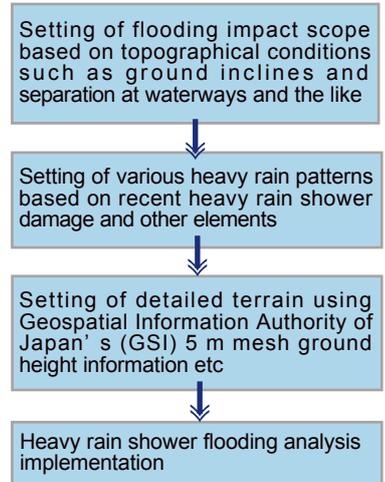


## Disaster prevention - Numerical analysis on HEAVY RAIN SHOWERS -

Furthermore, in recent years there have been frequent occurrences of flooding damage caused by torrential rainfall, and as a result of the concentration of assets in urban areas and the sophistication of urban functions like progress in underground space utilization, the potential for damage in urban areas resulting from flooding is increasing. At Nikken Sekkei Civil Engineering, we have an extensive track record in forecasting occurrences of inland water flooding triggered by torrential downpours for industrial facilities in coastal areas and other place, including buildings and underground spaces in urban areas, and in planning countermeasures such as installing sealing strips to mitigate flood damage and reinforcing rainwater drainpipes. Moreover, we're also working on evacuation route markers utilizing new technologies like Digital Signage used to provide guidance for evacuations, as well as the implementation of simulations for evacuation at times of flooding for underground spaces in urban areas.

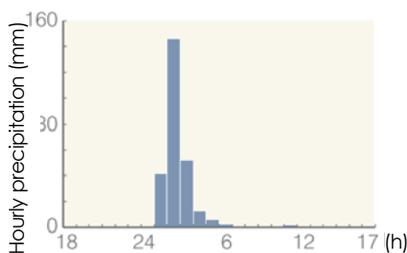


Generally, rainwater drainage facilities are designed by calculating downward flow capacity that assumes no variation of flow amounts in terms of the time or location thereof. At Nikken Sekkei Civil Engineering, we take into considerations time- and location-based changes of flow amounts (precipitation) when analysis of flow to drainage facilities in conjunction with flooding analysis for aboveground portions of business premise so that it is possible for us to find the causes and weak-point areas of flooding problems through conducting analyses in a manner close to the reality.

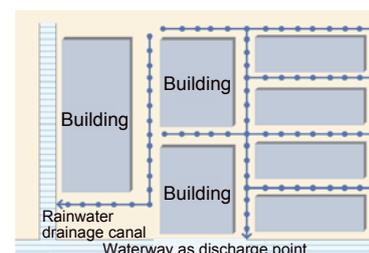
Once the problem areas are clear, we make proposals for optimal countermeasures in accordance with on-site situations, which include drainage pump facility installation, temporary storage facility improvement, enhancement of pipe conduit size and sealing strip installation.



Manhole waterspout situation resulting from heavy rain showers



Example of precipitation subject to analysis



Rainwater drainage canal model

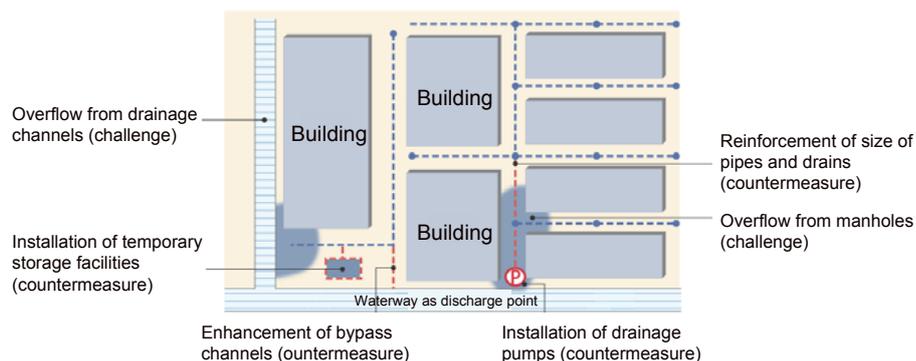


Image of analysis results and countermeasure proposals (flooding analysis for the business premise)