LIDOTT APPLICATION:
INTERNAL SEWER FLOODING

Internal Flooding is defined as flooding which enters a building or passes below a suspended floor.

In this context, buildings are defined as those normally used for residential, public, community, commercial, business or industrial purposes. (SOURCE: OFWAT PR19 Guidance)

In this application, we consider shallow chambers that are <800mm from cover level (CL) to the invert of the pipe (IV).

MEASUREMENT	DETAILS
Invert to cover level (IV-CL)	800mm
Invert to sensor (IV-SEN)	320mm
Invert to spill (IV-SP)	800mm
Level at install	5mm
Flow at install	Intermittent
Weather at install	Dry
Pipe diameter	100mm

The specifications of the manhole used in this example are described in the table opposite. Based on this specification, should a downstream obstruction occur, the rate of rise will be fast.

The LIDoTT is the best option for this application because a 100mm diameter pipe is too restrictive for an insertion pressure sensor.

The LIDoTT is mounted just above the crown of the pipe in order to achieve millimetric accuracy and avoid the beam spread of the ultrasonic hitting the benching area.

As the liquid level rises, the ultrasonic sensor is in charge. Once the level reaches the bottom of the pressure sensor, pressure reading starts and a calibration sequence begins.

By the time the liquid level enters the ultrasonic dead-band, the calibration sequence is complete and the calibrated pressure sensor takes over, delivering continuous, accurate depth data.

You will notice (fig 1) that there is no loss of data as the level in the sewer passes through the deadband of the ultrasonic sensor.

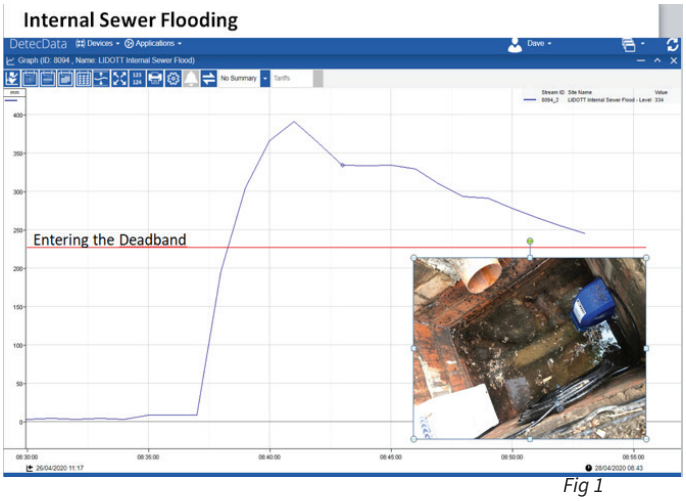

Fig 1

EARLY WARNING OF INTERNAL SEWER FLOODING

Under normal conditions, the peak discharge of 13mm has a duration of 5min as shown in fig 2.

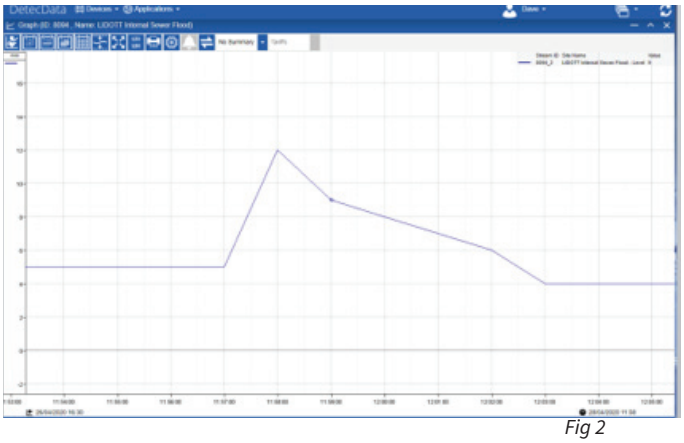

Fig 2

A DOWNSTREAM BLOCKAGE

When a downstream blockage is introduced, the time it takes for the data to normalise again increases.

