

Throckley WTW Abandonment Scheme

a sustainable scheme to turn a liability into an asset suitable for redevelopment

by Richard Nixon MEng MICE

Throckley WTW is located within an urban area approximately 8 miles west of Newcastle City Centre. Originally built in the early 1800s, the works received raw water from Whittle Dene Reservoir. The works ceased to operate as a WTW in 2003. It was then used by Northumbrian Water (NW) as office space and a storage facility until 2006 when the site then became disused. After its abandonment the site became a target for trespassers, in part due to easy access offered by damage to the perimeter fence so health and safety was a priority. Consequently, NW was incurring on-going expense providing site security as numerous hazards were still present on the site including deep tanks, falls from height and unsecured abandoned buildings. A feasibility study of the complete abandonment of the works was undertaken, which would retain the site's brownfield status for redevelopment.



Demolition of the existing assets
Courtesy of JN Bentley Ltd



Existing abandoned tank and administration building
Courtesy of JN Bentley Ltd



Abandoned tanks
Courtesy of JN Bentley Ltd



Demolition ensuring architectural masonry was salvaged
Courtesy of JN Bentley Ltd

Scope of works

Throckley WTW was originally a slow sand filter water treatment works fed with raw water from Whittle Dene reservoir via a 42" aqueduct when it first started operating back in the early 1800s.

Over the years the works was upgraded and in the 1950s the current works layout was constructed. This comprised an inlet chamber, two sedimentation tanks, rapid gravity filters and the associated filter gallery and two buried storage reservoirs. The rapid gravity filters and gallery were part of the main fire damaged administration building which also housed much of the electrical and control equipment, welfare facilities and testing labs. Clean and dirty back wash tanks, chemical storage and dosing facilities, a transformer building and the original works pump house were also present on site.

The scope of works was to reinstate security fencing, remove the water from all the old tanks on site, remove all above ground assets and backfill/grade all tanks below ground with site won material to reduce the residual risks associated with the site. The old pump house is a Grade 2 listed building and therefore work to secure the building was undertaken under the conditions of a listed building consent.

The inlet chamber still had a flow passing through; this is the compensation flow from Whittle Dene reservoir and an unknown quantity of field drains. The flow then runs through a bye wash channel which runs along the front of the works. The inlet chamber itself was isolated from flow by being backfilled with mass concrete which permanently diverts incoming raw water into the bye wash channel.

Planning and design

Extensive surveys were initially undertaken to quantify the scope of work required and identify all the health, safety and environmental issues. These surveys included dimensional, topographical, ecological, bat, archaeological, and asbestos testing.

The planning stage included liaison with stakeholders such as the local authority, adjacent primary school, and a specialist demolition contractor to agree a safe methodology to undertake the works that minimised disruption and nuisance to the local community. The site was located in a residential area as well as adjacent to the primary school.

Various consents and permissions were required before work could begin; these included applying for a demolition notice, planning permission to install a new fence line and backfill the tanks as well as listed building consent for the work to the old pump house. Natural England was also consulted due to the proximity of Hadrian's Wall.

Operations

The first stage of the project on site involved replacing the existing damaged fence line to ensure the site's long-term security. The work was discussed with the adjacent primary school and it was agreed it would be best undertaken during the school summer holidays.

The next phase included the removal of approximately 1.5ML of water from the various underground tanks. To develop the most cost effective and safe disposal route JN Bentley worked with NW and the EA to assess the options. It was concluded that the most sustainable disposal method was a controlled discharge into the adjacent foul sewer during periods of dry weather.

Specialist contractors were then brought in to carefully remove all the asbestos which had been identified in the surveys in the administration building.

A demolition contractor then began the dismantling of redundant buildings and structures. All demolition material was stocked piled for reuse. Any material of value, for example steel and architectural masonry, was salvaged and recycled. A crushing and screening plant was brought on to site to break down the demolition waste to produce material suitable for recycling on site. The crushed waste was then laid and compacted to fill the underground tanks and structures to existing ground level. This meant there was no requirement to import backfill material to site.

Techniques and methods were specifically developed to take account of the surrounding land-use and protected structures. Hydraulic grabs were used to minimise demolition noise and extensive water dust suppression was installed.

The final phase included securing and protecting the listed building. Pipework and drainage modifications were also made to provide long-term flooding protection. A detailed site information pack was prepared to inform future use of the site. This included site testing to prove the new nature and condition of the site.

Conclusion

Throckley WTW Abandonment is an excellent example of where, through careful planning and material reuse, the construction works had minimal environmental impact and a piece of redundant industrial land can be turned from a liability into a reusable asset.

During all aspects of planning, design and implementation the JN Bentley team ensured NW's sustainability aspirations for the site were completely fulfilled. The project presented some great opportunities for best practice waste management whilst still providing full environmental protection. All demolition materials and arisings were reused, and the important heritage and architectural features were protected and restored.

The scheme was completed in December 2013. All Northumbrian Water's safety and cost liabilities have been removed from the site, and the site is now significantly more attractive to potential developers.

Northumbrian Water (NW) employed design and build contractor JN Bentley to undertake the abandonment of the Throckley WTW.

The facility's abandonment was one of a number of schemes JN Bentley have undertaken on NW's Abandonment Programme – turning redundant assets into safe, reusable spaces to benefit local communities.

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Tank wall demolition - Courtesy of JN Bentley Ltd



On site recycling of demolition material - Courtesy of JN Bentley Ltd



*Demolition of the old office building on site
Courtesy of JN Bentley Ltd*

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