

CLAREVILLE PUMP HOUSE

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Limerick Corporation's water treatment plant at Clareville first became operational in the early 1890s, marking an important step forward in the provision of a safe municipal water supply to the citizens of Limerick. Prior to that the supply had come from waterworks at Rhebogue, but the quality was poor and the water pressure inadequate in the higher parts of the city. Another problem associated with Limerick's drinking water was that many people at that time still relied on wells for their water; wells that were subject to contamination from leaking and overflowing cesspits. In 1888 a serious outbreak of fever at the Good Shepherd Convent Industrial School was traced to the wells in the convent grounds; one analyst declaring that the water resembled sewage. Other wells, one of them in the grounds of St. John's Hospital, were also found to be heavily polluted, the water considered unfit for human consumption.

The science of bacteriology was seriously undermining public confidence in the city's water supply and Limerick Corporation decided to rectify the situation by building a completely new water treatment plant at Clareville where the filtration system conformed with best sanitation practice and was far superior to the more primitive water treatment system used at Rhebogue. At the new plant raw water was taken from the Shannon, treated, discharged into a storage tank and then pumped to the newly built open reservoir at Newcastle Hill, Castletroy.

Location

The Clareville treatment plant was sited on the Co. Limerick side of the River Shannon near the Falls of Doonass. The site was chosen to make use of the head available on the Shannon at that point to power the pumping machinery located in the Pump House (also known as the Turbine House). A headrace canal took water from upstream of the Falls of Doonass to the Pump House where sluice gates were used to control the flow of the water that powered the turbines, which in turn powered the pumps. This water then returned to the river via the lower level of a tailrace canal.

Although it was a completely water driven, mechanical system (steam power was not used), each of the four pumps used in the Pump House was capable of delivering 1.5 million gallons of drinking water daily to the reservoir at Newcastle Hill, Castletroy via a

16-inch diameter rising main pipe, almost 3 miles long. This reservoir stands at an elevation of about 175 feet above that of Clareville.

Work on the project commenced in 1888 and the Clareville facility was officially opened in 1890. An event recorded by a commemorative stone plaque that can still be seen above the doorway of the Pump House:

Limerick Water Works. Inaugurated 5th August 1888.

Francis A. O'Keefe Esq. M. P. Mayor.

Water turned on 28th May 1890.

Cruise, Browne and Fogarty Engineers.

Thos. I. Dixon, Contractor

The Pump House became fully operational in 1891, but its working life was relatively short, being decommissioned in 1932 following the construction of the Shannon Hydroelectric Scheme (1929). The diversion of most of the Shannon water from near Killaloe to drive the hydro-electric turbines at Ardnacrusha meant that the flow of water downstream at Clareville was greatly reduced and could no longer be relied upon to drive the turbines in the Pump House.

Declared redundant, the functions of the Pump House were taken over by a new pumping arrangement driven by electric power supplied by the Ardnacrusha power station and the last occasion on which the machinery in the original Pump House was ever used was in 1950. Despite the fact that the machinery has been inoperative for over half a century, both the building and the pumping machinery are still in an excellent state of preservation owing to restoration work that was carried out during the early 1980s. As a result, a virtually intact example of industrial archaeology is to be seen in the shape of the Pump House and the structure provides a fascinating material record of late-Victorian municipal engineering techniques; although it has been a bit neglected in more recent times, as a section of the steel floor plating has collapsed.

Physical Description

The exterior measurements of the 1891 Pump House (Turbine House) are 48 feet long by 28 feet 6 inches in width, while the height of the pitch of the roof above ground level is about 25 feet. The roof is slated. The only door into the Pump House is in the south-facing gable end of the building and this wooden door, which has six glass panels, is surmounted by a Georgian-style fanlight. An oculus window has been inserted into the pediment of both the front and rear gable ends. These architectural features, and the sash-like style of the windows along the side of the building, give a Georgian 'colouring' to the building. However, all the window frames and glazing bars in the building are made of metal.

The walls are of stone 2 feet thick, while the door and all the windows are framed by red

brick, inside and out. A noticeable aspect of the stonework on the front gable is that up to the height of the door, and a little higher up in some places, the stonework appears rougher and older than that used elsewhere in the building; the pointing is also significantly different. This may indicate that the Pump House was built on the site of an earlier building, part of which was incorporated into the front gable.

Inside is a single room containing the pump machinery. The floor of this Pump Room consists of steel panels, some of which have collapsed into the 'basement' area where the turbines are located (see cross-sectional diagram). The height of this lower section of the building is 16 feet. The four Hercules turbines that were installed in the Pump House in 1891 were imported from England, but the pumping machinery itself and the other fittings were manufactured by the Shannon Foundry, Limerick.

Operation

The mechanics of the Pump House are quite simple: The turbines are connected to the pumping mechanism in the Pump Room. Water rushing down from the headrace seeking the lower level of the tailrace flows through the vanes of the turbines causing them to rotate. A connecting rod links each turbine to a driving wheel in the Pump Room. These wheels drive four reciprocating piston pumps that pump treated water into the 16 inch cast-iron rising main feeding the Newcastle reservoir. A compressed air vessel serves each pair of pumps in order to maintain a steady pressure on the rising main when the piston is on the suction stroke.

The flow of water from the headrace through each turbine is controlled by its own sluice gate. The raising and lowering of each gate is controlled by a mechanism consisting of a valve control wheel located on the inside wall of the Pump House that operates an external, threaded shaft linked to the gate. An interesting feature of the Pump Room is the overhead travelling gantry crane. The lifting device on the crane was used to raise machinery for repair and maintenance.

The Pump House was originally designed to supply Limerick City's water supply needs with just two of the four pumps working at any one time. But by 1915 the demand for water was such that it took three pumps to supply the city. This caused particular problems in times of drought because when the water level fell below one metre at the headrace it was not possible to operate three pumps. In June 1915 the level of water was so low that only one pump could be used. At such times the old steam powered water treatment plant at Rhebogue had to be used as an auxiliary.

Important Industrial Archaeological Site

The building and equipment is worth preserving and deserves continuous maintenance as it bears witness to the engineering skills of Limerick - all the machinery and fittings used in the building, except for the turbines, were manufactured in the city. The 1891 Pump

House belongs to the first of several distinct phases in the development of the Clareville water treatment plant and the supply of safe drinking water to the city. As such it is an important, though ignored, aspect of Limerick's industrial archaeology.

Bibliography

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