



Vacuum Plumbing Systems

13818 Oaks Avenue ♦ Chino, CA 91710 ♦ USA

(800) 591-9920 ♦ 909-902-1141 ♦ Fax 909-902-5041

## **Simple Estimated Water Savings Calculation for Typical Restaurant Using Vacuum Flush Toilets**

The calculations below are intended to provide an estimated overview of water and sewage savings using vacuum flush toilets compared to conventional plumbing fixtures in a typical restaurant serving approximately 715 clients per day. This estimate does not include staff bathroom use.

This estimate is also made without re-cycled water use for toilet flushing. Use of re-cycled grey water from hand wash basins and lavatories for toilet flush would further increase annual water savings.

### Summary:

Based on the assumptions listed below, use of vacuum flush toilets alone would provide an estimated supply water and sewage discharge volume savings of approximately 56% over conventional fixtures or the costs associated with 115,125 gallons water and sewage processing costs annually.

### Assumptions:

- Average service 5,000 clients per week
- The water supply requirement used for bathroom water closets and urinals in the calculations below are based on conventional low flush fixtures; client usage rate of approximately 70%; client population of approximately 50% male and 50% female
- Male use of plumbing fixtures is estimated at 85% for urinals and 15% for water closets. Note: ASPE norms and guidelines indicate 75% for typical workplace scenarios; however, for the purposes of this estimate, this guideline has been increased to 85%

### Water use calculations using conventional low flush gravity drainage fixtures

#### 1. Males

Urinals: Est. 1487 flushes per week x 0.5 gallons per flush = 744 gallons of water per week

Water closets: Est. 263 flushes per week x 1.6 gallons per flush = 421 gallons of water per week

#### 2. Females

Water closets: Est. 1750 flushes per week x 1.6 gallons per flush = 2,800 gallons of water per week

Total gravity drainage water demand and sewage output = 3,965 gallons per week, or a projected annual water supply and sewage output of 206,180 gallons combined for men's urinal and WC and women's WC fixtures.

### Water use calculations using vacuum flush water closets and conventional urinals

#### 1. Males

Urinals: Est. 1487 flushes per week x 0.5 gallons per flush = 744 gallons of water per week

Water closets: Est. 263 flushes per week x 0.5 gallons per flush = 132 gallons of water per week

#### 2. Females

Water closets: Est. 1,750 flushes per week x 0.5 gallons per flush = 875 gallons of water per week

Total vacuum fixture water demand and sewage output = 1,751 gallons per week; or a projected annual water supply and sewage output of approximately 91,052 gallons for men's urinal and vacuum WC and women's vacuum WC fixtures.

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