

Melingriffith Water Pump

Conservation and Refurbishment Works

Record Photographs

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Photographs taken prior to commencement of Conservation works

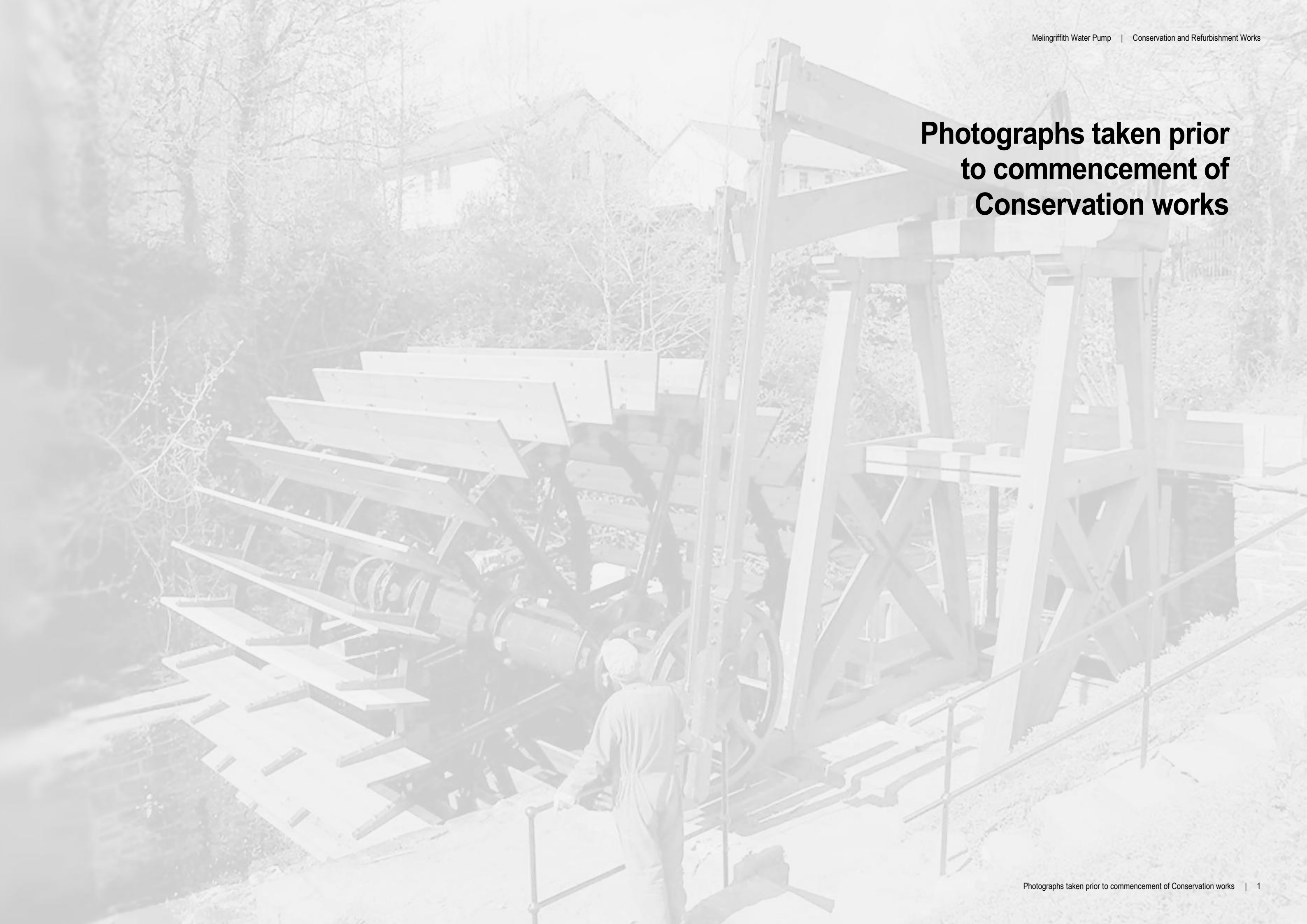




Fig 1 04/09/2008 View of the Wheel and Water Pump showing general dilapidated state of repair.



Fig 2 14/01/2009 Remains of the original timber Launder above the Pump cylinders.



Fig 3 14/01/2009 View of the Wheel pit as viewed from the Head-race. Note significant accumulated silt, debris and vegetation. Remains of original sluice gate frame visible.



Fig 4 14/01/2009 Enlarged view showing the condition of the Wheel hub and shaft.

Removal of Wheel, A-frame and Rocker Beams from site to the Engineering Workshop

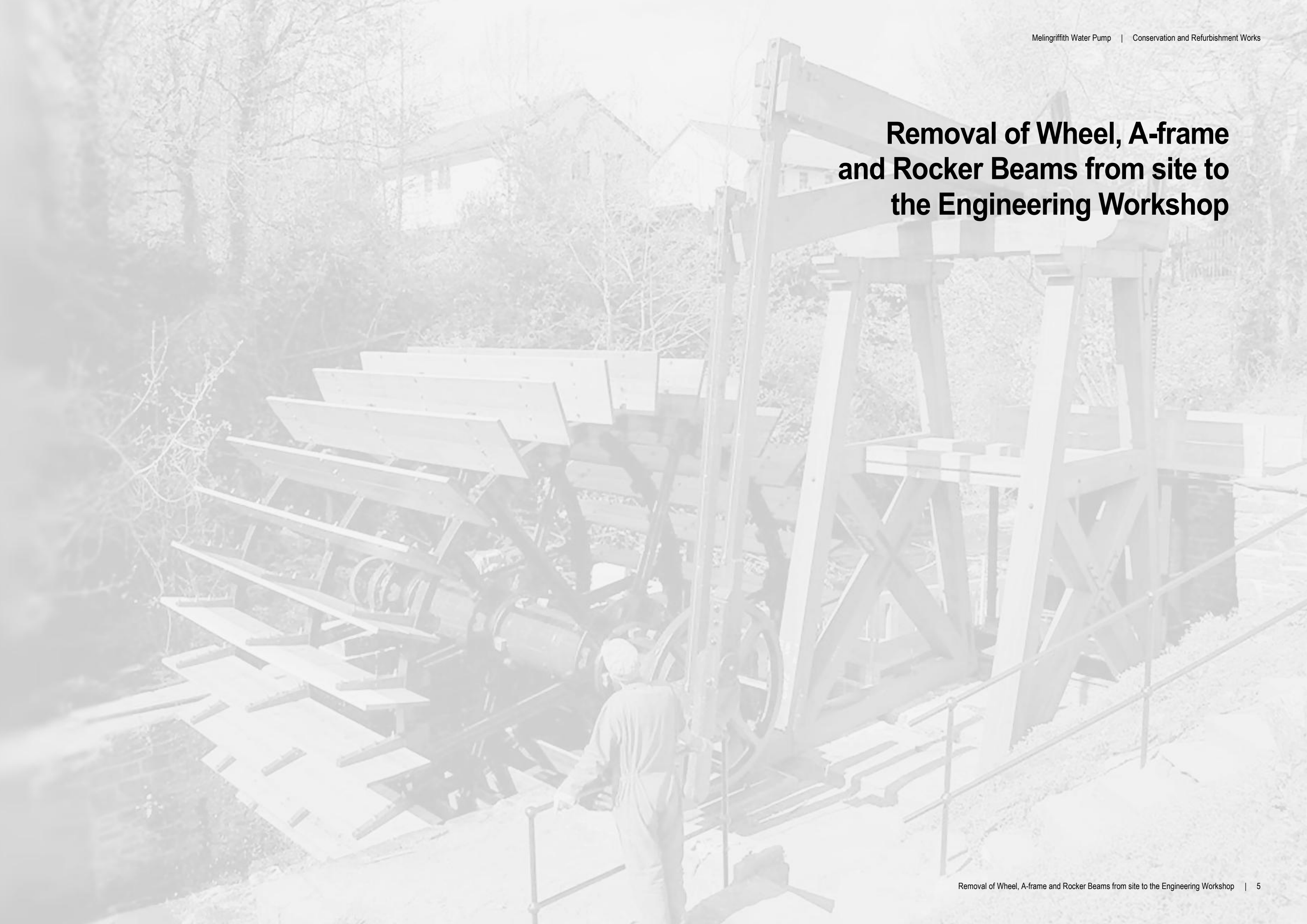




Fig 5 11/03/2010 View of Wheel (and Pump) with paddles blades removed, ready for lifting out.



