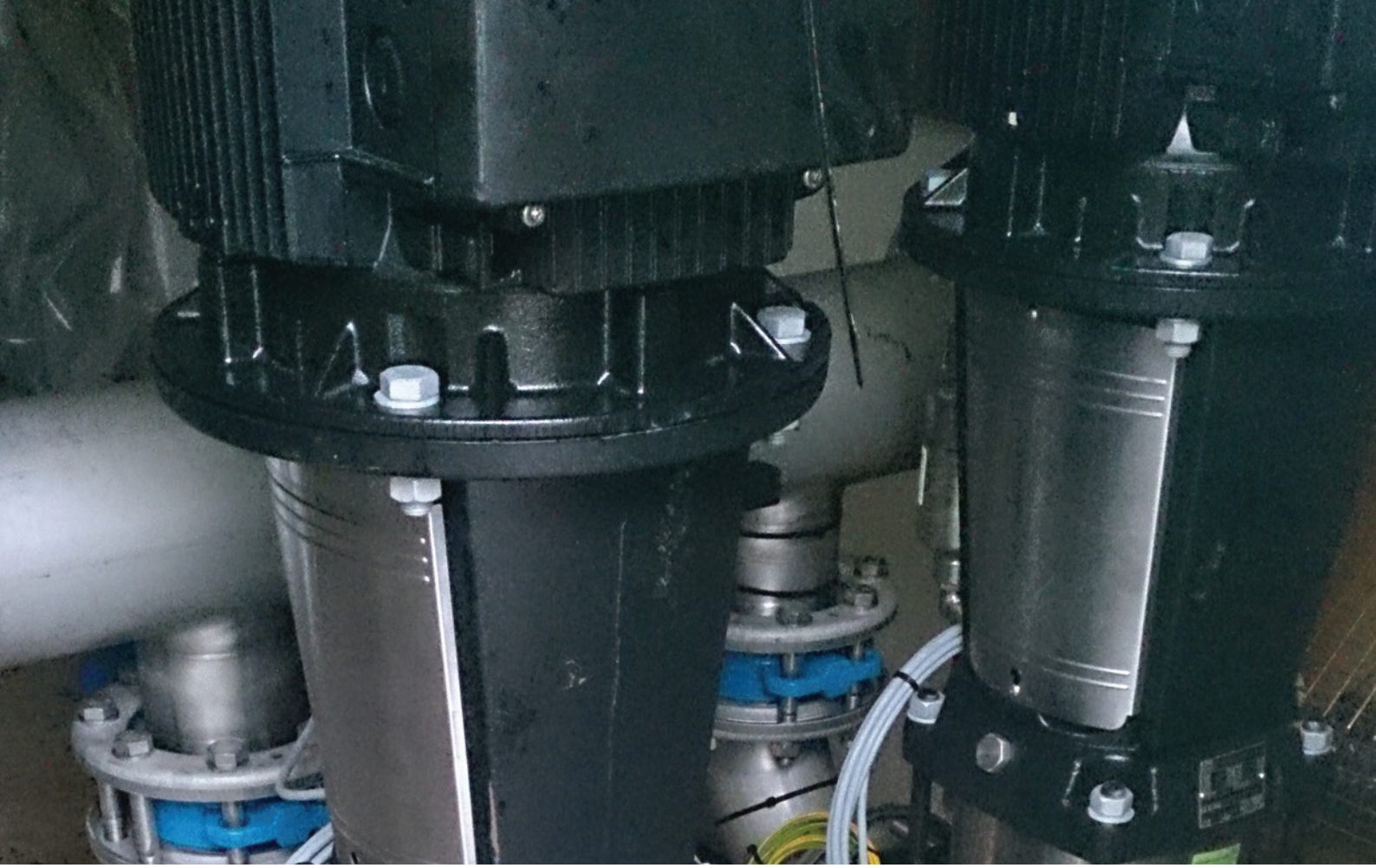

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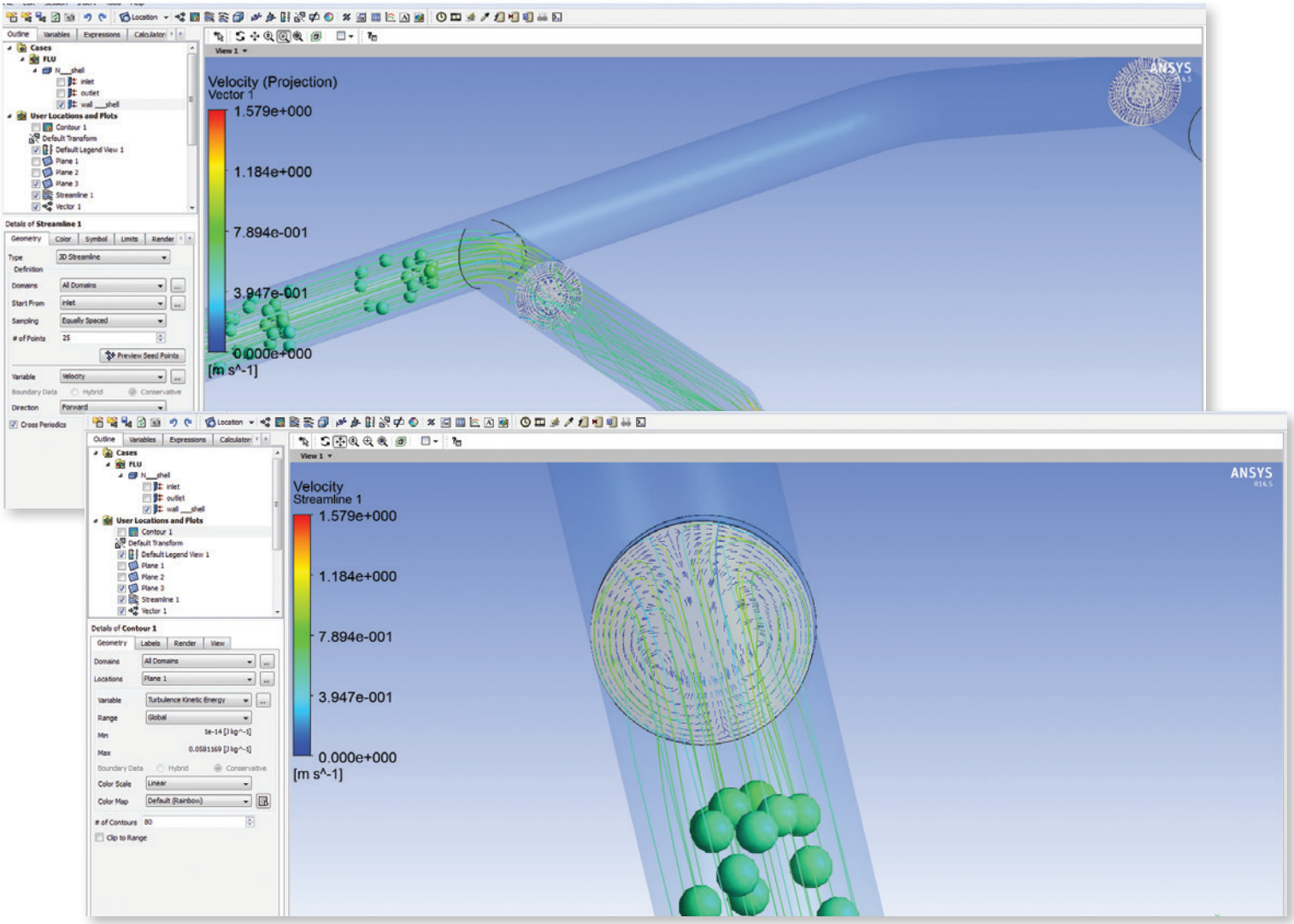
Providing water engineering services to the water industry and commercial organisations



227 Environmental

A wealth of experience in the water industry

Established ten years ago, 227 Environmental provides water engineering services to the water industry, engineering contractors and commercial organisations.

