

WET10 - THE CITY WATER DEBATE 2015

When Will London Flood?

Introduction

Roger Hewitt, Past Master of the Water Conservators, opened the event by thanking the Worshipful Companies of the Glaziers and the Launderers for the use of their magnificent hall. He then introduced the two guest speakers, Dr Paul Leinster, CBE, Chief Executive of the Environment Agency, and Prof David Balmforth, BSc PhD CEng FICE FCIWEM, President of the Institution of Civil Engineers giving a brief background about each speaker.

Dr Paul Leinster, CBE

Dr Leinster began his talk describing the two major flood threats to London, firstly an East Coast tidal surge, and secondly flooding from high flows in the River Thames and its tributaries.

London is well protected against a tidal surge by the Thames Barrier for the foreseeable future. The barrier protects around 400,000 properties in London, otherwise at risk of flooding. During the most recent flood event in December 2013, the high tide level was 4.4 metres, leaving a headroom of 2.8 metres. The barrier was designed to protect London until 2035 but it is now estimated that it could continue to operate until 2070. The EA has recently signed a major maintenance contract with CH2M Hill to ensure the barrier's continued operation. The most probable site for the next barrier would be at Long Reach near Dartford.

Although the Thames Barrier was designed primarily to protect against a tidal surge, it is also playing a significantly increasing role in the prevention of river flooding by holding back the incoming tide, thereby allowing the tidal reach to capture a greater volume of water from the river. During 2013/14 the Barrier was closed 50 times, 9 times to protect against tidal surges, 41 times to protect against river flooding. The number of Barrier operations has also increased significantly in recent years confirming the importance of this role.

Dr Leinster concluded his talk by underlined the impact that climate change may have on London's future flood risk. Extreme rainfall events occurring now could be normal events by 2040. The highest recorded one day rainfall, highest river levels, wettest winter and wettest summer have all occurred in recent years.

Professor David Balmforth

Professor Balmforth focussed his talk on how best to alleviate the consequences of inevitable future flooding when it occurs. He gave as an example the Hull 2007 floods, which may be described as a “backdoor” flood. Before the 2007 floods the primary flooding threat to Hull was from the sea and the Humber estuary. All the flood preparedness work had looked towards coastal flooding. But in 2007, the flooding came from behind, from overloaded sewers and drainage channels due to heavy rain that fell on the urban catchment and the upstream rural catchment to the north of Hull. Hull flooded in a similar fashion to Glasgow in 2002, where watercourses and sewers were overwhelmed by the quantity and rate of surface run-off. Lessons learnt from these events showed that, in such events, substantial volumes of flood water are conveyed on the surface, water flows downhill and accumulates in low spots, and the direction of floodwater is often affected by relatively small features of the urban surface such as kerb height. Such flooding in London is possible and could have serious consequences.

The 2004 Foresight project on Climate Change, Floods and Coastal Defence showed that urban flooding from surface water would become more frequent and more severe in the future. A three-fold increase in flood damage could be expected by 2080. Conventional solutions such as upgrading drainage capacity or building more flood defences may become unaffordable.

It follows, therefore, that our cities need to be made more resilient to flooding in the future if escalating flood damage costs are to be avoided. The UK is not as well advanced in building resilience to flooding as other parts of the world. The following measures have been shown to have considerable merit and are worth adopting in the UK.

1. Making space for flood water on the surface. Much can be learnt from the Dutch programme “Making Room for the River”. Adapting roads to act as surface flood pathways and creating sacrificial flood storage areas can help to manage surface flooding during extreme events and keep flood water away from vulnerable assets such as homes, businesses and critical infrastructure.
2. Raised thresholds are a technique used on new developments in many parts of the world, Singapore being a good example. A threshold height of 0.5m above surrounding ground or maximum flood level can do much to reduce flood risk and should be considered for all critical infrastructure and building development, especially in flood risk or high value areas. In more extreme cases, building on stilts or designating ground flood areas as sacrificial flood areas can be very effective. Critical or valuable items should not be installed in basements or ground floor areas of buildings as a precaution.