Fig 3 shows the water level gradually increasing in height, and the tail off becoming exaggerated as it recovers before the next discharge.

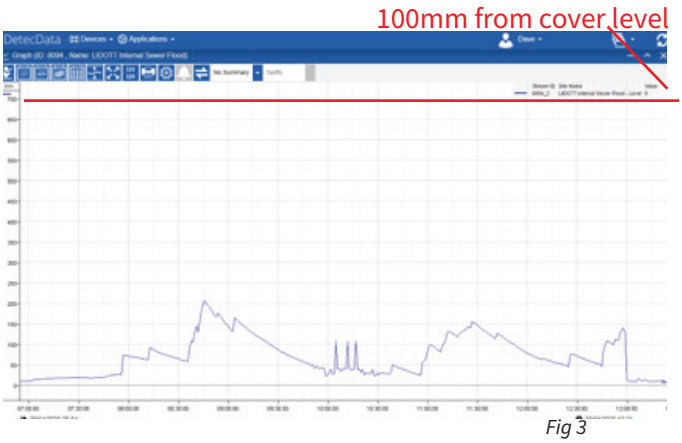

Fig 3

With four full bath discharges, as shown in fig 4, there is still ample warning before the downstream blockage causes raw sewage to enter the property.

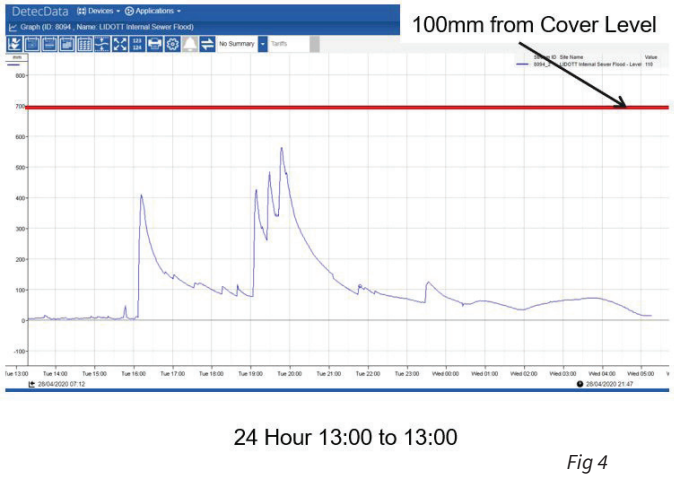

Fig 4

Fig 5 shows when the downstream blockage is introduced and removed over the 24 hour timeline.

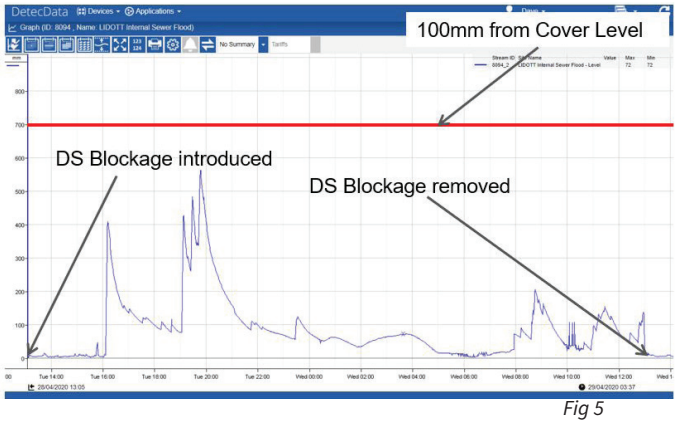

Fig 5

CONCLUSION

Installing a low cost monitor close to homes at risk from blockages and flooding will act as early warning signs and mean the water company can proactively clear blockages and prevent internal flooding and pollution incidents at customers' properties.

ABOUT DETECTRONIC

Detectronic Ltd is a water monitoring specialist with its head office based in the North West of England. We work with companies throughout the UK, Europe and rest of the world, helping to prevent flooding, reduce pollution and improve rivers and bathing water.

Detectronic is passionate about quality and efficiency. We are committed to helping customers through an analytical, innovative and creative approach to problem solving.

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