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**STORM SEWER DESIGN INCORPORATING GRADED SEDIMENT
TRANSPORT**

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ABSTRACT

Majority of established equations for sewer design originates from experimental of uniform sediment transport in pipes. Very few equations are available for graded sediment transport due to lack of either experimental or field data. In this paper, a new relationship for graded sediment transport in sewers was derived based on limited experimental data.

INTRODUCTION

Recent field data collection programmes in UK and Western Europe confirm the presence of loose sediment beds in sewers. Several relationships (Ab. Ghani 1993, May 1993) based on experimental data have been derived to account for the presence of loose beds in case of uniform sediments. Nalluri and Ab. Ghani (1994) found that sewers of diameter of 1 m or more may best be designed with some bed deposition.

In this paper, a limited experimental data conducted by May (1993) on graded sediment transport in sewers with loose beds were used to obtain a new relationship based on Ab. Ghani (1993)'s transport function. Comparisons were then made to show the effects of sediment grading on the slope requirements.

EXPERIMENTAL DATA

Figure 1 shows the definition of cross-section for a pipe with a deposited loose bed. y_s is the mean bed thickness after averaging the thickness of the loose bed at several locations along the pipe. The difference between overall flow depth (Y) and the mean bed thickness (y_s) gives the mean flow depth (y_o).

May (1993) conducted experimental data on sewers with loose beds using two graded sediment sizes obtained by mixing two uniform sands with mean sediment size (d_{50}) of 0.73