

Cooperative Study on Countermeasures against the Tsunami for Sewerage in Kochi Prefecture

Year of Research

2012

Promotion of earthquake disaster prevention

(Purpose)

According to the outcome of the revised-study on the prediction of the inundation hazard by Tsunami in east Japan (hereinafter referred to as National Prediction of the Tsunami Hazard (NPTH)) which was revised after the disaster caused by the great earthquake in the east Japan 2011, approximately 70% of the sewage treatment facilities in Kochi Prefecture was practically put to use, was established to realize effective countermeasures against the damage by Tsunami.

(Results)

Outline of the study and the results is shown with the description of the subject facilities in the Table -1.

(1) Subject Facilities for Confirmation of Reproducibility

Simulation model was established by provision of the Tsunami data which was analysed by mesh method (10m) from the authority. Reproducibility was verified in the result of the model and actual record.

Verification was made for the inundation depth, the area range of inundation, and arrival time of the Tsunami attack.

(2) Organization of the basic data and implementation of the simulation

After the provision of the data of the land area and topographic configuration from Geographical Survey Institute of Japan, structuring the basic data (2m mesh) for the analysis was conducted.

Using the data, simulations were conducted as follows:

Case 1: With the structures and buildings in the area for study of the highest depth of the inundation, the time of the fastest arrival, the flow direction in the area and standard water level)

Case 2: without any structure and building(=>for research of the Froude number)

From the results of these studies, investigation of physical/hydraulic parameters for the target area and buildings was conducted.

Setting of the parameters used for wave force and hazard prediction for each facility was made to predict the damage from these outcomes.

(3) Master Plan of the countermeasures against Tsunami

Master Plan for the countermeasures against Tsunami was formulated based on the result of the article (2).

Examination was made for installation of dikes at the boundary of the facilities, waterproofing buildings, watertight bulkhead for rooms and immersion proofing of equipment.

(Future subject)

Implementation of the effective measures according to the measures for Tsunami established in this Study will be expected.

Further, it is necessary to continue the case studies for accumulation of the knowledge.

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Table-1: Subject Sewage Treatment Plant

Municipality and Sewage Treatment Plant	Current Capacity for Sewage Treatment (m ³ /day)	Sewered Population (person)
Takasu Sewage Treatment Plant in the catchment area of Shimosi Sewage Treatment plant in Kochi city	27,910	52,278
Shioe Sewage Treatment Plant in Kochi city	66,600	68,971
Seto Sewage Treatment Plant in Kochi city	30,180	32,200
Noichi Sewage Treatment Plant in Konan city	8,025	14,711
Yashu Sewage Treatment Plant in Konan city	3,500	2,711
Kishimoto Sewage Treatment Plant in Konan city	2,555	1,784
Toochi Sewage Treatment Plant in Nankoku city	500	995
Hamakaida Sewage Treatment Plant in Nankoku city	2,680	3,594
	486	932



Figure -1: Confirmation of the consistency with the National Prediction of the Tsunami Hazard (NPTH)

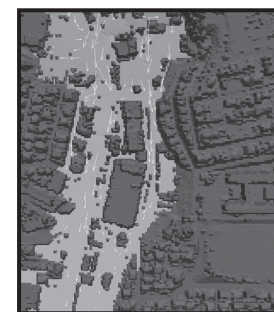


Figure -2: Simulation of the Tsunami Attack

Key words

Tsunami measures, Simulation, Numerical analysis, Crisis control, Disaster prevention measures, Mitigation