



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 Lakeside. 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 Ridge (approximately 130 plots) which is supplied by meter 99S654321

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 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 supplying Pine Ridge area



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.



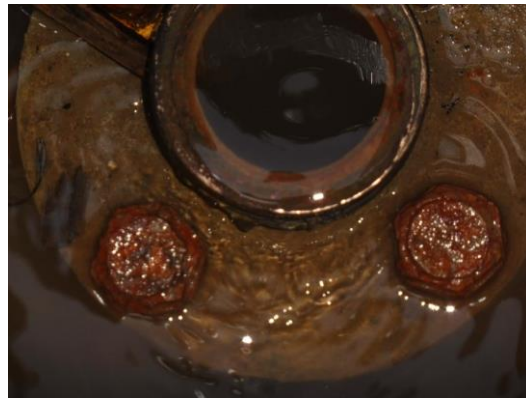
Leak 1 - location in staff parking area



Leak 1 - location marked by traffic cone



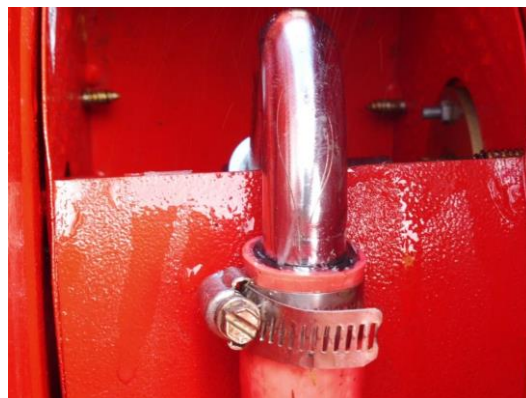
Leak to excavate by staff canteen – high leak noise



Leaking Fire Hydrant



Location of leaking Fire Hydrant



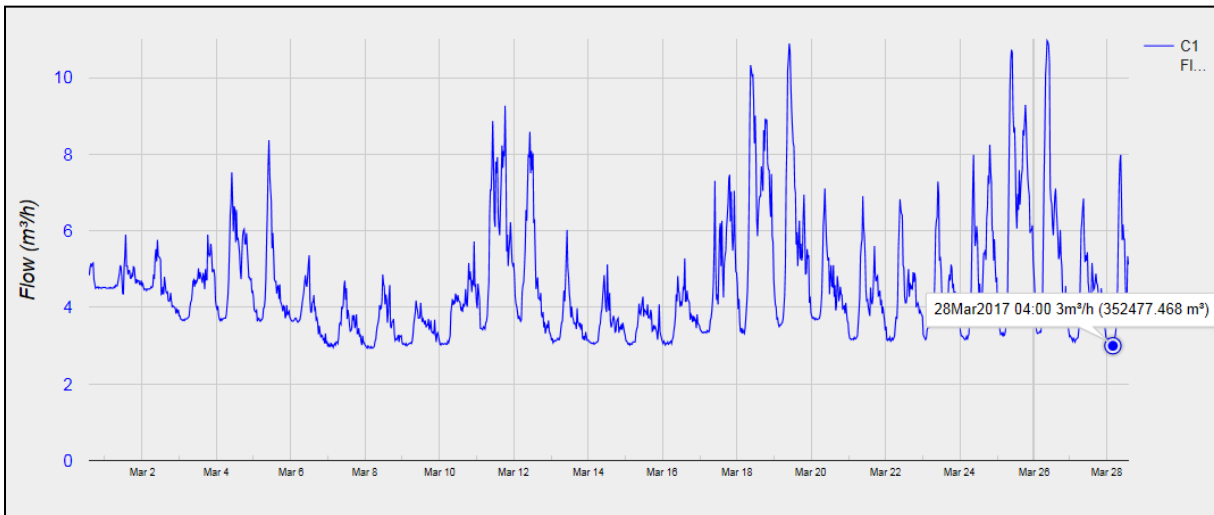
Leak on Fire Hose Reel – near plot 11 Bramp Heights



Location of leak on isolation valve between 5/6 Bramp Heights

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 Silverwoods In F/P by noticeboard		Fire Hydrant	To shut off
3	Between 5/6 Bramp Heights		Leak on isolation valve	To repair
3	Bramp Heights	13	Leak on fire hose reel	To repair
3	Bramp Heights	11	Leak on fire hose reel	To repair
3	High Reach	G32	Leak on hose connection	To repair
3	Beech Road	D16	Leak on fittings under plot	To repair
3	Maple Wood	7	Leak on fitting under plot	To repair
3	Lakeside plot 12 to 11		Leak on fire hose reel	To repair
3	Pine Ridge	33	Leak on fittings under plot	To repair
3	Oak	G11	Leak on fittings under plot	To repair
3	Oak	G14	Leak on fittings under plot	To repair
3	Rowland Close	66	Leak on fittings under plot	To repair
3	Rowland Close	3	Leak on fittings under plot	To repair
3	Rowland Close	89	Leak on fittings under plot	To repair
3	Rowland Close	77	Leak on fittings under plot	To repair
3	Rowland 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
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