

Hyndburn WwTW

£12m quality & maintenance improvements

Hyndburn WwTW receives crude sewage via the Calder Valley, Hyndburn Valley and the Huncoat Sewers and serves an estimated population of 114,000 in the Great Harwood area of Blackburn, Lancashire. Effluent from the Hyndburn works discharges into the River Calder after treatment via inlet works screens, primary settlement, aeration and final settlement. As part of the River Quality Objectives, the Environment Agency require that the works achieve an improved effluent standard by 31st December 2004.



Hyndburn WwTW Quality & maintenance improvements

courtesy: HMB Alliance

Quality improvements

The main process improvements are to ensure that the works can accept a flow to final treatment of 150MI/day with a total return activated sludge of 90MI/day. Additionally, the inlet works screens area should be able to cope with 500MI/day maximum flow into the works.

The £12m scheme is part of United Utilities AMP3 Quality Improvements, developed by Montgomery Watson Harza and constructed by HMB Alliance as part of the Northern Area Framework.

Process

The process improvements required to comply with revised discharge consents are:

- * construction of a new inlet works structure to house two new screening channels with 6mm escalator type screens and associated penstocks;
- * one new emergency screen by-pass channel;
- * new 10.0m diameter grit detritor with associated channels and main structure;
- * new storm channel adjacent to existing storm channel. including new electromagnetic flow recorder in new storm channel;
- * addition of anoxic zones at the head of existing aeration

lanes and conversion of existing Halifax system from re-circulation mode to eight flow straight through lanes in the existing four tanks;

- * new return Activated Sludge Main incorporating flow measurement from existing RAS pumping station to new distribution chamber. New distribution chamber to split RAS equally between four anoxic zones;
- * dosing plant to enable ferric dosing upstream of primary settlement tanks and into activated sludge plant, including main storage tanks;
- * two new additional 35m diameter final settlement tanks with full bridge scrapers.

In addition to enhancing the process performance of existing works, the scheme also requires the following 30 year old assets to be replaced or refurbished:-

- * Calder Valley, screw pumping station mechanical refurbishment;
- * new dedicated washwater supply to new screens, including new wet well; required as a result of increased number of screens at the inlet works screening plant;
- * modifications to the existing inlet works area including, replacement of four existing screen plates with high efficiency units, extension of conveyor, extension of access platforms and new hardstanding area;



courtesy: HMB Alliance

- * new actuators for inlet and outlet penstocks to existing detritors; new actuated inlet & outlet penstocks to new detritor;
- * modifications to existing FTFT channel, including narrowing flume within channel, modifying actuated FTFT control penstock and storm overflow weir height;
- * auto emptying of the top water only of storm tanks, with new control panel on gallery. Fourth storm tank – each of three existing (blind) sludge hoppers to have sludge removal pumps and pipework;
- * install new surface aeration system comprising 80 new surface aerators supported by 20 support frames. Electrical supply and control equipment housed within existing aeration control building;
- * sludge processing upgrade; to include one new centrifuge, polymer pipework modifications, PC type sludge feed pump, one additional 'Big Bag' unit for polymer dosing and four new additional dosing pumps, piping and valves; three blowers to vent existing sludge liquors return pipework;
- * telemetry upgrade;
- * site works, including site lighting, extension of site access roads, modifications to access road off highway, access platforms, access steps, ladders & site lighting.

The team

HMB Alliance, consisting of *Volker Stevin* (formerly Harbour & General), *Morgan-EST*, and *Barhale* are responsible for the detailed design and construction activities for this job in the larger Northern Area Framework for United Utilities, which runs from the Ribble Valley Basin to the Borders of Scotland.

United Utilities have adopted the ECC Option C Target Cost as the contract form to deliver this contract. The projects are administered by *Montgomery Watson Harza*.

Construction

The contract construction period of 90 weeks is, unusually, split into a series of sectional completions, rather than a series of constraints. The sludge processing and ferric dosing systems were to be complete by week 40 (3rd September 2003), final settlement tanks and new RAS system by week 48 (29th October 2003), the ASP reconfiguration by week 86 (21st July 2004) and the whole of the works by week 90 (18th August 2004). Each sectional

completion attracts a percentage of the liquidated damages for the contract, which are set at £1800/day.