Fig 6 11/03/2010 View of Wheel and Pump from Island wall.



Fig 7 11/03/2010 Rocker Beam being lifted away, the other being prepared for lifting.



Fig 8 11/03/2010 A-frame being lifted out in one piece.



Fig 9 11/03/2010 A-frame being loaded onto transport. Rocker Beams already loaded.



Fig 10 11/03/2010 Pump Valve and Lifting Rod being loaded onto transport.



Fig 11 11/03/2010 Wheel and axle being prepared for lifting off its bearings.



Fig 12 11/03/2010 Wheel rims collected at one end of the axle.



Fig 13 11/03/2010 Wheel rims, axle and crank arms lifted away in one piece.



Fig 14 11/03/2010 Wheel rims, axle and crank arms lowered onto temporary jig to allow dismantling by hand.



Fig 15 11/03/2010 Mini excavator lowered into wheel pit to assist with removal of silt and accumulated debris. Note Pump cylinders remain in-situ.



Fig 16 11/03/2010 Original Tow-path Bridge lifted from area of wasteland into the site enclosure for safe storage and display.

Clearance works within the Head-race and Wheel Pit, Masonry Conservation and preparation of Pump cylinders

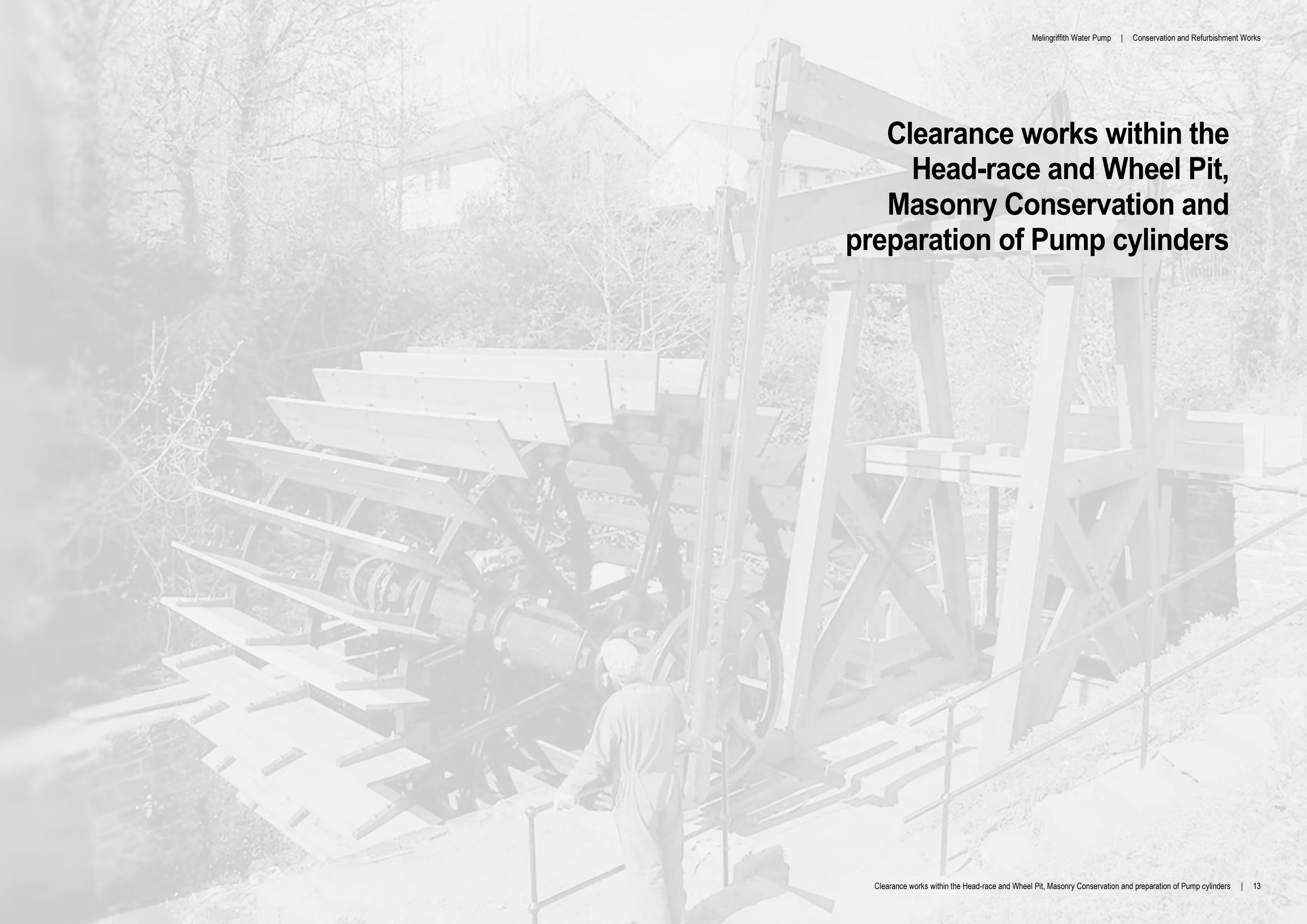




Fig 17 09/07/2010 Excavation of the Head-race and Wheel Pit. Large excavator plant used to lift material away, mini excavator used to collect debris.



Fig 18 09/07/2010 Mini excavator collecting silt and debris from the Head-race. Bedrock exposed close to the final surface levels. Investigation could not establish the position of original Filter Screens.



Fig 19 15/09/2010 View on Island wall following masonry conservation work to repair defective areas of original mortar pointing etc.



Fig 20 15/09/2010 Pump cylinders following cleaning by hand and coat of primer ready for decoration.



Fig 21 15/09/2010 Original Rocker Beams ends returned to site and mounted onto the wall adjacent the Pump cylinders. Metal brackets secured to the wall with resin anchors. Rocker Beams returned as part of the Bat Licence mitigation works. Beam ends also received replica metalwork to match original curved metalwork (not shown).

Condition of original metalwork prior to Conservation work





Fig 22 11/05/2010 Wheel Rim sections stacked ready for cleaning by hand.



Fig 23 11/05/2010 Typical defect to Wheel Rim ends – fractures and loss of fabric where Wheel Rim segments are joined together. Repaired by splicing mild steel and welding.



Fig 24 11/05/2010 Typical defects to Wheel Rim sections – fractures and loss of fabric where Spokes are connected to Wheel Rim segments. Repaired by splicing mild steel and welding.



