

Earthquake-Resistant Water Tank†

1. Introduction

Damage to the water supply lifeline in an earthquake has an enormous impact on the everyday lives of citizens. Therefore, securing drinking water immediately after a disaster, and securing water for domestic use until restoration of the interrupted water supply, are extremely important for disaster victims. The JFE Engineering's Earthquake-Resistant Water Tank (hereinafter, "Water Tank") is disaster prevention facility for securing the water that is necessary for victims as preparation against disaster conditions. Following the Great East Japan Earthquake, this system was effectively utilized in base facilities for emergency water supply to the victims in areas neighboring installation sites (**Photo 1**).

2. Outline of Earthquake-Resistant Water Tank

JFE Engineering's Water Tank is lightweight and has excellent earthquake resistance thanks to its integrated welded structure and use of the material properties of steel, namely, high strength, high ductility, and high toughness. Water Tanks are generally installed underground at parks and schoolyards which are used as evacuation areas during disasters. Because the tank is structurally part of the water distribution system, as shown in **Fig. 1**, fresh drinking water circulates through the tank

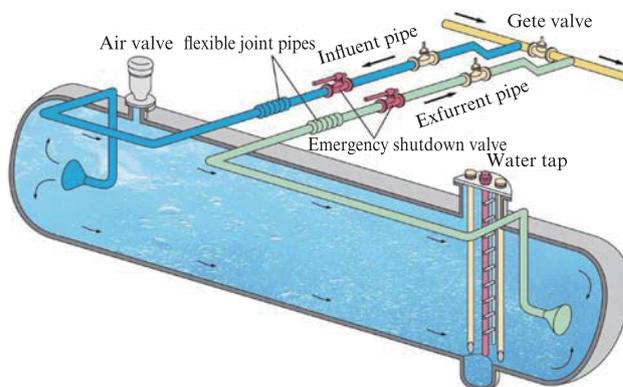


Fig.1 Constitution of the water tank and pipes



Photo 2 Setting situation of the water tank (Minato Mirai 21 District)



Photo 1 The Emergency water supply after East Japan Great Earthquake in Sendai City

at all times. If the water distribution line to which the tank is connected suffers damage that causes leakage during an earthquake, the resulting pressure loss is detected, activating the emergency shutdown valve and cutting off water circulation. This feature makes it possible to secure the drinking water in the tank if the water distribution system is damaged. Since this water can also be used for fire-fighting as well as drinking water, the JFE Engineering's Water Tank is eligible for financial support as a type-approved earthquake-resistant water storage tank (combination use for drinking water) product of the Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications.

The JFE Engineering's Water Tank is available in three types ((1) diaphragm wall type, (2) duct tube type, and (3) perforated tube type), considering circulation performance, etc. Since the first unit was installed in

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1980, more than 400 units have been installed throughout Japan (**Photo 2**).

3. Conclusion

An outline of JFE Engineering's Water Tank was presented. During the Great East Japan Earthquake of 2011, this system demonstrated that it functions effectively not only for securing drinking water immediately after a disaster, but also as an emergency water supply base for

supplying domestic water while water service is interrupted. JFE Engineering is working to realize wider dissemination of this facility in order to build communities that are capable of withstanding disasters.

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