CASE STUDY: LIVERPOOL - EGREMONT LAWN, WOODLANDS ESTATE

OVERVIEW

The Woodlands Estate consists of 481 houses and around 1200 residents falling within a predominantly privately owned urban housing estate on the outskirts of Liverpool close to woodland, farmland and a river. The estate consists of an open plan layout with large areas of associated landscape with community facilities and ageing and limited retail offerings.

The boundary between Liverpool and Knowsley is Netherley Brook and Halewood Brook. Properties close to the brook suffer from regular flooding which has most recently included internal flood damage in September 2012. Since more than five houses were internally flooded, the flood event was deemed to be 'Locally Significant' and Liverpool City Council's formal Flooding Investigation Process was implemented.

CATCHMENT

Winster Drive is a residential road in the Netherley area of Liverpool. Winster Drive is built on land at the confluence of Netherley Brook and Halewood Brook. Both Netherley Brook and Halewood Brook form the boundary between Liverpool City Council and Knowsley Metropolitan Borough Council. The area is drained by separate foul and surface water drainage systems. The foul flows are pumped away by the nearby Woodlands Pumping Station on Winster Drive to a United Utilities waste water treatment works and the surface water drains into Netherley Brook by two outfalls. The sewer network is the responsibility of United Utilities.

FLOOD INCIDENT

The area experienced considerable rainfall from around 18:00 on the 23rd September and continued over night. The rain gauge at Fazakerley recorded over 82mm in 48 hours and nearly 90mm in 60 hours. This amount of rainfall has a probability of occurring approximately every 30 to 35 years. The properties flooded initially from the front and later from the rear (Winster Drive) as a pond of water accumulated on the road and into the gardens of the properties.

Image: Liverpool City Council

At around 12:00 on the 24th, residents of properties on Egremont Lawn described water flowing over the steps at the front of their properties, due to water running off from the estate which slopes down to the properties. Residents confirmed that water initially ponded right at the front of the houses (Egremont Lawn side) in an area approx. 300mm lower than the pavement, and despite efforts by the residents to bail it out, water entered the properties.

The water entered through the kitchen wall in one property and later through the doors in another. The water was said to have come over the top step that had been built up to stop flooding in the past, this is about 60 mm above the pavement level where the drainage grids are located. The surface water drains within the surrounding area would not drain the initial ponding at the front of the properties, but there are no reports of them surcharging. The manhole on the road which was reported as surcharging at around 14:00 on the 24th September is at a slightly lower level to the house drains.

Water later came in through the rear of the houses, not helped by the wash caused by cars travelling down Winster Drive. Residents blocked off the road with their cars. The Environment Agency issued a Flood Alert for the River Ditton catchment that includes Netherley Brook at 15:50 on 24th September 2012, although this alert was not for surface water flooding. United Utilities were contacted on the 24th September and offered to supply sandbags. They confirmed their assets were in order after attending the site on the 25th. Enterprise Liverpool attended the site on the 25th and used a suction wagon to inspect and clear the gullies. The water had drained away by 06:00 on the 26th September according to a resident.

Image: Liverpool City Council

CAUSE

It is likely that the flooding was caused by the drainage system being exceeded, possibly due to partial blockage not helped by Netherley Brook being high and reducing the efficiency of discharge into the river from the surface water sewer. The initial flooding to the front of the properties may have been caused by the pavement drains not taking water due to the sewer system capacity having been exceeded or blocked. Surface water drainage systems are rarely designed to cope with a rainstorm of greater than a 30 year return period. It was initially thought the Brook overtopped its banks but it has been confirmed that this is not the case.

Although there was a large amount of rain it was fairly low intensity, which may lead to surface flows, but often these are associated with higher intensity rainfall. Increased surface flows may have been the result of extensive areas of the drainage system being unable to drain the surface water. The fact that the household drains did not accept any water suggests the sewer system was at capacity. Similarly later when the road flooded to the rear of the properties, water could not drain away. The road gullies may have appeared blocked, however, this is most likely due to the system being full with water (between the gully, gully branches, and sewer).

IMPACTS

PEOPLE

- 6 houses suffered from internal flooding.
- Issues around insurance and excess.
- Affected people psychologically.
- Anxious waiting for the next flood event.
- Reluctance to do home improvements.
- Loss of 'connection' with the property.

ENVIRONMENT

- Disturbance to wildlife along the banks of the brook.
- Damage to rear gardens.
- Further damage to a long term vacant property considered to be a blight on the area.
- Possibility of contaminated water entering the brook.

ECONOMY

- Effect on the property values of the houses.
- Costs of carrying out the emergency works to investigate and resolve the issues.
- Householders unwilling to invest in their homes.
- Increase in private landlord properties.

Image: Liverpool City Council

RESPONSE

After the response by emergency services, investigations were undertaken by the Lead Flood Authority, Liverpool City Council.

Investigation included the condition and functionality of the outfalls into Netherley Brook, whether high river levels may cause future drainage problems in the area and the inspection and cleaning of the surface water drains at the front of the properties and the highway gullies.

FUTURE RISK MANAGEMENT

Six of the most at risk properties received Property Level Protection from Environment Agency grant monies. This included fitting flood doors, flood airbricks, re-pointing and spraying sealant on the house bricks to 1 metre.

On the back of this, a Defra Flood Pathfinder bid put in by Liverpool City Council is looking to protect a further 32 properties along the line of the brook. In addition the council is looking to set up the first Flood Group in Liverpool at this location and have a local resilience hub that allows volunteers to access items such as flood sacks, wind up radios/torches and other resilience equipment.

It is worth further investigating the drainage system for the estate, as there remains a question as to whether there are enough gullies or whether the drainage gullies are adequate in the estate, especially on the pavements.

Image: Liverpool City Council

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SOURCE: Liverpool City Council