THREE DIMENSIONAL STRESS ANALYSIS OF BOX GIRDER BRIDGE

Dr. Eng. Ichiro Konishi, C.E. Member, and Sadao Komatsu, C.E. Member

Synopsis : A calculation method, based on the bending torsion theory, is proposed for the determination of the stress in main girder and floor beam of the box girder bridge, which is sujected to the torque loading. During the loading the cross–section deforms in · such a way as to induce some local twist.

Numerical example on one actual composited box girder bridge shows that this deformation changes somewhat the effect of the load-distributing action by the floor system.

An ·approximate analysis about the statically equivalent structure is developed. Thus the distribution rate of the loads, concerning the bending moment at the middle section of main girder, is plotted for reasonable design.

THE ELASTIC PROBLEM OF THE TENSIONED THIN PLATE WITH SEVERAL EQUI–DIAMETRIC CIRCULAR HOLES

Minoru Okabayashi, C.E. Member

Synopsis : The writer gives an approximate solution of the problem of the tensioned thin plate with several equi-diametric circular holes, and gives a formula to calculate the stress concentration on the boundary of a hole.

INFLUENCES OF TRAFFIC LOADS ON THE SAFETY OF HIGHWAY BRIDGES

Akira Nishimura, C.E. Member

Synopsis : Because of the rich varieties of traffic loads, it is extremely hard to grasp the influence of traffic loads upon the safety of a a highway bridge. In this paper the writer statistically studies the safety under some conditions, i. e., the relative frequency of occurence of heavy vehicle to not heavy one, and the traffic flow per unit time on the road, vary, by using the traffic probability of vehicle existence. In these performances, the safety has to be judged by the probability of occurence of working stresses superior to the specific stress in a certain member, the damage of which has an indirect effect on the whole structual failure.

Applying the similar considerations on the design-linear-load for highway bridges, the rational method for determinig the design-class of the highway bridges is also discussed briefly.

ON THE DISCHARGE COEFFICIENTS OF THE CREST SPILLWAYS

Toshio Iwasaki, C.E. Member

Synopsis : The formula of the discharge coefficients of the crest spillways was introduced theoretically and the constants in this formula were determined by using many experimental values available.
The discharge coefficients of the standard crest and of the crests similar to it, for example, parabolic crests or crests composed of two or three circles, were reasonably expressed by this method.

ON THE CHARACTERS OF HYDROLOGIC QUANTITIES IN JAPAN, CONSIDERED BY THE TIME SERIES THEORY

Nobutada Takase, C.E. Assoc. Member

Synopsis : In connection with the development of hydrologic statistics, the ideas of probable precipitation and flood discharge have been generally popularized and contributed greatly to the rationalization of river plannings in Japan. But, in the practice, it is lacked to examine closely the incidental occurrence of hydrologic quantities on which the probability theory bases. In this paper, the author analyzes many data of annual maximum daily precipitation and flood discharge by the time series theory being developed recently, and makes clear their statistical treatments and characters.

ON THE APPLICATION OF AN ANALOG COMPUTER FOR FLOOD ROUTING TO ACTUAL RIVERS

Yasuo Ishihara, C.E. Member

Synopsis : The principle of an electronic analog computer for flood routing, based upon Dr. Hayamis excellent theory, and its characters were already explained in the author's previous papers. In this paper, the methods of application of this computer to actual rivers with various figures, inflow from tributaries, outflow to distributaries, retardation pool for flood protection, etc., are discussed and it is found to be applicable to actual rivers, changing the constants contained in the computer. As some examples of application, the results of flood routing in the Kiso and the Yodo Rivers are shown.

A RELATION ON COMPRESSION INDEX OF SOILS

Yosichika Nishida, C.E. Assoc. Member

Synopsis : This paper reports a new approximate formula on the compression index of soils, deduced from some simple assumptions by the author, which shows a relation between the compression index and the void ratio or the natural water content.
It agrees well with experimental results and seems to be applicable to practical problems.

ON THE COMPRESSIBILITY OF GRANULAR LAYER

Kiichi Tanimoto, C.E. Member

Synopsis : In this papers, a theoretical treatment on the compressibility of granular layer such as sandy soil mass is described. In order to explain the experimental results obtained by repetitional loading, a mechanical model of granular layer is proposed. This model is at least qualitatively consistent with the compressibility characteristics, and is applicable to the explanation of a characteristic in vibro-compaction.

EXPERIMENTAL INVESTIGATIONS ON VIBRO--COMPACTION
OF LATERALLY CONFINED SOIL

Dr. Eng. Sakurō Murayama, C.E. Member
Kiichi Tanimoto, C.E. Member
Saburo Matsuno, C.E. Assoc. Member

Synopsis : The mechanism of the vibro-compaction of soil specimen in a mold has been researched as the fundamental investigation for the vibro-compaction of ground. According to the results of the experiments under various conditions of vibration, it has become obvious that the compactivity of the sandy soil is much influenced by vibro-acceleration, weight of vibrator and vibration energy.