

Ashton under Lyne WwTW

collaborative team effort delivers all round success

by
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Ashton under Lyne Wastewater Treatment Works is situated to the east of Manchester and serves a population equivalent of 46,000. It discharges to the River Tame and forms part of a suite of projects that have been strategically developed to deliver an integrated solution for the catchment as a whole.



Ashton WwTW activated sludge plant and final settlement tanks

courtesy of KMI+

The initial challenge was to address spills from unsatisfactory sewer overflows across the catchment. A traditional approach addressing each site separately would have led to 29,000m³ of storage being constructed at 5 locations across the area, some of which were in congested urban sites. MWH developed an integrated catchment model that allowed an alternative solution to be developed. This led to an increase in the flow to full treatment at the works from 31ML/d to 45 ML/d, and the provision of 8,300m³ of additional storm storage. However this removed the need for any storage elsewhere in the catchment other than at nearby Hyde WwTW, and realised an overall reduction in storage volume of 9,000m³. In addition, a tightening of the final effluent standard was required, with the maximum ammonia concentration decreasing from 10mg/l to 3mg/l.

The project to upgrade the works was undertaken under the auspices of the United Utilities AMP4 Integrated Alliance, a collaboration of United Utilities (Client), MWH Ltd (Solution design) and KMI+ (Construction), supported by GHA Livigunn who provided detailed design services.

The works itself is located in a site bounded by the River Tame on two sides, with a railway to the north and the Peak Forest Canal to the

east atop an embankment some 6m above the ground level of the site. The site was also home to a small colony of great crested newts, which presented particular challenges to the overall schedule for the project.

The scope of the solution involved the construction of a completely new wastewater treatment works facility alongside the existing works, incorporating:

- New inlet overflow, inlet screens and detritor;
- 4 new 19m diameter primary settlement tanks;
- 520 l/sec inter-stage pumping station;
- 3 lane 40m x 40m activated sludge plant (fine bubble diffused aeration);
- 4 new 26m diameter final settlement tanks;
- Conversion of existing redundant tanks to provide 3 (No.) 700m³ additional storm tank capacity;
- New 4,600m³ off line inlet overflow detention tank.

It was apparent at the outset that the large extent of the project scope, coupled with the constraints associated with the great crested newts presented very significant challenges in achieving the project target

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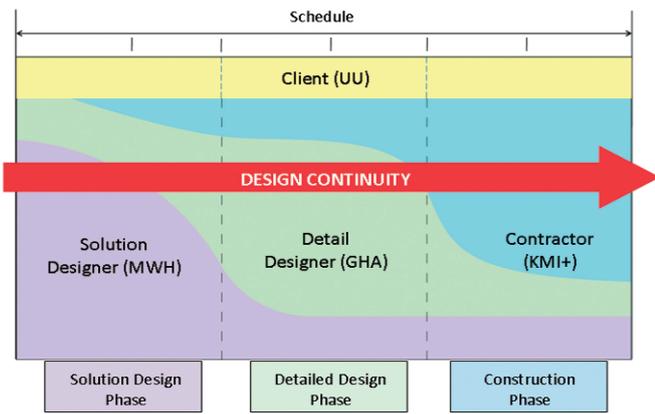


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Collaboration throughout project life leads to design continuity

courtesy of MWH Ltd

completion date of March 2010. A new approach was needed, and this took the form of splitting the design into several packages, which enabled detailed design and construction work to commence before the overall design was completed. The strategy enabled construction work to start on site almost a year ahead of the original schedule, and meant that the plant was put into use 8 months ahead of the regulatory target date.

This approach required very close collaboration between all partners in the alliance. A series of weekly design meetings including all the project partners was commenced in 2006 and continued throughout its duration. This earlier involvement of GHA Livgunn and KMI+ team members in the solution design phase, and the subsequent ongoing involvement of MWH during the detailed design and

construction phases, led to an integrated team which ensured continuity of design and also realised over £2.1million of savings for the project through innovative design solutions.

During the solution design phase, the team sought to challenge the asset standards and looked for new ways of designing the process units needed for the site. One example in particular concerned the design of the sludge processing equipment. The existing United Utilities asset standard for a project of this size called for Gravity Belt thickeners housed in a building of suitable size. The team identified the possibility of adopting an alternative approach using drum thickeners which had a smaller footprint and would not require a building. Following a successful visit to see similar plant already in use in the Thames Water region, buy in was secured from United Utilities operations staff and the initiative was adopted.

