

Osaka City Waterworks and Earthquake-resistance Measures Reinforcement Plan 21 (Basic Concept)

Osaka City's waterworks service, which has entered the second century since its foundation, serves as an important lifeline to support rich civic lives and advanced urban activities, supplying all types of water, including not only drinking water but also water for domestic use and commercial use. Any trouble with the water supply function will have an extremely serious impact. It is therefore a mission of waterworks to ensure stable water supply constantly both at normal times and during accidents and disasters. Based on this standpoint, after the completion of the expansion projects, Osaka City worked to enhance earthquake countermeasures while continuing to promote the projects to improve water purification facilities and water distribution pipes. However, the Great Hanshin-Awaji Earthquake of January 17, 1995, which was an inland earthquake with a Japanese seismic intensity of 7, far beyond the conventional assumption, forced nationwide review and reinforcement of earthquake countermeasures for the future. In particular, securing the water supply for an earthquake disaster is the most important issue to be addressed urgently. Osaka City therefore formulated the Osaka City Waterworks and Earthquake-resistance Measures Reinforcement Plan 21 (Basic Concept) in March 1996 as a basic concept to effectively strengthen its disaster countermeasures. Osaka City has been making a contemporary review of the Plan. Based on lessons learned from the Great East Japan Earthquake of March 11, 2011, measures against tsunami inundation have been newly included.

The core of earthquake countermeasures for waterworks is to ensure a stable supply of water, a lifeline that saves the life of residents. Osaka City will continue its efforts to build more reliable waterworks by promoting projects based on the Plan 21 in order to secure water that will be necessary after a disaster, such as drinking water that will be necessary immediately after the disaster and water for domestic use that will become necessary later on, at disaster prevention bases, such as evacuation centers.

Basic measures

(1) Reinforcement of the earthquake resistance of key facilities

In order to maintain a stable water supply system in the event of a disaster, designate the water intake, purification and distribution facilities and pipelines that should be made earthquake-resistant prior to others, thereby implementing the work of earthquake-proofing efficiently. Furthermore, to secure the central function in implementing emergency measures after an earthquake, perform the seismic reinforcement of its office buildings.

(2) Establishment of supply and distribution bases network

Ensure a well-balanced placement of water supply and distribution bases throughout the city, along with necessary equipment for emergency activities related to emergency water supply and restoration, thereby enhancing post-disaster measures.

(3) Enhancing mutual water supply between water distribution systems

To enable urgent and flexible water distribution after an earthquake, reinforce the trunk line network by installing pipes connecting water distribution systems in the City.

(4) Countermeasures against power failures

To secure power necessary for the operation of water intake, purification and distribution facilities even in the event of an earthquake, implement measures against power stoppage, such as reinforcing the reliability of power receiving equipment and installing in-house power generation equipment.

(5) Maintaining the system to procure materials

To facilitate smooth implementation of emergency measures after an earthquake, place material storage facilities in a well-balanced manner in the city so that stockpiled materials for emergency water supply and restoration can be used in the event of an earthquake disaster.

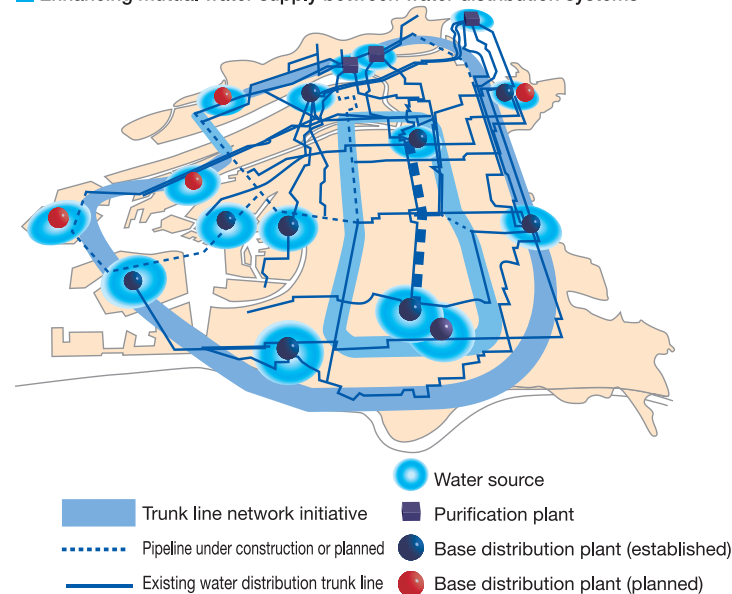
(6) Reinforcing reliability of information and communication systems

Secure stable information and communications means in order to facilitate smooth implementation of a series of earthquake countermeasures, including forming an organizational readiness system and early grasping of the damage on waterworks facilities after an earthquake.

