



Golf Course Construction

from the

Greenkeeper's Standpoint

By EDWARD B. DEARIE, JR.

Noted Chicago Greenkeeper and Golf Course Architect

CHAPTER III—Moulding the Course

THE most artistic golf courses are those upon which the least attempt has been made to modify the natural topography of satisfactory sites.

Nature is *The Great Artist* and, while the landscape may be changed in appearance, there is seldom much improvement. Harmony of proportion and form may always be observed in natural environments. In moulding a golf course, therefore, it is best not to endeavor to excel Nature—but to cooperate with her.

The game of golf, however, was man's own idea and he originated the idea of placing 18 holes in sequence to test the patience and skill of the golfer. It is believed by some that the placing of traps, pits, bunkers and hazards to bewilder the player was the idea of the Devil.

After a club has secured a satisfactory site, it is anxious to accomplish one object: to transform the property into the most artistic golf course permitted by its resources.

Money is Not Everything

THE amount of money available for this transformation does not always materially affect the result. Sometimes common sense is far more effective than an abundance of cash. While funds are necessary for the creation of a golf course, it is not desirable that they should be spent with reckless abandon. For every dollar wisely spent in golf course construction about two dollars are wasted. Such extravagance is inexcusable. The courses upon which the most money has been wasted are certainly neither the most beautiful nor the most satisfactory. If the amount of money spent in construction determined the calibre of links,

there would be many more championship courses in United States.

Efficient business-like methods should be adopted by a club as soon as it is organized. The spending of the sums required for the creation and operation of golf courses require such management. Nowhere can wisdom be used to better advantage. An attitude of indifference on the part of club officers is quite unfair to the membership. The spending of the thousands of dollars involved is no mean responsibility.

The master plan submitted by the golf course architect to the development committee should be given the most careful consideration. The arrangement of the holes, which requires the greatest ingenuity, should be carefully checked and an effort should be made to ascertain if the lay-out utilizes the natural features of the property to the fullest extent. Fortunate is the club with a competent civil engineer for he may explain the proposed design so that it may be visualized.

Specifications submitted by the architect should include an estimate of the number of cubic yards of dirt to be moved, the number of feet of tile and pipe lines, the number of acres to be cleared and all other details likely to affect the cost of moulding the course.

Letting of Construction Contracts

COMPETENT golf course contractors should then be furnished blue prints of the master plans and copies of the specifications and invited to furnish bids. The quotations will provide club officials with data upon which to base intelligent action. Salesmanship

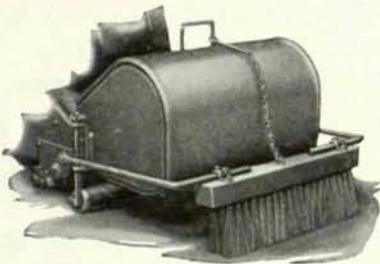


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should not be the controlling factor in the awarding of the construction contracts. Many clubs, which have been influenced by flowery promises, have later faced treasury deficits.

Rightfully, the course architect should be the representative of the club and should not be financially interested in the construction work. His advice can be of far more value then. He should be called upon as a consultant in the awarding of the construction contracts and should have his own engineering crew and construction superintendent on the job to see that the course is laid out according to the master plan.

Whether the construction work should be handled by one contractor or several is a question requiring forethought. Each practice has certain advantages. When the work is given to one general contractor, the club may look to him for strict adherence to the lay-out and can hold him responsible for variations. When several contractors are awarded independent contracts, it is somewhat difficult to fix responsibility. However, the various phases of golf course construction require the services of specialists. Clearing the site, moulding the terrain, installing the drainage and irrigation systems and landscaping the course all require the attention of men experienced in these respective fields. If such men are available, probably it is better to take advantage of their services.

Actual bids should be furnished before the real work is commenced. "Estimates of probable cost" are practically valueless. Such guesses are always exceeded and the difference is invariably at the club's expense. Inability to submit a definite price indicates a vague opinion as to the cost of the work and perhaps this shows an unfamiliarity with the work at hand. Bids may be submitted contingent upon the number of cubic yards of dirt moved or the number of feet of tile or pipe laid before the job is completed. Sometimes there is a change in specifications. Information furnished by the architect should be sufficient for the submission of bids. If not, bidders should have the privilege of inspecting the site.

Bids for Clearing Land

BIDS for the clearing of the land require a personal inspection of the property. Usually the bidder will visit it with the course architect. The price for such work is based upon the approximate number of rocks or stumps to be removed per acre.

