حكومة دبي
GOVERNMENT OF DUBAI

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

DUBAI ELECTRICITY AND WATER AUTHORITY

GUIDELINES FOR NEW DEVELOPMENT PROJECTS

UPDATE - 2015

POWER & WATER PLANNING
(WATER TRANSMISSION PLANNING)

DUBAI ELECTRICITY AND WATER AUTHORITY

WATER TRANSMISSION PLANNING GUIDELINES FOR NEW DEVELOPMENT PROJECTS

CONTENTS AMENDMENT RECORD

This Document has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0	First Issue	23/3/2008	Amany
1	1	Updated as pre DEWA New Organization	02/02/2009	Amany
1	2	Updated for year 2010	13/10/2009	Amany
2	0	Document is separated for guidelines of WTP only and updated for the year 2010.	22/2/2010	Amany
2	1	Categorized demand updated	27/2/2011	Amany
2	2	Distribution System (Section 6), Demand Requirements (Section 11) updated and (section 9) sustainability statement added.	28/10/2013	WSP
3	0	Several enhance on the document, inclusion of DEWA's vision and mission.	08/062015	WSP

Our Vision

رؤيتنـا

A sustainable innovative world-class utility

مؤسسة مستدامة مبتكرة على مستوى عالمي

Our Mission

رسـالتنـا

We are committed to the happiness of our stakeholders and promoting Dubai's vision through the delivery of sustainable electricity and water services at a world-class level of reliability, efficiency and safety in an environment that nurtures innovation with a competent workforce and effective partnerships; supporting resources sustainability.

نلتزم بتحقيق السعادة لكافة المعنيين وتعزيز رؤية دبي من خلال تقديم خدمات مستدامة للكهرباء والمياه بمستوى عالمي من الاعتمادية والكفاءة والسلامة ضمن بيئة محفزة للابتكار، بكادر مؤهل وشراكات فعّالة، داعمين لديمومة الموارد.

Our Motto

شعـــارنا

For Generations to come

لأجيالنا القادمة

Contents

1 INTRODUCTION

The purpose of this document is to provide guidelines to Developers and Consultants submitting projects Master Plans for DEWA's Water Transmission Planning Department review and approval. The guidelines document is intended to help understanding DEWA requirements and facilitate minimizing consultants' time and efforts in preparation of development projects' Master Plans and other required supporting documents.

Figure 1 illustrates development projects Master Plan approval Process including concerned department for each step.

The completeness and quality of submitted information by Developers and Consultants are vital for DEWA's master plan preparation and, accordingly, for the timely availability of water services for each new development project.

