NATIONAL TECHNICAL ADVISORY GROUP ON FLOODING ISSUES
SUSTAINABILITY FLOOD MANAGEMENT SUB-GROUP

FLOOD PATH MAPPING PROPOSAL

Purpose

1. The purpose of this paper is to provide the NTAG Sustainability Flood Management Sub-Group with an overview of the need for mapping tools to assess potential urban flood routes and to recommend the procurement of a potential flood path mapping (PFPM) pilot study to develop end user guidance. This proposal will confirm the data and methodology required to allow Scottish agencies with a flooding remit to manage urban flood risks associated with overland flooding more effectively.

Background

2. Whilst the impact of climate change is an emerging issue in the design of drainage systems, the need to understand the potential impact of severe weather events has become more important. One problem associated with these events is urban flood routing. When sewers or urban watercourses are at capacity and excessive runoff is being generated by catchments, we need to be able to predict where this surplus water may go, e.g. overland flow, and how any associated flood risk is best managed. New mapping tools and guidance are required.

3. The need for urban flood routing mapping tools applies to both existing and new development. Severe weather events will expose inherent flood risks within the existing built environment while in any single year and for most communities, new development and therefore modern design criteria will influence 2% at most of the built area. Local authorities and Scottish Water need guidance for the existing built environment and Developers, LAs and Scottish Water need improved guidance for new development.

3. For the built environment, existing flood route guidance is sparse if not non-existent. For new developments some guidance is provided in SPP7 and Sewers for Scotland. The following are extracts from SPP7 and Sewers for Scotland:

"Intense rainfall can overload drainage systems, including sewers and culverts, leading to local flooding. If natural drainage patterns are disturbed by development, flooding may also be caused. Drainage is a material planning consideration. Drainage measures proposed as part of a planning application should have a neutral or better effect on the risk of flooding both on and off the site. Planning authorities have a duty to consult Scottish Water and SEPA on appropriate planning applications. Applicants may however show as part of the information in support of a planning application that the drainage is acceptable to Scottish Water and SEPA."

"During extremely wet weather, the capacity of surface water sewers may be inadequate, even though they have been designed in accordance with national guidance. Under such conditions, sewers may surcharge and surface water may escape from those manhole covers that lie below the hydraulic gradient. Checks should be made to ensure that an adequate level of protection against the flooding of properties internally is achieved and the design adjusted

where the required flooding protection is not achieved. This is particularly important on undulating or steeply sloping catchments.

In designing the site sewerage and layout, Developers should also demonstrate flow paths and the potential effects of flooding resulting from storm events exceeding the design criteria.

Where there are flood risk problems associated with the Site, it is the responsibility of the Developer to liase with the Water Authority and the Unitary Authority as Flood Prevention Authority, to ensure that all necessary measures are included in the design to prevent flooding of the Development. The Developer will be required to prove that the measures incorporated in the design are effective, thereby ensuring that the Development does not aggravate existing flood problems."

4. Despite the prescriptive nature of SPP7 and Sewers for Scotland we are not managing to address the overland flow flood risk presented by pluvial events satisfactorily and some recent high intensity rainfall events have resulted in the internal flooding of new property. Post mortem discussions with designers in Scotland and the UK suggest the key stakeholders involved do not have the necessary mapping tools, guidance or knowledge required to address the problem of urban flood routing consistently.

5. Potential flood path mapping expertise based on the application of GIS systems and LIDAR data is in its infancy and a number of engineering consultancies are now developing this capability (see attached example of a consultant's PFPM flyer).

6. It is considered the Scottish Executive and Scottish agencies with a flooding remit should ensure appropriate mapping tools and guidance for urban flood routing are developed and applied by stakeholders.

Members are invited to:

- **discuss the above,**
- **recommend the procurement of a potential flood path mapping (PFPM) pilot study and report for an agreed urban area,**
- **recommend said pilot study should develop indicative end user guidance for the following PFPM applications (principal stakeholders shown in brackets):**
    - **total developed catchment flood path mapping (LAs/WA)**
    - **specific site catchment mapping (Developers/ LAs/ WA)**
    - **Identification of potential locations at risk (LAs/WA)**
    - **Planning for New Developments (Developers/ LAs/WA)**
    - **Flood Risk Analysis – Urban Watercourses/ Roads/Overland Flow (LAs)**
- **recommend the appointment of a lead local authority to champion this initiative,**
- **seek NTAG funding approval.**

David Wilson,
Scottish Water
July 2004