3. More radically, floating buildings and buoyant (tethered) buildings that adapt to rising flood levels could be a cost effective way of building in areas prone to frequent flooding or vulnerable to sea level rise.
4. Adopting flood resistant building materials and measures would add little additional cost to new building construction and should be part of an update to the Building Regulations.
5. For existing communities, resilience can be built through improved public engagement, better forecasting, improved response planning, and education.
6. Many techniques are now available for retrofitting to buildings that are vulnerable to floods, such as flood shutters, and rising flood gates. These are far more effective than sandbags and should be considered for all existing buildings where there is a significant risk of future flooding.
7. Experience shows that the best flood management measures achieve multiple benefits, improving the urban landscape, amenity and biodiversity. This requires an integrated approach to urban design. Experience in other parts of the world shows that this is best delivered with early stakeholder and public engagement.

In conclusion he said we cannot hope to defend all areas for all future flood events. As climate change and population growth impacts begin to bite it will be increasingly important to build flood resilience into our communities. This will require some investment and effective forward planning. When this planning is done well it will improve the urban landscape and enhance amenity and biodiversity. Waiting until after a serious flood occurs could result in high impact costs that could have a sustained adverse impact on the economy.

Questions

Question 1 – When will London Flood?

Response – because it depends on extreme events predicting when and where it will happen is like predicting which horse will win the Grand National. Small areas of London were flooded last year.

Response – Accepting an area of London will flood is almost inevitable, therefore we need to plan better for it. For example better preparation can mean returning people to their homes after 3 days rather than months later.

Question 2 – Following the recent floods what is in the Party manifestos on flooding?

Response – The current revenue funding for flood maintenance is under discussion.

Response – Flood resilience is delivered by a whole number of groups and that is the big challenge.

Question 3 – Should we set up storm water companies to manage drainage and flooding?

Response – Surface water drainage is currently the responsibility of local councils.

Response – It is more important to determine factors such as do we have enough fuel reserves to deal with a flood event.

Question 4 – What is the human casualty threat?

Response – In London lots of people live in basements and we need to develop better flood alarm systems.

Response – The EA carry out flood hazard assessments. We have a campaign with the AA warning motorists not to drive through flood water. There is a high risk that people viewing storm events on storm barriers could be swept away. Now almost all cars are designed to float.

Question 5 – What has been the impact of upland scalping?

Response – EA catchment studies are assessing this and looking at proposals to hold back water and reduce the speed of transfer to rivers.

Question 6 – Can SUDS (sustainable urban drainage systems) be effective in reducing flood risk?

Response – SUDS prevent water rushing into rivers during floods but we need a law on SUDS for new developments. This has been discussed for 7 years but without success.

Question 7 – What is the risk of “backdoor flooding”?

Response – A rainfall intensity of similar to that which occurred over Canvey Island last year, over a part of London would have a significant impact. Hence we need to prepare also for local flooding events.

Question 8 – Why have there been delays in getting sign up for the partnership funding for the Lower Thames Scheme from Datchet to Teddington?

Response – For partnership funding there have been cost versus benefit and central government versus local business funding issues. Local people should pay for local flood protection.

Summary

Roger Hewitt summarized the key points from the discussion. Although predicting exactly where and when flooding might occur was difficult we should be planning for both preventing and dealing with the consequences of future flood events. There was a demand for better planning and dealing with the potential consequences, and for more money to be made available to reduce and deal with future flood risks.

He thanked the speakers and guests for a very interesting and challenging debate.

Colin Drummond, OBE, Past Master of the Water Conservators, thanked the Worshipful Companies of the Glaziers and the Launderers for the use of their hall, Roger Hewitt and Barry Dennis for organising the event, the speakers and guests, and thanked Castle Environmental for sponsoring the event. This was the 7th WET10 event and with around 180 people attending, was the largest event so far.