Fig 25 11/05/2010 Remains of Wheel Rim segment with original segment tie. Ties exhibit loss of section and heavy corrosion. Note part remains of original square-head bolt. All Ties subsequently replaced with new to match original details.



Fig 26 11/05/2010 Typical Wheel Hub. Found to be in good condition requiring cleaning by hand to remove loose metal and rust.



Fig 27 11/05/2010 Typical defects to Spokes (Wheel hub end) –loss of fabric due to corrosion.

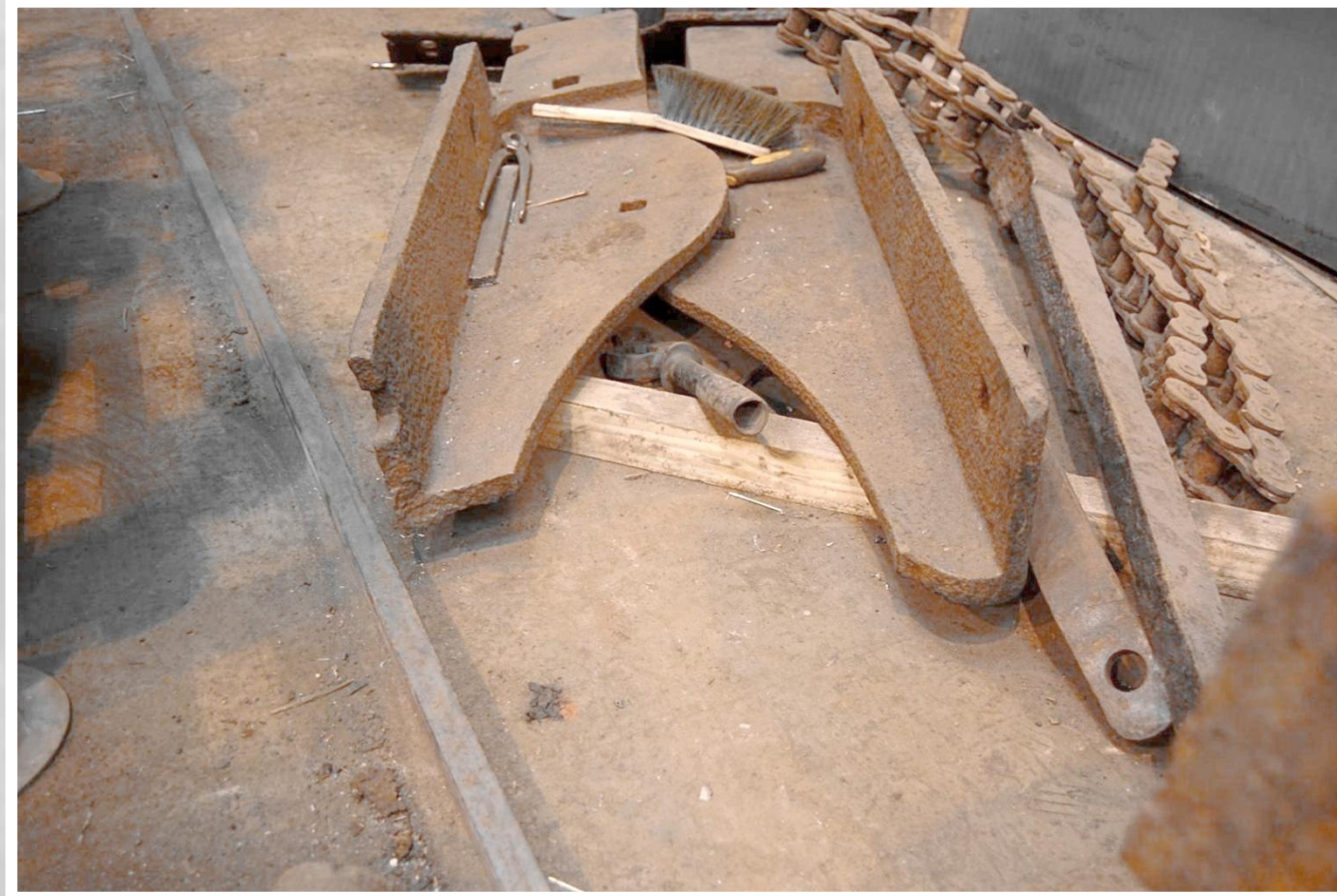


Fig 28 11/05/2010 Connection Rod upper housing plates (separated from sides of Rocker Beams). Loss of fabric where fractured around bolt hole.



Fig 29 11/05/2010 Connection Rod ball joints (upper ends). Filing required by hand to achieve a smooth bearing surface.



Fig 30 11/05/2010 Crank Arm found to be in good condition. Journals require filing by hand to achieve a smooth bearing surface.



Fig 31 11/05/2010 Rocker Beam bearing caps (2 foreground pieces) – other pair was missing. Connection Rod bearing housings (4 background pieces).