The contract should specify that all stumps should be piled up and burned. Frequently, they are merely blasted out of the ground with dynamite and the fragments left on the property. There should be a distinct understanding in regard to the timber. Sometimes a small power saw may be rented and used to advantage to cut the tree trunks and limbs into suitable lengths to be used in the construction of rustic shelter houses. If enough lumber is available, it may even be used in the clubhouse.

Unless other arrangements have been made, the clearing contractor usually appropriates the timber which he clears from the property. His contract should set a time limit as delay in this preliminary work is likely to prevent the sowing of the turf at the proper time.

Rush work is seldom desirable. Too often the job is negligently done and necessary details are neglected. Clubs often delay approval of master plans and postpone ratification of contracts until it is necessary to rush construction work in order to have the course ready for play by a certain specified time. Besides the inconvenience, there is likely to be added expense for labor.

The weather may interfere with the normal progress of the work. Sufficient time must be allowed for newly moved dirt to settle into place. Otherwise, the condition of the course may be ruined after acceptance of the work thru the appearance of pot-holes and sunken ridges on the fairways.

Construction work may be done at any time of the year when the condition of the ground and the weather permit. Frozen or muddy soil should not be worked. The former is almost impossible to dig and the latter is inclined to cake and congeal into a mass which later bakes and hardens. Dried mud cannot be modified and will not grow turf.

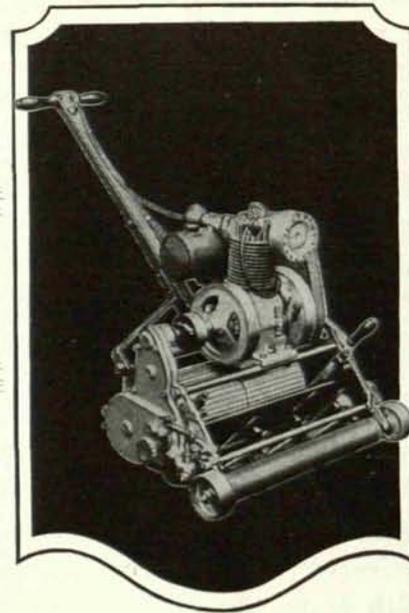
Equipment Depends Upon Contracts

THE equipment to be used will depend upon the contracts. In almost all cases contrac-

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Cuts Labor Cost 58 Per Cent

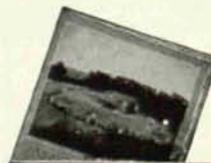
Regarding the cost of mowing the greens with Jacobsen Power Mowers as compared with the ordinary greens mower, would say that we have made a careful comparison and find that we can save ourselves 58 per cent of the labor cost. T. K. Harris Co., Tam O'Shanter Public Golf Course, Canton, Ohio.

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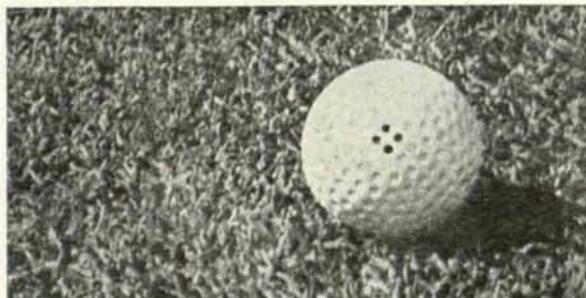


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tors will furnish the equipment and relieve the club of all responsibility. However, it is well for the club to know whether or not the contractors are prepared to use the most efficient equipment. This may make it apparent whether or not they are able to perform the work properly. Few contractors in other fields are able to build golf courses and the selection should be made from those who have had experience in this field.

Now there are some very competent golf course contractors. Generally, contractors will hire their equipment on a day-to-day basis. This obviates the necessity of paying rental for the equipment when it is idle on account of weather conditions. Usually such equipment is accompanied by competent men to operate it who are responsible for its care.

The most efficient equipment usually will be found the most economical. Select the equipment which will do the most work in the least time. Capacity of equipment is more important than cost per day. Frequently, the equipment which costs the most to rent, is the cheapest.



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Large quantities of dirt may best be moved by a No. 206 P. H. Dragline with a 45-foot boom and a cubic-yard bucket. This machine is able to move about 88 cubic yards per hour and has a wide range of operation. Next in efficiency is a steam shovel with a 20-foot boom and a cubic yard bucket. This machine can excavate about 55 cubic yards per hour but its range is more restricted because of the shorter boom. Both machines require an operator and a ground man and are equipped with caterpillar traction. One of these machines may be used to advantage and sometimes several when the plans provide for a lake or lagoon.

