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Factors of Damage of Temples and Shrines caused by the Taisho Kanto Earthquake: Case study of south-central Fujisawa

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In recent years, the occurrences of earthquake which caused extensive damage at the capital function have been concerned. To reduce building damage caused by the earthquake, it is necessary to understand the area shake stronger. Many previous studies had been discussed the relationship between building damages and topographical and geological conditions. However, few studies had considered the factors which divided the degree of damage with each building on similar conditions (i.e. soft ground). In addition, it is important to discuss the building damage including the several factors, for example, topographical,geological and engineering factors, land use, and so on.In this study, we focused on the damages oftemples built on the alluvial lowlands in south-central Fujisawa city, Kanagawa Prefecture, to examine the factors which divided the extent of building damage at the 1923 Kanto Earthquake.

Taisho Kanto Earthquake occurred at 11:58 September, 1923, and measured Magnitude 7.9, maximum seismicintensity 6, 25km depth. We researched the damage records managed by Kanagawa Prefecture with fieldwork to add the records,investigated the construction age of temple, made the map of sectionalized geographical surface and sectionalized micro topography classification, and estimated the subsurface structure.

As a result of consolidating these data, it revealed that the difference of damage overlapped the multiple factors on each temple. It might be able to be the factors of building damage as follows;macro-scale geography (depression contour), surface soil layer is thick, alluvium is thick, groundwater height is high, the building is old, and characteristic geology (mud and thick sand layer deposit). On the other hand, it might not be the factors which work for the building damage as follows; micro topography classification (fine highlands), the distance from the hills is near (that engineering foundation layer thickness is thin),groundwater height is low, the building is new, and characteristic geology (shallow region composed of gravels and hard rock).

It is expected to become a significant data for performing the disaster prevention measures at the individual level by combined topographical and geological factors with engineering factors. Considering and analyzing the factors which cause the building damage, as big date, it is possible to evaluate the degree of shaking at individual buildings, and then perform more effective disaster prevention in the future.

Keywords: Taisho Kanto eatthquake, Fujisawa, temple and shrine, microtremor