Lyons Holiday Parks - Robin Hood Water Leak Detection Site Survey Report

26th August 2015

We attended Woodlands Hall on Tuesday 18th August to carry out water leak detection after receiving a call from Lyons Holiday Parks advising that the meter was spinning very rapidly on site, indicating that they have leakage on site.

We identified the water meter on site as meter 07GD028940 reading 59749m³ at approx. 09.30am and approx. 59763m³ at 18.30pm. The consumption in between these two readings equates to 14m³, which gives an hourly usage of approx. **1.5m³ per hour** and **approx. 37m³ per day**. This equates to a **daily cost of approx. £109.89** and over the course of one year, this equates to an **annual cost of £40,109.85.**

Picture 1 – Welsh Water Meter 07GD028940

Picture 2 – Water Meter Location

When speaking to staff on site, we were advised that previous readings had shown consumption to be in excess of 40m³ per day which is much higher than expected for the size of this site. Woodlands Hall consists of approx. 200 mobile homes including a number of larger chalet style accommodation units. The park is primarily for owners with only s very limited number of rental accommodation units.

The water meter supplying the park is located off site on the road between Llanfwrog and Bontuchel. From the meter, pipework is anticipated to run through fields before reaching a set of isolation valves in the bottom corner of the park.

Above and below ground pipework consists of a number of different materials. Above ground connections to the mobile homes are either black polythene or blue MDPE (Medium Density Polyethylene, or blue poly). Below ground pipework (where visible) was found to consist of MDPE or black poly. Connections to the plots are ½" black poly or 20/25mm blue poly with a controlling stop tap located close to where the pipe rises from the ground.

From meter readings taken throughout the survey, a minimum flow to the park was recorded of around 30 litres per minute however some of this is likely to be legitimate usage. With the two sets of water storage tanks isolated, the flow rate dropped by a rate of around 17 litres per minute.

Therefore it is expected that the likely **leakage volume is around 16 litres per minute** equating to an **excess consumption of approx. 23m³ per day**. This is an **excess cost to site of approx. £68.31 per day** and **£24,933.15 per annum.**

Picture 3 – Large water storage tanks & pump set

Picture 4 – Pump on outlet of large water storage tanks

The section of water main from the meter to the park was tested first by isolating the valves in the bottom corner of the site. With the valves isolated, the meter remained stationary which confirmed the off-site section of main was not suffering from leakage.

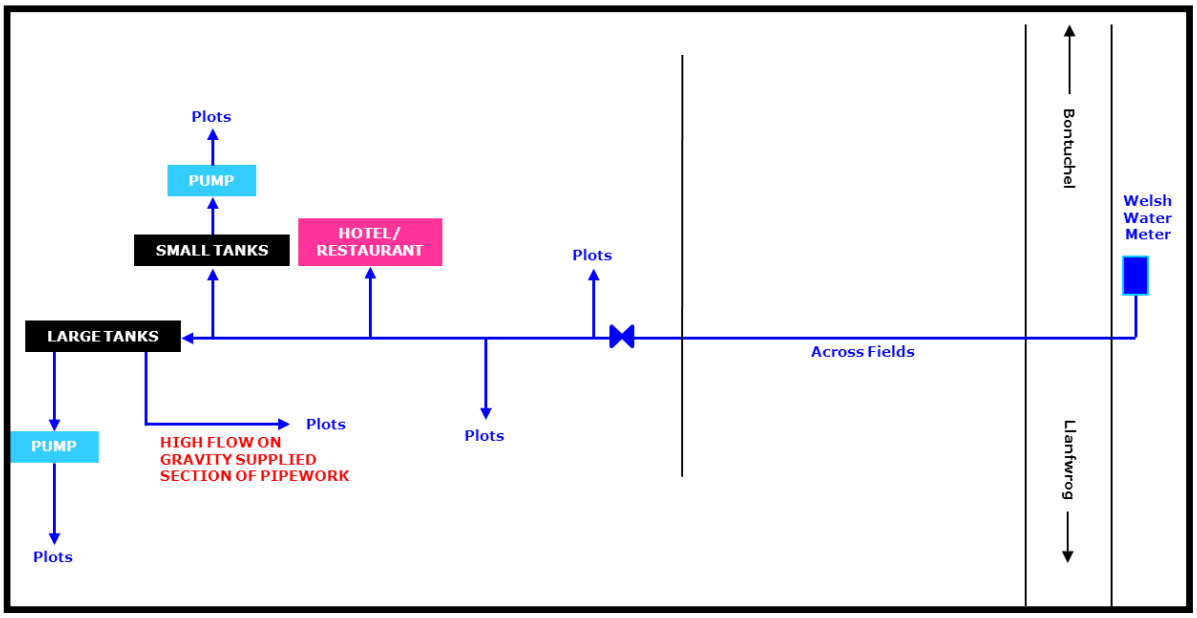
The next section of pipework (supplied directly at mains pressure) was also checked for leakage by closing the three isolation valves found in a chamber at the top level of the site (the valves isolate the hotel, and the inlets to the set of small and large tanks at the top of the site). With the three valves closed, the meter slowed down to a minimal flow rate confirming that this section was also not suffering from leakage.

A check of all other water tanks and pumps was then completed to identify any unusually high flows of water. It was mentioned that the set of large water storage tanks struggled to fill, even during the night and with other areas of the park isolated. The two areas supplied by the tanks are a pumped area and a gravity fed section of the site. The pumps were checked and only found to operate intermittently which suggested that the pipework supplied from this point was leak free, leaving the gravity supplied section the only section of pipework with an unexplained high flow of water through it.

Before leak detection work could commence, the exact extent of the area supplied by gravity from the tanks needed to be confirmed. This was carried out using a pressure gauge and hose connection attached to available water points on each required plot.

Approximately 75 plots were checked to determine the available pressure and confirm which 'zone' each plot was supplied from.

Picture 5 – Pressure & Flow testing equipment



Picture 6 – A schematic plan of the site supply & layout

Once the extent of the gravity supplied 'zone' had been proved, all water connections to each plot were acoustically sounded for leak noise. Whilst being acoustically sounded for leak noise, the connections were inspected for any above ground leaks on connections and fittings underneath and at the side of each plot.

A number of drainage and water valve lids were also lifted and inspected to check for water ingress. In one particular area of the site, a continuous flow of clear water was found which was followed and found to be breaking through the side of the drainage chamber. Leak noise could also be heard on the surrounding slabs and pipework to the adjacent plot.

Detailed acoustic sounding was then carried out to confirm the exact point of leakage in the identified area. It is likely that the leak is close to or under a small landscape retaining wall at the side of the plot (Steve aware of where to excavate first).

Picture 7 – The leak location

Picture 8 - Water breaking into drainage chamber

Survey Summary:

1. Significant below ground leak identified on gravity supplied pipework. Leakage rate confirmed to be around 23m³/day.
2. Approximately 100 connections checked for leak noise and visual leaks;
3. Top of site (including hotel and restaurant) suffers from low pressure. Although 30 metres head of pressure is experienced in the lower parts of the park, some of the higher areas suffer due to the significant change in ground level. At times there is almost zero pressure in the main to supply the tank and hotel/restaurant.

Survey Recommendations:

1. Excavate and repair identified leak with appropriate fittings then check water consumption by reading water meter regularly.
2. It is also recommended that consideration is given to evaluating the position of the existing water storage tanks (or installing new ones) due to the poor pressure experienced by some parts of the site.

Annual Saving: £24,933.15