

ABSTRACT

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This research is about booster pumps, which are frequently used by the engineer who is concerned with water supply networks for large cities. The aim of using such a booster pump is to remedy the low pressure heads which occur at some of the nodes of an executed network which is subjected to an unexpected expansion or in cases where additional water demands from some of its parts come out for some unexpected reasons. On the other hand boosting pumps could be a design mean of which an engineer would use to avoid bursting of pipes which are near by the elevated tanks in networks that are greatly extended or with highly elevated tanks. In such cases if such pumps are not used there would be a need to use highly elevated tank and very strong and expensive pipes in order to bear high pressure and to stand against bursting and/or leakage through pipe joints.

In this research some practical cases facing the designer engineer had been dealt with, such as, the selection of both locations and characteristic curves of booster pumps.

The first phase of this research involves cases of unexpected extension of an executed pipe networks as well as those networks which are being under design. For this purpose the best location, hydraulic and mechanical characteristics of booster pumps of such networks have been focused. This has been achieved by preparing and using a computer program called (EMO). The program has been written in BASIC LANGUAGE on the theoretical of analytical procedure belonging to Hardy-Cross method, specifically the "Loop Method". First, this program has been used to analyse many networks, containing one or more booster pumps, on the basis of trial and error. Through this, many conclusions and recommendations, related to the main factors and variables affecting the best selection of booster locations, have been deduced. Two methods serving this purpose have been introduced accordingly, and named