



*Pleasant Valley Country Club, Little Rock, Arkansas, has excellent underpasses for protection of the golfer.*

## Roads Extend the Life of Turf and the Golf Car

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**T**HERE ARE MANY REASONS why golf and country clubs continue to build roads through their property, and so whether we fear an asphalt jungle or not, golf cars and golf roads are here to stay. The popularity of the cars assures the survival of the roads.

There are other reasons why the use of golf cars is promoted. Revenue derived from their use is one. Some courses require all golfers to ride in cars, and no one can play the course without renting one. Management believes it speeds play. Because of this, caddies have all but been eliminated in some areas. In others, clubs still insist that a caddie accompany a group whether or not they take a car. By doing this, some clubs preserve and protect the traditional role of the caddie.

The increase in the number of rounds of golf at resort areas, municipal fee courses and clubs is causing roads to be built not only to preserve the

grass, but also to get more mileage from each golf car. Maintenance is reduced and the cars last longer. To the turfgrass manager, at least part of the income from golf car rental should be returned to course maintenance. It is a cost item in this budget.

Roads are the best solution to the problem of playing golf under adverse weather conditions. Because of the extremely cold weather across the South last winter, a number of clubs have stepped up road construction. The continuous use of golf cars on dormant bermudagrass caused thin, bare areas, if not outright bermudagrass kill. The winter traffic pattern on many courses was still evident by late summer of 1977.

As car fleets increase, worn, thin, bare turfgrass areas expand. This calls for increased maintenance programs, extended roads and, hopefully, a stronger strain of grass for the future. Many

golf courses today require golf cars to stay on the roads at all times.

The simplest means of illustrating the effect of keeping traffic off turf is to select a par-3 hole and restrict cars to the rough, or construct a road and confine all traffic to it. The grass will recover from excess golf car and maintenance equipment traffic wear in a short time.

Courses with very steep terrain also call for a road system. It will reduce hazards on steep hills, spinning wheels and excessive wear of grass. Holes with unusually steep grades require road construction to minimize hairpin turns and allow golf cars to proceed safely from tee to green. This unusual condition exists on the 12th hole at Gatlinburg Country Club, Gatlinburg, Tenn. There is a drop of perhaps 150 feet to 200 feet from tee to green.

Practically all members will comment when the club decides to build roads. Some members believe their golf course will be turned into a super highway and roads will run in all directions. They fear the destruction of the beauty of the course and interference with the game. Most members think only of the width of the golf cars and fail to realize maintenance equipment may also have to use the roads. If this is the case, the roads should be wide enough to accommodate tractors and other equipment as well. There are many narrow roads where both golf cars and maintenance equipment run off the edge, kill the grass and cause erosion and hazardous conditions.

Many roads built 10 years ago are now being renovated, widened and reinforced with concrete or thicker asphalt. The first roads on any course are usually developed in areas of obvious need. Discussions about roads usually begin two or three years before actual construction. The discussions may continue endlessly, but someone eventually must make a decision, and it is doubtful if that decision will please every member.

The size of tires on golf cars as well as tires in maintenance equipment has a great influence on the wear. Research at the Coastal Plains Experiment Station, Tifton, Ga., in 1966 showed that 300 repeated golf car passes over a selected area of bermudagrass compacted the soil to the extent that a measurement made one year later showed as much as 33 per cent water runoff from the compacted area. Different tire sizes were used and research indicated a 9½- x 8-inch tire size was best. Five different selections of bermudagrass were tested. Tiflawn was the most wear resistant and Tifway was second. Tiflawn is not in use on golf courses today, but Tifway, Tifgreen, and common bermudagrasses are. Research at Texas A&M University by Dr. James B. Beard and his staff has indicated that Tifway is one of the most wear-resistant bermudagrasses used on golf courses today.

