

SYNOPSIS OF PAPER - CASE STUDIES USING INHERITED HYRAULIC MODELS

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Introduction

Hydraulic models can be inherited for various different reasons, however, this process appears in nearly all cases to create a vast array of problems. Many of these problems originate from the early stages of the model build and tend to become exaggerated as the individual project proceeds. Over recent years Mott Macdonald have inherited numerous models as part of both planning and design work. The lessons learnt from attempting to use these models are considered in general and hopefully this paper may be used to initiate further thought and possible action with regard to resolving this difficult paper. This paper has been formulated into a few individual case studies and out thoughtsd have been directed into trying to formulat a common approach to this subject.

Case Studies

As part of this paper we have focused on four case studies, three of which have been inherited for Drainage Area Study Projects whilst the other has been for Design Work. Each case study briefly itemises the problems Mott Macdonald encountered and indicates the proposed procedures for the modelling work that would hopefully have avoided these problems.

Recommendations

After a careful analysis of the above case studies associated with the inheritance of hydraulic models, the majority of these problems could perhaps could perhaps have been avoided if certain procedures were followed during the model build, flow survey (if performed) and subsequent verification. The procedures to avoid these problems vary from what is considered to be normal current good practice to new procedures that perhaps could be adopted to enhance the current situation.

Conclusions

The concluding note to this paper and its' associated research has taken the view that a significant number of the problems associated with the hydraulic modelling are recurrent and that perhaps a specific number of these problems occur within hydraulic models. If some of the more significant recommendations, were adopted during the conventional modelling procedures, then a significant proportion of these problems, which continue to be encountered, could be eradicted.

CALLIBRATION AND ACCURACY OF SEWER FLOW SURVEY MONITORS

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Introduction

The paper reviews the requirements for sewer flow survey monitoring and the accuracies which can be expected from the results of a flow survey. Flow surveys are essential for the proper assessment of the behaviour of sewer systems. The types of studies which demand that detailed in-sewer flow monitoring should be carried out are both short and long term and may accompany sampling programmes.

The field equipment normally used for measuring flows in either full or part-full pipes employs the ultrasonic doppler-shift principle for velocity and some form of depth measurement, typically a pressure transducer. The equipment is portable and self contained, and is manufactured by companies such as Montec, Scan Technologies, ADS and Unidata. A wider range of manufacturers produce level-only devices which may be applied to open channel flumes or CSO monitoring. The quality and accuracy of the data obtained may be highly variable and detailed quality assurance techniques can be of great value. The Wastewater Technology Centre (WWTC) at the University of Abertay, Dundee has been involved for 10 years in both long and short term monitoring programmes in which time a wide range of sewer performance data have been amassed.

This paper describes the methods used for calibration and the lessons which have been learned from their use. The methods of obtaining accurate data are reviewed using data from three surveys of sewer systems with medium and large diameter pipes. All of the data referred to in the paper were gathered from studies in the East of Scotland and included long and medium term monitoring programmes together with a commercial short-term survey. Some of the terms evaluated are routine throughout the industry, while others are novel and form part of research programmes. The equipment deployed was manufactured principally by Montec, although most types of flow survey packages have been evaluated in these or other studies.

Discussion and Principal Conclusions

The overall reliability and accuracy of the monitors relies on the inherent accuracy of the equipment, its' maintenance prior to installation, the quality of the field site checks, installation conditions and a range of operational factors.

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Technical Session 1- Modelling Chairman Brian Sharman North West Water

Case Studies Using Inherited Hydraulic Models

Graham Brine

Mott MacDonald (North West)

Comment Chris Noble Anglian Water

I fully endorse the comments particularly the contents of Appendix 2

Question David Ogden - Allott and Lomax

Have you considered that when WASSP was being used that MADD was not available and therefore the software would have not stamped MADD in the data files, even though it may have been applied?

Answer

I agree that is a valid point but even though the manholes may have been added manually it should be noted it should not preclude the good documentation and the fact that notes should be made at every stage.

Question Jon Farrar MW Barber Group

It is difficult to assimilate changes in town layout and development if that information is not passed forward from the planners, hence the models get out of date. Should not more information be passed from planners?

Answer

Yes it should, and the information should go both ways. Planners need as much feedback as the modellers, they should use the model to assess proposed schemes.

Question Laurie Bailey Severn Trent Water Ltd

Considering the cost of building the models in the first place why do you say that at times it is more cost effective to start from scratch?

Answer

Because of the work involved in having to backtrack to update models, if insufficient documentation is provided it is often cheaper to start again than to try to find out what has been done previously. The biggest problem is how to decide whether to use the model or start again, you can go a long way down the road before finding it would be better to start again