KUWAYFIYAH PROJECT

WATER INFRASTRUCTURES

ÍNDICE

1 BACKGROUND

In addition to the water infrastructures proposal, it is presented in this document the design criteria regarding the water tanks (underground tank with 2300 m^3 and elevated tank with 400 m^3).

2 WATER TANKS

2.1 STORAGE CAPACITY

2.1.1 Data base

The information collected to develop the proposal was:

Population (year 2011) = 12 621 inhabitants

Population (year 2025) = 20 431 inhabitants

Average water demand (year 2025) = 4066 m^3/d

Maximum daily demand = 6099 m^3/d

Maximum peak hour demand = 10978 m^3/d

Actual storage capacity:

- Underground water tank = 2 220 m^3, located in the city;
- Elevated tank = 180 m^3, in the city.

2.1.2 Design Criteria

According to the European Legislation (EEC) the water tanks design criteria are:

Storage capacity = regularization volume + maximum (fire, damage).

The regularization volume depends on the dimensioning of the adduction system (for which flow the pipes are dimensioned). If the dimensioning is for the maximum daily demand the storage capacity should be calculated to cover hourly fluctuations, during the day. However it is supposed that we know the hourly consumption during the day in order to estimate de cumulative volume curve, and evaluate the regularization volume.

The fire volume and the damage volume depend on the characteristics of the city and the maintenance team and equipment available, respectively.

It is also said in the EEC Legislation that regardless of feeding conditions the storage capacity should be equal or greater to 1.25 of the average water demand, concerning to populations of 10 000 to 100 000 inhabitants.

In this proposal, to evaluate the storage capacity it was adopted this last condition as we didn't know the hourly consumption during the day.

This leads us to:

Storage capacity = 1.25 x 4066 = 5082 m^3.

This means that:

Missing Storage capacity = 5082-2400=2700 m^3.

Since the distribution center will be constituted by an underground water tank and an elevated one, it was assumed that the elevated tank would function to stabilize the pressure in the network. In these conditions, the ECC Legislation says that the capacity of the elevated tank should be at least the volume consumed for fifteen minutes at peak flow, which leads us to a minimum volume of about 120 m^3. It was adopted 400 m^3 (about 1 hour).

2.1.3 Conclusions

The volumes obtained regarding to an increase of population of about 8000 inhabitants seems to feet when we look at the actual storage capacity (2 400 m^3).