Leakage Detection April 2017
Survey Report

Client

Hospital, North West England

Mains water meter information

Size (mm)	15-28		32-50		75-100	✓	125-200		Above 200mm	
Serial number	V/12345/1/1/1									
Readings (1)	3259931.000				Time:		11:09 19 April 2017			
Readings (2)	3260617.000				Time:		13:30 20 April 2017			
Location	Meter located in building next to the rear of Lodge House									

Leakage Activities

Acoustic sounding	✓	Correlation	✓	Ground microphone	✓	Environmental Inspection	✓
Other	Inspection of all fittings on below ground pipework						
Pipe traced					Distance		
Pipe correlated	Accelerometer	✓	Hydrophones		Distance	300m	

Background Information

The Hospital has a usual night line of around 6m³/hour but through mid-January saw this baseline rise to nearly 12m³/hour per hour and has not decreased since therefore there is an unaccounted consumption of 6m³ at the Hospital site. This rise has not been attributed to any increase of usage within the hospital.

A constant unaccounted excess overnight flow rate of 6m³ per hour equates to an excess cost to the Hospital of approximately £16.92 per hour, £406.08 per day, £2,842.56 per week and over the course of one year £148,219.20 per annum.

Activity Summary

Pipework & Metering

The water meter is located is a small room behind Lodge House off Main Road. The meter is non-mechanical with an outreader fitted to the wall (see below photographs). The average flow during the metering period is 26m³/hour which equates to a usage of 625m³/day.

All chamber lids that were accessible to lift around the hospital along the likely route of the supply pipework were lifted to check for isolation valves or control points, and to check for water ingress. Water is pumped from tanks around the site through a mixture of Cast Iron and Medium Density Poly Ethylene (MDPE) pipework.

Meter location in room off Main Road

Meter reading

Leakage Activities

On arrival the main meter had to be repaired due to a faulty output from the meter which meant the meter was not recording data correctly. After repair, a reading was taken and a flow of 38.4m³/hour was noted.

A test to prove the incoming main to the hospital tanks from where the water is boosted around the hospital was carried out. The inlet of the tanks was isolated and the flow monitored. Although not fully shut off, the incoming meter and the inlet meter to the tanks were comparable in flow rates, confirming no leakage on this section.

A full inspection of the remaining pipework was then carried out to locate any water efficiency issues or isolation valves which would assist with the sectioning of the water network to prove the location of water leakage.

An **area of interest around a valve was noted outside on the road by the health clinic on a 180 MDPE main**. The main is close to a ducted service walkway. This area has been correlated and acoustically sounded with a ground microphone to further investigate the area.

A good correlation was achieved which suggests a leak position close to the isolation valve.

Additionally, **a drain situated around 15m away has a large continual flow of clear water running through it.** The next drainage chamber upstream has little flow through it.

300 metres of pipe work was correlated for leakage purposes.

Three further leaks were also found on site. Two overflows were found to be leaking and also a fire hydrant which could not be fully shut off. Photographs of these leak locations are below.

Valve (L/H cone) and service duct (R/H cone). Likely excavation point is between the two, taking care to avoid disturbing the service duct beneath

Hydrant leak on Barn Drive near Motor Road

Overflow leaking rear of Health Clinic

Overflow leaking from the Silver Centre

Summary & Recommendations

The three small leaks were confirmed and should be repaired as soon as possible, although this is **not the main cause** of the increase in water consumption at the Hospital.

It is recommended that the area identified outside the Health Clinic should be shut in prior to carrying out any repair to confirm the leakage volume. These options and all relevant valves required for the shut have been discussed at length and in detail with the site contact on how to proceed with carrying out these works.

Once confirmed, the leak position should be excavated taking care to avoid the service duct below the surface.

Potential Annual Saving: £148,219.20

Survey carried out by

Engineer	H2O Building Services	Date	20 April 2017