

THE VERIFICATION OF THE WALKABILITY ON THE PEDESTRIAN DECK

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Summary

There is an intricate transportation network of cars and trains in the center of Tokyo. There are the layers of the network were stretched around the stations as transportation hubs that didn't fit well in the limited space on the ground. If there are no technical problems similarly with skyscraper construction, the flow of multi-story construction is unstoppable, considering the space required and the space on the ground that is limited. Pedestrian networks are retrofitted to gaps in cities.

The span of this pedestrian deck was decided in consideration of the place where the railway runs underground and the place where it straddles the Metropolitan Expressway.

Since it is an important flow line of the pedestrian in urban areas, we verified the vibration usability of this deck especially for the largest span of it. By measuring the bridge vibration of the actual bridge of this deck, we grasped the difference from the calculated value assumed at the time to design it and confirmed the vibration usability when the pedestrians walk on the deck.

In order not to cause discomfort to the pedestrian, the limit of the natural frequency is that the vertical vibration should not be around 2Hz (1.5 to 2.3Hz) and the horizontal vibration should not be around 1Hz, but the vibration of this deck has applied this restriction. From the displacement and velocity values obtained from the external force, it was judged that no countermeasures were necessary. It can be evaluated that the actual bridge also satisfies the vibration limit, there is no problem in vibration usability.

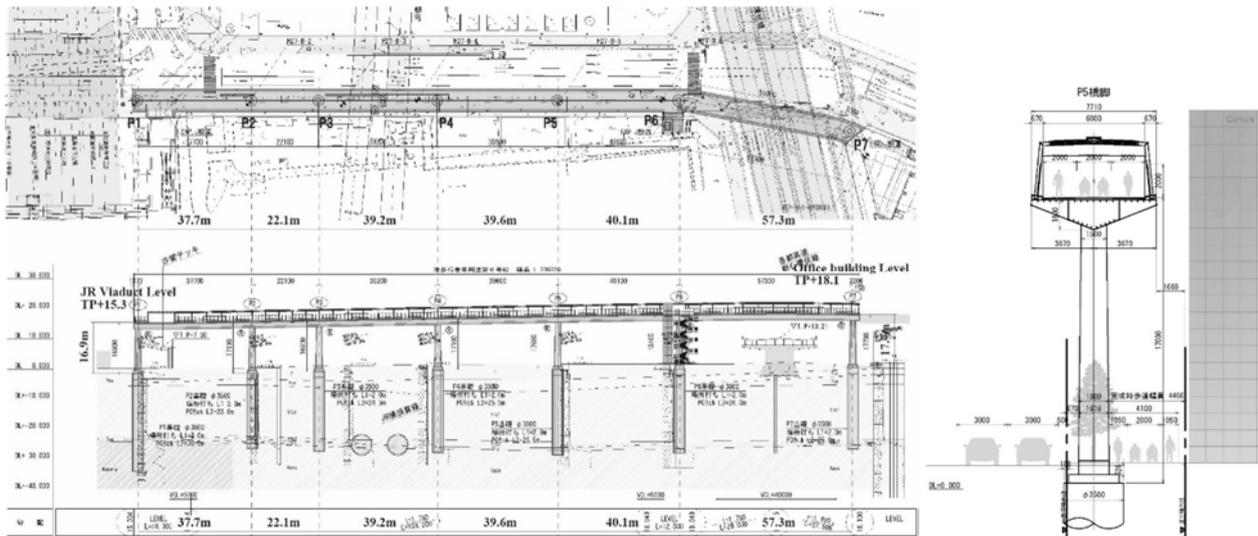


Fig. 1. Bridge drawing (Plan, Side view, Cross section)



Fig. 2. Excitation status

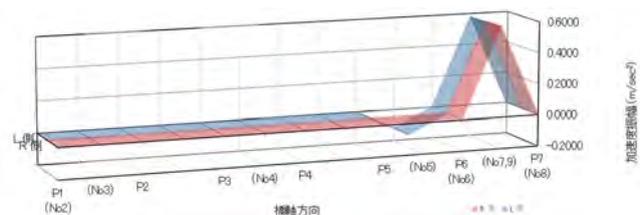


Fig. 3. Vertical vibration mode (measured value)

Keywords: vibration usability; pedestrian deck in urban districts; excitation experiment