

Case Study

Howden Sewage Treatment Works

SDS flood prevention system



Howden Minster and town centre; image kindly supplied by Pocklington Post.

SDS Systems

SDS Weholite Attenuation Tank.

Client

Ward & Burke Construction.

End Customer

Yorkshire Water.

Project

Howden Sewage Treatment Works.

Purpose

To improve water quality and resilience in the existing network.

Brief to SDS

To provide a storm water storage system.

Timing

Construction started in July and is scheduled for completion by the end of 2024.

Project Background Information

This project is part of a £6 million investment by Yorkshire Water in Howden and Howdendyke to enhance the capacity of a nearby wastewater treatment works ahead of a planned expansion of residential properties in the area.

In February 2021, homes and fields across Howden became waterlogged with surface water and foul waste, the problem chiefly a consequence of the inability of several pumping stations to deal with the volume of foul and surface water discharged to them from the entirety of the town of Howden and its population of around 5,000.

Two sources of water enter the pumping stations, one from the older established parts of Howden, from which a combined sewer pipe system takes all of the household wastewater and surface water, and the other household wastewater only from more recently developed areas. Particularly during heavier rainfall events a lack of storage capacity overwhelms and shuts down the pumps; the foul water starts to back up the pipes, which are already full, eventually filling inspection chambers in gardens and toilets in houses at the head of the system.

Howden is set to undergo major expansion that will effectively double its size and includes a new factory building for Howden's Joinery, a school, supermarket, community, medical and sports facilities and circa 2,000 planned new residential properties. A new relief road, beneath the M62 motorway close by, is already under construction and due for completion in 2027.

Project Objectives

To ensure the town, in both its current and planned future states, is safeguarded against the risk of flooding.

Project Requirements

To enhance the capacity, and increase the resilience, of the town's current flood prevention infrastructure before the drainage network is developed further to accommodate the planned future expansion of the town.

SDS Product Features

A 4,000m³ capacity, 8 leg stormwater storage tank, comprising of 889 metres of 2,500mm diameter pipes and including 74 welded joints, has been installed complete with 16 access shafts and dry weather flow channels. The tank will connect to Howden Wastewater Treatment Works at Howdendyke, which will be served by a new 1.9 mile (3km) long rising water main, directionally drilled underneath the M62, from Howden Broad Lane Sewage Pumping Station.

This is the first occasion on which a Weholite tank has been installed in conjunction with the unique 'Platipus' Percussion Driven Earth Anchor (PDEA®) system, an environmentally friendly, corrosion resistant and highly efficient pipeline security solution that counteracts ground movement and pipeline buoyancy. With a 60 year design life the system provides significant time and cost savings compared to more traditional concrete anchor blocks.

Issues Overcome

Growth in the size of the catchment required that the wastewater treatment assets must be designed and sized in accordance with 'Enhancement Case' regulations to achieve a minimum performance requirement in alignment with the Environmental Discharge Permit for each site.

For all of the sites within this Enhancement Case (with the exception of Heronby STW) flows were forecast to exceed permitted Dry Water Flow ('DWF') rates. As a result, an increased or new DWF permit was required which in turn led to increased Flow To Full Treatment ('FFT') and reduced other permit parameters.

The permit changes meant that the water management systems put in place ensured that each site complies with current permit requirements but further investment will be required to ensure future compliance as the local population continues to grow and impose further demands on infrastructure.

Results

Research undertaken by Yorkshire Water into customer priorities revealed that customers see the potential impact of failure to invest and ensure sewer treatment works can cope with increase in growth as of significant priority. Water quality across rivers, streams and the sea is a top six priority area indicated by household and non-household customers. Furthermore, not meeting targets on pollution was considered 'inexcusable' and that the areas customers would most like Yorkshire Water to focus on were reducing pollution and leakage.

Sarah Albone, Project Manager, Yorkshire Water, said:

"This significant project will provide increased capacity to the existing network and is an important part of our commitment to environmental performance and improving river quality. This first phase of works sets a solid foundation for phase two, ensuring the correct infrastructure is already in place to enable Yorkshire Water to prepare for the expansion working alongside the large-scale development plan."