Roads should be constructed so that they do not distract from the course or the clubhouse. If they are carefully planned they may even add to the beauty, or at least blend into the landscape. From green to the following tee, they may be attractively landscaped with flowering shrubs and annuals. This type of scenery is quite often found at resort areas. In some instances, roads may also be used to divert water away from the playing areas of the course and clubhouse grounds.

Roads should generally follow the direction of the fairways wherever possible rather than follow a straight line from tee to green. Roads at the Countryside Country Club, in Clearwater, Fla., go from the first tee through the 18th green, but they were constructed to be as inconspicuous as possible. Landscaping plays an important role in designing roads; the use of flower gardens, flowering or evergreen shrubs and selected trees help break up the monotony of any road system. Roads should be designed for each hole so that the game will



*Yacht and Country Club, Stuart, Florida, has high curbs to keep automobiles and golf cars separated.*



*Safety is important to Green Island Country Club, Columbus, Georgia.*

have the least interference and at the same time the golf ball be accessible with minimum loss of time and play. Some roads are designed to curve around bunkers and mounds and at the same time place the golfer near the landing area or in proximity to the ball. An island can divide roads so that golf cars will not be too close if they should meet in a congested area. Small shrubs and rock gardens have been planted to improve the appearance of roads at the Las Colinas Country Club, in Irving, Texas.

Control of traffic on busy golf courses is becoming more of a problem. Sometimes patrols are needed to keep play moving with minimum disturbance to other golfers. Many people play only one to three rounds of golf a year. They usually drive their golf car wherever they please because they may be paying \$100 a day or more for their stay.

The golfer usually goes to the course to relieve business pressure and for recreation. In many instances, he does not pay much attention to directional indicators to minimize traffic wear or to alert him to possible danger. Accidents are becoming more numerous and insurance coverage has become increasingly necessary. Miniature replicas of highway signs have been used for directing golfers and to indicate hills, danger areas and uneven terrain in an effort to reduce accidents. Unfortunately, they are too often ignored.

Some quite elaborate bridges across drainage ditches, creeks, rivers and highways are now being built on golf courses. Some of them compare quite favorably with bridges on public highways. To prevent golf cars from accidentally running off bridges, railings are of particular importance and are usually required by insurance companies.

Tunnels or bridges have been constructed under or over public highways to permit the golfer to cross such thoroughfares without danger of collision. An excellent arrangement of bridges can be found at Pleasant Valley Country Club, in Little Rock, Ark. The bridges were built at the same time the golf course was developed, and there is adequate clearance for pick-up trucks as well as for golf cars.

Metal culverts are often used for tunnels under a road. The underpasses should be built to insure adequate drainage without requiring pumping. Of course, a minimum clearance to permit golf cars with tops to pass through the culvert is essential.

Increasing attention must be given to those golf courses where the golfer must cross a public highway or street. Some authorities predict that sooner or later, golf cars will have to have license plates or tags to cross public ways.

Since it is difficult to move a road after it has been installed, there should be a complete drawing and understanding of the road system throughout the course before construction begins. Roads should be wide enough for all vehicles that are expected to travel over them, including maintenance and delivery trucks. Developing roads with a concave design or curbing will help in diverting water and causing the least interference to play.

The cost of petroleum directly affects the cost of asphalt. In some areas today, asphalt is almost as expensive as concrete. Where asphalt roads cross water drainways, concrete slabs should be installed since asphalt deteriorates in standing water. Concrete requires minimum maintenance and lasts longer than asphalt installations.

The cost of road construction varies from one community to another, and, therefore, estimates from state to state cannot be quoted. Local paving companies will provide estimates for roads based on foundation preparation, width of road and depth of asphalt. Hot or cold, asphalt is sold by the ton.

Reinforced concrete requires little repair, but the original cost can be many times that of asphalt. One cubic yard of concrete will cover an area 80 square feet at 4-inch depth or 65 square feet at 5-inch depth. From these approximate figures, one can estimate the cost of a concrete installation based on its local price per cubic yard.

