

Sewerage Rehabilitation using the WASSP Model

by D.I. Aikman\* and N.A. Kent\*\*

1. This paper is based on a sewerage investigation carried out for the Metropolitan Borough of Rochdale with the object of preparing a "Drainage Area Plan" for the Spodden Valley area following the recommendations of the recently published Sewerage Rehabilitation Manual (SRM). The paper discusses various problems and solutions associated with modelling the existing sewerage system and analysing various integrated rehabilitation solutions.
2. The Spodden Valley Drainage Area covers about 5 km<sup>2</sup> and has a population of some 17,000. The topography is undulating and varies from open ground to old high density housing or industrial developments. The combined trunk sewer system serving the catchment dates largely from the period 1870 to 1910.
3. Initial attempts to run the model with version 6.0A of the WASSP-SIM program were unsuccessful due to instability problems and, following discussions with Hydraulics Research a pre-release version of WASSP version 7.0 was obtained and operated for all subsequent modelling and analysis. The complete model network consisted of 241 pipes, with 9 storm overflows, 2 inflow hydrographs and 1 bifurcation. One of the model overflows, and the associated hydrograph, was required to represent a flow bifurcation whilst the second hydrograph represented a controlled inflow from a neighbouring catchment.
4. For model verification purposes, flows were monitored at 3 major storm overflows and close to the point where the sewerage system discharged to the main outfall sewer. Rainfall data for model verification was derived by comparison of the precipitation at the two monitoring stations used. Areal variation was considerable (up to 45%) and adjustment of the recorded rainfall comprised taking the mean rainfall intensity between the two gauges and making an allowance for the movement of the storm over the catchment. The initial modelled response to the three verification storms was reasonably accurate. Subsequent model modifications resulted in differences between modelled and measured flows within those recommended by WRC discussion document "Guide to Sewer Flow Surveys".
5. The version of WASSP-SIM used did not define a procedure for the modelling of siphon overflows. An assumption was made that the siphon primed

\* Projects Engineer: Babbie Shaw and Morton, Preston

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**FIG N° 1 PIPEWORK LAYOUT.**

