**Zeitschrift:** IABSE congress report = Rapport du congrès AIPC = IVBH Kongressbericht

**Band:** 11 (1980)

**Artikel:** Hormonious development of computer analysis and structural design

**Autor:** Aoyagi, Tsukasa / Uchida, Naoki / Kirihara, Hideaki

**DOI:** https://doi.org/10.5169/seals-11340

**Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Mehr erfahren

**Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. En savoir plus

**Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. Find out more

**Download PDF:** 15.08.2025

**ETH-Bibliothek Zürich, E-Periodica, https://www.e-periodica.ch**

NIKKEN SEKKEI
planners architects engineers

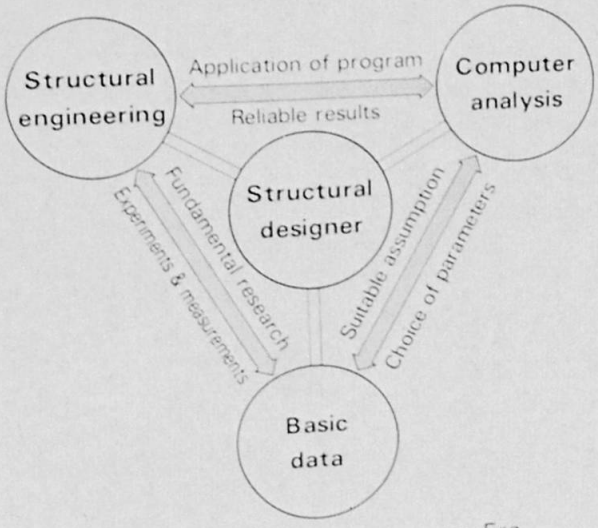
JAPAN

# Harmonious Development of Computer Analysis and Structural Design

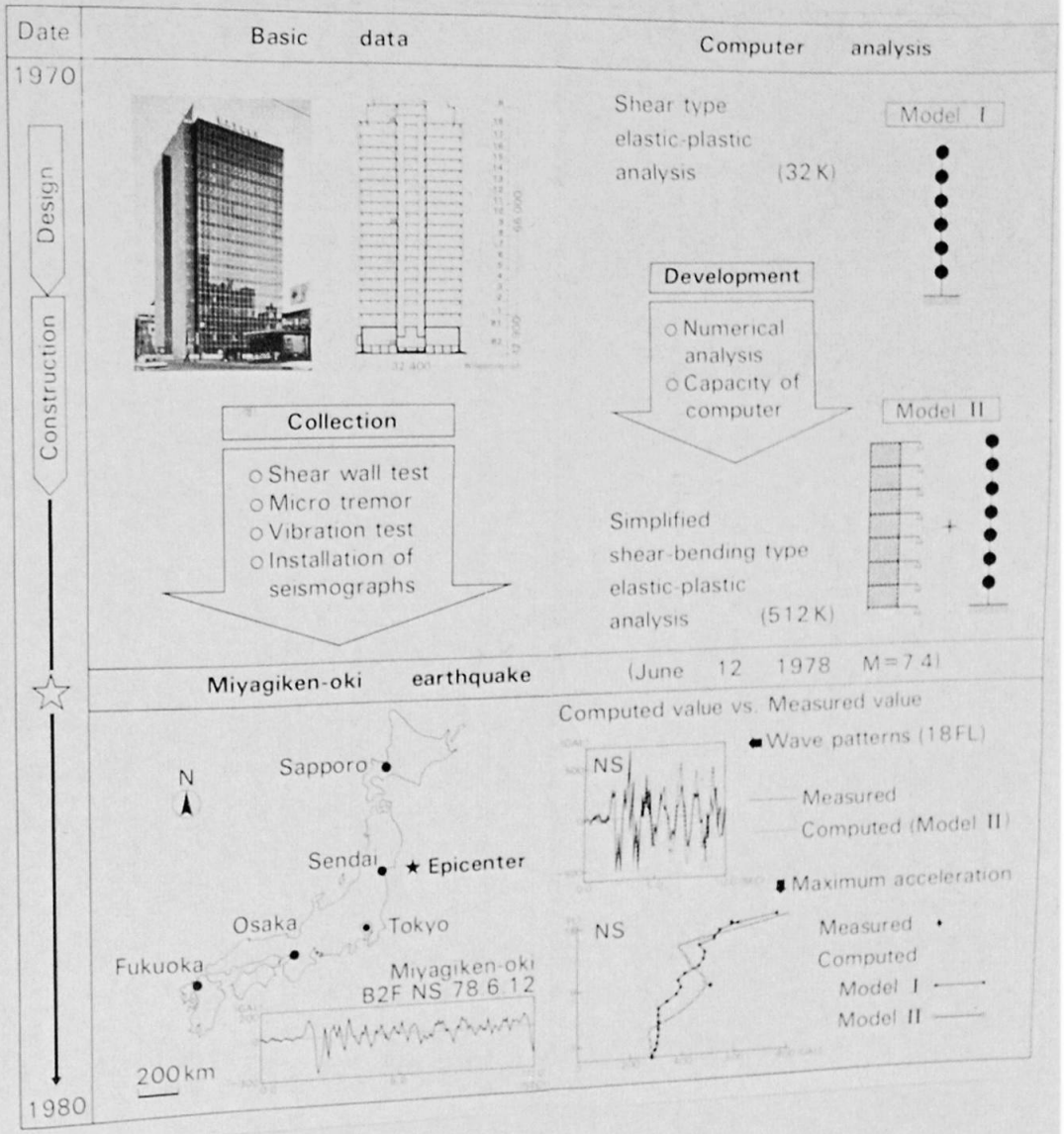
## Dynamic Analysis of a Tall building under Strong Earthquakes