With a track record of delivering a fast and flexible response to requirements of all customers, they can be safe in the knowledge that a response to requests will come within a few days at the most.

The services and consultancy provided can be streamlined, which helps to guarantee this quick response, and this comes either on an individual basis or as a package; the ultimate one-stop solution.

Clients are again assured by the list of accreditations achieved by the Company, which includes ISO9001, MIW, as well as being a Royal Academy of Engineering EDT programme member.

As an Achilles B1 contractor, 227 Environmental offers a wide range of services, with feasibility, design, project management, research and development, and environmental assessments carried out for a range of water industry applications.

A wealth of experience can be drawn upon at the Company, with employees who have worked extensively within the water sector in a variety of technical, managerial, environment engineering and contract management roles.

Water companies at this time in particular will benefit from 227 Environmental's expertise because providing skilled solutions in such areas as metering and advanced hydraulic modelling is a great asset.

With the start of AMP6 imminent, water companies will of course, be looking to make as many savings as possible.

227 Environmental is ideally placed for this, given the success during AMP5 for water companies as a result. One of the Company's significant clients is Severn Trent

Water (STW), who have enjoyed the benefits of a direct working relationship and continue to do so.

STW used the services of 227 Environmental extensively throughout the AMP5 process, and the Company also held contracts with Morgan Sindall, Enterprise, Amey Plc, Mouchel and RPS amongst others.

It resulted in a contract comprising 110km of water mains renewal design, many pumping and booster stations and flow meter replacements undertaken by the Company.

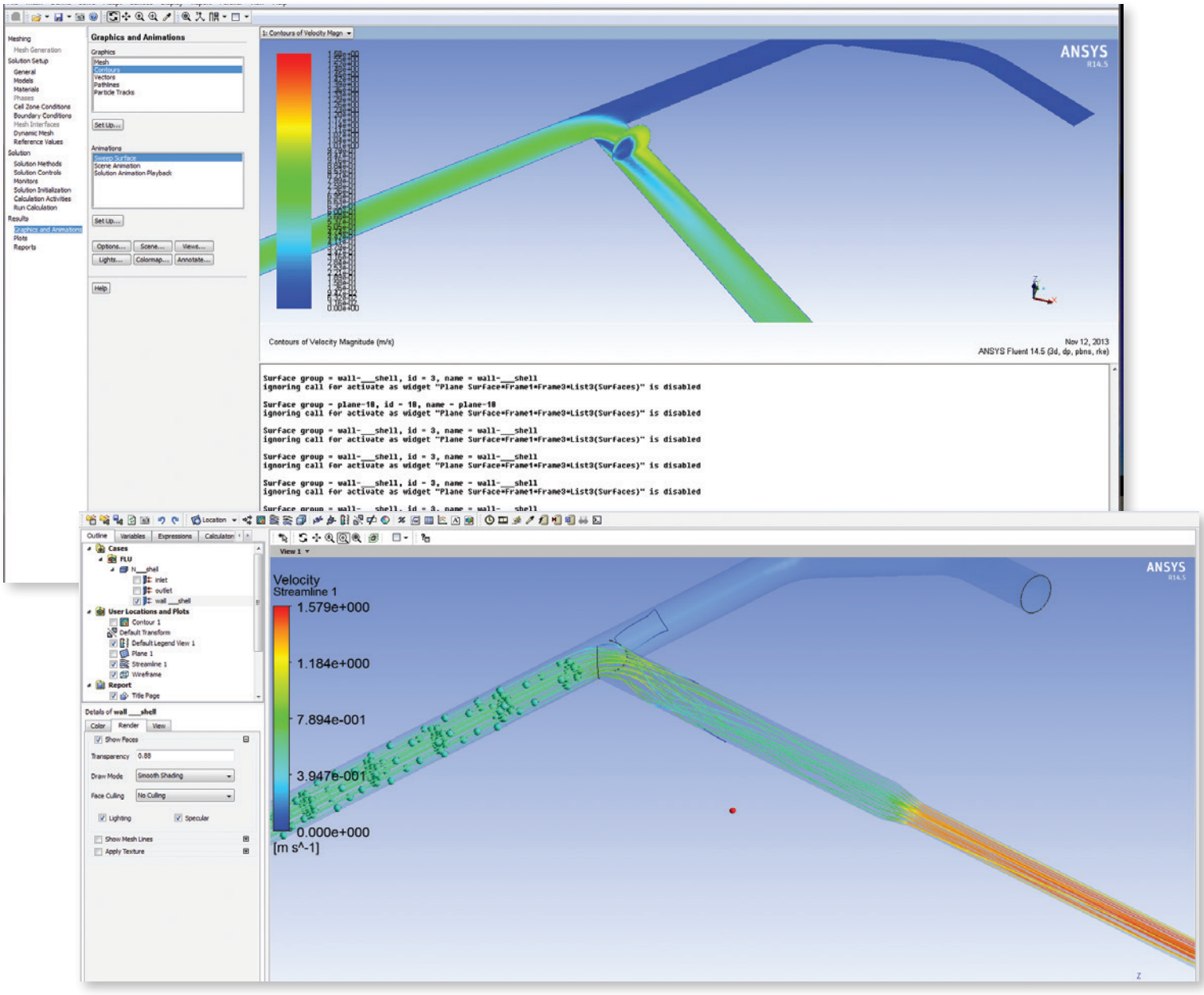
There have also been a variety of sewer projects, specialist kiosk and chamber design, feasibility studies and strategic meter installation contracts.

