

MODELLING OF RAINFALL INPUTS TO STORM SEWER SYSTEMS

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As the modelling technology relevant to storm sewer system rehabilitation studies has developed, it has become evident that new methods of synthesizing rainfall inputs are required over and above the traditional short-duration, highly peaked design storm rainfall input. In rehabilitation studies the hydraulic performance of a system has to be considered under two headings:

- (i) public health risks and flooding arising from overloading:
- (ii) river pollution generated by storm sewer overflows.

In each case, the rainfall inputs must be specified in a form which will allow measures of the improvement in standard of service achieved through upgrading to be quantified. A rainfall time series is considered to be the appropriate form of input, since this contains all of the information required to assess the improvement in system performance achieved through rehabilitation. However, the computation effort associated with the use of rainfall time series in storm sewer system simulations is potentially very large. Accordingly, methods are required for sampling appropriate rainfall events and antecedent conditions from an original time series which will generate the required information on system performance under different headings.

The paper concludes that the rainfall inputs for each category of problem must be sufficiently representative to ensure that critical system response is accurately reproduced in each case. While rainfall time series measured at one or more points within the study area contain all of the desired information to achieve the above objective, such time series are not generally available in the UK on the time interval required. Methods are required whereby the necessary time series can be synthesized at any point in the UK, together with sampling procedures for the different applications which can keep the computational load manageable. Techniques are also required to enable the sensitivity of storm sewer system response to spatially variable rainfall inputs to be quantified, so that recommendations can be made for the spatial sampling of rainfall in storm surveys.