FloodProBE

Pilot Site: Prague

FACT SHEET

FloodProBE PRAGUE Pilot Site summary:

The City of Prague is participating as the pilot in WP3 and WP4. WP3: geophysical measurements conducted at the locality Riverside Rapm Vyton (RRV) and the data evaluation. WP4: flood control measures in Prague - mobile barriers. Related reports were uploaded to the web.

The document is intended for:

- Flood defence experts, city planners, developers, emergency planners, policy makers, researchers.

Where to find the document:

- www.floodprobe.eu

WP03-01-11-03: FloodProBE WP3 (Task 3.2) works in Prague (2010 -2011) – geophysical measurements on RRV

WP05-01-10-04: Pilot Prague: flood control measures – movable barriers: description of the entire flood control system of Prague, which was originally divided into seven phases, with phase E0008 having been added after the flood in 2002.

In Brief

Main relevance of Prague to FLOODPROBE project tasks:

- Geophysical methods for assessing urban flood defences and focus on forecast reliability (Task 3.2)
- Concepts and technologies for multifunctional flood defences (Task 4.1)
- Dissemination of the best practices - use of demountables (Task 6.2).

Prague is the capital of the Czech Republic with about 1.5 million inhabitants. It is located at the river Vltava (Moldava). In 2002, Prague received significant damage from what were deemed to be the worst floods to hit the capital in 200 years. There are several kinds of local flood protection measures in Prague including lines of mobile barriers, which are used uniformly on the entire area of Prague, primarily in the historic urban centre. The total length of these mobile barriers is about 7 km in Prague. The dam bar system was created by the firm Eko-System.

Relevance to Task 3.2: In Prague, the geophysical methods can be applied to monitor the disturbances of protective structures (their routine maintenance), and also to diagnose damage after extensive floods.
In application of the geophysical methods in the towns, it has to be kept in mind that the use of certain methods is limited by frequent occurrence of underground distribution systems, building foundations, by the existence of stray electric currents and high level of vibrations caused by traffic. In maintenance of protective flood control structures, complex of the following methods is mostly applied:

- geological radar GPR,
- resistivity tomography,
- seismic methods, seismic tomography,
- microgravimetry.

Relevance to Task 4.1: During the design and construction phase of the Prague Flood Defence System, some riverside areas were in the private property with intention to build dwelling houses. As these houses were designed in the flooded area, and to allow the owner his plans the houses were designed to be flood-proof to the anticipated water level and therefore they became a stabile part of the whole system of demountable barriers.

Goals/strategies/tools to be applied

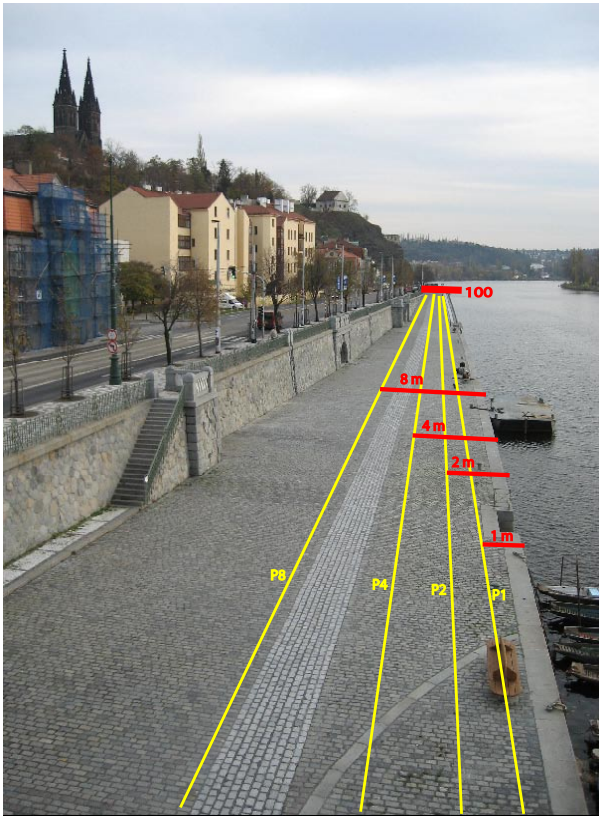
The following G/S/T are being applied within the FloodProBE Prague pilot:

- Method for assessing homogenity of urban flood defences (Geophysical Monitoring System - GMS).
- Technologies and design for multifunctional flood defences – demountable barriers, flood-proof buildings.

Why we would like to transfer the geophysical experiences from Prague pilot site?

- Water level fluctuation and water flows during the floods affect the geological setting in the vicinity of bridge and tunnel foundations, thus impacting service life of the entire structure. Disturbances in the underlying layers may come out in the form of defects in the statics and changed behaviour of the entire structure. This can be registered through the monitoring of bridge structure vibrations. In addition to visible damage to the structures and their furnishing directly caused by water, disturbances of geological underlying layers (occurrence of cavities, degradation of soils by washing out fine-grained particles, contamination of subsoil, etc.) often occur. Such damage is not immediately visible, the detection and rectification thereof may take even several years after the flood. The total level of damage caused by disturbances of geological underlying layers may finally be even higher than direct damage caused by flooding of the structures.

Figure 1 – A Riverside Ramp Výtoň – the profiles of the GMS measurements



The FloodProBE Project

FloodProBE is a European research project with the objective of providing cost-effective solutions for flood risk reduction in urban areas. FloodProBE aims to develop technologies, methods and tools for flood risk assessment and for the practical adaptation of new and existing buildings, infrastructure and flood defences leading to a better understanding of vulnerability, flood resilience and defence performance. This research supports implementation of the Floods Directive through the development of more effective flood risk management strategies.

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