During AMP5, 227 Environmental undertook network modelling using software including SynerGEE and feasibility and design was carried out for strategic flow metering utilising precise hydraulic analysis.

Projects have included significant capital works renewals and rehabilitation work. This has seen a £2.65M development undertaken for a major framework contractor in the Midlands.

A larger project than this was undertaken for STW and Enterprise. This involved construction management, design implementation, commissioning and project management of 30km of trunk main installation on the Welsh Borders.

The cost was £16.5M, which is slightly more than another development in the Company's portfolio - a £12M project for the design and planning of 100km of water mains cleaning.



227 Environmental is moving into the AMP6 programme by using BIM and detailed 3D designing

BIM is becoming more and more prominent, with 2016 the target for the achievement of Level 2 BIM.

Encouraging collaboration, the use of BIM technology - seen as a 'game changer' - will bring with it a host of benefits to the whole lifecycle of a construction project.

All relevant engineering information can be communicated in 2D or 3D detailed designs thanks to technicians who are experienced in the use of CAD and BIM.

If all companies throughout the process are using the same information and working together more closely than before, which BIM encourages, accuracy will undoubtedly be improved and the greater efficiency means that costs throughout a project will be lower than ever before.

The Company can help with this through its hydraulic modelling of existing supply networks that uses SynerGEE water - used extensively in the STW region.

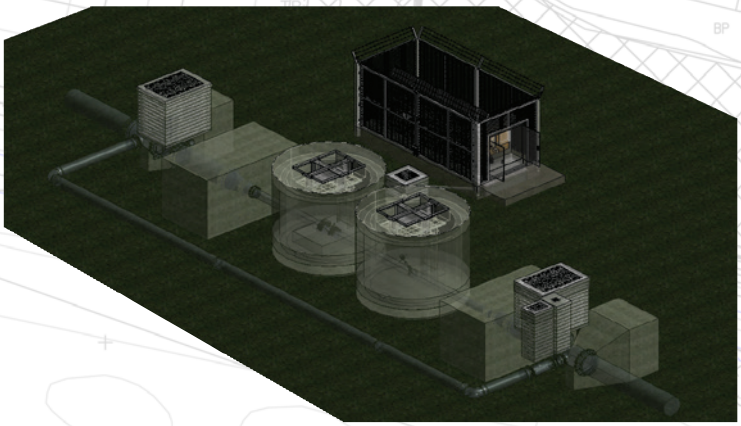
Used alongside experienced water industry professionals, the models can predict the effects of alterations to the network.