Efforts were also made to identify savings during the detailed design phase, and nowhere is this better illustrated than in the innovative design of the walls for the Activated Sludge Plant. Situated above ground and with 7m high walls, a conventional in-situ reinforced concrete wall would have been in the order of 700mm thick. However the team developed an alternative utilising stainless steel tie bars at high level, and this tied cantilever design led to a 350mm thick wall, which realised savings of 825 m³ of concrete and 110 tonnes of steel reinforcement.

As has been mentioned previously, the site was home to a small colony of great crested newts. Usually the presence of these amphibians is considered a costly challenge for a project team, yet in this instance they actually gave rise to a money (and carbon) saving opportunity. As part of the project, a compensatory newt habitat was constructed on a piece of land adjacent to the treatment works. This



The activated sludge plant features slender walls with stainless steel tie bars

courtesy of KMI+



Final settlement tank under construction

courtesy of KMI+

utilised surplus excavated material from the site which would ordinarily have been disposed of off site at considerable expense. However in constructing “Newt World” as it became known to the site team, 5,700 off site vehicle movements were avoided, realising a saving of 700 tonnes of CO₂ emissions and nearly £1 million in material disposal costs and landfill charges.

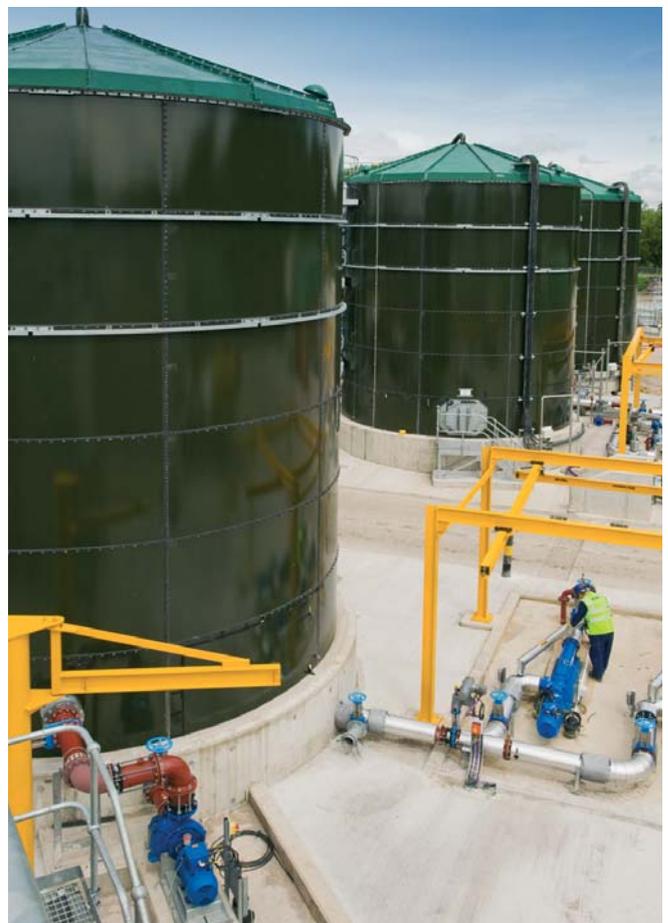
The health and safety record of the project was first rate. A culture of proactive involvement in health and safety issues at all levels from the construction team, supported by the efforts of the design teams led to there being no lost time RIDDOR accidents during the entire project life, with over 480,000 man-hours being worked in the construction effort.

Ashton under Lyne Wastewater Treatment Works has been one of the major highlights of the United Utilities AMP4 capital investment programme. The project was delivered ahead of schedule, with significant cost savings, and with an exemplary health and safety record. In achieving this, the quality of construction work was not compromised, with the team receiving extremely positive feedback from the client. Garry Edwardson, United Utilities Process Operations Director commented...

“I was really impressed with the site and the fact that the relationships between everyone involved had worked so well in delivering a first class outcome.”

Time, cost, quality, health and safety achievements aside, it was down to the outstanding collaboration between United Utilities, MWH, KMI+ and GHA Livgunn at all levels throughout the project that have made it the great success it is.

Note: The Editor and Publishers thank Andy Timms, Design Manager with MWH Ltd, for preparing the above article. ■



Completed sludge tanks

courtesy of KMI+