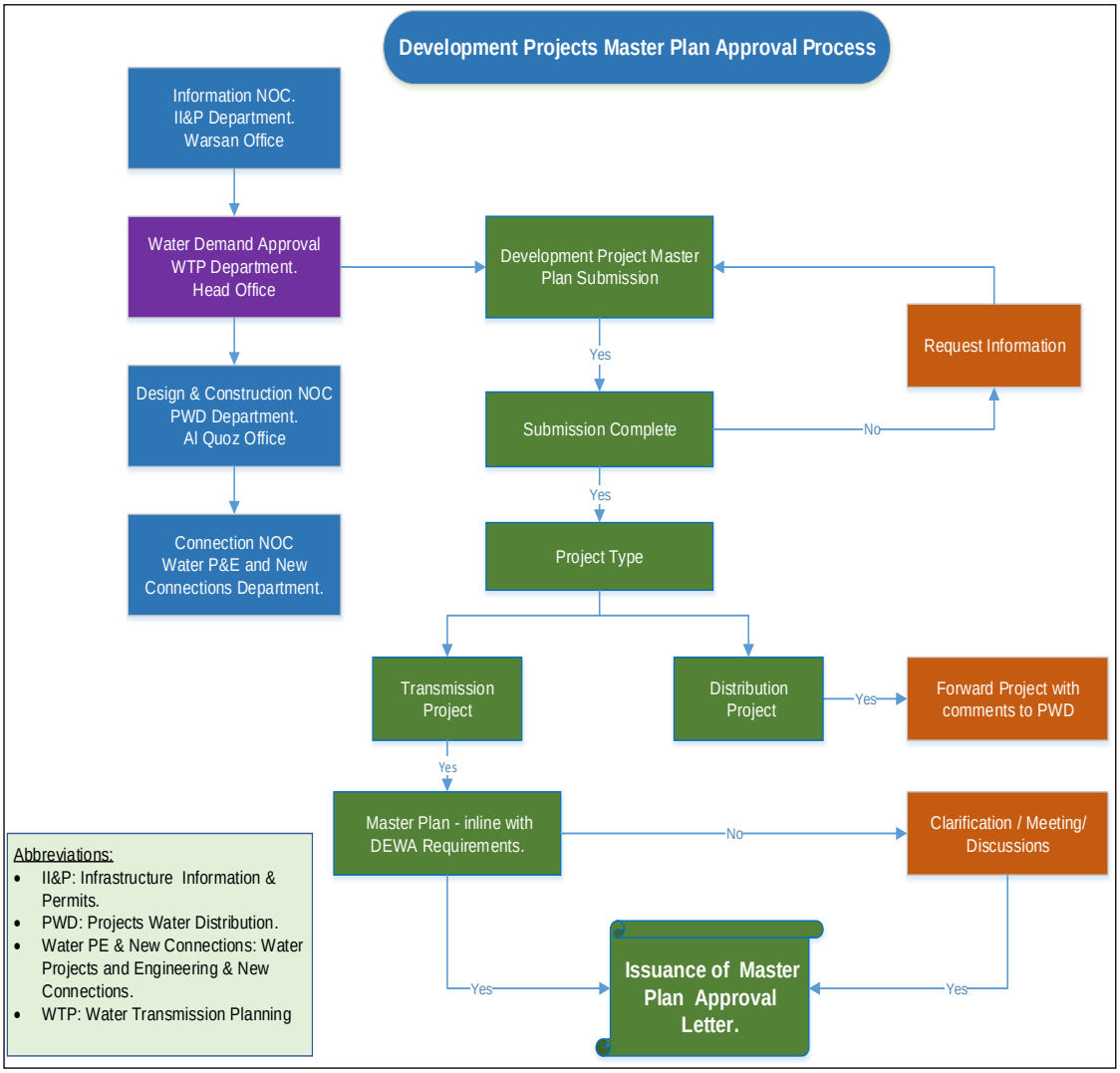
The developer / consultant shall submit estimated year-wise water demand for the project based on the occupancy envisaged for the project and using DEWA's category-wise consumption per capita factors listed in item 9 below.

The water services required for a project depend primarily on its size (water requirements) and location, and can vary from an extension of existing distribution network to a completely new transmission & distribution network, and may also result in the need for an expansion in desalination capacity.

The following sub-sections provide brief descriptions of DEWA's water supply system and the lead times required for commissioning water supply facilities. This also includes details of demand categories and list of typical ranges of acceptable water demand rates. The final page provides a list of documents that should accompany any master plan submission for review and study by the Water Transmission Planning Department.

DEWA preserves the right to amend or update this document as deemed necessary.

Figure 1. Development Projects Master Plan Approval Process



2 WATER RESOURCES REQUIREMENTS

Major development projects high water demands are likely to trigger the requirement of planning for additional water resources (productions plants). Developers and their Consultants are required to submit their Master plans including water demand requirements at least 5 years prior to the anticipated project completion date.

3 STORAGE RESERVOIRS:

(a) Bulk Storage for DEWA system

DEWA policy for System's potable bulk storage is aiming to maintain a potable water bulk storage that is equivalent to two days of system's peak demand. If required, major projects developers may be requested to

provide a plot of land for bulk storage within their project's area, as depending on the system requirements.

(b) Customers storage

The local storage for individual premises should be sufficient to cover at least 24 hours average demand. Provision of adequate on-site water storage facilities should be considered by the developers.

4 PUMPING STATIONS

Developers are required to provide existing (and proposed if applicable) site topography information, based on actual survey data, to facilitate hydraulic analysis and establish the need for booster pumping as required. Higher land within the water transmission system might require the installation of a new system booster pumping stations for which, a plot of land within the development area may be required. The standard planning and construction lead-time for pumping stations around 3 years.

