

Linton Falls Pumping Station

considerate construction in Yorkshire Dales

by Simon Bowes MEng (Hons), CEng, MICE

Located within the picturesque south east corner of the Yorkshire Dales National park, 10 miles north of Skipton, Linton Falls Pumping Station, constructed in the 1930s on the bank of the River Wharfe, some 155m upstream from the 12th century Grade 11 listed church of St Michael's and All Angels, suffered a number of operational difficulties in recent years. These difficulties were due to under capacity of both the pumps and storage within the wet well, together with a degradation in the structure of the pumping main and increased mechanical failure of the pumps. After addressing all these issues December 2004 saw the completion of Yorkshire Water Services (YWS) new Linton Falls Pumping Station in a scheme costing £372, 000.



Linton Falls PS: Photo show reinstated car park and pumping station kiosk hidden by stone wall

courtesy MMB & Yorkshire Water

The station receives combined sewerage from the rural villages of Threshfield and Linton, equating to a population of approximately (1300 people) and pumped across the river to feed into the sewer network upstream of Grassington Wastewater Treatment Works (WwTW).

There was a growing business risk to YWS from the frequent unscreened storm and emergency spills to the river (due to the increase in flows from the catchment and poor mechanical reliability of the pumps) and a significant business risk of a major pollution incident from failure of the pumping main beneath the river.

In 2003, to address these issues, YWS raised a scheme with Mott MacDonald Bentley (MMB), the joint venture company appointed to deliver YWS's capital schemes in AMP3 as the Wastewater Capital Solutions Partner for the north operational area. The brief of this feasibility, design and construction project was, to replace the existing pumping station with a new facility that would:

- * **establish a new pumped connection to Grassington sewer network;**
- * **provide capacity to transfer flows up to Formula A (23 l/s);**
- * **provide overflow screening equivalent to 6mm in two directions.**

Constraints & challenges

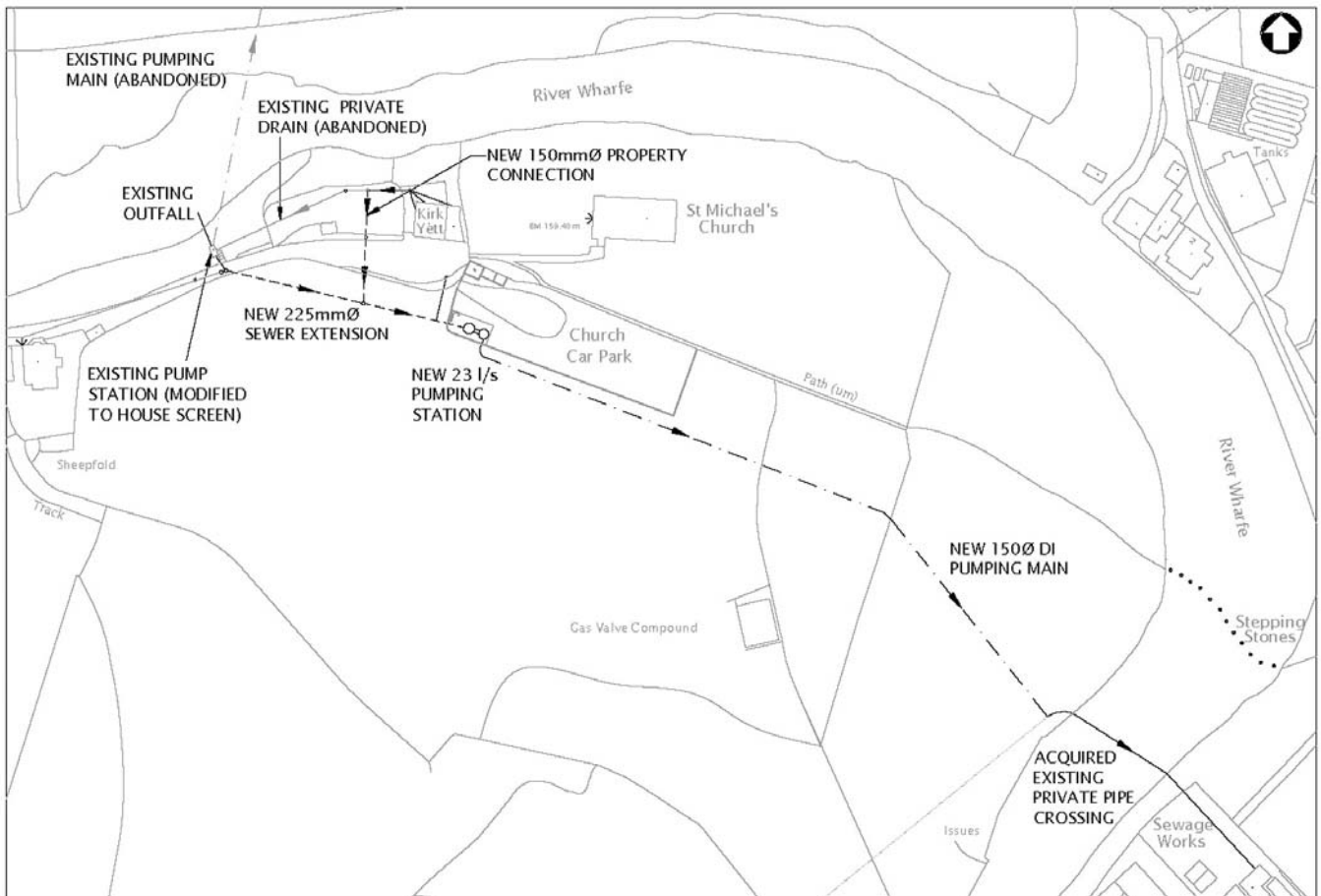
Located within a highly popular area of the Yorkshire Dales National Park, adjacent to the River Wharfe and neighbouring land owned by the Church, there were a number of environmental and aesthetic challenges and issues which had to be addressed as part of the initial feasibility study to ensure the overall success of the project.