Conservation work underway in the Engineering Workshop



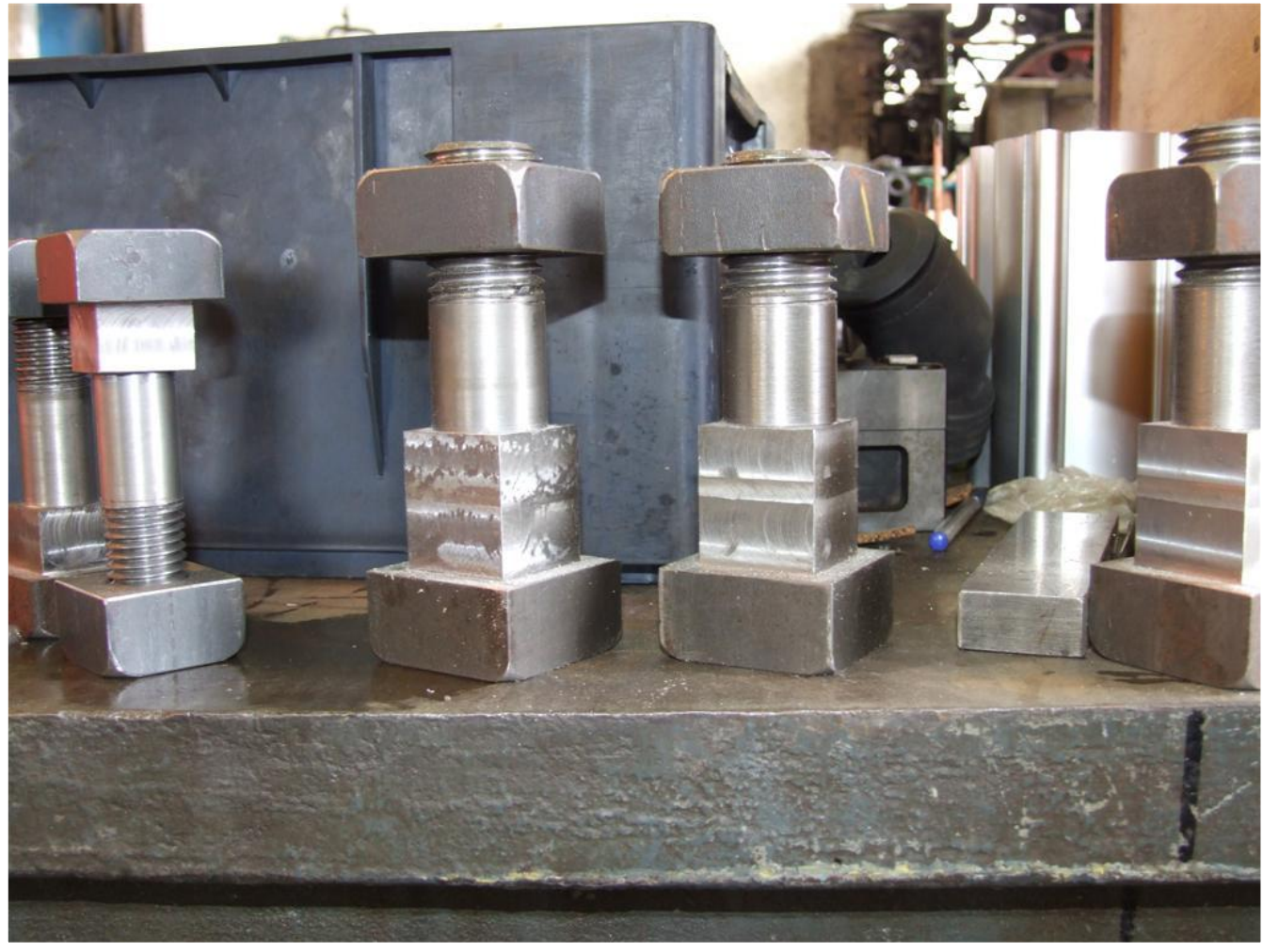


Fig 32 28/07/2010 Replacement mild steel square-head bolts and nuts to replace original (all damaged or destroyed during dismantling due to corrosion).



Fig 33 03/09/2010 Wheel being assembled following conservation and repair works.



Fig 34 03/09/2010 Enlarged view on assembled Wheel. Note replaced square-head bolts and nuts and key-pieces welded to axle.

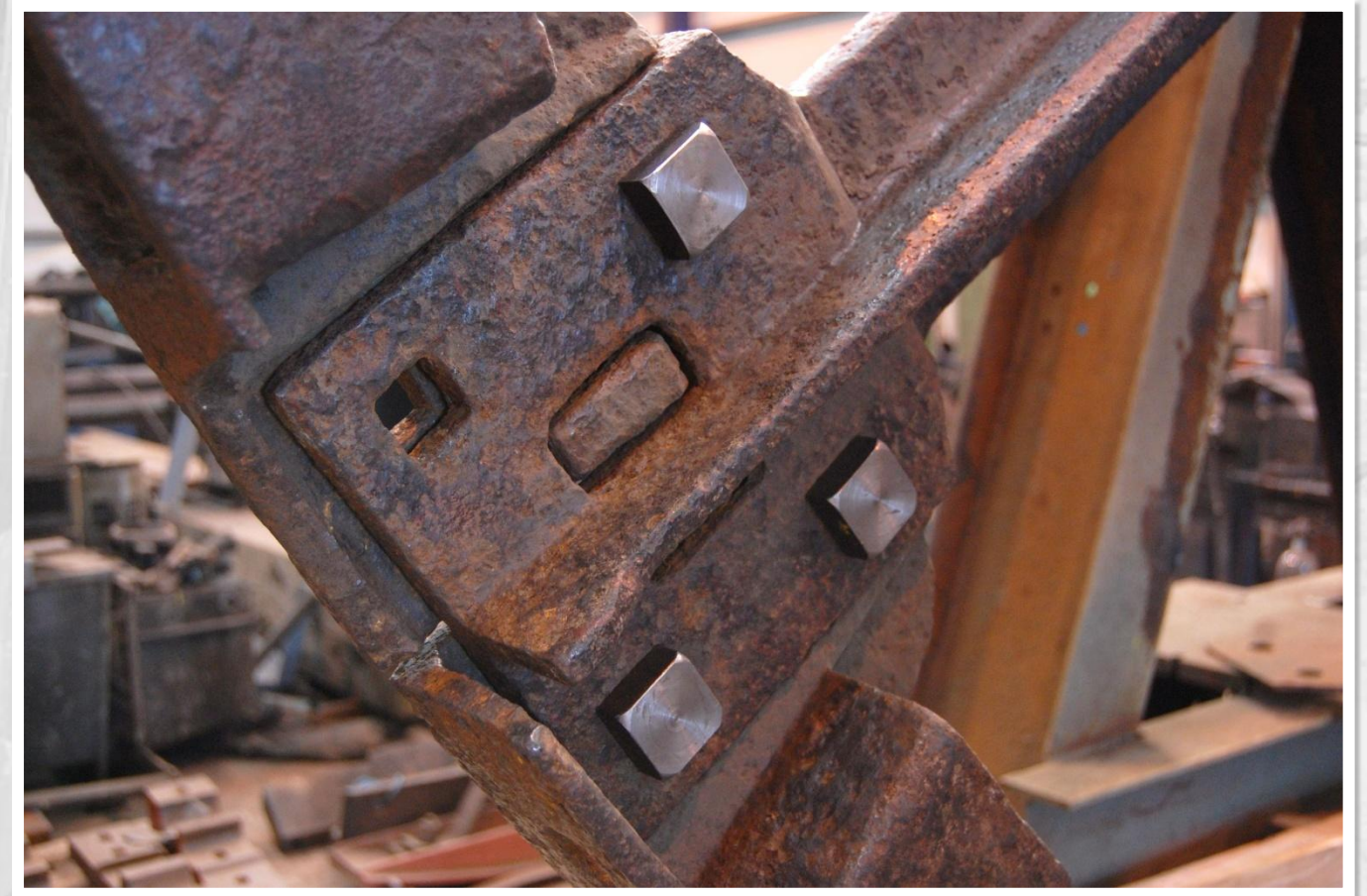


Fig 35 03/09/2010 Enlarged view showing replacement square-head bolts.



Fig 36 03/09/2010 Replacement Paddle Blade Brackets in Elm to match original details. Original Brackets were all defective, lost or rotten.



Fig 37 03/09/2010 Replacement Rocker Beams machined to accept Connection Rod bearing metalwork to original details.



Fig 38 24/09/2010 Repaired Wheel in the workshop fully assembled with crank arms and bearings pedestals, mounted on temporary jig. Painting and decoration underway. Temporary motor drive attached to test alignment and rotation.

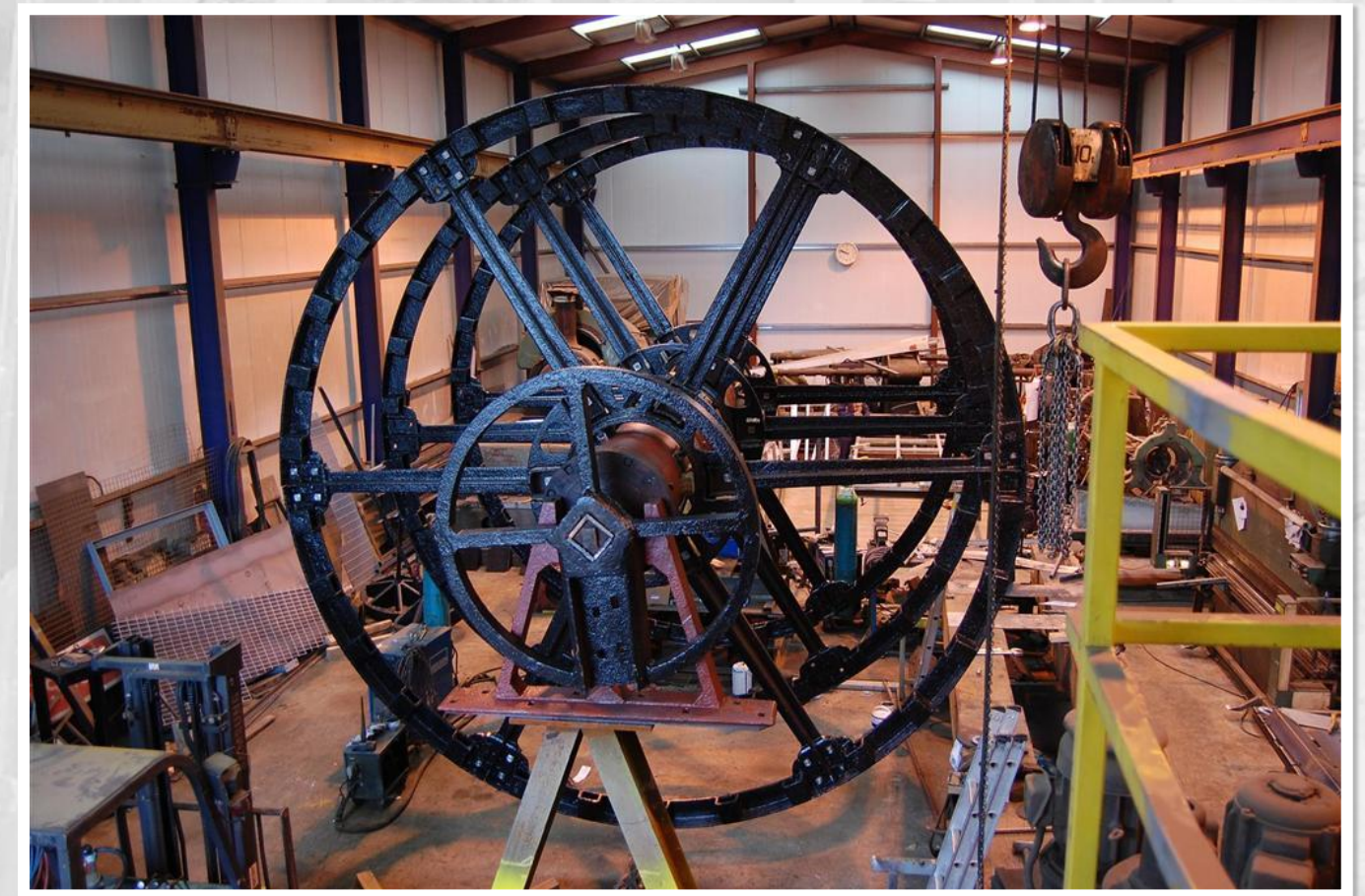


Fig 39 24/09/2010 Repaired Wheel in the workshop fully assembled with crank arms and bearings pedestals, mounted on temporary jig. Painting and decoration underway.



Fig 40 03/09/2010 Assembly of replacement A-frame in Ekki hardwood. Original metal braces reused and decorated.

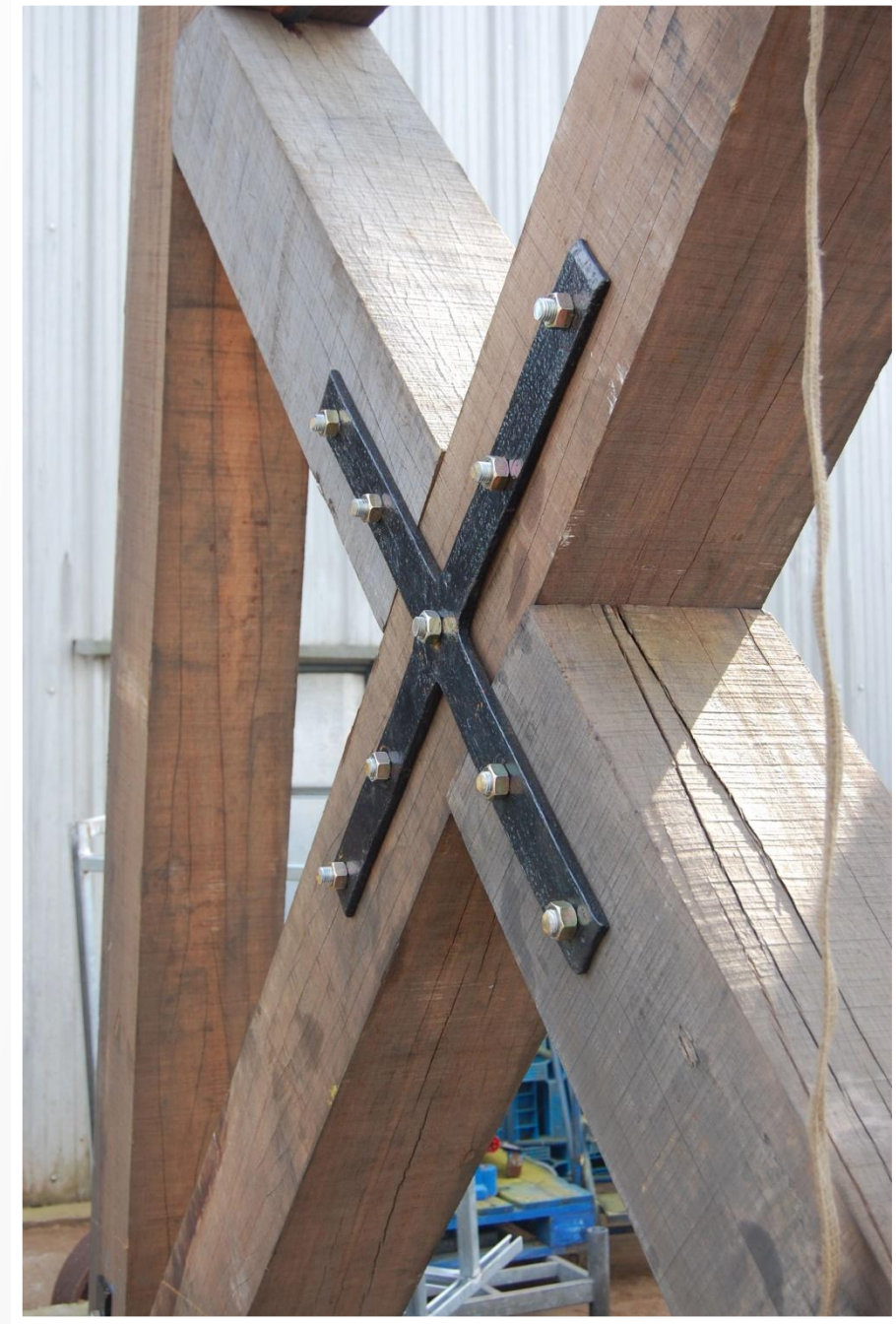


Fig 41 03/09/2010 Detail of new A-frame cross-brace.

Refurbished and new items returned and assembled on site

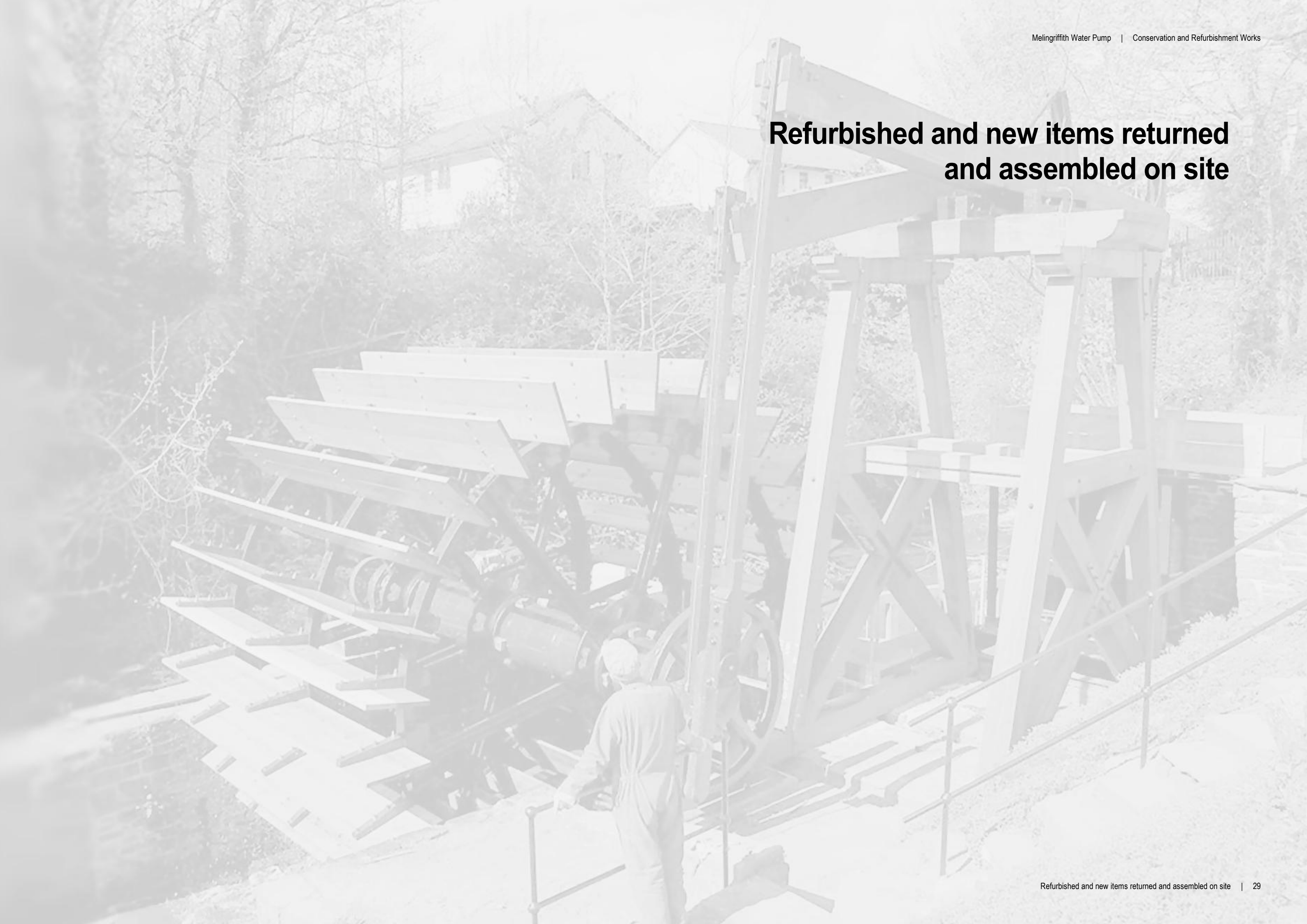




Fig 42 15/09/2010 Replacement A-frame lowered to temporary location in advance of main lift.



Fig 43 14/10/2010 Crane in position on Ty Mawr Road in preparation for main lifting operation.



Fig 44 14/10/2010 Replacement Rocker Beams and associated metalwork, Sluice Gate and Filter Screen frames delivered to temporary location on site.



Fig 45 14/10/2010 Wheel components delivered to site to be lifted into position.



Fig 46 14/10/2010 Near-side bearing pedestal lowered into position. Note new bronze bearings.



Fig 47 14/10/2010 Far-side bearing pedestal lowered into position. Note new bronze bearings.



Fig 48 14/10/2010 Wheel axle, Hubs and Crank arms lowered onto bearing pedestals.

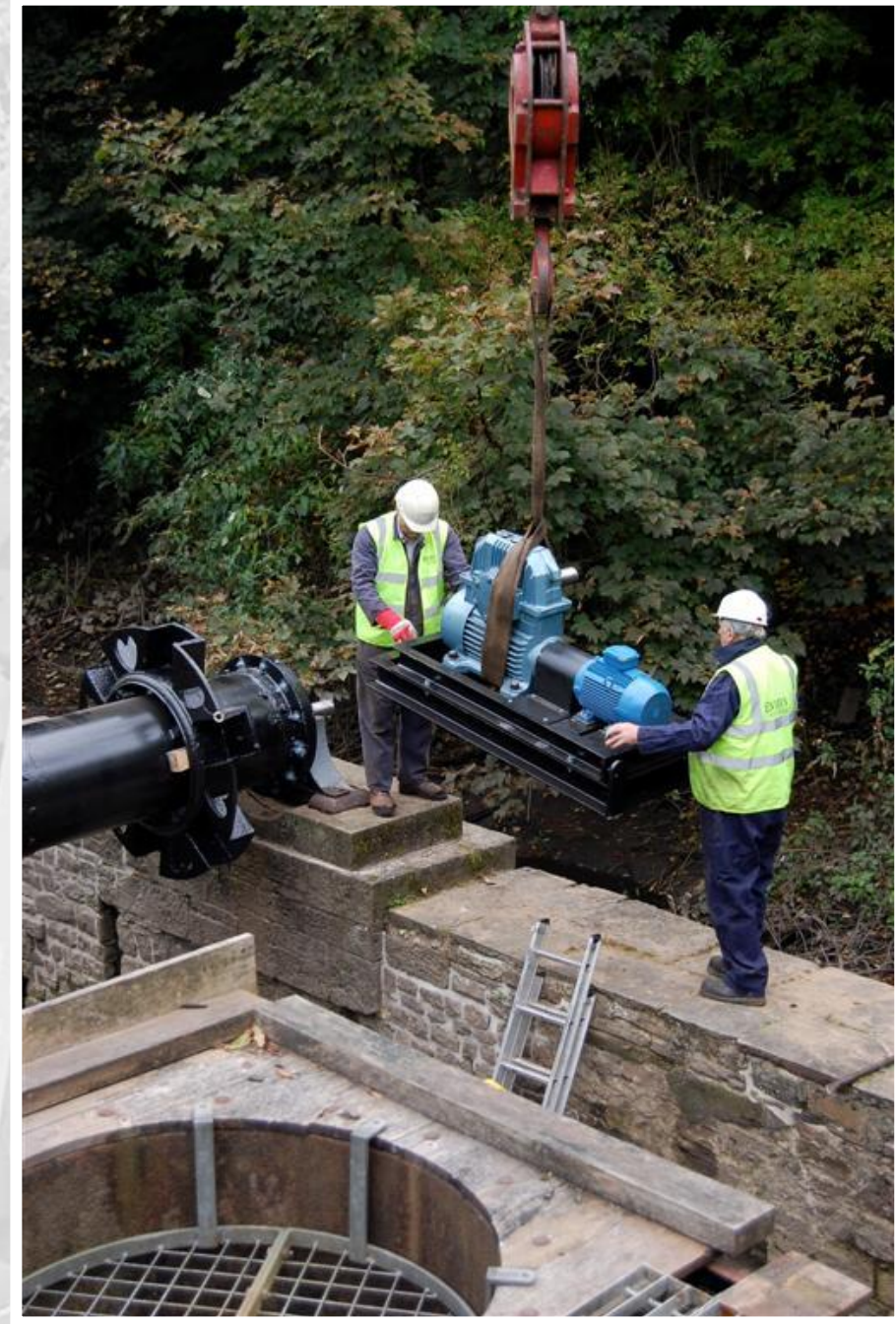


Fig 49 14/10/2010 New motor drive, gearbox and frame lowered into position on Island Wall.