T. AOYAGI N. UCHIDA H. KIRIHARA
K. MATSUNAGA M. KAWAMURA

A computer plays the following two major roles in the field of structural design. One is the fast and accurate processing of data - a task which involves enormous volume of work but requires only simple thinking. The other is the computer's aid in theoretical analysis of structure, which has tremendously expanded the domain of numerical analysis. Future development of structural engineering depends, to a great extent, on the pursuit of theoretical analysis with a thorough understanding of the computer's roles, and at the same time, on the storage of basic data, both requirements having to be advanced in a well-balanced state. From this viewpoint, the authors introduce here their ten year experience obtained from the design thro' simulation analysis for a tall building (in Sendai city) which encountered strong earthquakes.




Structural design in Computer Era



# " HARMONIOUS DEVELOPMENT OF COMPUTER ANALYSIS AND STRUCTURAL DESIGN "

Tsukasa AOYAGI, *Chief, Struc. Dept.*
Naoki UCHIDA, *Senior Struc. Engr.*
Hideaki KIRIHARA, *Struc. Engr.*
Koichi MATSUNAGA, *Struc. Engr.*
Masayoshi KAWAMURA, *Eng. D., Chief Advisory Struc. Engr.*

Nikken Sekkei Ltd, Osaka, Japan

Basically, the authors' poster is separable into two segments: a theoretical vision reflecting a structural engineer's roles in the computer era; and a typical example of such correlative event and study as envisaged in that vision. Thus, the following two became the main subjects of discussion with the audience.

☐ Discussion about "Structural Design in Computer Era"

Most of audience favorably agreed to this vision, with the related discussion covering the following.

1) Development of Program: At the authors' firm, the typical way of developing computer programs is that related engineers, say, those at the computer department and the structural department associate themselves with each other by establishing an adhoc task force on a specific project. When this was explained to the audience, most of them admitted that this approach was the most preferable way because the structural engineers' participation in programming would certainly make the program easier to operate and more effective, but some audience commented that this approach was difficult to follow in their country because of professional separation of analysis from design in practice.

2) Operation of Program: The authors explained that they used their own computers installed for in-house use, viz. two machines of IBM 370-M138 and associated terminals. Besides these machines, small computers of about 100 K are provided at the structural departments for simple calculation and analysis. Though all these programs being developed for in-house use, two major programs for integrated structural analyses as authorized by the Minister of Construction are made available to outside structural engineers under licensing agreements. Such positive attitude of the authors toward computer use was favorably accepted by the audience.

☐ Discussion about "Typical Example (Dynamic Analysis of a Tall Building under Strong Earthquakes)"

The practitioners for whom seismic force is an indispensable consideration made wide-ranging inquiries, from aseismic design methods in Japan to assumption of coefficients for the analyses, eventually being followed by rewarding discussion. They regarded this example as very rare and invaluable study which certainly helped to provide a basis for the harmonious development of computer analysis and structural design.

Thus, the authors acknowledge that the poster session afforded the authors with an otherwise unobtainable chance for better communication among participants to have them thoroughly understand the authors' philosophy. With their attitude so successfully supported, the authors wish to develop further study.