

RVT shields Glaswegians from noise during construction of the Shieldhall Strategic Tunnel

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The project

Construction of the largest wastewater tunnel ever built in Scotland. Once completed, the tunnel will improve water quality in the Clyde and reduce flooding.

Facts and figures

- 3.1 miles long
- 4.7 metres in diameter
- Each concrete circle of tunnel is 1.5 metres long and made up of 6 curved segments weighing 2.5 tonnes each
- More than 300,000 tonnes of earth will be excavated
- Able to store the equivalent in waste water of 36 Olympic-sized swimming pools
- Over 90% of the excavated material will be recycled
- £100 million budget
- The tunnel boring machine was named 'Daisy' by schoolboy Lewis Bennett, following a competition run by Scottish Water.

The challenge

Although the route of the tunnel was carefully planned to minimise disruption, it still ran close to several residential areas. It was therefore essential to adopt measures that would keep noise levels within acceptable limits.

Minimising noise from construction in residential areas



When completed, the Shieldhall Strategic Tunnel will be the largest wastewater tunnel ever built in Scotland. It runs for 3.1 miles under the south of Glasgow and is part of the most wide-ranging upgrade of the city's wastewater network since Victorian times. Big enough to accommodate a double-decker bus, the tunnel will improve water quality in the Clyde and help to reduce flooding.

For this mammoth undertaking, Scottish Water appointed contractor CVJV, a joint venture between Costain and Vinci Construction Grands Projets. Work started in October 2014 and is due to complete early in 2018.

After preparing the ground – which included installing 675 piles – the work of digging the tunnel itself began in July 2016. Since then, a state-of-the-art, 1000-tonne, 150-metre-long tunnel boring machine (TBM) has been cutting through rock at a rate of about two millimetres per minute, and should complete tunnelling later this year.

The tunnel route was carefully selected to minimise disruption. Even so, much of the construction took place within and close to residential areas, so containing the works-noise represented a significant challenge.

Key benefits of the RVT solution

- Each of the acoustic quilts provided the required height, so did not have to be hung above each other
- Speed of installation
- Cost effective
- Velcro connections between the quilts provided seamless barrier for superior noise reduction

"The Shieldhall Tunnel project has been designed to have the least amount of impact on homes and businesses but when you are delivering a 5km tunnel under Scotland's largest city, it is difficult to not have any impacts. The key is putting in procedures and measures that provide genuine mitigation and improvements.

Our need for RVT products stemmed from the need to run a slurry treatment plant 24 hours a day. While the main part of the plant is enclosed in an acoustic shed, the conveyor which removes the processed material to our storage area, wasn't enclosed.

We utilised the RVT barriers/blankets to reduce any noise from that conveyor.

The blankets did their job and reduced the audible impacts, so they can't be faulted. I have no complaints – we received good advice and had no real issues."

John McElroy - Costain

The challenge: to minimise the impact of noise on local residents

The tunnel route was carefully selected to minimise disruption. Even so, much of the construction took place within and close to local housing. In particular, several of the vertical shafts that were needed to supply air and power had to be sited in residential areas. With work continuing around the clock the noise from site machinery was considerable, so containing the works-noise represented a significant challenge.



The RVT solution

RVT was asked to provide noise control solutions, initially to contain the noise from generators, then later for a battery of compressors within a scaffold surround which were running throughout the night. To create a barrier that effectively blocked the sound, RVT deployed an array of 130 acoustic quilts, which provided up to 25.9 dB reduction in noise, as well as a Soundex Generator Exhaust Attenuator Box which dramatically reduced the impact of exhaust noise.