



Leakage Investigation Survey

10 October 2016

Client

Electrical Technologies, Lincolnshire

Mains water meter information

Size (mm)	15-28		32-50		75-100	✓	125-200		Above 200mm	
Serial number	15W123456									
Readings (1)	14615.000				Time:	10:30 10 October 2016				
Readings (2)	14619.749				Time:	17:10 10 October 2016				
Location	Meter located in large chamber in footpath to right hand side of offices. Under large metal lid.									

Leakage Activities

Acoustic sounding	✓	Correlation		Ground microphone		Environmental Inspection	✓
Other	Isolation of rising mains around the site, inspection of points of use						
Pipe traced	n/a	CAT & Genny			Distance	n/a	
Pipe correlated	Accelerometer			Hydrophones	Distance		

Background Information

Readings from the data logger show an increasing minimum flow rate to the site, which does not correspond to any increase in legitimate water usage on the premises.

The site is prone to leakage issues – the last leak was resolved in May 2016.

The site comprises a number of offices, warehousing and production areas. Water is used primarily within the on-site catering facilities, and for toilets, hand-washing and drinks. Very little water is used in production areas.

Activity Summary

Pipework & Metering

The water meter is located in the footpath outside the offices (on the boundary between the office block and the houses on Main Road). From plans supplied by client, pipework then runs down the narrow passageway and through into the contractor's car park area. At this point there are several isolation valves controlling separate sections of pipework around the site.

Leakage Survey Activities

The main isolation valve located in the contractor's car park was closed to check the integrity of the pipework from the water meter to this point. During the short period of the valve being isolated, no movement of water through the meter was noted confirming that any leakage was beyond this valve.

All other stoptaps in this area were operated and acoustically sounded for water flow. The new 63mm brass stoptap installed in May 2016 did not have any flow through it, and neither did the small atlas valve which supplies part of the offices. The 32mm diameter PE pipe running through the 100mm valve chamber was found to have acoustic noise on it when sounded, plus noise of a meter operating. When this pipe was squeezed off, the meter noise subsided. A significant flow of water passed through the squeeze off when it was removed indicating continual consumption or leakage on this section of supply pipework.

Further isolation testing was carried out on the 2" valve found in the roadway under a heavy chamber near the car park turnstile. With this valve closed and the squeeze off shut tight, the flow on the meter was reduced to zero. With the 2" valve open and the U/C area valve closed, there was **9 litres per minute** flowing through the meter into the H/C area. This equates to an **unaccounted flow of 0.54m³ per hour, 12.96m³ per day and over the course of one year, an unaccounted cost of 4730.4m³**. In financial terms, this equates to an **unaccounted cost to the client of £1.57 per hour, £37.71 per day, £264 per week, £1,055.98 every 4 weeks and over the course of a year £13,764.15**

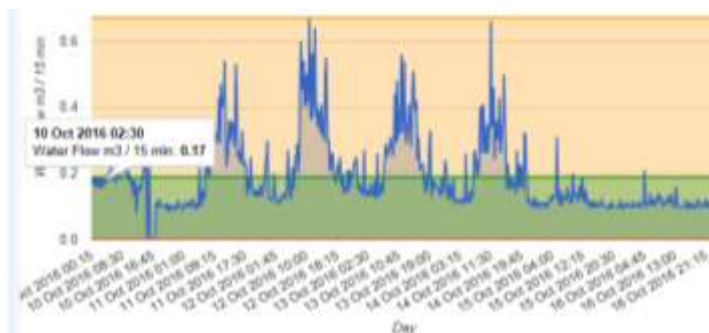
The fire tanks were inspected and no flows were detected in this area.

An inspection of all points of water use in the production areas was then carried out to identify any water efficiency issues. A hot tap was found to be left on in the H/C area, which was likely to have been as a result of the isolation testing earlier in the day. A WC cistern was also found to be overflowing in the main men's toilets in the U/C area at a significant rate. The cistern was accessed and the float arm adjusted to correct operation.

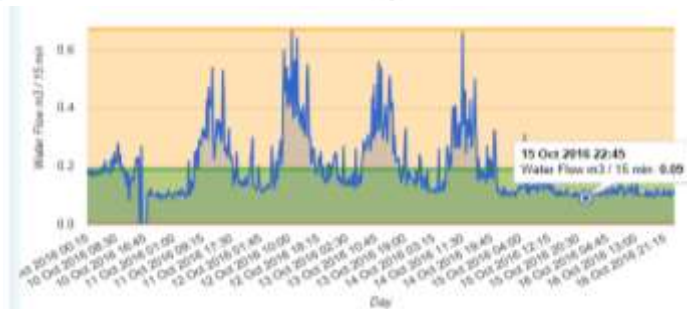
With these two issues addressed, the meter was read again and found to be recording flow at a rate of 6 litres per minute meaning **repair of the cistern and switching off the hot tap had reduced the unaccounted flow by 3 litres per minute, 4.32m³ per day equating to a saving of £12.57 per day, £87.99 per week, £4588.05**

With all points of use checked in the central riser area of the main offices, this volume is likely to be leakage on the supply pipe to the central office riser. Acoustic sounding of the area around the old lift shaft and external connections identified potential leak noise.

Therefore, there is underground leakage running at a rate of approx. 6 litres per minute, 8.6m³ per day. This remaining underground leakage equates to £25.14 per day, £176 per week, £9176.10 per annum.



Overnight flow prior to H2O intervention on 10th October running at approx. 16.32m³ constant flow per day.



Overnight flow after H2O intervention on 15th October running at approx. 8.64m³ constant flow per day.
Further remedial works will be carried out by site which will eradicate the overnight flow.

Summary & Recommendations

Summary:

1. Below ground leakage confirmed running at a rate of 6 litres/minute or 8.6m³/day on the supply to the central office riser. This pipework is likely to be supplied via a buried water meter in the car park area where the main set of valves are;
2. WC cistern found overflowing in the U/C men's toilets at a rate of 9 litres/minute or 12.9m³/day;
3. Hot tap found left running in H/S shop at a rate of around 8 litres per minute.

Recommendations:

1. Lift wooden floor in old lift shaft and inspect incoming pipework for leakage. Also check to see if water is running in from outside. If the leak is not visible in the bottom of the lift shaft, it is recommended that an alternative means of supplying water to the central office area is considered as any excavation work will require removing a newly installed concrete ramp;
2. Inspect WC's periodically to check for correct operation;
3. Excavate area around valves in corner of contractors car park to expose meter/stoptap chamber supplying central office riser.

NB: The client has advised that they will be carrying out the repairs themselves therefore no repair costs have been quoted.

Annual Saving: £13,764.15

Survey carried out by

Engineer	H2O Building Services	Date	20th October 2016
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