**Water System Design Project**

A

B

C

D

E

F

G

H

I

J

A community with a population of 220,000 has an average consumption of 600 Lpcd and a fire flow dictated by a building of ordinary construction with a floor area of 1200 m2 and a height of 8 stories. Increased at a rate of 2% per year and the increase of water consumption is 10 % of the percentage increase of Pop. Per year. Find the maximum monthly, daily and hourly consumption discharge now (2016) and after 30 years. Determine the required capacity of the pipe distribution system. Determine the diameter of each member assuming that the velocity in the distribution system range between 1 and 2 m/s. Determine the pump capacity, pump and power input (assume the pump efficiency is 80%) to fill the elevated tank at node "J" to a level 126 m.

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| --- | --- |
| Node | Elevation (m) |
| A | 102 |
| B | 100 |
| C | 105 |
| D | 85 |
| E | 95 |
| F | 95 |
| G | 95 |
| H | 95 |
| I | 100.5 |
| J | 99 |

|  |  |
| --- | --- |
| Member | Length (m) |
| AB | 1000 |
| BC | 550 |
| CD | 1300 |
| DE | 900 |
| EF | 1000 |
| FG | 1200 |
| GH | 1000 |
| EH | 1200 |
| HI | 700 |
| IJ | 400 |