

# 土木學會誌

第 48 卷 第 11 号

昭和 38 年 11 月

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年 間 会 費 正 員 1800 円 学 生 員 900 円

SYNOPSIS

RECENT DEVELOPMENT IN THEORY OF STRUCTURES

BY I. KONISHI (Page 7)

This paper describes some recently developed results of structural engineering in fields of civil and aeronautical engineering. Introducing the linear structural analysis contributed by Jenkins, Henderson, Morice, etc. and the application of energy theorems for structural analysis generalized by Argyris & Hunt the fundamental equations of equilibrium are considered from general point of views, which are classified into two categories of methods of investigation, namely, the stiffness method and the flexibility method. In connection with above linear problems of structures the Jordan's method for solving the linear simultaneous equations is illustrated and the results are used for purpose to judge the superiority of choice of redundant forces of framework structures.

Some additional recent topics in structural engineering are discussed mainly from a point of application of high-speed electronic computers.

HEAVY CONCRETE FOR NUCLEAR SHIELDING

—Experiments using Aggregates Produced in Tohoku Area—

BY F. KAWAKAMI, Y. GOTO AND J. MATSUMOTO (Page 16)

This paper represents the result of several experiments on heavy concrete for radiation shielding which were done using magnetite, hematite, paigeite and magnetite sand, etc. produced in Tohoku area as aggregates. The following facts were found: 1) that the workability, density and uniformity of heavy concrete are largely affected by the aggregate grading, 2) that the magnetite sand is very good for the finer parts of fine aggregate, 3) that the segregation of heavy concrete will be decreased by combining two kinds of aggregates which are different from each other in specific gravity. And this paper represents the results of  $\gamma$  ray penetration tests which were conducted to find roughly the segregation and  $\gamma$  ray shielding characteristics of heavy concrete for which the above mentioned aggregates are used.

CONSTRUCTION OF YAMASHITA PIER

—Extension Project and its Work of Yokohama Harbor—

BY T. SHINOHARA (Page 24)

The present paper describes the construction work of Yamashita pier (the total area is 465,700 m<sup>2</sup>) which was completed last March after having spent ten years since December, 1953, when the work was started.

DAMAGE OF STRUCTURES IN NORTH-MIYAGI EARTHQUAKE

BY F. KAWAKAMI (Page 31)

The present paper describes the outline of the damage of highways, bridges, river-dikes, railways and reclamation works in North-Miyagi Earthquake of April 30, 1962, and also the effect of materials of embankments, soil conditions of foundation etc. on the damage of earth structures.

PLANNING OF INDUSTRIAL AREA IN NEW INDUSTRIAL CITIES BY MEANS OF INDUSTRIAL COMPLEX ANALYSIS

BY K. YOSHIKAWA, AND K. ONO (Page 37)

This paper deals with a planning of industrial area in new industrial cities from the standpoint of developing secondary industries.

As a result of overconcentration of industrial plants, large industrial zones are finding themselves in a condition difficult to arrange for industrial site, water supply and transportation facilities to cope with the imminent needs. Consequently, bottlenecks to the development of industry are becoming serious. To overcome these difficulties, it will be necessary to disperse the industrial plants and to build industrial area in the new industrial cities. For this reason So-Called Industrial Complex Analysis has been introduced.

TIMBERING OF TUNNEL FOR WHICH PIPES ARE USED

BY S. SAKAMOTO (Page 44)

Aiming at the pipe timbering as a substitute of H-Shaped steel which is now generally used for the tunnel construction work on the new Tokaido line of the Japanese National Railways, the present author carried out experiments on it and also tentatively used it.

The present paper describes the results of experiments and tentative use from the standpoint of the design and execution of work.