

Cart Paths

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Dirt, pine needles, redwood and other types of wood chips, tanbark, peanut and pecan hulls, sawdust, shells, concrete, sand, gravel and asphalt are among things used for golf cart roadways.

Indeed, the grand entrance of mechanized golf carts has altered maintenance practices as well as the game itself. Golf carts, especially those with wide tires, cause little compaction to soils. However, the shearing action where the tire meets soil, sandwiching grass blades between, results in bare, rutted areas very quickly. One cart pass will cause damage or shearing. Consequently, many golf course superintendents have cart paths, or plan to install them.

What is the best arrangement? Courses which have 12-month play and where cart use is heavy have installed paths throughout the grounds, and many insist that carts stay on those paths at all times. A non-cart en-

thusiast measured the distance walked for 18 holes with a cart and again without a cart. The difference was approximately 500 yards longer without the cart. Unless the golfer is inhumanly accurate and can hit his ball to a path in every shot, he is in for some walking with this arrangement.

Rather than build paths throughout the course, some clubs install roads where cart operators naturally seem to go. Invariably, this starts at the Number 1 tee, and also in funnel areas between greens and the following tee. Efforts are made, as indeed they should or must be, to place paths in out-of-play areas, such as among trees which may be close to putting surfaces, behind traps placed near greens, or behind the green.

Fairway-Length Paths

Rules are made, but not always enforced, whereby cart operators must use paths in funnel areas or where paths exist. Some paths have been

Paths for three modes of transport are shown in this picture. First, the rail car for walking golfers who shun hills. To its left is an asphalt path for powered carts. Alongside the asphalt path is a worn track created by walking golfers who climb hills, but not on hard paths.





Paths often are laid through normally unused portions of the course.

installed the length of entire fairways for some specific purpose. If fairway and rough conditions are such on a given hole that paths cannot be installed, they are placed in remote areas or where cart use is assured.

Where paths have not been installed, it has been observed that less permanent damage is done if carts are allowed to roam throughout the course rather than restricted to specific locations, such as rough only or fairway only.

Cracked and crumbling edges demonstrate the damage done to paths that are not wide enough to contain a cart.



Where it is not desirable to install an artificial path, but turf wear is a problem, increased cultural practices are helpful. Such practices as aeration, extra fertilization, artificial watering and disease control should be carried out.

Even though many items are used as path material, the trend definitely is toward asphalt. If other materials, such as gravel or sand, are used, they eventually are covered with asphalt. Many superintendents, contractors, and cart users have been asked what type of path they prefer. Without exception, the one considered best, and actually the most economical in the long run, consists of 3 to 4 inches gravel underbase covered with 2 inches of "hot roll" (240°-280°) asphalt which will not harden to a consistency impenetrable by spikes.

Width Of Paths

In the beginning most paths were 4 feet wide. But carts simply will not stay on a 4-foot expanse. Paths have been increased to 6 feet in many cases but the trend is to 8-foot width. The

8-foot width is appropriate for a number of reasons:

- 1) Anyone can stay on them.
- 2) They can be used for maintenance equipment.
- 3) asphalt spreaders normally lay 8-foot swaths; thus it could be less expensive to place 8-foot rather than 6-foot paths in some instances.

At Number 1 tee locations, often even 8 feet is not adequate. Grass that once covered the areas next to tees is gradually being replaced by asphalt at some courses. Grass cannot grow when you are standing on it, and the Number 1 teeing area is the most difficult to keep turfed. As much asphalt or other type pathing as necessary must be placed here.

The range of path material is wide, from one extreme of just dirt roads formed by traffic to complete concrete runways. But, as previously mentioned, gravel covered with asphalt is finding favor. Generally these paths are built as follows:

1. Of most importance is the formation of a sound, well-constructed base; the resulting path will be as good



Water was encouraged to run off to the sides of this path, causing the erosion shown along the edge.

as its base.

Remove existing sod and soil to such a depth that the finished asphalt surface will be level with the soil. The center of the path should be 2% to 3% higher than the edges to provide for drainage. If four inches of gravel and two inches of asphalt are to be laid, the depth should be six inches. One variation here could be to "swale" the pathway or make the center lower if water drain or carry-off from the center area is necessary. This could

Once grassy, the area alongside No. 1 tee is now being converted to accommodate cart and foot traffic.



help control erosion at the edge of the path. This consideration is for areas where considerable water must move in natural drainways.

2. Be sure that drainage is assured, then place 3 to 4 inches either field run gravel, "pea" gravel (though pea gravel does not compact well or evenly), or what is known in Illinois as Grade 8 crushed stone. A material of this type is finding favor because it is easy to handle, compacts evenly, makes a smooth, even surface, does not erode readily, is acceptable to foot and cart traffic, thus can be left uncovered by asphalt for a period of time if immediate use of asphalt is not possible.

