

Kelman, I. and R. Spence. 2004. "An Overview of Flood Actions on Buildings". Engineering Geology, vol. 73, issues 3-4 (June) pp. 297–309.

Paper abstract:

This paper presents an overview of flood characteristics with respect to their applicability for estimating and analysing direct flood damage to buildings. The approach taken is to define "flood actions" as acts which a flood could directly do to a building, potentially causing damage or failure. This definition expands the traditional approach of analysing flood damage to buildings which often focuses on damage from slow-rise flood depth.

Flood actions may be energy transfers, forces, pressures, or the consequences of water or contaminant contact. This paper defines and categorises flood actions on buildings, indicating methods of quantification. The actions are classified in the following categories with respect to relative importance for flood damage assessment.

- High relevance and relatively predictable: Lateral pressure from water depth differential between the inside and outside of a building, lateral pressure from water velocity, and water contact due to slow-rise depth.
- Relevance varies and relatively predictable: Buoyancy.
- Relevance varies and difficult predictability: Capillary rise, erosion, debris, turbulence, waves, other velocity actions, other chemical actions, nuclear actions, and biological actions.

Due to the highly localised effects of some of the flood actions in the third category, coupled with their potentially significant impact, prediction of their impact on overall flood damage may be challenging. Awareness of their existence assists in developing an understanding of the uncertainties in flood damage estimation and analysis and in indicating areas which new research should tackle. In particular, work is needed in order to fully understand the physical processes by which flood damage arises and, hence, how flood damage may be prevented.