It became clear early on in the investigation that the poor condition and low hydraulic capacity of the existing pumping main across the River Wharfe would necessitate an alternative means of transferring flows to Grassington WwTW. Construction of a new river pipe crossing however would incur significant safety and environment risks.

Furthermore, the wet well capacity of the existing pumping station was found to be insufficient to accommodate the increase in flows from growth in the catchment since construction in the late 1930s. Positioned on the bank of the river, the scope to extend or replace the asset in this location was severely limited and could introduce further environmental and safety risks during the construction phase.



courtesy MMB & Yorkshire Water



courtesy MMB & Yorkshire Water

Considering construction of an alternative replacement asset, any new above ground development would be subject to planning approval due to the Yorkshire Dales National Park location.

To ensure any new development would be within keeping with the surroundings, a potentially lengthy planning approval period could be incurred.

Acceptance by local residents and stakeholders could also impact on the success of any proposal selected during the feasibility study. With the Grade 11 listed, 12th century church just some 155m from the existing pumping station, any development would need to be sympathetic not only to the landscape in this area but also take into consideration the impact of construction for visitors and parishioners.

Developed solution

The feasibility study investigated and assessed a number of solutions. During the investigation, the presence of an existing privately owned river pipe crossing some 470m further downstream of the existing pumping station was discovered. This pipe fed directly into Grassington WwTW and was found to have spare capacity.

Mitigating the environmental and safety risks associated with working in the watercourse, the Core Team of Project Leader and Programme Manager from MMB and representatives of Operations and Solutions Delivery from Yorkshire Water agreed to the solution illustrated below.

The construction phase, undertaken by J.N . Bentley Ltd, started on site on 19th April 2004 and lasted a total of 30 weeks.

Considerate construction

To ensure the success of the project in such an aesthetically sensitive area, a number of key stakeholder relationships were developed prior to starting construction.

Early liaison with the Yorkshire Dales National Park identified the restrictions that the proposed development would need to adhere to. As such, relatively minor changes to the proposals (such as control kiosk and handrail colour) were made to ensure planning permission was achieved without delay.

Moving an operational asset closer to the church and residential properties could have a detrimental impact on noise levels at these locations. To ensure that the proposed scheme did not adversely affect these customers, *Acoustic Associates* were commissioned to undertake an acoustic survey to prove that the background noise levels at the properties would not be impacted.