The book, *Standard Specifications for Road and Bridge Construction*, published by the State of Illinois, specifies Grade 8 stone as: "Crushed stone shall be the angular fragments resulting from crushing by mechanical means the following type of rock quarried from undisturbed, consolidated deposits . . . calcareous or dolomitic limestone . . . or similar rock." With the following specifications:

- 100 per cent passing a 1 inch sieve
- 60-90 per cent passing a $\frac{1}{2}$ inch sieve
- 40-60 per cent passing a No. 4 sieve
($\frac{1}{4}$ inch)
- 25-50 per cent passing a No. 8 sieve
($\frac{1}{8}$ inch)
- 20-40 per cent passing a No. 16 sieve
($\frac{1}{16}$ inch)
- 5-15 per cent passing a No. 20 sieve
($\frac{1}{25}$ inch)

With the above sieving specifications, it should be possible to locate similar material anywhere.

This type material definitely makes the most suitable cart path if gravel is used.

3. Roll—firm—compact gravel. Be sure soil to the sides of the cut is not broken down. Especially if existing

soil is sandy, superior results are obtained if barriers are placed at edges. Also, barriers definitely should be placed near the clubhouse or any other location that carries heavy foot traffic.

4. Place asphalt so that two inches will be present after compression ($2\frac{1}{2}$ inches to start), or figure that one yard of hot asphalt will be reduced by 30 per cent when compressed. Use material readily penetrable with spikes after hardening. This is important because golfers simply will not walk on hard surfaces and it is dangerous to do so.

As specified by the State of Illinois, asphalt is:

PA 1-2 For surface treatment and seal coat.

PA 3-4 For bituminous concrete, dense graded aggregate type, and for bituminous macadam pavement.

PA 5 For bituminous macadam pavement.

PA 5-6-7 For bituminous concrete, dense graded aggregate type.

PA 7-8 For sheet asphalt binder and surface courses.

PA 3 or PA 4 is suitable for cart paths.

5. Compress with rollers which are not to exert more weight than 400 psi or less than 200 psi of roller surface. Rollers are not to be propelled at more than 150 feet per minute.

6. The cost range is wide. It is difficult to arrive at an exact figure for every area. One course paid 37¢ a square foot for all work done by the contractor. Another dug road beds and the contractor laid stone and asphalt for 30¢ a square foot.

7. After asphalt has been firmed, turf damage to side of path should be repaired by filling and sodding. However, the freshly-laid path should be

allowed to harden for 8 to 12 hours before it is used.

8. After asphalt has been in place 30 days, apply a sealer coat. This sealer coat, which costs between 3¢ and 4¢ a square foot, can be obtained in various colors. If desired, a green, white, or lavender path can be obtained. Sealer coat lasts about 3 years. For sealing old asphalt, mix 1 quart of sand with every 3 to 5 gallons of material used. Sealer coat is merely dumped on and spread with mold boards or squeegees.
9. Asphalt paths hold up amazingly well if installed properly. Nonetheless, breaks are frequent. Cold patch can be used to repair small ruptures when hot mix is not available. Large breaks should be repaired with the same hot mix used in original construction because cold patch is not long lasting. Therefore, it is desirable to re-repair cold patches with hot mix when hot mix is available.

Care must be taken to insure safety, especially in hilly terrain. Sharp corners and turns should be adequately banked. In extreme cases, even a path eight feet wide may not be wide enough. Paths must not slope downhill or toward water. Except where absolutely necessary, stay away from trees. Repair large chuck holes immediately.

The tendency, even though much less than in the past, simply is to not make a long enough path. The carts must get off some place when the entire course is not pathed. Where carts always leave the path at the same spot turf is worn away. The roadway must be extended from the green to the tee and 50 yards or so down the following fairway in heavy traffic areas. If the cart path can be bowed or meandered off into the woods to

the right or left of the fairway, it is then possible to place barriers on the path which force carts off at that location.

Saving Wear

Carrying the roadway slightly past the tee, then "flaring" it out, is not particularly successful in reducing end-of-path wear. Unless forced to do so otherwise, all drivers leave the path in the same place.

Carts can be forced off the path at different points from day to day by the use of portable barriers. One very suitable barrier consists of a long steel rod, with both ends bent at a 90° angle. The ends are driven into the ground on either side of the path and the center of the rod stretches across the path at about a 3-foot height. A sign with an arrow pointing to the right or left can be hung from the center of the rod. Rarely will cart-using golfers move such barriers, and it is quite difficult to run over them; the cart occupants may be decapitated.

These barriers are moved to different sections of the extended path as considered necessary by the golf course superintendent.

Some sophisticated materials are being tried for paths. The big interest here is to find something with less bounce to the ounce than asphalt for use in areas where shots frequently land. Synthetics such as those used as surface materials in the Houston Astrodome and on race tracks are excellent but quite expensive. A suitable base such as asphalt must first be installed anyway.

Anyone considering installation of cart paths should plan to extend paths as dictated by cart wear even if it means completely from tee to green to following tee. This is especially so on hilly courses where the terrain limits areas where carts can travel.