Leakage Investigation Survey

28 April 2016

Client

Holiday Park, Sussex

Mains water meter information

Size (mm)	15-28		32-50		75-100	✓	125-200		Above 200mm	
Meter Serial Number	14 765432									
Readings (1)	16371.840				Time:	12:00 26 April 2016				
Readings (2)	16654.060				Time:	14:42 28 April 2016				
Location	Meter located in medium sized 'slide out' chamber in footpath right outside the park entrance.									

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	250m

Background Information

The minimum flow rate through the meter supplying the holiday park is currently 2.4m³/hour, suggesting leakage or other unidentified water consumption on the network around the park.

A potential **unaccounted water loss of 2.4m³ per hour** equates to a **financial loss of £191.23 per day** and **£69,799.68 per annum**.

The park contains approximately 800 accommodation units, together with leisure amenities including indoor and outdoor pool, bar/restaurants and laundry area.

Summary of Survey

Pipework & Metering

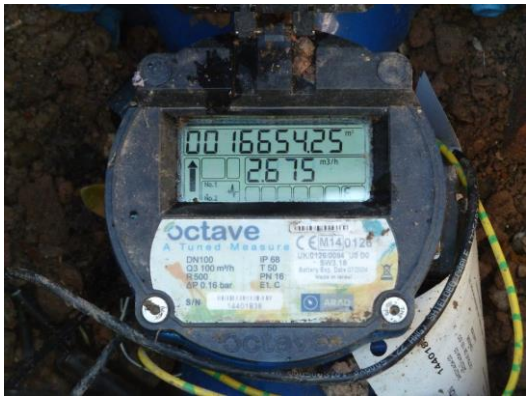
The water meter supplying the park is located in the footpath right outside the entrance to the park. It has recently been exchanged for one with the newer style digital display.

From previous work carried out on the network, it is known that the main pipework through the site is 6" diameter cast iron. Due to the location of the park on the side of a hill, there are two Pressure Reducing Valves (PRV's) to supply particular areas of pipework at lower elevations.

Visible pipework around the areas of the park is typically MDPE (Medium Density PolyEthylene or more commonly known as blue poly) of varying age, black poly and various types of ABS/PVC laid in the older areas. Some areas of the park have completely redesigned layouts with new sections of MDPE pipework. Isolation valves (some are the older wheel valve type) are located around the park on the larger sections of pipework together with a number of fire hydrants.

Meter location in footpath outside park

Meter chamber and loggers



Meter

PRV and valves located near top of Deanside

Location of PRV by 24 Hillview

Wheel valve

Leakage Survey Activities

All water connections on the park were acoustically sounded for leak noise together with all stoptaps, isolation valves and hydrants found. All water connections were also inspected for any visible leaks on stoptaps and fittings.

All amenity areas were also checked, including the swimming pool top up and filtration system, and restaurant/bar area (kitchens and toilets) – two minor issues were noted in the pool area (details below in table). The launderette and Anglo centre were also checked and no issues were noted in either of these locations.

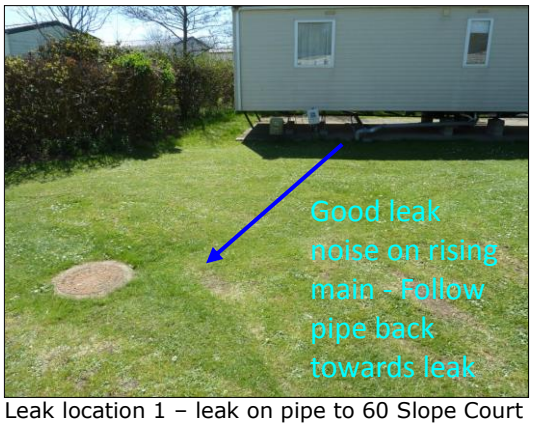
A number of potential areas of below ground leakage were found whilst carrying out the acoustic sounding on the park. Some of this acoustic noise could be attributed to intermittent water use or boilers running – these plots were revisited to check the noise being created by other means had subsided. Below ground leaks were identified in the following locations:

1. Good leak on supply pipe to **60 Slope Court** (could be on tee off 90 MDPE pipework?) Unable to achieve good correlation due to no leak noise being detected on any other rising mains. Excavate on rising main to no. 60 SC and follow towards leak;

2. Minor leak on supply pipe to **210A Holly Bank** – unable to correlate due to low volume of leak and unknown route of pipework. Leak possibly on connection to existing pipework by 210 MB;

3. Minor leak on rising main to **8 Hillview** – dig down on riser to locate leaking fitting;

4. Minor leak on rising main to **9 Hillview** – dig down on riser to locate leaking fitting.



Leak location 1 – leak on pipe to 60 Slope Court


Leak location 3 – leak on riser to 8 Hillview


Leak location 4 – leak on riser to 9 Hillview

Smaller visible leaks and water efficiency issues identified throughout the survey detailed below:

Park Area	Plot	Fault
Green Mead	1	Drip on stoptap
Seadream Village	29	Drip on connection
Low Quarry	12	Dribble on stoptap
	25	Dribble on stoptap
Holt Road	5	Good dribble on fitting
Holt Terrace	3	Drip on fitting
	5	Drip on fitting
	8	Good dribble on fitting
Holly Bank	206	Drip on stoptap
	211	Drip on stoptap
	245	Drip on stoptap
	252	Minor leak on fitting (hard to access under mobile home)
The Edge	270	Drip on stoptap
Slope Court	8	Spray on connection
Tudor Court	39	Good dribble on stoptap
Lower Hillside	30	Drip on stoptap
Hillside	64	Drip on connection
The Oaks	3	Drip on drain off point
	10	Drip on stoptap
Cherry Way	29	Drip on stoptap
	55	Dribble on stoptap
LEISURE POOL	Ladies WC's	Middle WC constantly running - approx 2 litres per min
	Disabled WC	Tap on Hand Wash Basin will not shut off fully

A number of wet/muddy areas around the park were highlighted by park staff prior to the survey which were potentially thought to be caused by supply pipe leakage. Particular attention was paid to these areas by carrying out a full correlation survey between mobile homes in the area surrounding them, together with detailed sounding of the routes off all pipework in the vicinity. No significant leakage could be identified in any of the identified areas.

Summary & Recommendations

Summary:

1. All water connections and underground fittings (stoptaps, isolation valves and fire hydrants) were acoustically sounded for leak noise and checked for visible leaks;

2. A number of above and below ground leaks identified (details above);

3. Simple step test attempted by isolating valves downstream of both PRV's but unable to confirm effectiveness without further proving and isolation work on other valves around the park. Several isolation valves could not be located, and others are hard to access under landscaping – all need locating and 'exercising' to check that they operate satisfactorily before any further step testing can be carried out;

Valve chamber located under bushes – needs to be made more accessible

4. Sub meter fitted next to PRV at top of Hillside found to be broken;

Recommendations:

1. Excavate, locate and repair all below ground leaks identified;

2. Repair all minor above ground leaks and water efficiency issues;

3. Check minimum night flow and confirm new leakage volume. Assess viability and costs of further work to identify these leaks;

4. Replace sub-meter fitted by PRV at top of Hillside – this would be a useful asset to monitor leakage in a significant area of the park;

Survey carried out by

Engineer	H2O Building Services	Date	26-28 April 2016