Fig 50 14/10/2010 New Sluice Gate frame lowered into position across Head-race. Cross-beam into original beam pockets already in place.

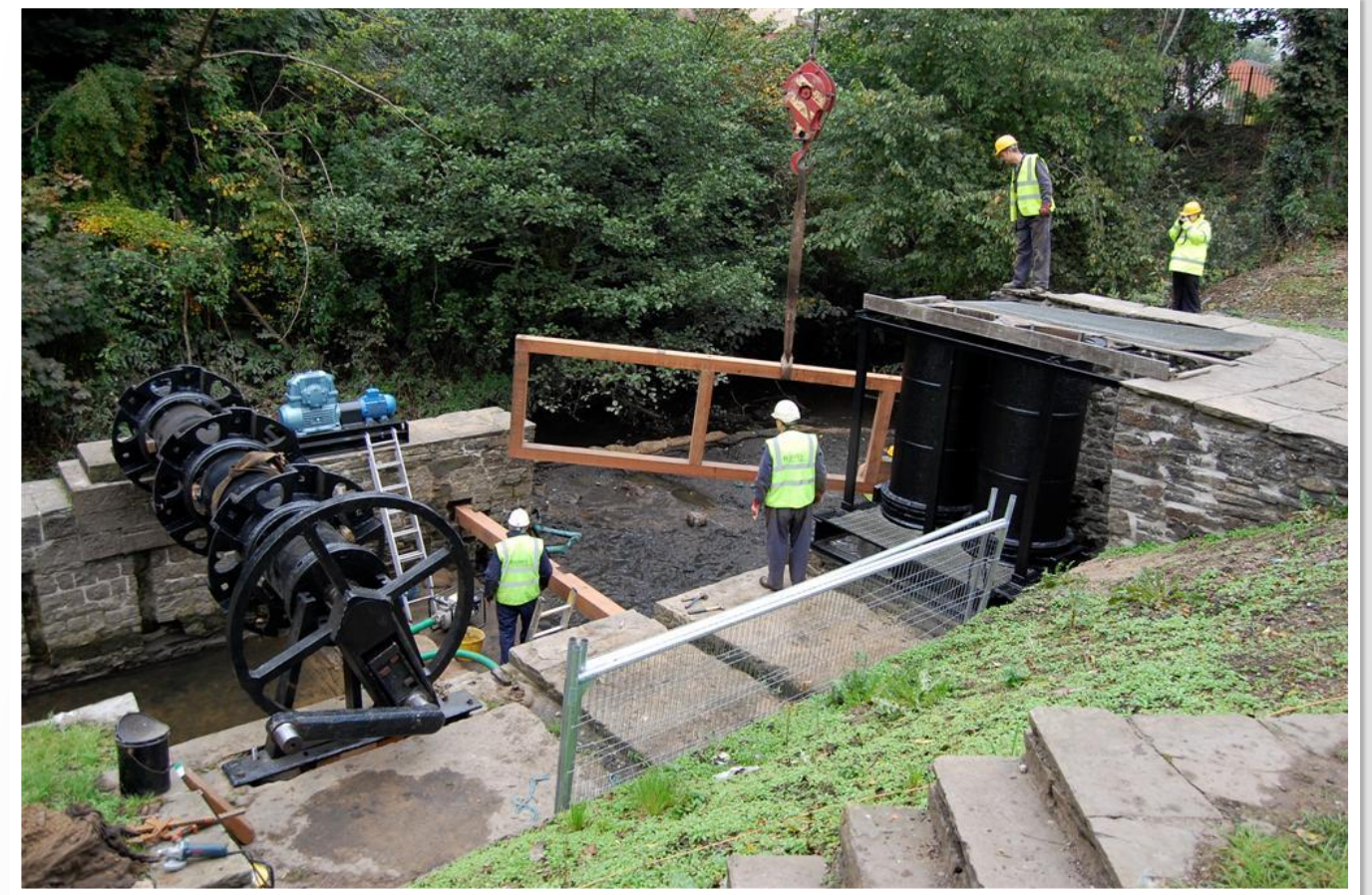


Fig 51 14/10/2010 Fine Filter Screen lowered into position across Head-race. Infill bars and mesh to be fitted later.



Fig 52 14/10/2010 Coarse Filter Screen being lowered into position across Head-race. Infill bars to be fitted later.

