

NATIONAL TECHNICAL ADVISORY GROUP ON FLOODING ISSUES**‘AUDACIOUS’ & URBAN FLOODING RESEARCH PROGRESS REPORT****Purpose**

1. The purpose of this paper is to provide the National Technical Advisory Group on Flooding Issues (NTAG) with a progress report on the AUDACIOUS research project and the relevance of this project to the management of flood risk within the built environment. The report will also address other ongoing urban flood research initiatives and how design tensions between flood risk management partners might be best addressed.

Background

2. Urban flooding is a complex phenomenon involving overland, groundwater, pipe and channel flow from within the urban area and its immediate environs. Flooding may be described as pluvial, resulting from the migration of rain generated water moving downwards through the catchment and fluvial, resulting from inadequate capacity in watercourses.

3. The problem of flooding is anticipated to worsen in many parts of the UK as a result of increased precipitation associated with climate change. It is expected that winters will become wetter in terms of total depth and intensity and that although summers will become generally drier, peak intensities may increase. Several flood events in Scotland in recent years have highlighted the importance of understanding the impacts of overland flow arising from very intense rainfall. AUDACIOUS (Adaptable Urban Drainage - Addressing Change in Intensity, Occurrence and Uncertainty of Stormwater) will provide new science and guidance that will address overland flow and climate change impacts within the built environment.

3. The AUDACIOUS project is part of a larger research programme entitled Building Knowledge for a Changing Climate (BKCC) and is sponsored by the Engineering and Physical Sciences Research Council (EPSRC) and the UK Climate Impacts Programme (UKCIP). AUDACIOUS will contribute to new science by developing tools that will:

- adequately model the processes that result in urban flooding, and
- allow appropriate risk based decisions to be made.

4. The new models will be utilised to assess the impacts of climate change on existing drainage systems and investigate the use of flow reduction and surface pathways (including highways) to relieve existing sewer systems. New whole life cost and risk based models will also be produced in order to assess the different means of flood alleviation and, in addition, assessments of potential impacts on public health will be made using new methodologies.

6. Various other ongoing UK research initiatives aimed at improving the engineer's, planner's and designer's appreciation of the risks associated with urban drainage systems will provide complimentary new science and guidance. The outputs of several Construction Industry Research and Information Association (CIRIA) projects in particular will reinforce the AUDACIOUS outputs and input from AUDACIOUS will form an essential component of the Urban Flood Management priority area of the Flood Risk Management Research Consortium (FRMRC) project launched in London on 7 April.

Update

7. The AUDACIOUS project is developing several models (hydrology, roof drainage, local and foul drainage, surface runoff and pathways, sewer) that will eventually be combined into an integrated modelling tool. Five case study areas have been chosen for the development of these models and help develop the framework for their application.

8. The Glasgow and Bradford case studies will provide data for initial model development and for model application to real complex problems. Further case studies in London, Birmingham and Manchester are designed to develop the use of AUDACIOUS outputs within the wider drainage and institutional framework.

9. Development of the new models is progressing well and the AUDACIOUS project team will present and feedback progress on the models at a workshop in London on 8 July. The workshop will present and feedback on the following:

- Adaptable runoff model
- Roof drainage model
- Local drainage model
- Pipe/surface interface model
- Glasgow and Bradford case studies, and

Consider objectives and methodologies for development of

- Risk assessment models
- Whole life cost models
- Health impact models, and

Discuss and agree data and support requirements for the

- FRMRC project

10. Data from the AUDACIOUS Glasgow case study will also provide essential baseline material for the Urban Flood Management priority area of the FRMRC project.

11. AUDACIOUS is also represented on several CIRIA research projects, viz.
 RP 675 - Development and Flood Risk – Guidance for the Construction Industry
 RP 676 - Standards for the Repair of Buildings following Flooding
 RP 699 - Designing for Exceedance in Urban Drainage Systems – Good Practice

12. The introduction of new science and guidance on flood risk management and design exceedance issues from AUDACIOUS and other research initiatives will help reduce design tensions between partners and provide information and opportunity for the development and application of improved working practices and procedures.

Members are invited to:

- **discuss the above, and**
- **consider how best to disseminate and share new knowledge arising from the above research projects and build an integrating framework within Scotland.**

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