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(Runge-Kutta Method)   VB(Visual Basic)

Application of Windows-Based Design for Detention Ponds with Long-Duration Rainfalls

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ABSTRACT   Because of rapid growth in population, the hillside has been over-developed in Taiwan. In the event of a flood, this situation results in disasters within the downstream areas. It is necessary to establish flood detention facilities to delay the peak time and to reduce the peak flow. This research builds an argument based on the isosceles trapezoidal inflow hydrograph model, using Runge-Kutta Method to resolve the governing continuity equation. In order to provide for designer computing exactly and conveniently, use of a Windows-based module developed by applying Microsoft's Visual Basic combined with the numerical method could be useful. Moreover, we can obtain comparative result of the effect of flood detention with different outlet devices in the same inflow hydrograph by computing the ratio of inflow peak reduction. We found that the orifice outlet shape is a more veritable design for flood detention.

Key Words: detention pond, long-duration rainfall, Windows-based module.