DESIGN OF A WATER DISTRIBUTION SYSTEM

Project Report submitted by

George Mavroudis

In part satisfaction of the award of
Diploma of Technical Engineer in

CIVIL ENGINEERING OF THE HIGHER

TECHNICAL INSTITUTE CYPRUS

Project supervisor : N Kathijiotes
Lecturer
in Civil Engineering H.T.I.

Type of Project: Individual ...✓...
Group .....

June, 1990

Importance of water

Water supply is surely one of the most important of all services needed by man whether he lives in metropolitan center in towns or in vilages or rural isolation.

Further more on the subject a water distribution system should be such that the community has no reason to doubt it's reliability.

Importance should be given to the area to be served wether it is urban community or a developing center.

Consumer in a rural community would be satisfied with a fraction or water demand. Small part unlike the continuously developing centers.

These would inquiere continous developments to the system in order to meet demand.

Also, the chemical, the biological and sanitary factor in all systems should alway be check to meet standards.

CHAPTER 1

Importance of water

Introduction to Water D.S.

Methods of Distribution water

a) Gravity supply

b) Pumped supply

c) Comined supply

CHAPTER 2

Distribution Reservoirs

Distribution system

a) Branching system

b) Grid system

Components of Distribution system generaly a) Pipes

b) Valves

c) Fire hydrants

Capacity and pressure Requirements

CHAPTER 3

Methods of analysing a water D.S.

a) Method of sections

b) Circle method

c) Relaxation method

d) Pipe equivalence method

e) Digital computer analysis

f) Electrical analogy method

g) Hardy cross method

CHAPTER 4

Cross Connections

Total losses in a D.S.

Leakage and it's Location today

Energy Losses - Bernoulis
The estimation of friction losses in pipes

CHAPTER 5

Demand
Demand and Consumption
Types of Consumption
Measurement of Consumption
Desirable Conditions
Estimates of future demand

CHAPTER 6

Water Resources
Hydrological circle and Per capita consumption
Purification for swimming baths
Setteling tanks
Filters

CHAPTER 7

Taste and odor removal
a) Cases of odor and tastes
b) Method for removal of taste and odour
    1. Superclorination
    2. Cloramine
    3. Chlorine dioxide
    4. Declorination
    5. Aeration - Types, Purpose
    6. Ozonization
Water causing corrosion

CHAPTER 8

Joints - Types
a) Butt welded
b) Sleeve welded

c) Screwed joint
d) Spigot and socket joint
e) Clamp on joint
f) Flanged joint
Storage of pipes

CHAPTER 9

Population Estimates
Population with Relation to W.D.S. expansion
Sustainability of a system

CHAPTER 10

Trench excavation and support
Route and Planning (For Pipeline)
Site investigation and it's use
Distribution of pipes along trench
Types of failure for trenches

CHAPTER 11

Forces in Pipelines
Thrust Blocks and anchorage
Anchorage of overground mains
Loads of Barried pipes

CHAPTER 12

Water meters
Flow test
Pump testing

CHPATER 13

Water Quality
Filters - a) Slow sand filter
b) HRF Watr treatment methods

1. Addition of flouride
2. Removal of detergent

CHAPTER 14

STEPs normally followed when desining a W.D.S.
Factors affecting the cost of a water
Distribution system

CHAPTER 15

Design of a Distribution system

Design of a Distribution system using HNA programming
1. Without fire demand
2. With fire demand

References
Special thanks to