Example 3

Estimating the annual water use of a sprinkler system operating in a holding area in Madison, WI

Assumptions:

- ✔ Holding area is 2,000 sq. ft.
- ✔ Water is applied at a rate of 0.025 gallons per sq. ft per cycle
- ✔ System uses valved nozzles, so water is not wasted between cycles
- ✔ Cycles are set to operate 1 minute in: 15 minutes at temperature 68 to 78ºF, 10 minute cycles at temperatures 79 to 88ºF and 5 minute cycles at temperatures above 88ºF
- ✔ Typical meteorological year has 1,171 hours from 68 to 78ºF, 389 hours from 79 to 88•F and 61 hours above 88ºF

- ✔ Water per cycle [gal] = square feet * application per sq. ft. = 2,000 sq. ft. * 0.0254 gallons per sq. ft. per cycle = 50 gallons per cycle
- ✔ Number of cycles is found by dividing the number of hours by the cycle duration

Setpoint range	Hours per year	Cycles per year	Gallons of water per year
68-78ºF	1,171	4,684	234,200
79-88ºF	389	2,334	116,700
>88ºF	61	732	36,600
	Annual water use in holding area		387,500

Note: Water can be saved in the holding area by staging sprinklers so they do not operate in the empty portion (only installing sprinklers in the area closest to the parlor, which is occupied a higher percentage of the time). Significant water could also be saved by staging the sprinklers to turn on at THI setpoints instead of temperature setpoints.