In addition, if required, depending on the development site location and topography, developers may be requested to consider booster stations while designing for the project's water supply network in order to supply water to higher grounds.

5 TRANSMISSION PIPELINES

DEWA's water transmission system consists of pipelines with diameters ranging from 600 mm to 1200 mm. The approved pipe materials currently used by DEWA for the water transmission network are:

- Fibre-cement (FC) pipe CLASS 18 /24 (subject to DEWA's approval)
- Glass fibre Reinforced Epoxy (GRE) PN10 (subject to DEWA's approval)
- All fittings (including bends, tees, reducers and flanges) used with FC and GRE water pipelines shall be of GRE material complying with DEWA's specifications.

If required by the system, the developer may be requested to provide a corridor within the development plot for the installation of water transmission pipelines.

Development of water transmission pipelines requires a lead-time of 3-4 years before completion (depending on the length). Therefore, developers and their consultants should submit projects design details including the internal network design well ahead of time for DEWA's review and approval.

6 DISTRIBUTION SYSTEMS

DEWA's water distribution system consists of pipelines with diameters ranging from 100 mm to 450 mm.

The Distribution System is planned and developed in parallel with the project's development only within road right-of-ways for which the final designs are approved and levelled accordingly. Lead-time for water distribution network development is 2-3 years before commissioning depending on the length and complexity of the proposed network).

New development projects submission reviewed and classified as Distribution Project will be forwarded to Projects Water Distribution Section under PE (W) Department, and the developer/consultant will be notified accordingly.

Developers must submit their project's internal network design for DEWA's Projects and Engineering Department study and approval. Please refer to PE (W) dept. for further assistance.

Pipe materials currently adopted are either FC or GRE, subject to DEWA's approval.

If required by the system, the developer may be requested to provide a corridor within the development plot for the installation of water distribution pipelines.

7 SYSTEM MONITORING

Depending on the nature and size of the project's network, developers will be advised on the requirements for monitoring devices at main connections as per DEWA's specifications.

7.1 Bulk Flow Metering

Bulk flow meters are essential for measurement and flow monitoring along the transmission and distribution systems. Bulk flow meters shall be proposed at selected locations as per DEWA's specifications.

7.2 Pressure Transmitters

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

7.3 Water Quality Monitoring

Analyzer Stations consisting of transmitters and sensor assemblies for measuring pH, residual chlorine, conductivity and temperature shall be installed at specified locations as per DEWA's specifications.

7.4 Water SCADA requirements

DEWA's requirements for integrating newly developed network for major projects into DEWA's SCADA system should be discussed and agreed by DEWA's Projects Dept. & Operation and Maintenance Dept.

8 SERVICE CONNECTIONS

As per DEWA's policy, separate house connection pipes for each premise should be metered. 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 building on the discharge side of the elevated storage tanks. Developers should provide house connections, proposed layouts and pipe materials proposed for DEWA's approval.

9 WATER DEMAND

9.1 General

As demand and its phasing represent the most crucial element for the whole water transmission network planning process, developers are requested to keep the following information available for DEWA's review ahead of time in order to cater for different lead times needed for each type of development:

1. Reasonably Projected Demand Figures (MIGD) along with yearly phasing up to ultimate build-up for each phase of the project as applicable.
2. Projected Yearly occupancy percentage rates until full capacity.
3. Detailed Land Use information

   DEWA Reference Water Demand Categories: Developers are advised to map their project demand types using the DEWA established demand categories as applicable.

   - Residential
   - Commercial
   - Government & public premises
   - Industrial
   - Labour camps

- District cooling (For reference purposes only)

4. Base information and calculations worksheets used to estimate the water demands, such as population, land use and district cooling demands, etc.
5. DEWA does not supply potable water for non-domestic purposes as per Executive Order No 27 for year 2008 including:
    a. Construction purposes (particularly if there is no existing developed network at the project area).
    b. Water features (lagoons, etc.).
    c. Irrigation / landscape purposes.
    d. District cooling.
6. DEWA encourages all developers to adopt sustainable solutions in the design of their development projects.

9.2 Peak Factor

A peaking factor in the range of 1.25 - 1.30 should be used while designing the water network in order to accommodate the daily variation in demand. This factor varies depending on the nature of the development and the demand categories adopted.

