

CASE STUDY

From 1935 to 2026: How 3D Printing Revived an “Unfixable” Heritage Asset



MAWDSLEYS



CIRENCESTER
OPEN AIR
SWIMMING POOL



MAWDSLEYS
- PUMP SERVICES -

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The Cirencester Open Swimming Pool is far more than a local amenity; it is a piece of living history. Opened in 1870, the pool is a community-run charity that has served the Cotswolds for over 150 years. Today, it remains a bustling summer destination, welcoming up to 500 visitors a day and 1,500 swimmers per week during its peak season from April to September.

Introduction

For Plant Operator and Mechanical Engineers Andy Sworn and Marcus Williams, these machines represent a standard of quality that is increasingly rare. His philosophy is one of sustainability and respect for legacy craftsmanship. The heart of the pool’s circulation—a Bell Brothers filter system and its accompanying pump and motor—dates back to 1935. In an era of throwaway plastic components that often fail within five years, the pool team’s goal was clear: preserve this 90-year-old industrial workhorse to ensure the charity can continue to provide for the community for another 20 years.



The Challenge

The 1935 split-case pump and motor were facing the inevitable toll of nine decades of service. The facility faced several critical obstacles:

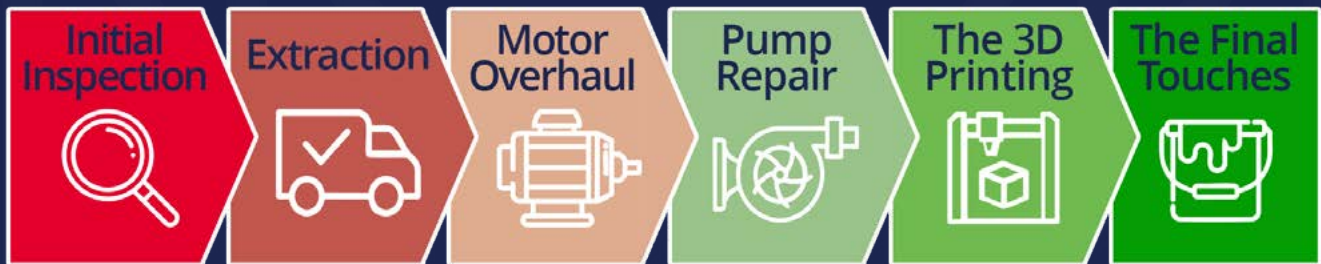
- **Critical Vulnerability:** The pool operates with a single circulating pump. There is no backup. If the pump fails during the five-month season, the pool is forced to shut down immediately, resulting in a total loss of community service and vital charity income.
- **Symptomatic Failure:** The system was pulling air through blown seals, and the motor was frequently tripping out upon startup, suggesting deep-seated electrical faults.
- **Obsolete Engineering:** All fasteners and components were based on old-style imperial sizing. Finding off-the-shelf parts for 1930s Bell Brothers equipment is a mechanical impossibility.



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The Solution

After doing his diligent research online, the pool’s team came across our website. His team chose us because of our multi-disciplinary expertise. With a long history of motor engineering excellence and, at the same time, pump specialist services, we offer a seamless total solution that few competitors can match.



Initial Inspection

The project began with a comprehensive on-site consultation to bridge the gap between the 1930s installation and modern requirements. Our engineers conducted a thorough physical assessment of the Bell Brothers system, identifying not just the failing seals and electrical trips, but the complexities of the surrounding imperial-sized pipework and infrastructure.

This initial phase was crucial for providing a phased, transparent quotation that balanced fixed costs with the variable nature of stripping down such rare, heritage machinery.

Extraction

Mawdsleys Pump Services engineers navigated the complexities of 90-year-old imperial bolts—some so seized they required heat treatment to remove—to safely extract the massive split-case pump and motor. Once retrieved, the equipment was transported to our specialised workshop.

Inside the workshop, Mawdsleys BER’s motor specialists performed a complete overhaul.

The Motor Overhaul

Upon dismantling, the windings were found to be unserviceable. Our specialists performed a full stator rewind, followed by a steam and stove process to ensure insulation integrity. We replaced the bearings with high-performance RMS10 and MRJ1 3/8 rollers and dynamically ran the motor to ensure it met modern performance standards.





The Pump Repair

The split-case pump was stripped to the drive shaft. We reclaimed both pack gland seatings and balanced the drive shaft assembly to eliminate vibration. To ensure a perfect seal, we utilised a specialised graphite-rope pack gland and custom-cut 0.5 statite paper gaskets.

The 3D-Printing Breakthrough

The most significant hurdle was the failed lantern rings and worn impeller neck rings. With no replacements available globally, Toby, a Mawdsleys BER engineer, took a modern approach to this vintage problem. Toby hand-measured the worn components and used 3D-printing to manufacture bespoke replacements from high-grade nylon. It deforms slightly under pressure, making it excellent for sealing while providing low resistance due to its naturally lubricious properties.

By insourcing the manufacturing via 3D printing, we eliminated external lead times and provided a custom-engineered solution that was literally made to measure for the 1935 housing.



The Finishing Touch

After mechanical checks on all journals and housings confirmed they were within tolerance, both units received a professionally re-sprayed in our signature protective finish, returning them to the site in better-than-new condition.

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The Results

The project culminated in the return of the equipment by the Pump Services team. The reinstallation was so precise that the original shims were no longer necessary; the pump and motor aligned perfectly with the pedestal on the first attempt.

- **Zero Downtime:** By acting rapidly and manufacturing our own parts, we prevented a total pool closure.
- **Better-Than-New Performance:** The motor now draws a steady 3.57A, well within its limits, and the 3D-printed nylon parts provide a seal superior to the original 1950s-era components.
- **Sustainability:** We saved a high-quality heritage asset from the scrap heap, satisfying the client's desire to avoid disposable modern alternatives.
- **Cost Efficiency:** The client received a bespoke, modernised pump system for a fraction of the cost of re-piping the plant room for a new unit.

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Knowing you have the expertise in-house to handle the whole service—from removal and stripping down to refurbishing and reinstallation—gave us total confidence. It is impressive to see this 90-year-old equipment working so well; having it fully refurbished and tested gives us the peace of mind we need for the season ahead.

Andy Sworn

Plant Operator, Cirencester Open Air Swimming Pool



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Reliable, Rapid, Informative



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