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ON THE LOAD DISTRIBUTION OF LADDER-GIRDERS

Haruo Hoshi, C.E. Member

Synopsis : This paper deals with distributing effect of deflection by cross beams and another qualitative properties on the ladder-girder construction applied box beam, and simple approximate calculation method by load distribution is explained.

ONE TEST FOR THE YIELDING CONDITION OF THE MILD STEEL

Dr. Eng. Toshie Okumura, C.E. Member

Synopsis : In this study the yielding condition of the mild steel is tested Semicircular notched bar's test specimens, which yield stress states in two axises are used. Experiments show that the maximum shearing stress theory is applied on the field, in which the displacement is comparatively free, but on the field of complexed stress state the Von-Mises-Hencky's energy theory is applied.

SOME CONSIDERATIONS ON THE DESIGN LIVE LOADS
OF STEEL HIGHWAY BRIDGES

Akira Nishimura, C.E. Member

Synopsis : To reveal the quantitative safety of a highway bridge in service objectively, the bridge would be designed in accordance with design loads based on the actual conditions of traffic and the frequency distribution of vehicle weights in the route.

In this paper, it is discussed statistically how to decrease the design vehicle loads on the slab which is designed with number of lanes. The same discussions are made on the design loads of main girder, namely on the uniformly distributed load and the linear load. These discussions are based on an assumption that the frequency of distribution of vehicles in the space is attributable to the binomial distribution.

The results are compared with the design loads specified in the new design specification of high-way bridges in Japan.

HOW TO SELECT THE STATICALLY DETERMINATE SYSTEMS
FOR SPACE STRUCTURES

Shigeto Kondo, C.E. Member

Synopsis : Generally it is very troublesome to solve the statically indeterminate space structures, but if we select the statically determinate systems properly, we can easily obtain the various in-fluence lines for them.

I describe here on the simple methods of properly selecting the main systems by matrix.

ON THE PERIOD OF FREE TRANSVERSE VIBRATION OF COMPOSITE GRILLAGE BEAM BRIDGE

Dr. Eng., Masao Naruoka, C.E. Member, Itsuo Hirai, Assoc. Member

Synopsis : Two measured values of period of free transverse vibration of the composite grillage beam bridges were compared by the theoretical values which were obtained by means of the following methods :
a) M.T. Huber's 4th order partial differential equation of the orthotropic plate,
b) A. Pfluger's more correct theory of the orthotropic plate,
c) grillage beam theory,
d) beam theory.
   It was found that the measured value can be well explained by the theory of orthotropic plate, and that in this case the value $\kappa = H/\sqrt{B_x B_y}$ is prefarably assumed as zero.

A STUDY ON MAXIMUM FLOOD DISCHARGE FORMULAS

Dr. Ph., Tae-sang Won, C.E. Member

Synopsis : This paper involves the general critia for the old formulas of flood discharge and new formulas for approaching velocity of rain water and for maximum flood discharge which were derived by the author. These formulas were also certificated by the comparison of the results of calculations and the data of observations.

ON THE VELOCITY-DISTRIBUTION AND THE MIXING LENGTH PECULIAR TO THE THIN SUPERCRITICAL FLOW STREAMING ON A ROUGH BED

By Dr. Eng., Shigeru Tanaka, C.E. Member, and Shūichi Sugimoto, C.E. Member

Synopsis : One of the characteristics of the thin supercritical flow running down a steepslope pavement, a mountain-side, or a reservoir spillway, may be that the surface disturbances are remarkable. It may be considered that the disturbances are marked not only on the water-surface but also in the whole flow-profile. The research workers took up the uniform steady flow involving not only the said kind of flow but also channel and river flow, and studied especially how the mixing length of disturbances and velocity-distribution along the stream-profile varied with the flow-depth (measured normally to the bed surface), clarified the above relations theoretically, and finally induced two theoretical formulas. Then they performed many experiments concerning the velocity-distribution of the above titled flow, and determined the two constants involved in the theoretical formulas representing the mixing length relations, in order that the results obtained by the experiments and those obtained by using the above-mentioned two theoretical formulas might show good agreement. It is to be hoped that the writers also determine the two constants involved in the formula, so as to be able to apply to apply the formulas induced by the writers to the river or channel flow, and then stress the characteristics of this kind of flow by comparing the values of these constants peculiar to the flow in question and an ordinary river or channel flow, if time permits. Up to now, they have been unable to ascertain these points, but they are intending to study further these details hereafter.

SAND CONCENTRATION IN PIPE LINES OF DREDGERS AND
THE TRANSFER COEFFICIENT FOR THE SAND IN PIPE LINES

Dr. Eng., Sitirō Utida, C.E. Member, Masaharu Katō, C.E. Member,

and Hazime Ogawa, C.E. Member

Synopsis : Testing sand concentrations in dredge pipes, the wrighters applied for them the formula which they have investigated formerly. And analysing its results, he proved that the transfer coefficient which he has adopted in his formula is suitable. Next, applying it to small pipes, he added some supplement and has decided a general form of transfer coefficient in pipes.

SOME EXPERIMENTS ON WATER-DROP EROSIONS

Yuichi Iwagaki, C.E. Member and Yoshito Tsuchiya, C.E. Assoc. Member

Synopsis : In studying the mechanism of raindrop erosion, one part of the erosion process of land surface by rain water, it is necessary to evaluate the eroding capacity of the falling raindrops and the erodibility of soils experimentally. In this paper, erosion of flat surface consisting of sand or sandy soil by a artificial water-drop is treated, and then volumes of sand or sandy soil eroded in the dry, wet and inundated conditions are measured. The experimental results show that eroded volume is proportional to the momentum of a water-drop and is also very much affected by porosity and water content of sand and sandy soil, and depth of water film on the inundated sand surface. Moreover, the empirical formula for critical depth of water, at which sand surface in the inundated condition is not disturbed by a falling water-drop, is proposed and some considerations on the conservation of land surface are made on the basis of the experimental results.