

THE SMETHWICK AND ASHTED ENGINES

Mike Hodder

Archaeological investigation and historical research have thrown light on the location, structures and use of the Smethwick and Ashted steam engines, which served the needs of West Midlands canal transport in the eighteenth and nineteenth centuries.

Steam engines pumped water on the canal system to replace losses through leakage, particularly at locks. There were numerous pumping stations along West Midland canals, but the original engines have long since been removed and only a few engine houses are visible above ground.

The Smethwick Engine is on display in Thinktank in Millennium Point in Birmingham, and the Ashted Engine and other steam engines which originally operated in the West Midlands can be seen at Henry Ford's museum in Dearborn, Michigan, in the United States. Archaeological excavation has revealed substantial remains of the engine houses at Smethwick and Ashted which can be compared with the actual engines and the documentary record to throw light on their installation and operation.

The Smethwick Engine House

The Smethwick Engine is a Boulton and Watt engine that was originally installed at what is now the junction of Bridge Street and Rolfe Street in 1779 to raise water for the Birmingham Canal. It was dismantled in 1897 and re-erected in Tipton, then dismantled again and displayed in the Birmingham Museum of Science and Industry, and later transferred to Thinktank.

The engine has a timber rocker beam which transfers motion from the cylinder to the pump. Its condenser, as developed by James Watt to prevent loss of heat in the piston and cylinder, was restored to its usual level when it was moved to Thinktank. As well as the engine itself, there is a plan of the engine, dated 1778, in the Boulton and Watt papers at the Library of Birmingham and a



Model of the Smethwick Engine, made by David Hulse.

photograph taken during dismantling in 1897 prior to its removal to Tipton.

The Birmingham Canal was constructed in 1769. Locks brought the canal up to the summit of high ground in Smethwick, and further locks lowered it. When it was first installed, the Smethwick Engine raised water carried along a tunnel from the lower level of the canal to a feeder which took it to the summit level nearly forty feet higher. When the summit was lowered in 1790 the engine was modified and subsequently pumped water through a tunnel to a much lower point above Smethwick locks.

Detailed research by Dr Jim Andrew located the site of the engine house, which was partly covered by a later weighbridge. Excavation in 1984 by Birmingham Museum of Science and Industry consisted of removing brick rubble which filled most of the engine house.

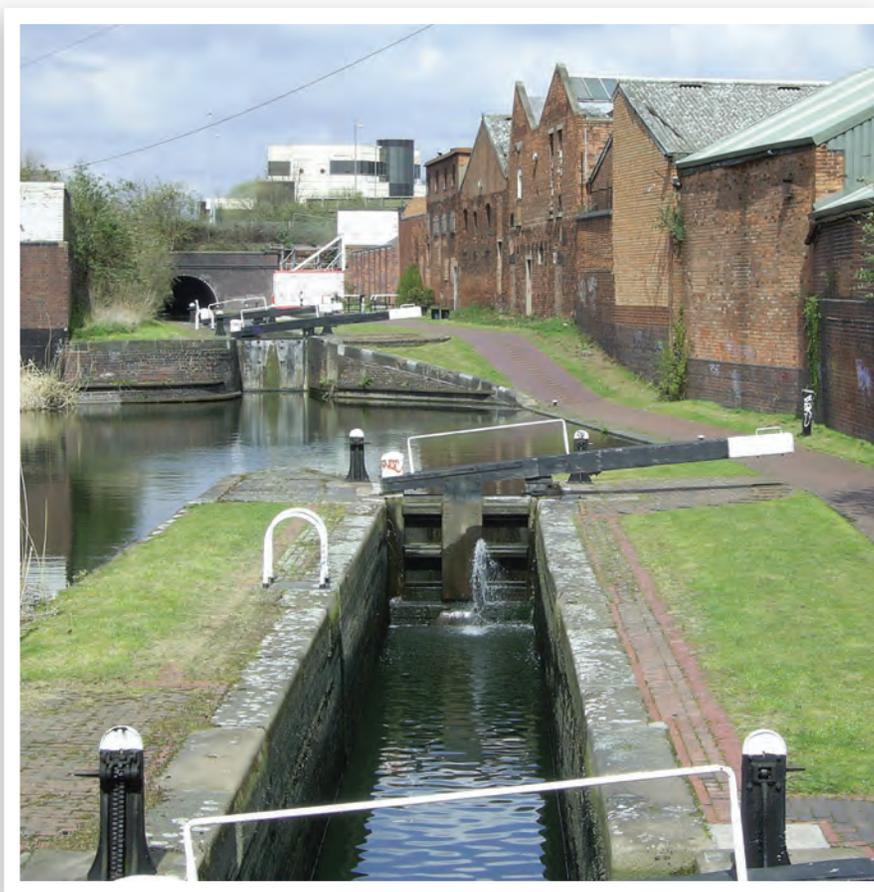
The engine's cylinder had been held down on stone blocks by long bolts fixed to cast iron plates under the stones and there was an inspection tunnel under the bolts. The condenser tank showed that the condenser had originally been at the expected level in the engine and had been raised when the engine was moved to Tipton.

An outlet culvert leading north from the pump shaft was a modification to accommodate the lower pumping level of 1790, and had been roughly cut through both the shaft and the engine house wall. The original outlet would have been above the present ground level and therefore above the level of the surviving remains of the engine house. A walk-through tunnel on the west side of the engine house may originally have passed below an embankment supporting the outlet feeder.

The Ashted Pumping Station

The Ashted pumping station was built in 1812 on the Digbeth Branch Canal, and operated until 1922. In 1928 its engine was dismantled and taken to Dearborn in Michigan, and the engine house was subsequently demolished – but the lower part of its outer wall is visible alongside the canal at the south end of Ashted Tunnel, near the present Ashted Circus.

The engine is a Boulton and Watt engine with an iron beam, in contrast to the earlier



Ashted locks, looking towards the southern end of Ashted tunnel. The wall of the former engine house can be seen to the right of the tunnel.

Smethwick Engine. Installation drawings and notes of 1811 in the Boulton and Watt collection include a plan, and elevations of the engine within the engine house.

The Digbeth Branch Canal, opened in 1790, lost water on its locks especially after it was joined by the Warwick Canal in 1796. The Ashted engine pumped water from a pound at the base of a flight of six locks along an underground channel to the Hospital Pound near Snow Hill.

The engine house was excavated in 2007, to establish its extent so that it could be preserved within a proposed development. The interior had been filled with sand rather than demolition rubble, resulting in good preservation of internal structures. An outlet culvert ran from the pump shaft and an iron pipe ran in a passage under the sandstone base of the beam support connecting the pump shaft to the top of the condenser tank. The cylinder base was a three-metre wide block of brickwork. A brick chute curving down to the canal from the cylinder base was probably a waste water overflow from the boiler room.

Differences between the excavated remains and the drawings of 1811 indicate improvisation when the engine was installed on site. The pump shaft is further from condenser tanks and the chute is not shown at all. ●

Dr Mike Hodder is an Honorary Lecturer at the University of Birmingham and was formerly Planning Archaeologist for Birmingham City Council.

Further Reading

Birmingham City Council, *Historic Environment Record*.

Jim Andrew, 'The Smethwick Engine', *Industrial Archaeology Review*, VIII (1), 1985.

Michael Hodder, *Birmingham: the Hidden History* (Tempus, 2004; The History Press, 2011).

Mark Peachey, 'Archaeological excavations of Ashted Pumping Station, Belmont and Belmont Row Glassworks, at the proposed Technology Park, Eastside, Birmingham', *Transactions of the Birmingham and Warwickshire Archaeological Society*, 114 for 2010 (2011), 115-152.