The tendency to take shortcuts leads to worn turf in certain cart path locations. The installation of a low curbing (3 to 4 inches high) will not damage a golf car if it runs over it, but it will be a reminder to stay on the path and thereby preserve the turf. Curbing can be made from almost any material. Asphalt, concrete, coconut trees, pine trees, old railroad cross ties, and any other product that can be used to discourage the "shortcut" will





*John Biddy at Lakeside Country Club, Houston, Texas, placed concrete in low drainage areas for minimum repair.*

prove valuable. For easier maintenance, fill in behind the curb with soil and turfgrass to the level of the curbing. This will permit easier mowing.

There will be some light reflection from white concrete. To reduce glare, dye can be added when the concrete is being smoothed or when the finishing touches are made to the road surface. Lamp black or green dye can be used quite satisfactorily. A portion of concrete that has been dyed and a portion that has been left in its natural state can be compared for contrast.

Most golfers who use pull carts do not believe they are damaging the turf when they park their pull cart on the turf. There is no research showing wear of the pull cart compared with the golf car.

Most members pull up to a tee, pull off the road and park. This is a natural reaction after driving on public highways.

Roads are seldom constructed by land labor today unless they are of limited length. Forms can be built and cold mixes used and then rolled with a 300- to 500-pound roller. This will form a very satisfactory road. When properly constructed, it will last at least 15 to 20 years with minimum repair.

The type of car and turning circle required will determine the width and turning circles of a road. Many have to be widened in the circle area when the model of golf car is changed. The turning circle at the end of the road should be large enough to make the turn comfortably without backing or

jockeying. A 4-inch curb will confine the cart to the road.

Many types of soil swell and shrink under varying weather conditions. These soils will affect the road surface even if it is made of reinforced concrete. Repair of concrete roads is much more difficult if swelling and shrinkage of clay causes the road to buckle or break.

The type of traffic using a road is important in determining construction and thickness of the material used. Delivery trucks of all sorts will be using roads around the maintenance building. A reinforced surface will not break under a 20- or 30-ton truck delivering sand, fertilizers, or other products to the golf course. Handling of delivery trucks should be taken into consideration when developing drive throughs. Ample backing space should be provided.

There should be a detailed drawing of the road system available so that everyone involved will have access to the system plans. The plans should be in great detail and careful thought should be given to efficient movement of both golf cars and maintenance equipment.

There should be at least a minimum of  $\frac{3}{4}$ - to 1-inch compacted asphalt for road building. A  $\frac{1}{4}$ - to  $\frac{1}{2}$ -inch thickness breaks up easily under heavy traffic, and pot holes soon develop. These damage golf cars as well as maintenance equipment. Water also causes asphalt deterioration; bare areas develop and erosion sets in.

Tree and grass roots will damage a road if growth inhibitors are not placed on the soil before laying asphalt or concrete. Bermudagrass and weeds deteriorate thin asphalt rapidly. It also absorbs heat, and bermudagrass and other warm season grasses grow extremely well under these conditions.

Drainage is very important when constructing an asphalt road, and, therefore, the foundation under the asphalt is equally important. The amount of substrate or foundation depends very much upon the type of vehicles that will be used. Construction does not have to be of reinforced material if only golf cars are involved. Asphalt could be three to four inches thick and counter-sunk in the soil to be flush with the surface if there is a good sand base. Sealing the asphalt will slow deterioration and prolong the life of the road.

Everything imaginable has been used for golf roads, from pecan hulls to cypress bark. These are very attractive materials and they make excellent roadways, but heavy rains and excess traffic eventually break them down and distort their appearance. They require constant attention, and even then very dusty conditions may develop. Eventually, they are replaced with asphalt or concrete.

To provide the best possible playing conditions and to enjoy golf to the fullest, healthy turf plays an important role. Many factors are involved in developing and maintaining good golfing turf. One of them is the problem from ever increasing golf car traffic. Roads on the golf course extend the life of turfgrasses and the golf car.