

## 2 EBARA's technology protect cities from floods

When typhoons and torrential rains come, underground channels prevent or reduce flood damage and realize flood resistant city. EBARA's technology plays an important role in drainage pump stations.

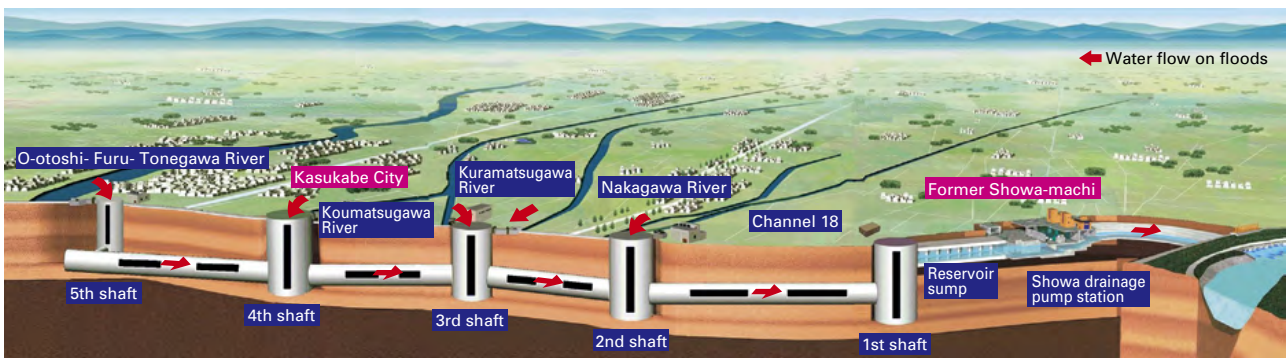
### Helping to develop a city resistant to floods

The low-lying area of the Nakagawa River and the Ayasegawa River has been urbanized and developed for housing. Therefore, that area has suffered from flood damage caused by typhoons. To reduce and prevent this damage, the underground tunnel type of "The Metropolitan Area Outer Discharge Channel" was completed in 2006 after 13 years of construction. The Metropolitan Area Outer Discharge Channel is a conduit approx. 6.3 km in length and 10 m in diameter, located approx. 50 m under Route 16 in Kasukabe City, Saitama Prefecture. If a flood happens, the rising water in small and medium-sized rivers such as the Nakagawa River runs down via four large shafts into the underground tunnel and finally reaches the reservoir sump connected to the last shaft. The reservoir sump is a huge facility with the area of a soccer ground and the height of a five-story building. The swift flow is abated here and discharged into the Edogawa River by the Showa drainage pump station. In the Showa drainage pump station, which adjusts the water volume for shafts and the underground tunnel and smoothly discharges the water into the Edogawa River, EBARA's technology is useful. Four of Japan's largest pumps with a drainage capacity of 50 m<sup>3</sup>/s are installed in this pump station, and can discharge a water volume up to the equivalent of a 25m-long pool each second. EBARA's state-of-the-art technology makes the pump compact and with high flow velocity, and also achieves a highly reliable system. Our technology actually helps to protect the Tokyo Metropolitan Area from disasters.



Impeller of main pump installed in the drainage pump station (Impeller diameter is 3,757 mm)

### Conceptual illustration of The Metropolitan Area Outer Discharge Channel



Floodwater from each small and medium-sized river is discharged into the Edogawa River via the Showa drainage pump station. [Source: Edogawa River Office, Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism]