

**WICKLOW COUNTY COUNCIL
WATER CONSERVATION PROJECT**



**DEMAND MANAGEMENT STUDY
COUNTY BUILDINGS WICKLOW**

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Demand Management Study

Introduction

A demand management study involves selecting a building with a high water use, analysing the consumption profile of the building, installing water management devices and comparing the reduced consumption figures to the previous figures. The reduced consumption should lead to reduction in the annual water charge, providing an economic benefit to the study.

Wicklow County Building was selected as the subject for the demand management study. The original building was built in 1979/80 but has since been extended twice; the most recent extension completed in 2006. Its current occupancy is approximately 260 people.

Pre Study Appraisal

The first stage of the study involved assessing the water usage of the building. A data logger was installed on the supply meter for the building to record the volume of flow into the building. The flow data was analysed to assess the consumption profile for the building. The daily water usage by the building varied depending on whether the building was in use.

The flow data analysis identified the following:

1. Average daily water use varied depending on occupancy of the building.
2. Average daily weekday flow was 12.0 m³/d.
3. Average daily weekend flow was 6.39 m³/d.
4. Average maximum hourly flowrate was 2.34m³/hr.
5. Average minimum hourly flowrate was 0.18m³/hr.
6. Consumption per head per day was 40.0 l/d

Flow data was recorded from 30th June 2006. Figure 1.1 below shows the consumption profile in the county buildings for the month prior to installation of the water management devices.

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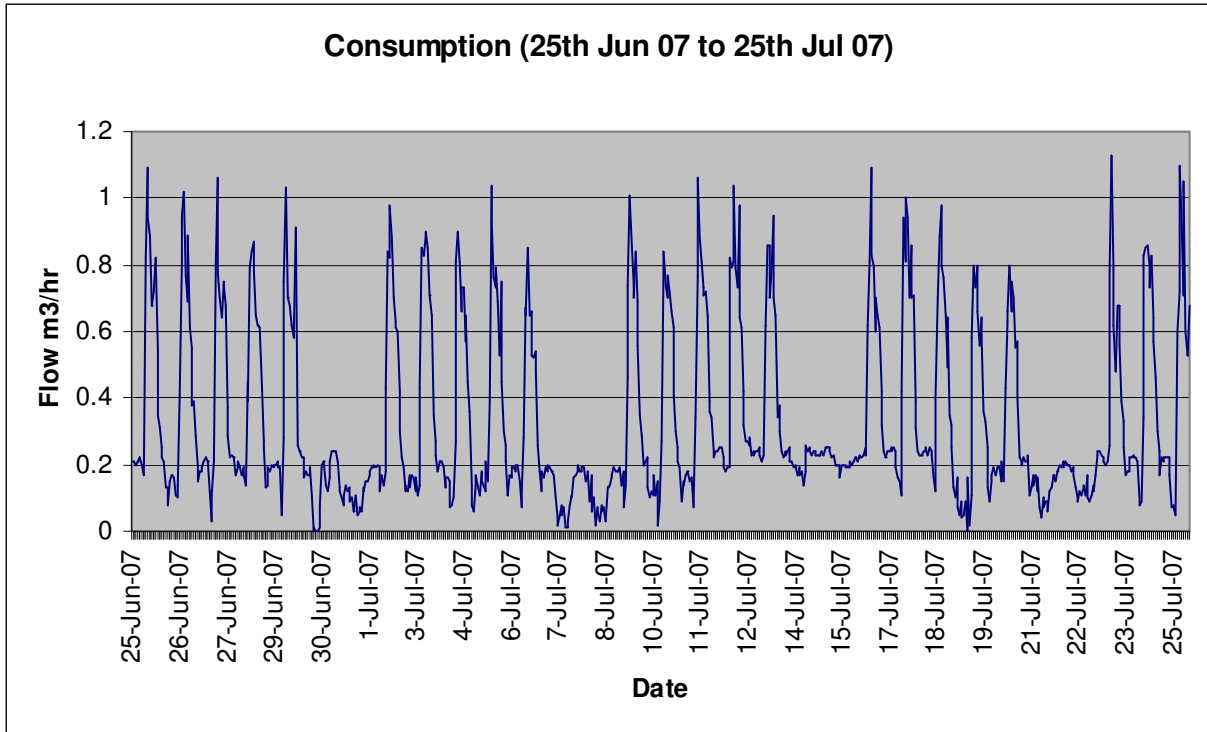


Figure 1.1 Consumption 25th Jul – 25th Aug 2006

A survey of the plumbing fixture and fittings was undertaken within the buildings. There was a variety of fixtures and fittings within the building as there has been several extensions to the building.

The survey identified the following water using devices:

- 1. Toilets** - There are 18 toilets within the County building and stores each with a 7.5l cistern.
- 2. Urinals**- There are 5 men’s toilets containing a total of 12 urinals. Each urinal has a 7.5l cistern and is operated by means of a ‘fill and flush’ system.
- 3. Showers** - There are 2 No. showers in the county building.
- 4. Taps**- There are a total of 26 wash hand basins; 22 of these had screw taps, three have push tap fittings and one has a lever & spray tap.
- 5. Canteen** - There are also canteen facilities in the county buildings however these have not been included in the demand management study.

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Water Conservation Measures

The following water management devices were identified for procurement and installation:

Urinal controls

The infrared urinal flush control valve was decided upon for the urinals. The infrared sensor detects motion in the washroom which opens the solenoid valve allowing flow to the cistern. The initial open period is 25 minutes, if no occupancy is detected after this time the solenoid valve is closed until the next movement is detected. By using flush control valves multiple flushing at busy times is prevented. The integrated flow regulator within the device allows the volume of water passing to the cistern to be adjusted. This can be used to allow the urinals to flush once every say 12 hours during periods of no occupancy for hygienic reasons.

Lavatory Push Fit Taps

A total of 36 timed flow push basin taps were retrospectively fitted in place of the original screw taps. The taps have an automatic shut off after approximately 21 seconds thus reducing losses from taps being left open after the person has left the room.

The water management devices were procured from MT Agencies Ireland at a cost of €3,233.12. Owen O’Neill & Son Ltd were contracted to install the water management devices at a cost of €2,876.09. This brings the total capital cost to €6,109.21, inclusive of VAT.

Results

After the water management devices were installed the logger continued to record flow data. This data was analysed to determine the savings gained from installing the devices. These results can be seen compared with the flow data prior to installation of the water management devices in Table 1.1 below. Figure 1.2 illustrates the consumption for the month following installation of the water management devices.

	Units	Before	After
Average daily weekday consumption	m ³ /d	12.01	6.65
Average daily weekend consumption	m ³ /d	6.39	0.8
Average maximum hourly flowrate	m ³ /hr	2.34	2.14
Average minimum hourly flowrate	m ³ /hr	0.18	0.0
Consumption per person per day	l/p/d	40	17.7

Table 1.1 Flow data before and after installation of the water management devices

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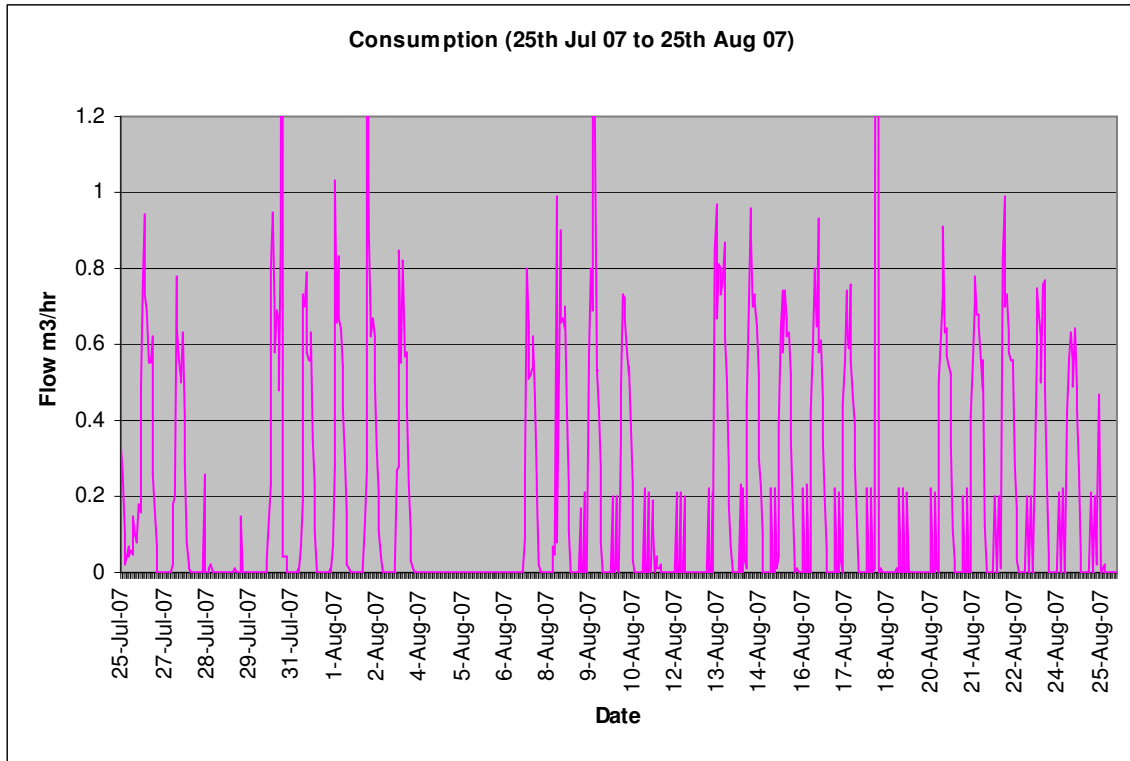


Figure 1.2 Consumption 25th Jul – 25th Aug 2007

This study indicates the potential reduction in water use that can be achieved by installing water management devices. This is demonstrated by the reduction in average weekday flow from 12.01 m³/d to 6.65m³/d and the reduction in weekend flow from 6.39 m³/d to 0.81 m³/d. Figure 1.3 illustrates the difference in consumption over the same five month period in 2006 and 2007.

