



CASE STUDY:
BELFAST CITY HOSPITAL

A LOW MAINTENANCE DRAINAGE SOLUTION AT BELFAST CITY HOSPITAL TOWER





PROJECT OVERVIEW

HOW GEBERIT'S ELECTROFUSION-WELDED HDPE DRAINAGE PIPES HELPED OVERCOME FREQUENT BLOCKAGES AT BUSY BELFAST HOSPITAL

A university teaching hospital with a capacity of up to 900 beds, Belfast City Hospital is not only a vital healthcare facility, but also a landmark structure on the Belfast skyline. Its distinctive yellow clad tower block is the fourth tallest storied building in Ireland, built in the 1970s on Belfast's famous Lisburn Road.

Like many structures of its age, the tower block has been facing increasingly frequent maintenance issues. Blockages in waste pipes and soil stacks were becoming far more frequent in recent years, resulting in a significant maintenance burden with plumbers often attending multiple blockages each day.

The BCH maintenance team found that a thick layer of congealed waste was causing the majority of these issues by reducing the bore of the 4 inch soil stacks to just over an inch in some places. Sewer rods with a variety of cleaning attachments were used to clear blockages, however much of the congealed layer could not be removed easily. The cast iron pipes, now over 40 years old, were heavily corroded in places leaving a delicate pipe wall. The team knew that excessive mechanical cleaning could damage pipe walls and cause major flooding and escape of contaminated waste to clinical areas. A long-term solution was required.



An opened cleaning eye reveals a thick layer of congealed waste inside



A worm screw pictured through an open cleaning eye as staff attempt to clear a blockage



Congealed waste had reduced the bore of the 4-inch soil stacks to just over an inch in some places



A cutaway image showing internal narrowing at a horizontal section at the bottom of a soil stack

→ Project information

Location: Belfast City Hospital

Project Completion: March 2023

→ Geberit Know-How

Challenge: To replace existing cast iron drainage system, which was no longer fit for purpose, with a reliable and low maintenance solution

Solution: Geberit's electrofusion-welded HDPE drainage system



WHY GEBERIT?

ENSURING SUITABLE MATERIAL CHOICE

Engineers at Belfast City Hospital started work to plan and undertake what would be an extremely challenging project within a live hospital building.

Recognising the importance of material choice, the Trust's engineering team selected Geberit's electrofusion-welded HDPE pipes as the preferred product - the idea being to provide a product that will enable a long term, reliable and robust solution.

Corrosion-resistant and resistant to a wide variety of chemicals, acids, alkalis, and many other substances, HDPE is a great alternative to cast iron, and is the perfect choice for drainage systems in commercial buildings.

HDPE has the benefit of being a lightweight system that is simple to install, and of being very robust. It has the necessary properties required for healthcare and commercial applications. Although it is not the lowest cost material, the investment in utilising HDPE can be outweighed by reduced installation times, ease of installation, low maintenance costs and a very long lifespan. In addition, as the system incorporates permanent fusion welded connections, it is strong and reliable.

HDPE pipes have a smooth internal surface which is maintained throughout their lifetime, ensuring that no waste gets trapped on the inside of the pipe. Additionally, the interior of a HDPE pipe can often be cleaned thoroughly simply by the use of running water.

MANAGING PROJECT LOGISTICS

The Trust arranged for nine floors on the north side of the tower to be decanted to allow the drainage system replacement scheme to proceed. This involved careful planning and close collaboration between technical, medical and nursing teams.

The complex programme of works required numerous temporary diversions to be installed on level 9, to divert waste away from the stacks that were being replaced. In total, it took three months to complete the challenging project.

Stephen Knox, Estates Officer at Belfast City Hospital, said: "Due to highly specialist services and the use of patient isolation rooms, we were unable to vacate the Haematology ward on 10 North. In order to maintain this area, we installed a network of temporary waste pipes on level 9. This allowed us to replace a total of 11 soil stacks down through 9 ward floors and into the midriff plant room below.



A Geberit HDPE bottom bend



A cleaning access point at the bottom of a new Geberit HDPE soil stack



OVERCOMING PROJECT CHALLENGES

Even allowing for the challenging site logistics and ongoing hospital operations, Engineers had to overcome a number of issues with the ageing system to enable this project to be completed successfully.

Stephen Knox added: "We found asbestos anti-vibration tape on some of the original pipe and ventilation support brackets. This meant bringing in our licensed asbestos removal contractor in advance to ensure all areas were safe to work in."

Access to the soil stacks was also very limited, as you would expect with drainage systems in a building of this kind. Walls had to be opened up slab-to-slab, and ceilings removed to give sufficient access for removal and installation works. In some cases, it also meant the removal of wash hand basins, hot and cold water services and various electrical services.

"As you can imagine, the extent of works going on led to an extremely dusty environment. A series of polythene screens were installed on all floors to prevent dust travelling to the main lift lobby and south side patient and staff areas. Ventilation systems were adjusted to create a negative pressure, further reducing any risk of dust escaping from the works area. Constant cleaning was required on all floors and we used sticky floor pads at all entry/exit points to minimise dust and dirt escaping on boots/shoes. Contractors only access to and from each floor was via a dedicated service lift. These control measures helped to ensure a very low risk of contaminating areas outside the site boundary"

DELIVERING THE SOLUTION

A TROUBLE-FREE FUTURE

With the north side project now completed and Geberit's HDPE system in place, the Trust can have confidence in a maintenance-free future for these soil stacks.

Lucas Vogan, Technical Sales Manager at Geberit, said: "HDPE provides the robust and reliable solution needed for modern drainage systems, and the addition of electrofusion welding made for quicker, easier and long-lasting connections. It was the perfect choice at Belfast City Hospital.

"Lightweight, robust and easy to maintain, our HDPE system includes permanent seals which remain leak-proof and a smooth pipe bore to reduce the risk of blockages. The use of electrofusion welding also ensures reliable joints for many years and a quicker, easier connection method than some alternative methods used with metal pipes."



Pictured left to right in front of the tower block at Belfast City Hospital are: Estates Officer (operations), Stephen Knox; Placement student, Jordan Drummond; Trust Estates Officer, Vincie McCann, and Geberit TSM, Lucas Vogan.