Development Services - Planning Division
311 Vernon Street
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LANDSCAPE WATER USE CALCULATION EXAMPLES

MAXIMUM APPLIED WATER ALLOWANCE

The Maximum Applied Water Allowance shall be calculated using the following equation:

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

The example calculations below are hypothetical to demonstrate proper use of the equations and do not represent an existing and/or planned landscape project. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

(Example 1)
MAWA calculation for a project in Roseville, CA with an irrigated landscape area of 50,000 square feet without any Special Landscape Area (SLA = 0, i.e. no area of edible plants, recreational area, or use of recycled water). To calculate MAWA, the annual reference evapotranspiration value for Roseville is 52.2 inches as listed in the Reference Evapotranspiration Table in Section 19.67.050.B.2.b.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]
MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.62 = Conversion Factor (to gallons)
0.7 = ET Adjustment Factor (ETAF)
LA = Landscape Area including SLA (square feet)
0.3 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)

MAWA = (52.2 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 0)]
MAWA = 1,132,740 gallons per year

(Example 2)
MAWA calculation for a project in Roseville, CA with the same ETo value of 52.2 inches and a total landscape area of 50,000 square feet. Within the 50,000 square foot project, there is now a 2,000 square foot area planted with edible plants. This 2,000 square foot area is considered to be a Special Landscape Area.

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]
MAWA = (52.2 inches) (0.62) [(0.7 x 50,000 square feet) + (0.3 x 2,000 square feet)]

MAWA = 32.36 x [35,000 + 600] gallons per year
MAWA = 32.36 x 35,600 gallons per year
MAWA = 1,152,016 gallons per year

ESTIMATED TOTAL WATER USE

For landscaping without Special Landscape Areas.

The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

$$ETWU = (ETo)(0.62)\left(\frac{PF\ x\ HA}{IE} + SLA\right)$$

Where:

ETWU = Estimated Total Water Use per year (gallons)
ETo = Reference Evapotranspiration (inches)
PF = Plant Factor from WUCOLS (see UC Extension)
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor
IE = Irrigation Efficiency (minimum 0.71)

(Example 3)
ETWU calculation for a landscape area 50,000 square feet; the plant water use type, plant factor, and hydrozone area are shown in the table below. The ETo value is 52.2 inches per year. There are no Special Landscape Areas (recreational area, area permanently and solely dedicated to edible plants, and area irrigated with recycled water) in this example.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	10,000	7,000
3	Medium	0.5	16,000	8,000
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
			Sum	24,700

* Plant Factor from WUCOLS, Water Use Classification of Landscape Species published by UC Extension, DWR and USBR, 2000.

$$ETWU = (52.2)(0.62)\left(\frac{24{,}700}{0.71} + 0\right)$$

ETWU = 1,125,902 gallons per year

Compare ETWU with MAWA: For this example:

MAWA = (52.2) (0.62) [(0.7 x 50,000) + (0.3 x 0)] = 1,132,740 gallons per year.

The **ETWU (1,125,902 gallons per year) is less than MAWA (1,132,740 gallons per year)**, so the water budget complies with the MAWA.

ESTIMATED TOTAL WATER USE

For landscaping with Special Landscape Areas.

(Example 4)
ETWU calculation for a landscape area of 50,000 square feet, 2,000 square feet of which is planted with edible plants. The edible plant area is considered a Special Landscape Area (SLA). The reference evapotranspiration value is 52.2 inches per year. The plant type, plant factor, and hydrozone area are shown in the table below.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	7,000	5,600
2	High	0.7	9,000	6,300
3	Medium	0.5	15,000	7,500
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
			Sum	23,500
6	SLA	1.0	2,000	2,000

* Plant Factor from WUCOLS

$$ETWU = (52.2)(0.62)\left(\frac{23{,}500}{0.71} + 2{,}000\right)$$

ETWU = (32.36) (33,099 + 2,000)
ETWU = 1,135,931 gallons per year

Compare ETWU with MAWA. For this example:

MAWA = (52.2) (0.62) [(0.7 x 50,000) + (0.3 x 2,000)]
MAWA = 32.36 x [35,000 + 600]
MAWA = 32.36 x 35,600
MAWA = 1,152,016 gallons per year

The ETWU (1,135,931 gallons per year) is less than MAWA (1,152,016 gallons per year), so the water budget complies with the MAWA.