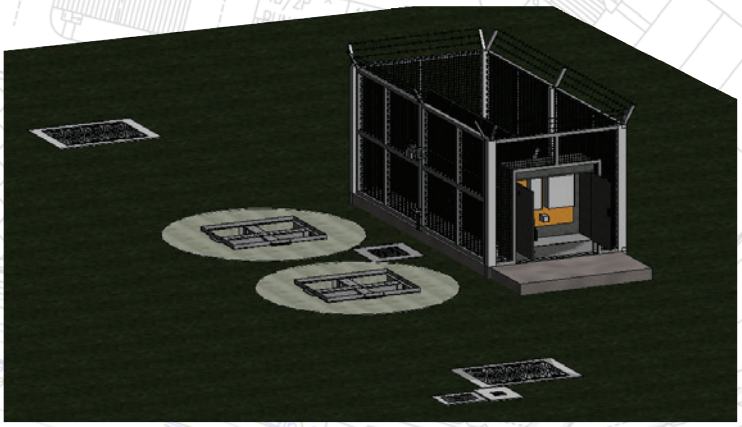
It helps to produce designs that are hydraulically validated and sized optimised to reduce costs. The simulations are used in developing risk and contingency plans to help STW minimise the extent of disruption to supply and risks of pipes bursting.

Also used in capital works when sizing up water mains, this modelling is completed at all levels, including for trunk mains.

The Company also looked at the potential of Computational Fluid Dynamics (CFD) and what benefits this could offer the water industry.

As a result, it has been used successfully on many projects. STW once again were one of the recipients of this, with a large study carried out on their behalf to compare losses in different types of bends.





The conclusion showed these could produce large capex savings.

Through the use of CFD, the perturbations of critical fittings on downstream flow profiles and therefore on accuracy of flow meter readings has been investigated, which has resulted in significant savings being made because of its use in the development of new flow conditioners.

A new type of flow conditioner was developed as part of the drive to find a strategic flow metering solution. This product enhances flow profiles in water mains, producing more accurate flow measurement.

In the tests conducted, the average turbulence levels are decreased by approximately one fifth.

This is because flow conditioners decrease swirl and turbulence, creating pseudo-developed velocity flow profiles that eliminate the main causes of inaccurate flow meter readings.

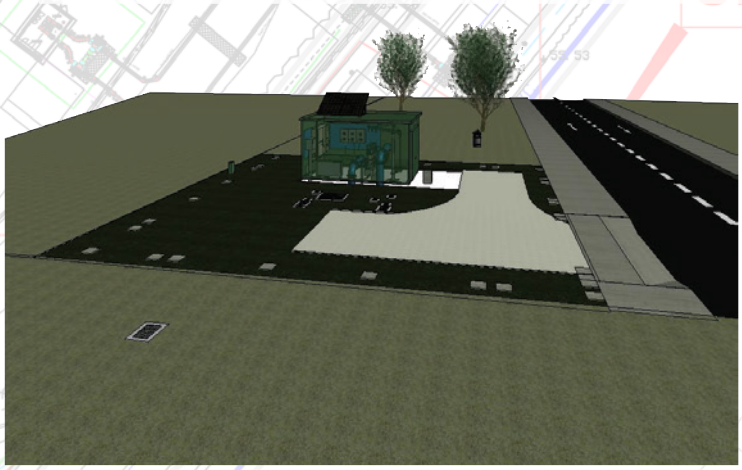
It guarantees a reduction in the length of straight pipes upstream and downstream of the flow meter, which brings savings through cheaper installation costs and the footprint of the working area.

