Leakage Investigation Survey

23 March 2017

Client

Holiday Park, North Yorkshire

Mains water meter information

Size (mm)	15-28		32-50		75-100	✓	125-200		Above 200mm	
Meter Serial Number	08XI123456									
Readings (1)	351807.120				Time:	14:48 22 March 2017				
Readings (2)					Time:					
Location	Meter located in large chamber behind caravan 37 Lakeridge. Accessed with two large lifting keys.									

Leakage Activities

Acoustic sounding	✓	Correlation	✓	Ground microphone	✓	Environmental Inspection	✓
Other	Inspection of all pipework connections, internal pipework in pool area and kitchens, bar area and toilets.						
Pipe traced	n/a	CAT & Genny			Distance		
Pipe correlated	Accelerometer	✓	Hydrophones		Distance	60m	

Background Information

The minimum night flow through the main meter supplying the Holiday Park has been around 3.0 cubic metres per hour, suggesting leakage or other unidentified water consumption on the network around the park.

A constant unaccounted water flow of approx. 3m³ per hour equates to an unaccounted cost to the Holiday Park of **£8.55 per hour**, **£205.20 per day** and **over the course of one year an unaccounted cost of £74,898**.

The park contains approximately 800 accommodation units, together with leisure amenities including swimming pool, bar/restaurant and owners area.

Summary of Survey

Pipework & Metering

The main meter supplies most of the park with water. The only area not supplied by this meter is Pine Hill (approximately 130 plots) which is supplied by meter 99S765432.

Some sections of larger diameter pipework around the park were anticipated to be Cast Iron. Visible pipework around the areas of the park is typically MDPE (Medium Density PolyEthylene or more commonly known as blue poly) or black poly of varying sizes was laid in the older areas. Some areas of the park have completely redesigned layouts with new sections of pipework. There are a limited number of isolation valves located around the park on the larger sections of pipework. Hose reels on the park, for fire fighting purposes, are also mains fed.

Main meter

Main meter location

Second meter location

Second meter reading

Leakage Survey Activities

All water connections on the park were acoustically sounded for leak noise (approximately 800 accommodation plots) together with all stoptaps, isolation valves and fire hose reels. All connections to plots were also inspected for any visible leaks.

Two potential areas of leakage were found whilst carrying out the acoustic sounding on the park alongside many small visible leaks. Other areas of acoustic noise were attributed to intermittent water use - these areas were revisited to check the noise being created by other means had subsided.

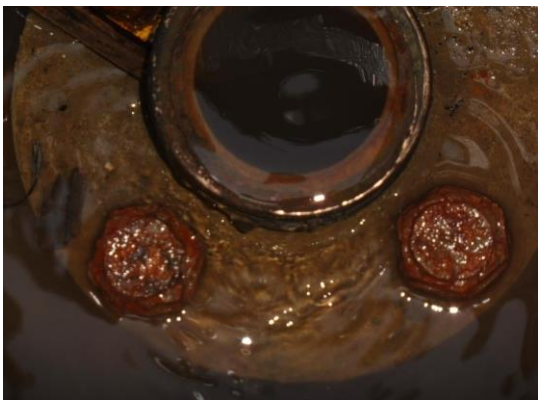
Detailed acoustic sounding was then carried out to pinpoint the exact area of leakage in all locations where required.

All internal water using fittings (WC's, Hand Wash Basins, Urinal controls, etc) within the entertainment and leisure complexes were also checked for correct operation.

Leak 1 - location in staff parking area

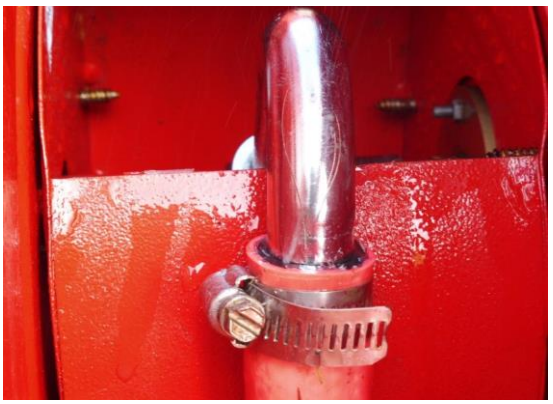
Leak 1 - location marked by traffic cone

