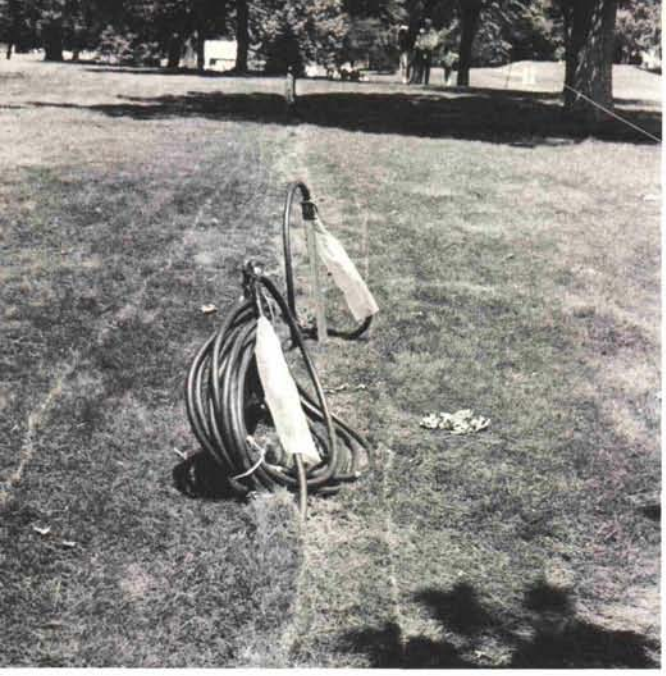

planned program of preparation.

We of the grounds department were caught up in the excitement of the Championship, the preparation and execution of duties throughout the tournament and made it all seem worthwhile. The hard work and long hours are soon forgotten, along with the anxieties and frustrations. These all seemed a natural part of a major tournament.

With a little cooperation from nature, the recovery from the Championship should be complete and the scars healed over before the first welcome snow arrives this winter.

Utility wires buried for protection from the gallery. Easily removed after the tournament.

Bridges Serve the Golf Course

by **WILLIAM G. BUCHANAN,** Eastern Agronomist, USGA Green Section

Bridges are constructed to various sizes and shapes, but they all serve the same purpose, to move people and vehicles safely over obstacles that would be difficult to traverse otherwise. Bridges constructed on the golf course speed play, speed maintenance, and make it more comfortable for golfers to span hazardous terrain (water, deep valleys, ditches, swampland, etc.). Bridges, therefore, are constructed primarily for utility. However, they should not detract from the overall beauty of the golf course. Finally, and most important, they must be constructed well enough to provide safe passage for all manner of traffic.

All bridge construction must be done well, but especially important is the superstructure which is the basic span with foundation tie-ins. The superstructure can be made of either steel or timber stringers that rest on abutments and any intermediate supports. The load-carrying component of the superstructure is the stringer system, which may be rectangular timber, round timber, or steel beams. Steel stringers are either I-beams, wide-flange beams, channel beams or built-up beams. Span length depends on the size of the beam and capacity requirements of the bridge.

Abutments and intermediate supports make up the substructure; these may be timber bents, timber piers, pile bents, or a combination of these supports. Rock and concrete piers are very popular around golf courses. Soil and water conditions at the bridge site dictate what type of intermediate support can be used. Deep water, swift current or adverse footing conditions make the use of piles necessary.

Figure 1 is a very good example of creek bank work, abutment installation and using steel I-beams for intermediate supports. The I-beam piles have angle iron lateral bracing. This particular bridge is located close to a dam that stores irrigaton water. The abutments of the bridge were built into the wing walls that prevent the creek bank from eroding behind the dam.

Figure 2 shows one abutment. The sill of the abutment is concrete with steel stringers on top. All decking on this bridge is 2x6-inch

Figure 1

Figure 2

Figure 5

Figure 6

lumber.

Figure 3 is an excellent example of a steel I-beam used for intermediate support. Concrete serves as a base for the I-beam.

Figure 4 — Rock and concrete are used on this bridge for intermediate supports. Steel stringers are placed into concrete abutments. The decking on the bridge is 2 x 6 with 3 x 12 used for treadway.

Figure 5 — This bridge is all steel, with the exception of the treadway and concrete footings. The span is approximately 180 feet high; the middle intermediate support is 35 feet high. An example of a bridge that does not span water.

Figure 6 — This bridge has a solid concrete intermediate support, has wooden stringers and is strictly for golf cart and foot traffic.

Many suspension bridges are used on golf courses. On a suspension bridge the floor system is suspended from cables which are supported on towers and anchored to abutments.

Regardless of the type of bridge, preventive maintenance is necessary. Figure 7 shows a suspension bridge that had a plywood treadway. The flooring had become rotted over a period of years and resurfacing became necessary. Floor support was 6 x 6 timbers. (Figure 8) Before the flooring was replaced, treated 2 x 4s were placed on either side of each 6 x 6 and then the flooring was replaced. (Figure 9) This bridge is capable of supporting an 8,000-pound load.

Figure 3

Figure 4

Figure 7

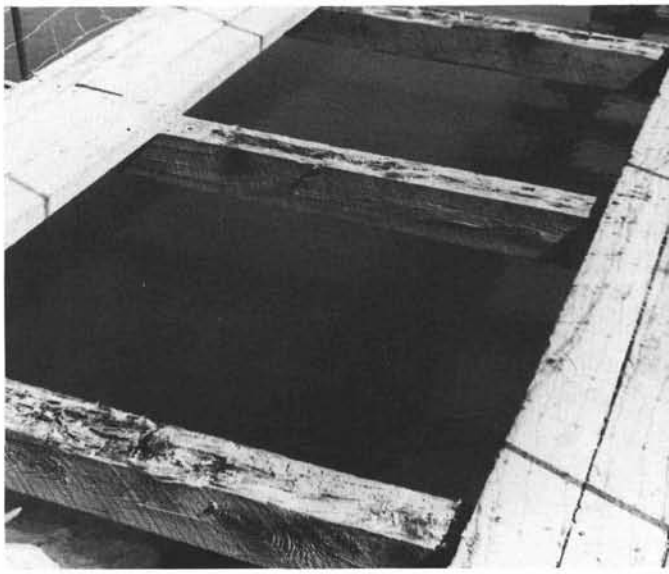

Figure 8

The expanded use of golf carts is forcing clubs to increase cart path systems and use bridges where in prior years a person could walk across an area or use a very simple bridge.

Figure 9