



# **DUBAI ELECTRICITY AND WATER AUTHORITY**

## **GUIDELINES FOR NEW DEVELOPMENT PROJECTS**

*UPDATE - 2008*

### **CORPORATE STRATEGY & PLANNING (PLANNING WATER TRANSMISSION)**





# DUBAI ELECTRICITY AND WATER AUTHORITY

## GUIDELINES FOR NEW DEVELOPMENT PROJECTS

### CONTENTS AMENDMENT RECORD

This Document has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0		23/3/2008	

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# 1 INTRODUCTION

The purpose of this document is to provide guidelines to developers and consultants before submitting development information for DEWA's review and approval. The guidelines are intended to help understanding DEWA requirements and facilitate the preparation of development projects master plans and related documents.

New development projects need to be carefully studied by DEWA in order to plan meeting water demands and other system requirements, which may involve building new transmission and distribution networks, or even increasing production capacity.

This document may be updated or amended as may be deemed necessary.

# 2 WATER RESOURCES REQUIREMENTS

Information on large developments with high demands that are likely to require planning for additional water resources (productions plants) must be submitted to DEWA at least 5 years prior to anticipate project commissioning date. (Water production facilities development's lead time is 5 years).

# 3 STORAGE RESEVOIRS:

(a) Storage for DEWA system

DEWA has a policy to maintain bulk storage of potable water equivalent to two days of system peak demand; major project's developers may be requested to provide a plot for bulk storage within their project, depending on project size.

(b) Customers storages

*The local storage for individual premises should cover at least 24 hours of average demand. Developers should take into consideration the provision of adequate on-site water storage facilities.*

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## 4 PUMPING STATIONS

Developers are required to provide adequate site topography information based on actual survey data in order to establish any pumping requirements. Higher grounds in the water transmission system might require the installation of booster pumping stations for which the standard planning and construction lead time of 2-3 years before commission.

In addition, occasionally, developers and their consultants may be required to consider booster stations to supply locations with high grounds where the relatively low pressures would not allow supply within the development site.

## 5 TRANSMISSION SYSTEM

DEWA's water system consists of a transmission network where pipelines diameters range from 550mm to 1200mm, and distribution network where pipelines diameters range from 100 mm to 450mm.

The pipe materials currently approved and used by DEWA for the water transmission pipelines are:

- Fibre-cement (FC) pipe CLASS 18 /24 ( subject to DEWA's approval)
- Glass fibre Reinforced Epoxy (GRE)
- All fittings (including bends, tees, reducers and flanges) used with FC and GRE water pipelines shall be GRE fittings complying with the DEWA's specifications.

Water transmission pipelines development requires a lead-time of 3-4 years before completion (depending on the line length). Therefore, developers or their consultants are required to timely submit details of the internal network design for DEWA's review and approval.

## 6 DISTRIBUTION SYSTEMS

The Distribution System is planned and developed in parallel with the project's development only within roads right-of-ways for those roads which final designs are approved and levelled accordingly. Water distribution network development lead time is 2-3 years before commission (depending on the network area coverage).

Developer is to submit his internal network design for DEWA's study and approval.

Pipe materials currently adopted are FC & GRE subject to DEWA's approval.

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## **7 SYSTEM MONITORING**

Depending on the nature and size of the project network, Developers may be required to install monitoring devices at main connections locations as per DEWA's specifications.

### **7.1 Bulk Flow Metering**

- Bulk flow meters are essential for measurement, monitoring the flow within the transmission and distribution systems bulk flow meters will be proposed at selected sites as per DEWA's specifications.

### **7.2 Pressure Transmitters**

- Pressure gauges and transmitters may be required at selected locations by DEWA and as per DEWA's specifications to monitor pressures in the system.

### **7.3 Water Quality Controls**

- Analyzer station consisting of the transmitters and sensor assemblies for measuring pH, residual chlorine conductivity and temperature may be installed at specified location and as per DEWA's specifications.

