Assessment of Testing Methods for Establishing Golf Course Accessibility Guidelines

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Goal:

- *Assess the surface characteristics of putting greens*
- *Quantify the disruption of playing surfaces*

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The Americans with Disabilities Act of 1990 was passed to eliminate barriers which limit accessibility to the disabled. This has heightened the awareness of the play of disabled golfers, especially regarding the use of assistive devices for the playing of golf. Of particular concern is the impact that non-conventional forms of traffic have on playing surface quality, particularly putting greens.

Work during 1995 focused on developing quantitative tests to i) assess the surface characteristics of putting greens and ii) quantify the disruption of playing surfaces. Tests were conducted on golf course putting greens with a range of soil moisture content, soil texture, and turfgrass species to evaluate a number of techniques that characterize surface hardness and soil strength. Both *push-up* and high-sand rootzone greens were used in these tests.

Two relatively inexpensive devices were found that adequately characterized surface hardness and soil strength. A number of techniques were evaluated for the ability to measure the extremely subtle rutting caused by traffic with golf shoes and assistive devices. A depth gauge micrometer was adapted to measure the micro-relief of putting greens surfaces. Techniques to measure the effects of traffic on ball roll are still under development; however, we have made progress.

Current methodology utilizes a Stimpmeter to create a repeatable ball roll. Before traffic, the path of ball travel for an average (8 to 10-ft Stimpmeter roll) putt is determined, and the final resting point of the

ball is recorded by measuring the forward (x) and lateral (y) positions relative to the line of travel and end of the Stimpmeter. After traffic, ball roll is measured again to determine any deviation from the non-trafficked path of travel.

Work during 1996 focused on utilizing the quantitative tests described above to describe the relationships between putting green surface characteristics and the ability to bear traffic. Considerable data has been gathered from putting greens on eleven different golf courses located throughout New Jersey and is currently being summarized.

Traffic was applied to greens using wheelchairs, a single rider cart, and the heel of a golf shoe. Each type of traffic was evaluated for the amount of surface depression remaining after 30 seconds of static (stationary) pressure on the putting green. Stationary pressure was applied because this was considered the form of traffic that would result in the most obvious damage and the 30-second time would be representative of the approximate time of putting and waiting for fellow competitors to play out a putt.

Preliminary data indicates that relationships between soil strength and the depth of rutting are beginning to emerge. Edaphic features of each putting green, including the soil texture of the root zone, soil moisture content, thatch depth, organic matter content of the thatch, and particle size distribution of topdressing, are being determined and will be related to the ability to bear traffic.

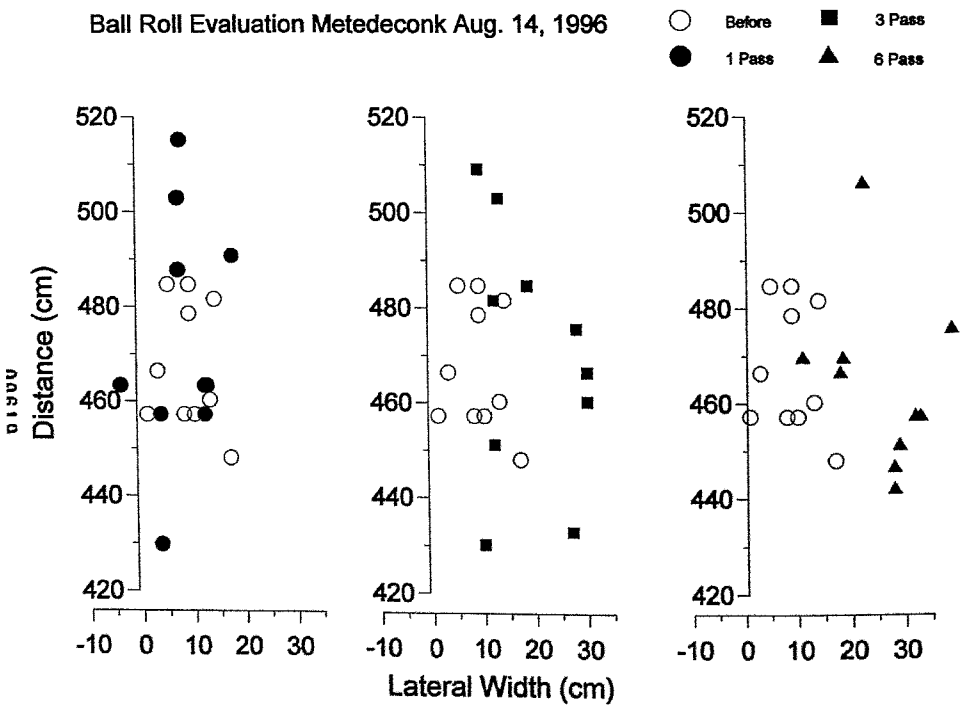

Figure 7. Ball roll deflection across the path of a hard tire wheelchair. The increasing pass number was across the same path and increased the depression depth and width.

Preliminary data indicates that relationships between soil strength and the depth of rutting, and soil strength and depth of rutting are beginning to emerge. Edaphic features of each putting green including the soil texture of the root zone, soil moisture content, thatch depth, organic matter content of the thatch, and particle size distribution of topdressing are being determined and will be related to the ability to bear traffic. Data collection and analysis will continue through 1996 to further develop the relationships discussed above