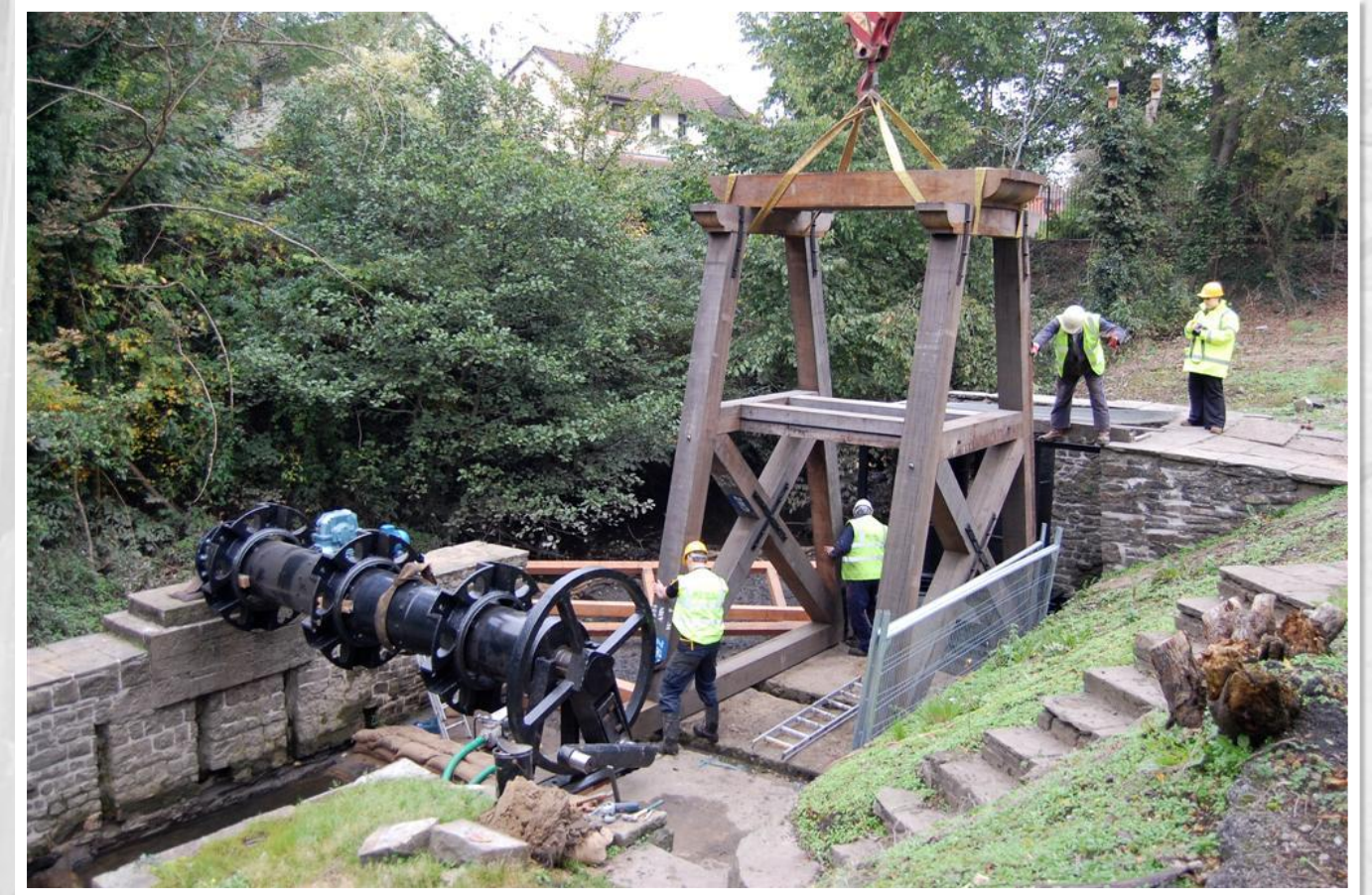


Fig 53 14/10/2010 A-frame lifted and lowered into final position.



Fig 54 14/10/2010 Rocker Beam bearing saddles lowered into position atop the A-frame. Final alignment to follow once Beams are in place.



Fig 55 Far-side Rocker Beam lowered in position on bearing saddle.



Fig 56 14/10/2010 Near-side Rocker Beam lowered into position on bearing saddle. Saddles adjusted to final alignment.



Fig 57 14/10/2010 Connection Rods lowered into position within bearing housings.



Fig 58 15/10/2010 Wheel spokes being attached to the axle and hubs.

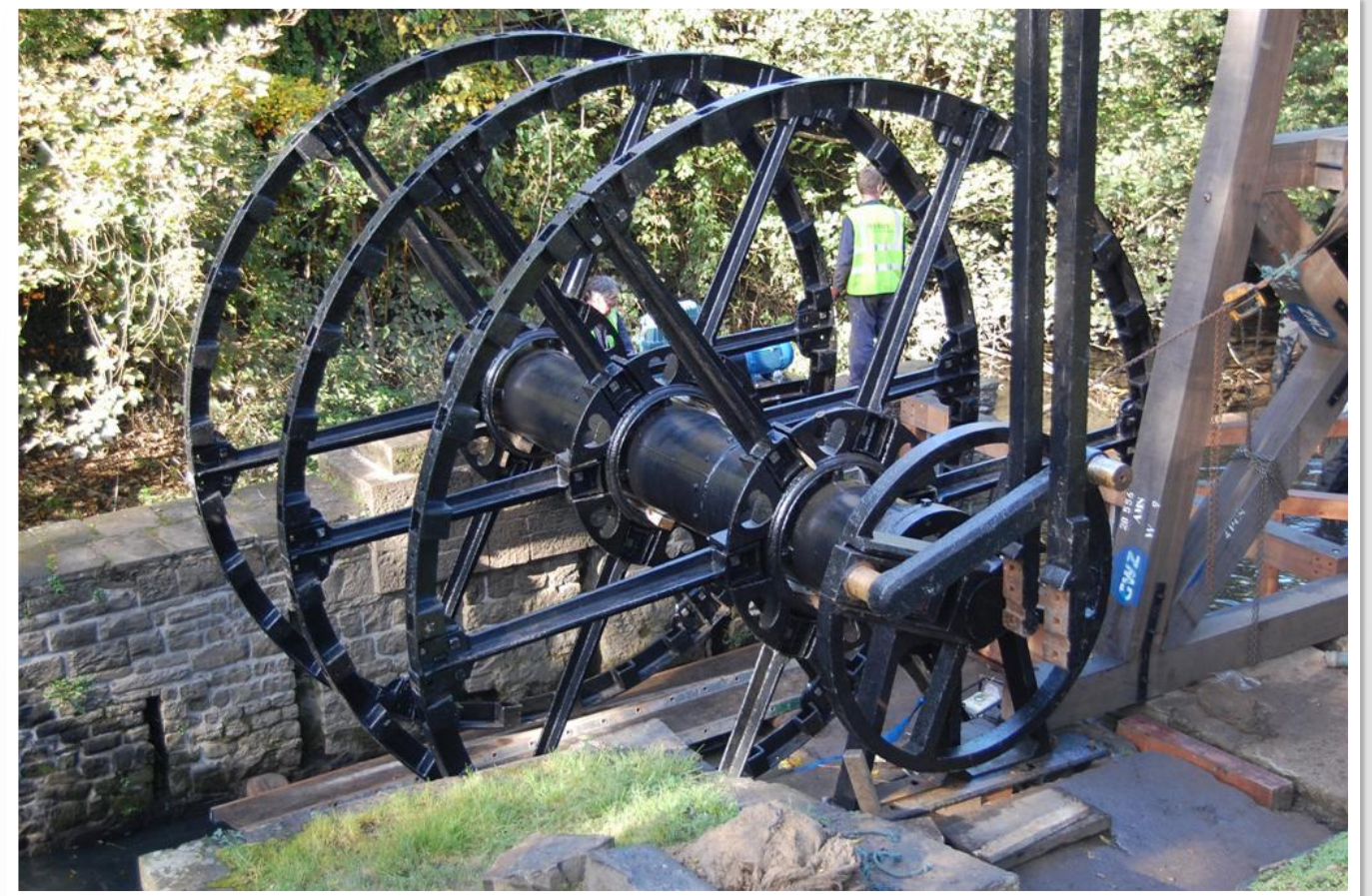


Fig 59 19/10/2010 Wheel metalwork fully assembled.



Fig 60 21/10/2010 Elm Blade Brackets being attached to the Wheel Rims.



Fig 61 04/11/2010 Enlarged detail of new phosphor-bronze bearings to Crank arms / Connection Rod. Note lubrication point (square bronze "nipple").



Fig 62 02/07/2011 Lubrication access points mounted on A-frame for safe lubrication of Rocker Beam bearings saddles.



Fig 63 02/06/2011 Lubrication access point to upper Connection Rod bearings. Lower bearing lubrication point on reverse face.



Fig 64 21/10/2010 View from the Wheel Pit showing alignment of Filter Screens. Infill bar and mesh not fitted.



Fig 65 02/06/2011 Completed Filter Screens in position across Head-race.



Fig 66 02/06/2011 View showing new galvanised mild steel access walkway fixed to replacement Sluice Gate frame. Sluice Gate lifting mechanism also shown, one for each Gate.



Fig 67 02/06/2011 Walkway support steelwork fixed to Sluice Gate frame and masonry wall.



Fig 68 02/06/2011 Detail of lifting mechanism and pedestal.



Fig 69 02/06/2011 View showing lifting Sluice Gate mechanism details below access walkway.



Fig 70 02/06/2011 View of completed motor frame showing position of Cintec anchors to bedrock (below isolator switch). Safety cover to chain drive shown.



Fig 71 02/06/2011 View of the replacement timber Launder.



Fig 72 02/06/2011 Cast lead Counterbalance weight set within and on top of the original Valve Frames and Pump cylinders.



Fig 73 12/04/2011 Restored Water Wheel and Pump being turned by electric power for the first time following final balancing and adjustments.



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