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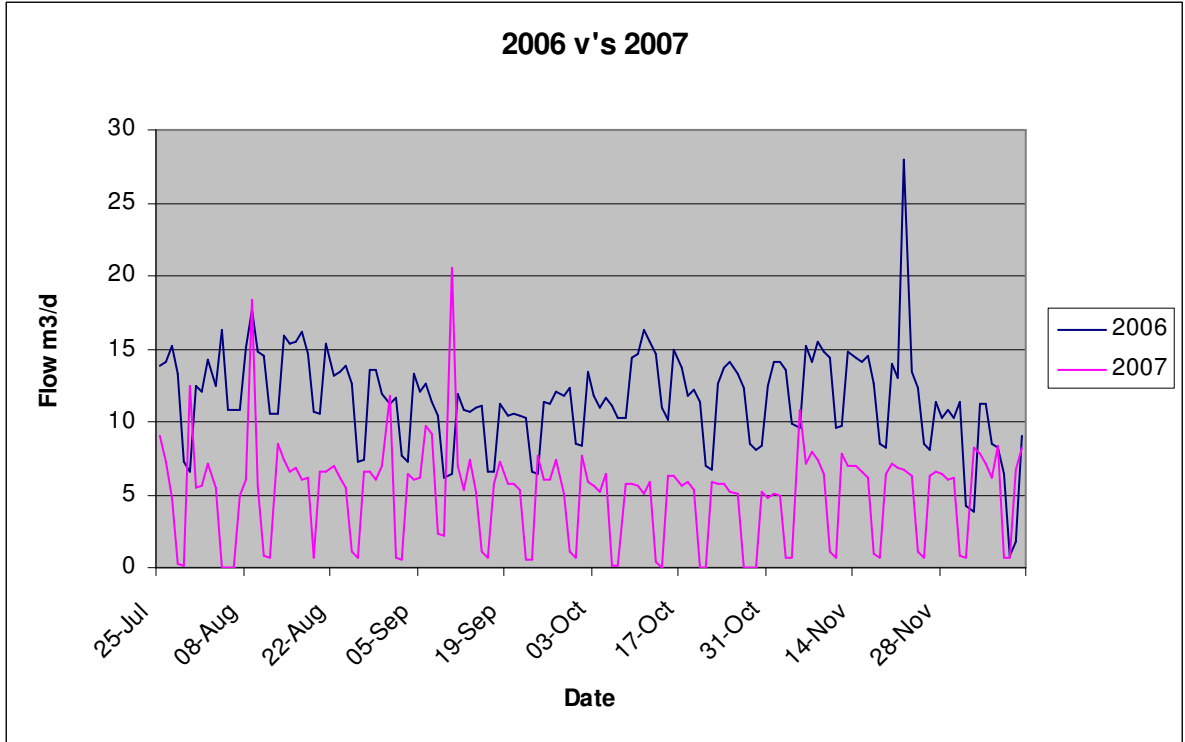


Figure 1.3 Comparison of consumption in 2006 and 2007

The following Cost/Benefit analysis indicates the savings achieved by implementing demand management in the County buildings and the return period on the capital invested.

		€
Reduction in flow	1,990m ³	
Savings: Water charges	1,990m ³ @ €1.34/m ³	2,666.60
Wastewater charge	1,990m ³ @ €1.11/m ³	<u>2,208.90</u>
Total Savings (a)		4,875.50
Total Investment cost (b)		6,109.21
Return Period (b)/(a) months		15

Based on the capital cost of €6,109.21, if this saving is realised, it gives a return period of 15 months.

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Conclusions

1. Continuing to achieve this level of demand reduction will require ongoing maintenance and monitoring of water consumption in the building.
2. Given the cost return period calculated above there is an economic benefit to managing and reducing the volume of water used in public buildings.
3. The demand management study has demonstrated that demand management can be implemented using the following procedure:
 - Monitor the meter supplying the building and assess the consumption profile of the building to determine if savings can be achieved by implementing demand management measures.
 - Survey of all water fittings in the building. This will highlight where any repairs might be made (dripping taps, leaky ball valves) and indicate where water managing devices could be installed.
 - Install the appropriate demand management devices
 - Finally, monitor the water consumption on a continuous basis to ensure it remains consistent with the building occupancy.