

IRRIGATION SYSTEM CONTROL AND ZONING

All golf courses are similar in that they are designed to be a series of "holes" made up of a teeing ground where play is started, and a putting surface with a hole marking the final destination of the player's ball. The layout of earth between tee and green is what makes every golf course unique. Every golf hole in the world has a unique set of circumstances separating it from the rest by the way that it relates to the earth's natural topography, weather patterns, sun exposure, and plant environment. Each hole is constructed to be a series of "zones of play" for the ball, and the player is either rewarded or penalized depending on which zone of play his ball comes to rest within. Often these separate zones of play provide ideal guidelines for separation of irrigation control on the golf course.

Most contemporary golf course irrigation systems use sprinkler heads that are equipped with an electrically activated control valve as part of the head. The main advantage to this of "valve-in-head" sprinkler is that each sprinkler can be wired to a controller station for individual control of starting time and length of operation. This enables individual control of each sprinkler to provide the amount of water needed by the turf in its specific water zone radius. If the golf course has large areas that have very similar irrigation requirements, several adjacent valve-in-head sprinklers are wired to a single control station, it is important that the piping system is designed to provide the hydraulic flow required by all of the sprinklers that will be operating at one time; and that the controller is able to provide the electrical output required to activate all of the sprinklers at once.

It is important to consider the following control zone parameters when establishing the zones of irrigation control on a golf course:

***Determine zones with similar water requirements.** Try to group the course into high water use areas, moderate water use areas, and low water use areas. Do not wire sprinkler heads together that are in different water use areas. Separate turf areas of the course from non-turf areas that are irrigated.

***Determine zones that have similar use patterns.** Try to group the course into high, moderate, and low traffic areas. Separate greens, tees, fairways, and rough areas wherever possible. It is always advisable to wire each head around the greens and tees to their own controller terminal to allow for individual sprinkler head control at these two critical types of use zones on the golf course. Many golf courses with sand based turf greens are designed to use a "back-up" row of sprinklers around the greens in order to provide separate control for the green surface and its surrounding terrain.

***Group zones along similar slope gradients and elevations.** Sprinklers on steep slopes may need to run frequently and for shorter durations to avoid unnecessary run-off, while sprinklers in relatively flat areas may not require such restrictive programming to be effective. Turf areas on top of berms will tend to dry out more quickly than flat areas or swales, each type of zone should be grouped together with similar conditions. Elevation changes can effect operating pressure at the sprinkler nozzle which may create a difference in sprinkler performance. In addition, water tends to run downhill so lower areas on the same zone with higher areas may receive too much water and

create drainage problems on the course. Sprinklers should be grouped into zones along similar elevations rather than up or down slopes.

***Be aware of typical weather patterns and sun/shade zones on the course.** Determine prevailing wind direction and try to zone areas in a crosswind direction rather than with the wind to avoid excessive water in "down-wind" zones. Areas receiving direct sunlight will require more water than areas that are typically in the shade. Try to group these areas into separate control zones.

Total control and management of the sprinkler heads is necessary if a golf course is expected to survive. Currently in California, many superintendents don't have enough water or available funds to irrigate their entire course as it was originally designed. Many are faced with the challenge of selecting areas or zones that will not be irrigated in order to have enough water for their primary zones of play; the tees, greens and fairways. If the irrigation system has proper control zoning, the superintendent can be very effective in managing the system's water use when economic cut-backs or drought restrictions are imposed.

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