Leak to excavate by staff canteen – high leak noise



Leaking Fire Hydrant

Location of leaking Fire Hydrant

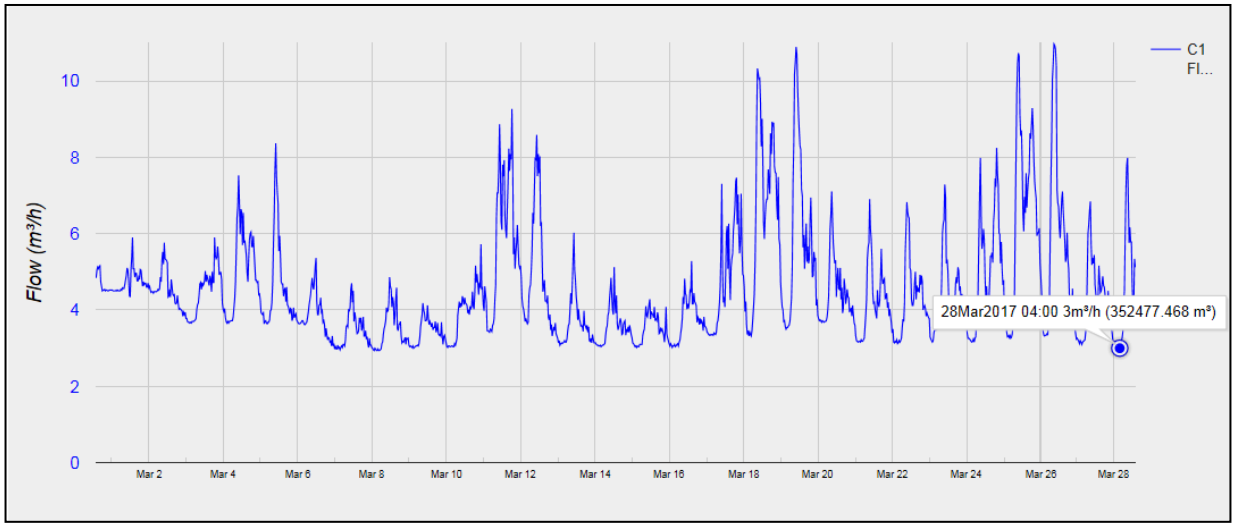


Leak on Fire Hose Reel – near plot 11 Brampton Hedge

Location of leak on isolation valve between 5/6 Brampton Hedge

Summary of all water issues identified on the park:

Priority	Park Area	Plot	Fault	Comments
1	In car park area by staff canteen		Burst main	To excavate
1	Near wall by staff canteen		High level of leak noise	Worth excavating
2	Opp 91 Silvertree In F/P by noticeboard		Fire Hydrant	To shut off
3	Between 5/6 Brampton Hedge		Leak on isolation valve	To repair
3	Brampton Hedge	13	Leak on fire hose reel	To repair
3	Brampton Hedge	11	Leak on fire hose reel	To repair
3	High Elms	G32	Leak on hose connection	To repair
3	Beech Rise	D16	Leak on fittings under plot	To repair To repair
3	Maple Court	7	Leak on fitting under plot	To repair
3	Lake Ridge plot 12 to 11		Leak on fire hose reel	To repair
3	Pine Hill	33	Leak on fittings under plot	To repair
3	Oakwood	G11	Leak on fittings under plot	To repair
3	Oakwood	G14	Leak on fittings under plot	To repair
3	Row Close	66	Leak on fittings under plot	To repair
3	Row Close	3	Leak on fittings under plot	To repair
3	Row Close	89	Leak on fittings under plot	To repair
3	Row Close	77	Leak on fittings under plot	To repair
3	Row Close	14	Leak on stoptap	To repair
3	Swimming Pool - L/H WC		Overflowing WC	To repair



The above remote water data logger graph shows a constant flow of water running through the water meter and never dropping to zero. As mentioned above, this constant unaccounted flow equates to an **unaccounted cost of £8.55 per hour, £205.20 per day and over the course of one year an unaccounted cost of £74,898.**

Summary & Recommendations

Summary:

1. All pipework connections and underground fittings (stoptaps and isolation valves) were acoustically sounded for leak noise and checked for visible leaks;
2. One significant leak and another potential leak identified on the below ground network;
3. Several minor visible leaks identified (refer to table above).

Recommendations:

1. Excavate, locate and repair below ground leak identified in staff car park;
2. Excavate potential leak close to wall of staff canteen;
3. Repair all minor above ground leaks;
4. Check minimum night flow and confirm new leakage volume.

Potential Annual Saving: £74,898

Survey carried out by

Engineer	H2O Building Services	Date	21 - 23 March 2017