9.3 Consumption Rates

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

DEWA's Reference for Demand Categories

Category	Demand Range (L/Cap. Day)
Based metal chemical zone	100
Clubhouse/recreation	100
Commercial buildings	60-100
Entertainment & leisure's	60
Events	10-50
Guardhouse	60-75
Headquarters	60-80
Hotels (per employee)	60-80
Hotels (per guest)	200-300
Laboratory	60-80

Category	Demand Range (L/Cap. Day)
Labour accommodation / Workers	80-150
Local plaza	60-82
Logistic, academic & business zone	60-75
Manufacturing	60-80
Medical (per bed)	350-450
Minerals	80
Mixed used commercial	60-80
Mixed used residential	250-350
Mosques	10 - 60
Nursery	60-75
Offices	60-75
Public amenities	10 - 50
Residential buildings	250-350
Restaurant (per meal)	10-15 l/d per meal
Retail	60-80
Schools	60-80
Shops	60-75
Theatre	10-50
Town Center	60-80
University	60-75
Villas	250-350
Visitors	14-40
Workshops/ Machinery/Warehouse	60

Source: Standard Practices & Submitted Master Plans for Major Developments.

10 NETWORK DESIGN CRITERIA AND HYDRAULIC MODELING

A hydraulic model should be built for every development project, and used as a basis and tool for network design.

The following criteria should be considered by developers during their network design:

- Maximum Pipeline Velocity is 1.0 m/s for Distribution lines & 1.5 m/s for Transmission lines.
- The minimum pressure at the connection points of DEWA transmission network is around 1.5 Bar and this should be initially assumed (subject to DEWA confirmation) in designing the distribution network.
- Minimum expected Pressure is around 1.0 Bar within the developer distribution network.
- Maximum Pressure is around 4 Bar *at lowest point within the Transmission network.*
- A minimum of two connections to the water transmission system 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.
- Depending on the size of the development project zoning as applicable should be considered in the design.
- Hydraulic Model demands should correspond to the Demand figures submitted in the demand calculation sheets.
- The developer or their consultant should submit peak conditions Network Models for each main phase of the development as applicable.
- Models should be created using DEWA's adopted software (InfoWorks) or any EPANET compatible software.
- Network Models should be geo-referenced to the actual physical Geographic location's 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, as well as one overall network model as appropriate.
- DEWA will review the models in contrast with its requirements and planning information, and as required, recommendations for changes will be made accordingly.
- The network design layout should consider looping the system wherever possible, for better water circulation and system reliability.

11 ANNEXURES

11.1 REQUIRED DOCUMENTS:

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

Addressed to:

Mr. Yousef Jebril.
Executive Vice President – Power & Water Planning
P.O. Box 564
Dubai, U.A.E.
Fax 04-3249206

1 Copy of valid DEWA's information NOC.

2 Coloured Hard copy of the Location map and layout of the project as well as soft copy in CAD or GIS system shapefile format in DLTM coordinate system.

3 The complete project Master Plan.

4 Project's water demand calculation sheets, year wise phased total demand, plot / zone or phase wise demands " all calculations should be provided in MS Excel spreadsheet format including all formulas used along with supporting data files".

5 Land use demand calculations including percentage of land use types and year wise percentage of occupancy envisaged by the developer.

6 Consumption rates and factors used to calculate Average as well as Peak Demands along with justification of the same as applicable.

7 Availability Statements for plots / corridors required for the development as per DEWA requirements.

8 Digital as well as hard copies of internal network design indicating proposed take off points and expected pressure at each of them.

9 All Hydraulic model file(s) developed for the network study geo-referenced to the actual coordinate system (DLTM)

10 Updated submittals for the above-mentioned documents are required in case of any changes in the demand requirements or network design.

Upon receipt of Water Transmission Planning Approval for submitted water demands and main connections, developers or their consultants should submit application for network design approval to DEWA's Water Projects Department "please refer to PE (W) Guidelines".

11.2 CORRIDOR AND PLOT REQUIREMENTS:

The developer will be advised should any requirements for plots and/or corridors within the project area arise, and provisions should be made accordingly.

11.3 LIST OF CONTACT INFORMATIONS:

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