

# 1987 Fiscal Year Final Research Report Summary

## Prediction of Damage of Road Networks to Natural Hazards and Its Strengthening

Research Project

### Project/Area Number

60302060

### Research Category

Grant-in-Aid for Co-operative Research (A)

### Allocation Type

Single-year Grants

### Research Field

土木構造

### Research Institution

Kanazawa University

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### Project Period (FY)

1985 - 1987

### Keywords

Natural hazards / Road networks / Damage prediction / Method for strengthening / Reliability analysis / Design code / Earthquake / 豪雪

### Research Abstract

The purposes of this project are to clarify the damage characteristics of road networks to natural hazards, to propose a prediction method for their damage and to establish a proper method for strengthening road networks. Achievement of this project can lead to not only reduction of the damage but also rapid repair of the damage following natural hazards and quick rescue of injured people.

We carried out four main points of this project. In the 1st project, we dealt with evaluation of the strength of road networks, which were constructed according to the design codes, and their damage. A method for evaluating reliability of bridges was focused in this project. We developed a new method for evaluating reliability of the system composed of super and sub structures.

In the 2nd project, we dealt with the dynamic response of road bridges and acting forces on them. We pointed out the response of bridges becomes smaller as the number of spans and the span length become larger. Furthermore, we developed an automatic measuring system of the weights of moving vehicles, and a method for evaluating frequency response of continuous bridge.

In the 3rd project, we discussed on the response of the sub structure near coast and the reliability of bridge piers to scour. The vibration of a small diameter pile due to small amplitude waves was analyzed. Moreover, we also discussed on the relationship between the local scour around bridge piers and supplying sand.

In the last project, the method for evaluating strength of roads as a network and strengthening them for the future, were discussed. In the reliability analysis of road networks, we took earthquake intensity level for ground and the randomness and uncertainty in the evaluating the strength of the road. Furthermore, we took helicopters and ships into consideration in evaluating network reliability and discussed preparation for plural natural hazards.

## Research Products (11 results)

All Other

All Publications (11 results)

- [Publications] 小堀為雄: 橋梁と基礎. 19. 35-40 (1985) ▼
- [Publications] 小堀為雄: 土木学会論文集. 374. 583-592 (1986) ▼
- [Publications] Hidiyuki Honda: IABSE Proceedings. P 98/86. 57-75 (1986) ▼
- [Publications] 石田 啓: 土木学会論文集. 369. 243-251 (1986) ▼
- [Publications] 辻本哲郎: 土木学会論文集. 375. 53-60 (1986) ▼
- [Publications] 北浦 勝: 第7回日本地震工学シンポジウム1986講演集. 2017-2022 (1986) ▼
- [Publications] Tameo, KOBORI: "A Finite Element Analysis of Stress Distribution with Bending or Slip in the Connection between Pile Head and Footing" Proceedings of JSCE. No. 374. 583-592 (1986) ▼
- [Publications] Hideyuki, HONDA: "Dynamic Factor of Highway Steel Girder Bridges" IABSE Proceedings. p-98/86. 29-44 (1986) ▼
- [Publications] Hajime, ISHIDA: "A Theoretical Solution about Vibrations of a Small Diameter Pile Due to Small Amplitude Waves" Proceedings of JSCE. No. 369. 243-251 (1986) ▼
- [Publications] Tetsuro TSUJIMOTO: "Fluctuation of Scour Depth Around a Bridge Pier Responding to Fluctuating Sediment Discharge" Proceedings of JSCE. No. 375. 53-60 (1986) ▼
- [Publications] Masaru KITAJIMA: "Damage Prediction of Road Networks Subjected to Earthquake and Its Strengthening" Proceeding of the Seventh Japan Earthquake Engineering Symposium-1986. 2017-2022 (1986) ▼

URL: [https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-60302060/603020601987kenkyu\\_seika\\_hokoku\\_](https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-60302060/603020601987kenkyu_seika_hokoku_)

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