



Yokohama Station Area Public-Private Partnership Flood Control



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INTRODUCTION

In the area around Yokohama Station, water is drained to the surrounding rivers at the rainwater development level in the confluence area of rainfall (about 60 mm/hr) once every ten years, three rainwater pumping stations, and three small-scale pumping stations.

Features of Area around Yokohama Station

- One of the leading terminal stations in the Tokyo metropolitan area
- A redevelopment is planned based on the large-scale commercial integration and community development plan (Plan name: Excite Yokohama 22)
- A district with a low foundation surrounded by waterfronts



Figure 1 - Status of Area around Yokohama Station



Figure 2 - Excite Yokohama 22 Area



Figure 3 - Rainwater Pumping Stations and Surrounding Rivers

METHODS

Risk of a flood in the area around Yokohama Station

1) Frequent concentrated torrential rain

- Frequent occurrence of rainfall exceeding the rainwater development level (occurrence of large typhoon and increase of torrential rain)

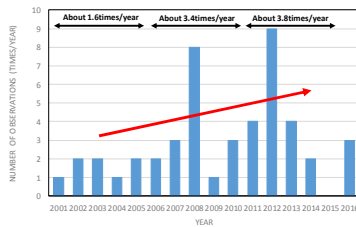


Figure 4 - Number of Occurrences of Rainfalls above 50 mm/hr

2) Concentration of life, wealth, and economic activity

- Underground shopping centers are formed in the east and west of the station, and large commercial facilities are located in each area
- Many people are concentrated, such as business guests, tourists, shoppers from within the country and abroad, workers, passengers of railroads and buses



Figure 5 - Flooding around Yokohama Station's West Exit during Typhoon Ma-on in 2004

RESULTS

Amendments to Sewerage Bylaws of City of Yokohama and Japan's First Flood Damage Control Area

Flow to area designation

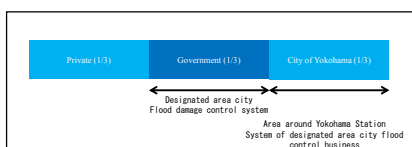
- (1) Since 2015 Revision of the Sewerage Act (establishment of national system)
- (2) Dec. 2016 Revision of the sewerage bylaws of City of Yokohama
- (3) Jan. 2017 Designation of the flood damage control area (first nationwide)
- (4) Feb. 2017 Initiation of collaboration with private operators (enforcement of the city subsidization system)



Figure 11 - Designated Flood Damage Control Area

A unique system had been considered since 2015 or earlier, but as the national system was established, a scheme was made allowing utilization of the national expenses as well.

Scheme of development cost for private rainwater storage facility



DISCUSSION

Conventional rainwater development level

- Rainfall of about once every ten years in the all cities (about 60 mm/h)
- For the time being, for natural drainage areas, etc., a rainfall of about once every five years (about 50 mm/h)



Figure 6 - Conventional Rainwater Development Level in City of Yokohama

Step-up improvement in countermeasures against a flood

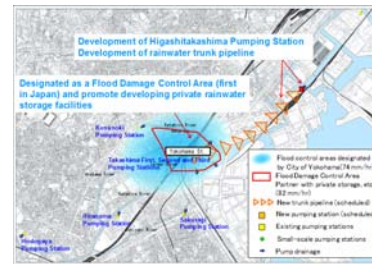


Figure 7 - Full Image of Yokohama Station Area Flood Controls

1) Improvement by City of Yokohama (government side)

- Address a rainfall of once in every 30 years (about 74 mm/h) in the area around Yokohama Station. (Improvement in the rainwater development level)

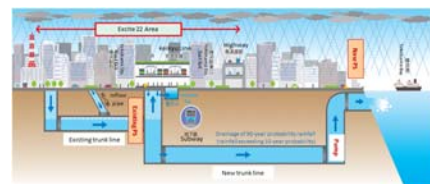


Figure 8 - Development image of rainwater trunk line, pump station

2) Improvement by private operators (public-private partnership) that conducts large-scale developments

- Address a rainfall of once in every 50 years (about 82 mm/h) in the Excite Yokohama Center Zone. (Development guidance)

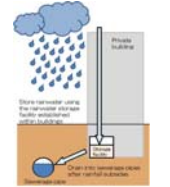


Figure 9 - Private Rainwater Storage Facility (illustration)

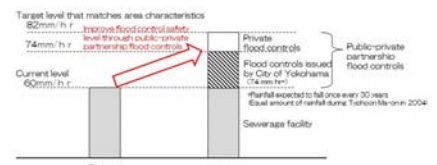


Figure 10 - Effects of Public-Private Partnership Flood Controls

CONCLUSIONS

As a result of designating the area around Yokohama Station as a flood damage control area, the measures against flood are expected to effectively make progress down the road.

- *Target: Operators conducting large-scale developments of 5,000 m² or more
- *Size: 200 m³ per 1 hectare of land area

The first project applied to the system is under preparation aiming for opening in 2020

City of Yokohama is committed to continuous efforts toward flood control measures that will become a norm for Japan



Figure 12 - Image of the First Project Development