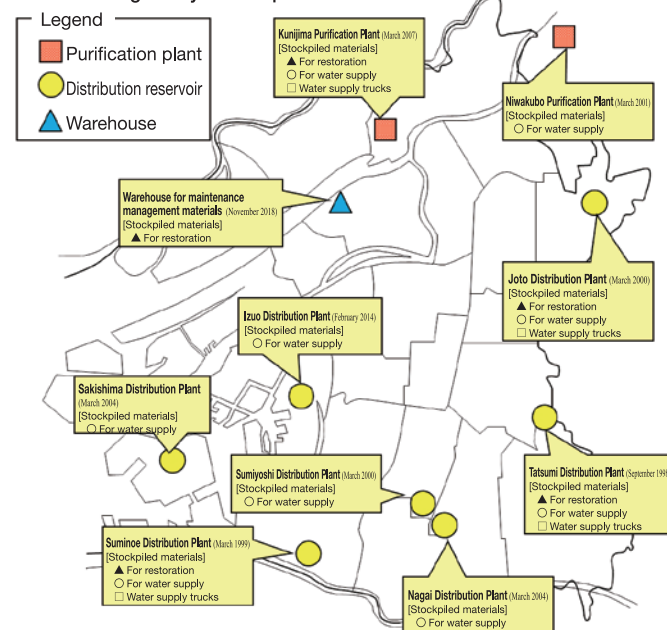
(7) Tsunami inundation countermeasures

In preparation for tsunamis after a great earthquake, such as the great Nankai Trough earthquake, implement inundation countermeasures, including the installation of tide doors at water purification and distribution facilities.

Enhancing mutual water supply between water distribution systems



Maintaining the system to procure materials



Waterworks Bureau Disaster Information System

The Waterworks Bureau's Disaster Information System was reconstructed in fiscal 2015 as part of its initiative to enhance the reliability of its information and communications system. The System uniformly manages the City's disaster-related information, including information on damage, restoration activities and the status of emergency water supply in the event of an earthquake or other disaster, so as to support the prompt and precise understanding of the situation, decisions on countermeasures, and implementation of activities.

The Disaster Information System can collect information promptly and smoothly by sharing data with other systems, such as the Water Distribution Information System and the Pipeline Information Management System.

Information terminals used for regular work operations can access the System. In the event of a disaster, each staff member of the Bureau may enter disaster-related information into the System, which can be communicated to and shared with other members, facilitating emergency restoration activities and emergency water supply activities.

Enhancing crisis management systems

The Waterworks Bureau has a disaster response manual for prompt emergency restoration and emergency water supply, and it strives to build a broad-area mutual support system by concluding mutual support agreements with large cities, such as government-designated cities, Japan Water Works Association's Kansai Branch, neighboring cities, and organizations concerned. The Waterworks Bureau has been enhancing the emergency response system by participating in joint drills with these organizations and disaster drills of each ward in which many citizens participate. Furthermore, aiming to build an organization capable of continuing or quickly resuming the water supply service even in the event of a large-scale earthquake, the Bureau has been endeavoring to improve its crisis management capabilities by formulating a business continuity plan to promote capacity development of its staff through disaster response education and training and by continuously reviewing the plan.

Emergency water supply system of Osaka City

Osaka City will formulate an emergency water supply system for each elementary school district, which is a community familiar to residents in their daily lives, and set up an emergency water supply base with temporary water tanks and temporary water taps at the wide-area shelter in each elementary school district, each accommodation shelter such as an elementary school, junior high school and high school, and each nearby city park.

For important facilities, such as hospitals and social welfare facilities, the necessary amount of water will be transported.

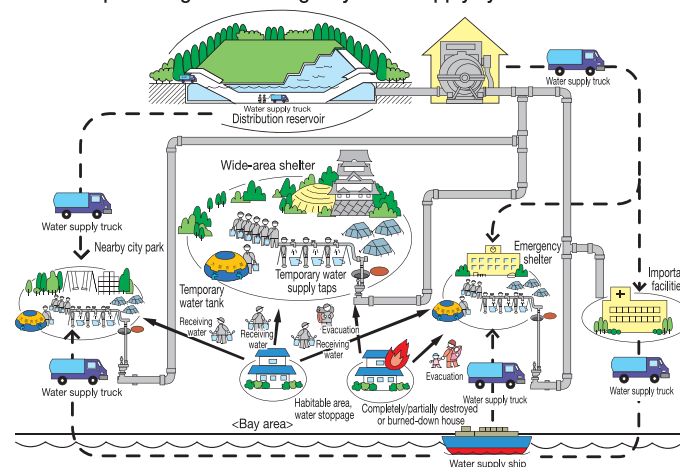
Emergency water supply targets

- Immediately after earthquake:
 - Secure drinking water immediately after an earthquake by stockpiling water bottles
- For three days after earthquake:
 - Secure a minimum required quantity of water for life, such as drinking water and water for medical use
- On and after 4th day after earthquake:
 - Increase the quantity of water for domestic use and urban activities
- 3 weeks after earthquake:
 - Secure a normal amount of water

Recovery targets for each pipeline route

- Pipelines to wide-area evacuation locations:
 - Aim to recover within three days after the earthquake
- Pipelines to accommodation shelters and critical facilities:
 - Aim to recover within 10 days after the earthquake
- Pipelines to nearby city parks:
 - Aim to recover within 15 days after the earthquake

Conceptual diagram of emergency water supply system



Booster pump-type water truck



Material for emergency water supply (temporary water tank)



Material for emergency water supply (temporary water taps)