Ditching Requires Care

FOR ditching, care should be taken to select a machine which will cut the required maximum depth. While the average trench depth is only three feet, sometimes it is necessary to lay a pipe or tile line through a hill and to dig a trench as deep as ten feet. The capacity of the average ditching machine is about 300 cubic feet of soil per hour. At the usual speed, made by these machines, two men will not have

much trouble in following behind and installing the pipe or tile lines.

Backfilling should be done by a tractor with a mould-board or bulldozer in front. No attempt should be made to level the surface of the refilled ditch for at least three weeks in order to give the dirt a chance to settle.

For grading slopes large fresno slips which have a capacity of a cubic yard, will be found most efficient. These may be pulled by tractors but the weight of these has a tendency to pack the soil and when turning, tractors often tear down slopes. For finish grading horses will be found more desirable. They can turn in a shorter radius and do less damage to the slopes. While they are slower, their work is somewhat more efficient. Four horses are recommended for every scraper. Three horses will work fairly well for the first few hours of the day but after that they tire. One two-horse plow will be required for every three four-up slips to loosen the soil. If rock or baked ground is encountered, the plowing is doubly important and will call for the use of a railroad or breaker plow which is heavy enough to sink into the

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developed as a result of experiments by Green Section of U. S. G. A. Controls both large and small brown-patch most economically. See Prof. McClure's article this issue.

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hardest ground.

The quantity of equipment to be used will depend entirely upon the amount of dirt to be moved which varies greatly. The maximum distance from trap to center of green usually is not over 125 feet but the quantity of dirt to be moved varies from 500 to 3000 cubic yards, depending upon the design of the green site.

Timekeeper Should be Installed

BEFORE construction work is commenced, headquarters should be established on the property and a timekeeper installed. He should

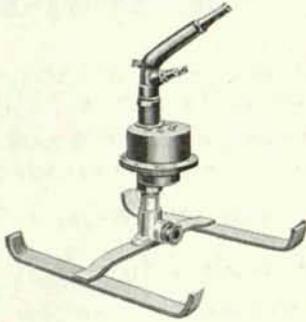


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be made responsible for the receiving of supplies and should prepare either a weekly or daily report of construction and all material details so that the progress of the work may be controlled. Records of the facts should be made in duplicate and given to the interested officers of the club.

At least a month before the dirt-work is commenced, an engineering crew under the direction of the golf course architect should commence staking out the grades. Three men will require about a day to stake out the average green. When the preliminary levels have been reached, restaking will be necessary as all the contours cannot be indicated by the first set of stakes. Careful supervision of this work by the architect will enable him to individualize each green, trap and bunker.

Greens require very careful grading. The maximum slope should not be over 1 foot to 35 feet. Greens with steep slopes are not satisfactory. Surface drainage requires careful consideration. Storm water from the greens should be prevented from draining into the traps. The contour of each green area should be made to blend with the surrounding landscape.

A fleet of tractors may often be used to advantage in conditioning the fairways. All pockets should be leveled from the surface. If any ditches have been dug, the backfill should be properly graded after settling. Fairways should be marked so that the lath stakes distinguish them from the rough and to assist sowing the seed. The tees should be graded carefully and levels should be taken with a transit. All work should be inspected very thoroughly before approval.

While the course is being moulded, it is often possible to proceed with the drainage and irrigation work to advantage too. Before this can be done, careful plans must be made. These should be given immediate consideration right after the master plan.

Common Sense is the Best Guide

COMMON sense is the best guide for the actual procedure in construction work. Where wooded areas and swamps do not interfere, it is often most practical to move directly across the property, completing each piece of work in the path of the progress. Areas broken

up by deep ravines and encumbered by outcroppings of rock require special attention in order not to cause any delay.

The efficiency with which a construction organization is managed often decides the quality of its work. Day-labor requires the most careful supervision. Best results will be obtained artistically when foremen and sub-foremen understand golf and realize that they are not merely moving dirt but are creating the picture of a beautiful golf course.

To lessen maintenance cost and to eliminate the necessity of reconstruction work in the future, proper attention to construction work is most desirable. Upon it depends many times the failure or success of the country club. With steam shovel, drag line, plow and scraper it is possible to mould the surface at will and to create effects and features which can but rarely be found provided by Nature. Superb hazards and attractive greens have been built on land once thought impossible to develop.

Next Month: Chapter IV—Drainage on the Golf Course.



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