18% to 98%, this means that the 'Rolls-Royce' mixtures of Fescues/Bents etc we read about don't do well and we have to rely on Bermudagrass (Cynodon sp) for our greens. With only 5 months of rainfall we must irrigate to keep any sort of green going. Therefore, irrigation management is critical if a decent green is required for the whole year. Bermudagrass greens grow well but can give a very hard surface under dry conditions. They put true but hold like polished concrete. Unlike the greens mentioned in the Wisbey/Arthur exchange, drainage is seldom if ever a problem, water deficit rather than water excess characterizes our situation. Even though our situation is diametrically opposite to that experienced by the majority of your readers, often lessons can be learnt from basic principles that apply to all. I therefore offer my comments from the standpoint. We have the whole range of sprinklers for irrigation over greens, from the most up to state of the art 'pop-ups' to hand held hose with rose. In general we have found that most sprinkler systems tend to apply water at a faster rate than the green surface can absorb them.

With low humidities and high winds, if our pumping pressures are too high and nozzles too small we get excessive atomization and 'perfect' evaporation. We have measured up to 50% of the moisture not reaching the green surface on a hot dry day if pressures are too high. Our surface evaporation is extremely high in spring and early summer with open Type 'A' evaporation pans giving a surface evaporation of 10-12 mm of water per day. Therefore, we need a lot of water but at the same time we have to put it in effectively, while still allowing time for play and not keeping the surface too wet to encourage fungus diseases (Drechslera poae and Dollar spot being the worst). High winds especially in August and September also play havoc with distribution over the surface of the green. We have found daily watering promotes fungal growth and yet we require sufficient time to get the water on. Less waterings per week are unpopular because the surface dries out too quickly and players complain that the greens don't hold. Most courses with heavy traffic have come to a local compromise. Water is only applied at night, early morning or late evening at a maximum of 3 times per week with a 5mm spurt on the morning of major competitions to keep the players happy. On new greens we've had excellent results, even in our hottest months, with two irrigations per week, but the players complain about hard greens on non-irrigation days. With the large amount of water required in the hot months 84-90mm/week to offset the very dry conditions it has therefore, been essential to develop a scheduling system especially where water supply is limited, bearing in mind that both over and under watering causes problems.

Scheduling is based on calculations of the evapotranspiration rate against the evaporation from an open surface of water (ET/ Eo) and the relation of this to the moisture extraction depth of the roots and the stage of growth of the grass. Added to this is a conversion factor for the efficiency of the watering system. This net amount is then measured during watering by using strategically placed rain gauges, especially on windy days. We have found that in our 'dry' regime as opposed to the 'wet' regime most of your readers experience, efficient water application makes the difference between a very good green and a poorly grown hard green. The principles we adhere to rigorously are:-

1. A weekly determination of the amount of water required based on an irrigation schedule related to growing conditions.
2. Adequate supervision to make sure that the irrigation systems are being used under optimum conditions.
3. Constant measuring of exactly how much water is actually put on each green. Manufacturers specifications or the rating of the equipment is used only as a guide and not relied on particularly because of variations in Relative Humidity, Temperature and Windspeed.
4. Continual checking of application rate to prevent run off. A useful guide we have found is that as soon as a green starts to shed water it is time for a verticut.
5. With fixed sprinkler positions under very adverse conditions supplementation with hand watering is also practised.
6. Not relying on programmed irrigations willy-nilly despite all the fancy computer programmes etc. that comes with them. The criteria on which these are based are too generalized and nothing makes up for basic good 'on the ground' management especially if problems occur.

I would certainly be interested in other people's comments as you can always learn from others.

Dr. D.S. McClymont
Royal Harare Golf Club
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