

Appendix G

Cost Estimation and Financing Tool

Zone 40 Infrastructure Cost Estimation Tool

Overview

Zone 40 Infrastructure Cost Estimation Tool (ICET) is a management tool to estimate the cost of water supply facilities, i.e., water treatment plants, storage tanks, wells, and distribution network. The ICET integrates into Zone 40's 50 year financial model for "Development Fee" calculations. The ICET has two main components: (1) a database and, (2) an interactive interface that implements cost estimation and summary algorithms. The ICET database stores Zone 40 infrastructure details and unit cost information of all infrastructure components. The infrastructure details tables compile all the information about water supply facilities in Zone 40, which include description of components quantities, types, sizes, material, etc. The interactive interface provides utilities for cost estimation of components and facilities, as well as data editing and export to MS Excel utilities.

The ICET Database Structure

The ICET database has a flexible structure that can be edited and expanded to include other infrastructure management aspects, e.g., maintenance and operations. The ICET database stores infrastructure information in two levels: (1) facilities tables, and (2) components tables. The facility set includes water treatment plants, wells field, and storage tank sites. Each facility in Zone 40 is assigned a service area, i.e., NSA, CSA, or SSA. Each facility consists of components, which include pipes, filters, valves, pumps, waste discharge tank, land, site improvement, administration buildings, landscaping, emergency generators, etc. It should be noted that a water treatment plant facility can include wells and storage tanks, and that a storage tank site can have wells attached to it.

The details of the distribution network are stored separately from the facility set, where each service area is associated with a distribution network. Each of the three distribution networks, i.e., NSA, CSA, and SCA, consists of components, which include pipes and valves.

The ICET Interactive Interface Features

The ICET is provided with a graphical user interface (GUI) that allows the user to navigate, edit, expand, and manipulate the database. The GUI has the capability to export all tables in the tool to excel through automated routines. The user can select a facility, and execute many different processes on that facility. The user can:

Navigate through the three regions and their facilities

Display all the components in a facility and the cost of its components

Add, delete, or edit any component in the selected facility

Display and export details of the facility to MS Excel

Display and export a summary table of the cost of the selected region.

The cost of each infrastructure component in the database is calculated using the unit cost information. The total cost of each facility is then developed from its components costs and the variable *Engineering & Environmental and Construction Contingency* ratios. The ICET handles additions/changes in the cost calculation algorithm for each infrastructure component through cost template text file. The text file allows the user to change the formula and variables that are used to compute the cost of a specific component.

The ICET prepares a summary table with the costs of water supply infrastructure in Zone 40, including all facilities and distribution networks. The summary costs are distributed over the 50 years horizon of 2000 to 2050, according to the phasing of the facilities described in Zone 40 WSIP. This summary table is prepared such that it can integrate readily into Zone 40's 50 year financial model for "Development Fee" calculations.

Finally, the GUI provides help though an "F1" context-sensitive help that has an extensive topic searching utility. The user can press "F1" key at any window of the GUI and the help associated with this feature will be displayed.

