



Improved Cost-Base Design of Water Distribution Networks using Genetic Algorithm

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Abstract

Population growth and progressive extension of urbanization in different places of Iran cause an increasing demand for primary needs. The water, this vital liquid is the most important natural need for human life. Providing this natural need is requires the design and construction of water distribution networks, that incur enormous costs on the country's budget. Any reduction in these costs enable more people from society to access extreme profit least cost. Therefore, investment of Municipal councils need to maximize benefits or minimize expenditures. To achieve this purpose, the engineering design depends on the cost optimization techniques.

This paper, presents optimization models based on genetic algorithm(GA) to find out the minimum design cost Mahabad City's (North West, Iran) water distribution network. By designing two models and comparing the resulting costs, the abilities of GA were determined. the GA based model could find optimum pipe diameters to reduce the design costs of network. Results show that the water distribution network design using Genetic Algorithm could lead to reduction of at least 7% in project costs in comparison to the classic model.

Keywords: Genetic Algorithm, Optimum Design of Water Distribution Network, Mahabad City, Iran.