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PAPERS OF THE HYDRAULICS DIVISION

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PAPERS OF THE TECHNICAL
COUNCIL ON WATER RESOURCES
PLANNING AND MANAGEMENT

DISCUSSION

Proc. Paper 10182

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[a]Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

TECHNICAL NOTE

Proc. Paper 10192

INFORMATION RETRIEVAL

The key words, abstract, and reference "cards" for each article in this Journal represent part of the ASCE participation in the EJC information retrieval plan. The retrieval data are placed herein so that each can be cut out, placed on a 3 × 5 card and given an accession number for the user's file. The accession number is then entered on key word cards so that the user can subsequently match key words to choose the articles he wishes. Details of this program were given in an August, 1962 article in CIVIL ENGINEERING, reprints of which are available on request to ASCE headquarters.

[a]Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

10224 HYDROLOGIC EVALUATIONS IN BRIDGE PIER SCOUR

KEY WORDS: **Bridges (piers);** Channel stabilization; Floods; **Hydraulics;** Hydraulic structures; **Hydrologic properties; Scour;** Scouring; Sediment transport; Streambeds

ABSTRACT: Several hydrologic evaluations are important for the design of bridge piers to protect them against stream bed scour: (1) Prediction of the local stage versus discharge relation; (2) determination of appropriate design floods, their recurrence intervals, and their stages; (3) selection of suitable stream bed reference elevations; (4) assessment of hydrograph influences on channel stability with respect to channel alinement, stream bed configuration, and stream bed degradation; (5) evaluation of the effects of dams, dredging, and sand-and-gravel operations upon sediment transport near bridge piers; (6) evaluation of the effects of scour protection measures; and (7) anticipation of the magnitude of debris transport during floods as related to river stage and to watershed conditions. Method and difficulties in making these hydrologic evaluations are examined. The techniques considered rely mainly upon the development and analysis of stream gaging records and the analysis of aerial photographs.

REFERENCE: Klingeman, Peter C., "Hydrologic Evaluations in Bridge Pier Scour Design," *Journal of the Hydraulics Division,* ASCE, Vol. 99, No. HY12, **Proc. Paper 10224**, December, 1973, pp. 2175-2184

10216 COMPUTER SIMULATION OF STORM WATER RUNOFF

KEY WORDS: **Computer models; Computer programs; Computers; Hydrography; Hydrology; Runoff; Sewers;** Simulation; Storms; **Storm water**

ABSTRACT: A computer program has been developed that eliminates most of the intuition or experience required in calculating storm water runoff by the classical "rational" method. The program gives an approximate solution of the partial differential flow equation over the area. The area considered is divided into a grid of squares, with the elevation and soil condition (flow coefficient, initial surface retention, infiltration rate) tabulated for each grid element; often all these may be considered constant except elevation. Typical rainfall data are entered, and the program gives the runoff into drainage lines as a function of time. Depth of water standing in the area is also computed. Copies of the program are available to those interested.

REFERENCE: Offner, Franklin F., "Computer Simulation of Storm Water Runoff," *Journal of the Hydraulics Division,* ASCE, Vol. 99, No. HY12, **Proc. Paper 10216**, December, 1973, pp. 2185-2194

10233 DAM-BREAK FLOOD IN A PRISMATIC DRY CHANNEL

KEY WORDS: Computation; **Dams; Floods; Flood waves; Hydraulics; Mathematical models;** Open channel flow; Unsteady flow; **Wave equations; Waves**

ABSTRACT: A mathematical model is presented for the prediction of the flood wave resulting from the instantaneous break of a dam in a prismatic, dry channel of general parabolic cross section. It consists of the numerical integration of the characteristic equations over the irregular grid formed by the characteristic lines using a predictor-corrector scheme. The solution is advanced towards the wave front by a gradual refinement of the characteristics net for reasons of accuracy and economy. Finally, the solution is extended over a short region to the wave tip, which is characterized by zero depth, using a simplified form of the momentum equation resulting from physical considerations in the wave-tip region. Computed results are compared with experimental and theoretical results obtained by others. Corroboration with experimental results is generally good. The solution can be advanced in time until the negative wave propagating into the still water reaches the upstream end of the reservoir.

REFERENCE: Sakkas, John G., and Strelkoff, Theodor, "Dam-Break Flood in a Prismatic Dry Channel," *Journal of the Hydraulics Division,* ASCE, Vol. 99, No. HY12, **Proc. Paper 10233**, December, 1973, pp. 2195-2216