

Case Study

Heage WTW, Derbyshire

Weholite pumping station prevents wastewater spills to the receiving watercourse



SDS Systems

Weholite Pumping Station.

Client

NMC Nomenca (now Galliford Try).

End Customer

Severn Trent Water.

Project

Heage Pumping Station.

Purpose

To protect the local environment from pollution.

Brief to SDS

To replace an ageing, increasingly unreliable sewage pumping station with a new online scheme.

Timing

2016.

Project Background Information

Heage Pumping Station is situated between the village of Heage and the town of Belper in Derbyshire. The existing pumping station served approx. 330 individuals from the surrounding residential area and comprised of a wet and dry well topped by a brick superstructure and an emergency overflow chamber located within a small compound along with a separate storm well with an overflow to the nearby watercourse. The station offered less than the 2 hours' storage at 3 x dry weather flow (as stipulated by Severn Trent Water's standards) and, when pump failure occurred, the surcharging system resulted in pollution incidents to the watercourse.

Project Objectives

To prevent wastewater spills to the receiving watercourse.

Project Requirements

To increase wet well storage capacity and deliver Severn Trent's AMP target of min 20% efficiency.

SDS Product Features

The solution encapsulates pioneering off-site prefabrication with only final assembly and connections taking place in situ. The new 3.5 metre diameter, 4.5 metre deep, Weholite wet well chamber provides the required pump station storage and was delivered pre-fitted with internal M&E fixings, the precast concrete cover slab complete with pump access covers and the precast valve chamber with valves, including pipework, flowmeters, access ladder and open mesh flooring, assembled entirely off-site. Two new 7.4kW submersible pump units deliver the necessary 6l/s at 34 metre head on a duty/standby basis.

Long term maintenance and future servicing of the pumping station was also at the forefront of its design, achieved through the inclusion of defender covers to provide the safest possible access arrangements, a new 500kg lifting davit system and the provision of an upstream inlet manhole to isolate and divert flows.

Modifications to the existing control panels to include level instrumentation and flowmeter telemetry provide Severn Trent with real-time operational information which is used to monitor and facilitate review of the station's performance.

Issues Overcome

Due to the restricted footprint of the Severn Trent compound and the adjacent area of ecological importance, executing the construction of a standard pump station design was proven to be ineffective and costly. This required designers to think innovatively about the realisation and implementation of this scheme.

Results

The best practice procurement of off-site manufactured components combined with effective project management accelerated the programme by 3 weeks. The shortened period on site also delivered reductions in third party disruption and in accompanying costs.

Factory thinking approaches have led to a safer assembly which reduces the overall Health & Safety and environmental risk from on-site construction, whilst the scheme's QA controlled prefabrication guaranteed consistent products. The 120 year design life of the wet well ensures that all future site work is limited to only maintenance or minor modifications.

A significantly reduced carbon footprint, compared to a traditional concrete pumping station solution, has been achieved as a result of the reduction in the overall construction programme and the use of recycled materials utilised in the manufacture of the wet well. The whole life environmental credentials associated with the scheme's innovative design were further boosted by a reduction in site waste of 70%, all of which was recycled off site, compared to similar previous pumping station schemes with NMC Nomenca.



Shaun Godman, Project Engineer, NMC Nomenca, said: *"The combination of diligent project procurement and planning saw a pioneering excavation, final assembly and installation period of only 11 days. Off-site manufacture and a studious design phase ensured reduced health and safety risks and improved environmental credentials over the construction and future operation of this asset, thus delivering to Severn Trent a highly successful end product."*



Image (l/h) kindly supplied by NMC Nomenca.