With the site compound and routes of gravity and pumped sewers in grazing land owned by the Church and let to a local farmer, early consultation identified special requirements for the reinstatement to ensure the terms of the farmer's Stewardship Scheme were not breached. Also by consulting with the farmer over the proposed

route of the sewers, existing gaps in the dry stone walls were selected as crossing points. Such an agreement avoided the need to dismantle existing walls and gave added value to the farmer by rebuilding the wall on completion.

With the majority of construction work planned in, or adjacent to land owned by the Church, their buy-in to the scheme proposals was fundamental in delivering the scheme to programme for YWS. Consulting with the Church's Land Agent from the outset, an



St Michaels and All Saints Church

courtesy MMB & Yorkshire Water

understanding of their potential concerns could be gained. The main issue for the Church was the level of craftsmanship that would be employed during the reinstatement. Employing locally sourced labour, the dry stone walls (dismantled to facilitate construction) were rebuilt to an extremely high standard. Furthermore, the previously uneven stoned car parking surface was levelled and resurfaced on completion of the scheme, with additional parking provided with the use of a plastic grass block system, resulting in a visually pleasing finish with enhanced practicality for the Church.

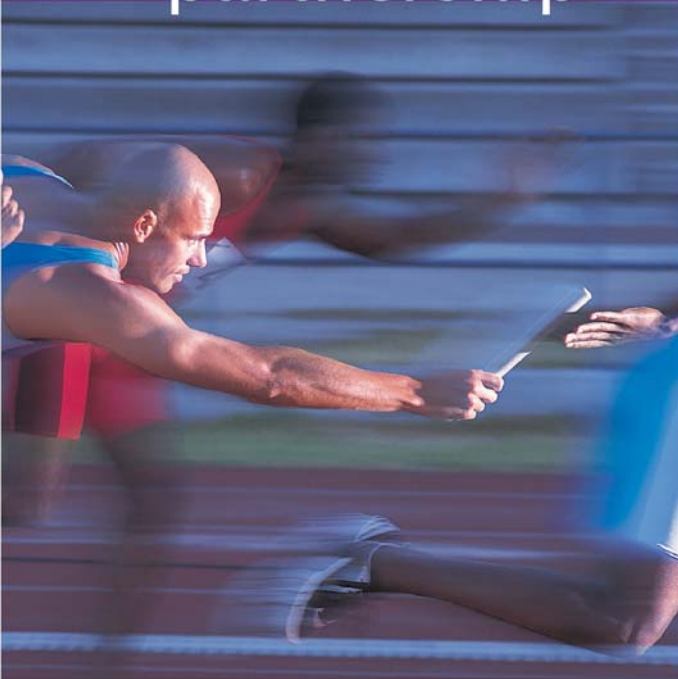
Conduct on site during construction was also extremely important. With a number of popular walks running past the site and high levels of tourists making special visits to the locally important church, the site was highly visible.

Being so close to the church special arrangements were also agreed for key services such as weddings and funerals. For such occasions, work was suspended on site leading up to, during and after a service in respect for the congregation. From comments in letters received during the construction phase such as "We must thank you and your team for their great consideration" and "The appreciation for the quiet during yesterdays funeral was greatly appreciated by the family and many of those who attended the service", this considerate behaviour by the team on site was greatly appreciated by local residents.

The success in delivering this high profile scheme to meet YWS objectives is undoubtedly due to engaging with the key external stakeholders at the earliest opportunity and developing and maintaining these relationships throughout the feasibility, design, construction and take-over phases of the project. MMB have produced a scheme, which not only meets the needs of YWS, but also delivers additional value to those impacted stakeholders and the wider community. ■

Note: *Yorkshire Water Solutions Manager for the scheme was Paul Almond; MMB's Project Delivery Manager, Mike Birtles, supervised the construction and the author of this article, Simon Bowes was Project Leader for the scheme. Yorkshire Water & MMB would like to thank all the customers and stakeholders for their cooperation and support in the delivery of this scheme.*

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