The sludge processing upgrade was put into operation in early October 2003 after additional refurbishment works to the existing centrifuges was undertaken. The ferric dosing system was completely redesigned to achieve superior operability and reduce future maintenance costs.

The first final settlement tank commenced processing liquors in November 2003. The second final settlement tank became operational in early December after problems with the existing infrastructure were resolved.

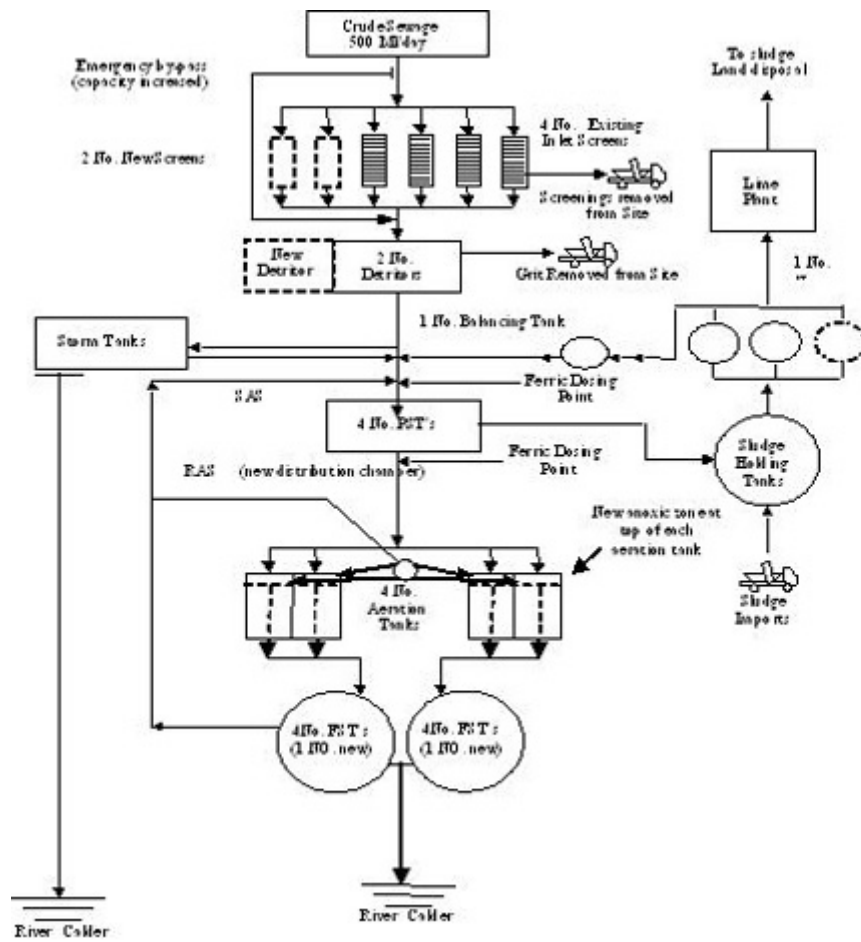
Early in the contract *HMB, MWH and UU* agreed on a method for undertaking the refurbishment of the aeration plant which represented a £200k saving by avoiding the construction of various temporary channel works. As the works progressed it also became increasingly apparent that the existing process system was not sufficiently robust to allow aeration lane refurbishment works to be undertaken without additional treatment measures. At a brainstorming session in early November, the team elected to install additional temporary aeration in three of the existing lanes, complete with automated control, before any contract works could proceed.

The first aeration lane was drained down in February 2004. Duration for each change over has increased from 9 weeks per lane to 12 weeks per lane to allow for strict testing to ensure the system will function correctly before the next phase commences.

HMB, MWH and UU are now committed to meeting the consent date of 19th December 2004 and the whole team has set this date as their target.

Throughout this contract, the team has been beset by problems, consent and process issues and approximately £2m worth of additional works that have tested their mettle to the utmost. The team still hopes to achieve handover of the majority of the works by week 90, the original completion date and remain committed to reducing the delays on the aeration plant. ■

Note: *The Editor & publishers wish to thank HMB Alliance for providing this article for publication.*



Hyndburn: Quality and maintenance improvements

courtesy: HMB Alliance