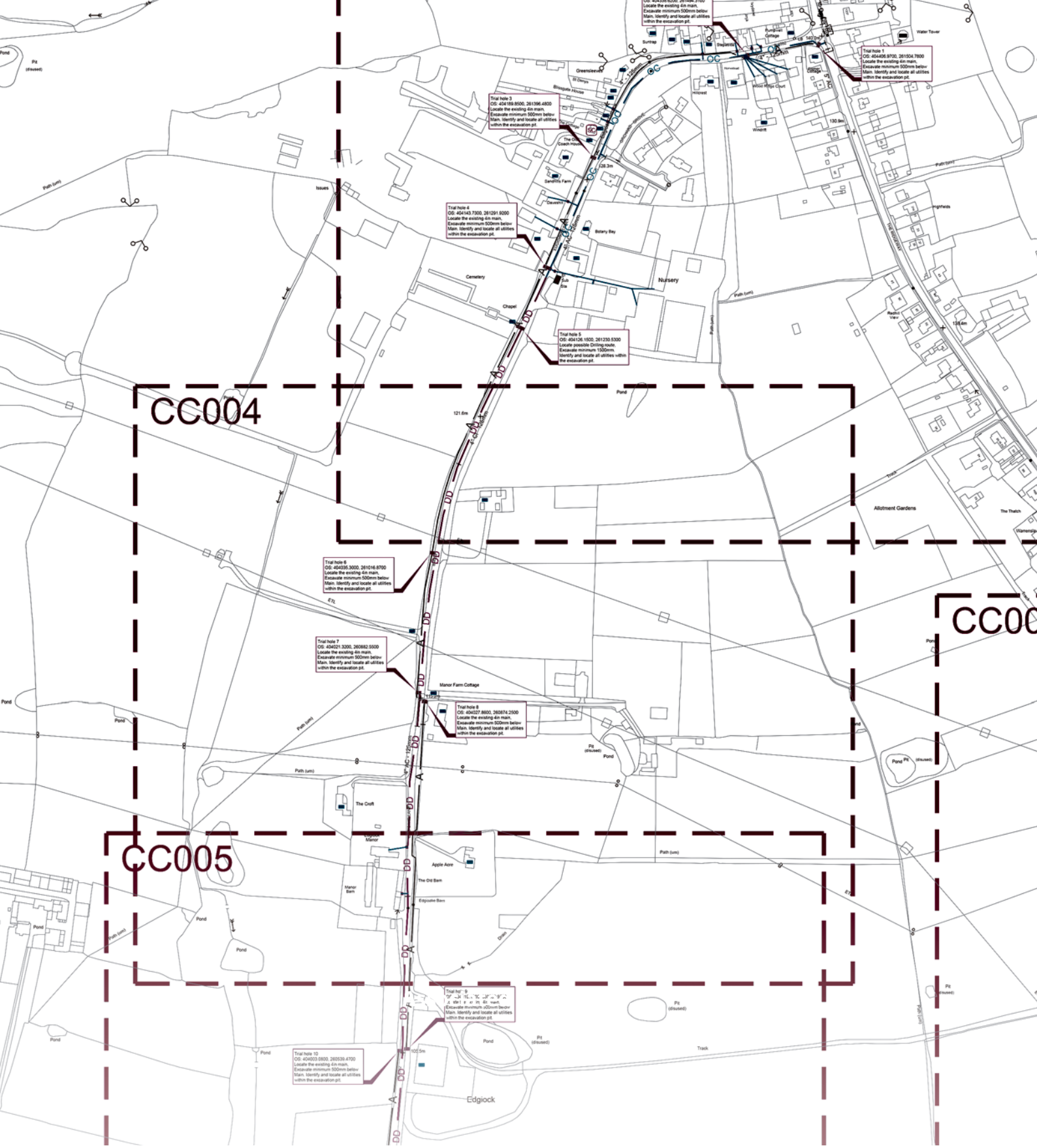
CFD has been used in the development of new flow conditioners; testing is currently underway to determine their effect on flow profiles.

SynerGEE was also used in testing the hydraulic performance of the pumps while assessing their impact on the network. BIM was implemented to provide the best design and visualisation.

The fact that the flow conditioners result in more accurate measurement of flow means the distribution network can be managed in a much more effective way, in particular leakage measurement.

Consequently, improved leakage assessments can be made to provide enhanced targeting for Capex and Revex activities. The end result is leakage within the distribution network will be reduced in a cost effective way, simply by improved measurement.





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