### **7.4 Water SCADA requirements**

- DEWA requirements for integrating the new developed networks of the major project with DEWA's SCADA system should be discussed and approved by DEWA's projects Dept. / Operation and Maintenance dept.

## **8 SERVICE CONNECTIONS**

- DEWA's policy, at present, is that all premises should be metered on separate house connection pipes. In case of buildings, a main meter is installed on the main inlet pipe before the Under-ground storage tank and sub-meters are installed on the roof of the buildings at the discharge side of the elevated storage tanks. Developers should provide house

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connections proposed layouts and materials to DEWA's approval.

## 9 WATER DEMAND

Because demand and its phasing represent the most crucial element for the whole water transmission network planning process, developers are required to timely provide the following information in their submissions to DEWA:

- 1- Reasonably Projected Demand Figures.
- 2- Reasonable Demand Phasing throughout the development planning period. Each planning phase should be represented by commissioning dates rather than construction start dates. For Mega Projects, information for each phase should include the relevant small projects and their demands.
- 3- There are six major demand categories established for DEWA system:
  - RESIDENTIAL
  - COMMERCIAL
  - GOVERNMENT & PUBLIC PREMISES
  - INDUSTRIAL
  - LABOUR CAMPS
  - DISTRICT COOLING

Developers should as reasonably as possible map project demand types with DEWA established demand categories. This is required in order to facilitate incorporating the same into the demand forecast process.

- 4- Base information and calculations used to determine the water demands such as population, land use and district cooling estimates.
- 5- DEWA does not supply potable water for:
  - a. Construction purposes (particularly if there is no existing developed network at the project area).
  - b. Water features ( lagoons, etc)
  - c. Irrigation / landscape purposes

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## **10 PEAKING FACTOR**

A factor in the range of 1.2 -1.5 should be used to accommodate for the variation in demand at peak hour. This factor will vary depending on the nature of the development and is driven by the demand categories adopted.

## **11 DEMAND REQUIREMENTS**

The following Table outlines general typical ranges of water consumption (rates which may be used as a guide for calculating development projects water demands. However, the consultant / developer shall accurately calculate the demand required with due consideration to the nature of the development project.

<b>CATEGORY</b>	<b>Demand Range (L/Cap. Day)</b>
RES. BUILDINGS	250-400
COMMERCIAL BUILDINGS	60-100
VILLAS	250-400
LABOUR ACC./WORKERS	80-150
RESTAURANT (per meal)	10-15 l/d per meal
MOSQUES	10-60
HOTELS( per room including workers, visitors	300-500
WORKSHOPS/ MACHINERY	60
SHOPS	60-80
OFFICES	60-80
SCHOOLS	60-80
PUBLIC AMENITIES	10-60
RETAIL	60-80
VISITORS	14-45
MIXED USED commercial	60-80
MIXED USED resedintial	250-400
ENTERTAINMENT AND LEISURES	60
THEATER	10-60
TOWN CENTER	60-80
MEDICAL (per bed)	60-80
HEADQUARTERS	60-80
UNIVERSITY	60-80
LABORATORY	60-80
MANUFACTURING	60-80
BASED METAL CHEMICAL ZONE	100
LOGISTIC, ACADEMIC & BUSINESS ZONE	60-80
MINERALS	80
NURSERY	60-80
LOCAL PLAZA	60-82
OTHER	60-82
EVENTS	10-60
GUARDHOUSE	60-80
CLUBHOUSE/SWIMMING POOL	100

Source: standard practises and submitted major developments master plans

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## 12 NETWORK DESIGN CRITERIA AND HYDRAULIC MODELING

For every developer network models should be the basis for network design, including pipe sizing, layout, and connectivity.

