

yond the number stated in the golf course architect's contract.

4. Major changes requested by the client after preliminary drawings are approved or after detailed work is completed on the working drawings.
5. Administering construction work let on a "cost-plus" basis.
6. Serving as an expert witness.
7. Consultation, when no other architectural services are required.
8. Furnish field engineering in connection with the work. During construction set stakes to assure accurate installation of the work in accordance with lines and grades shown on the plans.
9. Special travel in the interest of the client.
10. Measured drawings of existing features to be altered. Normally included in regular service.
11. Extra supervision resulting from unduly protracted construction periods through causes beyond the golf course architect's control.
12. As built drawings when required. Normally included in regular service.

As a rule the golf course architect saves the owner a sum much larger than his fee in the actual cost of construction. His contribution enhances the value of the finished job even more because he designs for savings in maintenance and operating costs. Carefully weighed against the total costs of construction, operation and maintenance; the golf course architect's fee is one of the best construction bargains available.

Dick Nugent  
Golf Course Architect

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## SHADE GRASSES

Dr. Robert W. Schery  
The Lawn Institute

For the northern half of the country lawngrass blends that are shade-tolerant almost always depend upon the fine fescues (*Festuca rubra*). Bluegrasses and bentgrasses stand moderate shade, especially if compensated by high mowing and frequent enough feeding and watering to accommodate both grass and trees. A reasonable fertilization aim might be double the frequency recommended for these grasses in the open.

Perhaps the most publicized shade testing in recent

years has been at Michigan State University. The test area is heavily wooded, far more densely shaded than would be anything but an out-of-bounds woods on a golf course. There even fine fescues suffer, but are recuperative enough to come back. Really, one doesn't need a University test to realize how well fine fescues are adapted to dry shade; just walk around the block and note what is growing under trees. Mowed tall, fine fescues persist well.

Fine fescues often hold up reasonably well even under rather low mowing, as for tees. But they do not spread easily, and should be regularly overseeded. Quicker healing of divots would be expected from bentgrass mixed with the fescue where the tee is not too densely shaded. For moist shade *Poa trivialis* can be used, but it is a "soft" grass that does not stand traffic well.

There is not a great deal of difference between the prominent fine fescue varieties so far as shade tolerance is concerned. The Michigan State work suggests that the grass declines because disease is more prevalent and the grass less able to "shake it off" in the shade. The Pennlawn variety was originally bred in Pennsylvania for a degree of disease-resistance, and might offer some advantage over unselected "creeping red". At the Lawn Institute, Chewings, Illahee and Rainier have all performed about equally as well as Pennlawn. Fine fescue varieties currently on the market include:

**Cascade** — a new Oregon selection out of Chewings.

**Chewings** — now mixed, but the original New Zealand type tightly erect.

**Creeping Red** — the unselected parent type mostly from western Canada.

**Golfrood** — a recent European variety said to be somewhat salt-tolerant.

**Highlight** — a European selection now grown in Oregon, dense and bright.

**Illahoe** — widely used Oregon selection out of Creeping Red.

**Jamestown** — a new release from Rhode Island, from a shore location.

**Pennlawn** — A synthetic from three Pennsylvania selections.

**Rainier** — an Oregon selection performing well in northern locations.

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