DEWA's Water Network design criteria are based on previous experience and on recommendations by material manufacturers. The following criteria should be considered by developers during the hydraulic analysis for network design:

- Maximum Pipeline Velocity is 1.0 m/s for Distribution lines & 1.5 m/s for Transmission lines
- Minimum Pressure: 1 Bar at highest point within the developer network.
- Maximum Pressure: 4 Bar at lowest point within the Transmission network.
- A minimum number of connections should be adopted for better network management. Pressures assumed at connection points should satisfy the design criteria above for the adopted network layout. However, these pressures will be reviewed by DEWA and changes if necessary will be recommended as appropriate, including additional pumping or pressure reduction requirements.
- Zoning and pressure control of the network if applicable should be considered.
- The model demand should correspond to the figures submitted in the demand sheets.
- The developer or their consultant is expected to submit PEAK Hour Network Models for each main phase of the development as applicable.
- Models should be in EPANET or any other compatible software.
- Network Models should be geo-referenced to the actual physical location coordinates using the standard DM coordinate system known as "DLTM".
- If the development expands through major phases, it is required to submit separate models representing each phase.
- DEWA will review the models in contrast with DEWA requirements and planning information, and recommendations for changes will be made accordingly.

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- The network layout should consider looping wherever possible for a better water circulation.

## **13 REQUIRED DOCUMENTS:**

Developers or their consultants should submit the following documents for the review of Planning Water Transmission Department.

Addressed to:

Mr. Yousef Jerbil.

Vice President – Corporate Strategy & Planning

P.O. Box 564 Dubai

Fax. 04-3249206

- 1 Location map and layout of the project
- 2 A Master plan study for the project.
- 3 Project's water demand Calculation total demand phased year wise, plot / zone wise demand (district cooling demand calculation separate)- digital as well as 3 hard copies to be submitted to DEWA.
- 4 Land use demand calculations including % of land use types and year wise % of occupancy envisaged by the developer.
- 5 Factors used to calculate Average as well as Peak Demand.
- 6 Statement of availability of plots / corridors as per DEWA requirements.
- 7 Digital as well as hard copies of internal network design.
- 8 Hydraulic modelling file(s) developed for the network geo-referenced to the actual coordinate system (DLTM)

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Upon receipt Water Transmission Planning Approval for submitted water demands and main connections, developers or their consultants should submit the following information to DEWA's water projects Department approval:

Addressed to:

Mr. Branly Nassour.

Senior Manager, Water Projects & Engineering

P.O. Box 564 Dubai

Fax. 04-3244922

- 1 Project's demands table as approved by Water Transmission Planning Dept.
- 2 Expected date of connection to DEWA main lines.

The following is to be observed during the project's network design:

- (a) For 450 mm Dia. and above butterfly valves to be used & less than this G.V. " Gate Valve" To be used (450 BFV. chamber >1.75 m so must be noticed in corridors), and the depth from F.R.L Till 450 mm pipe crown top level =1.50 m.
- (b) Road Cross-Sections (Distance= 0.9 to 1.2 from B.L till C.L. of water pipes for distribution, details of DEWA corridor if any & also details of connection with DEWA main lines & corridor for this connection (cross section)
- (c) Check locations of valves distributed along network to suit operation and Maintenance standards.
- (d) Space between valves along straight lines from 500 to 1000 m, air valves 800 m, wash out valves 1500 m.
- (e) Provide 5 meters for 1200 mm & 900 mm; 3 meters corridor for 600 mm Transmissions lines, 1.75 meters for 450 mm & 1 meter for less.
- (f) Valves or fittings should Never be placed under carriage way.
- (g) Water lines shall not be under carriageway or parking areas.
- (h) Approximate location of the house connections to be shown on the layout drawings.
- (i) Clear notice on the drawings saying that air valves locations will be in highest locations (for transmissions lines only) & wash out valves will be in low locations as per site conditions & engineer decision but must shown on drawings wash out valves if there is end caps.
- (j) BOQ for NOC with related drawings attached as per DEWA standards.