RVT Group provides bespoke noise and air quality control solutions at Waterloo station

Oct 2017

London Waterloo facts and figures

- South West Trains operates 1,700 services carrying 650,000 passenger journeys a day, making it one of the busiest commuter operators in Europe.
- The number of passenger journeys on this line has more than doubled in the last 20 years to 234 million and is expected to increase by a further 40% by 2043.
- As part of the £800 million programme, the upgrade includes spending:
  - £274m each on track renewals and signalling enhancements
  - £182m on bridges, tunnels, major structures, culverts, footbridges and earthworks,
  - £127m on building improvements
  - £88m on electrification
  - £33m on telecommunications
  - £23m on plant and machinery.
- The extensive alterations are improving the Wessex Route and Waterloo station.
- RVT Group was called on to provide solutions to the problems of noise and air quality on this significant project.

Managing challenging conditions in a temporary environment

The £800 million Waterloo and South West Upgrade, which started in October 2015, involves rebuilding much of the station to increase capacity by 30% and improve passenger facilities - the biggest-ever single concentration of work by Network Rail.

As part of the Railway Upgrade Plan, this significant project is designed to provide more capacity and relieve crowding and congestion. Key benefits are longer, faster, more frequent trains, a more reliable infrastructure, and better facilities for passengers. The Waterloo station upgrade includes:

- Rebuilding the former Waterloo International terminal to provide a spacious, modern, accessible station concourse.
- Reconfiguring platforms 20 to 24 to bring these back into use.
- Extending platforms 1 to 4 to allow 10-car trains to run to London suburban stations.

Network Rail emphasises that the safety of workers, the public, passengers and lineside neighbours is 'at the heart of every decision taken' during the project life cycle. Principal contractor Skanska, delivering the project together with Alliance members (Network Rail, Colas Rail, AECOM and Mott MacDonald) and their sub-contractor Coleman & Co. had the challenge of minimising the harmful effects of noise, fumes and smoke within the station so nearby workers and passengers would be unaffected, whilst services continued as normal.

Key benefits of RVT Solution

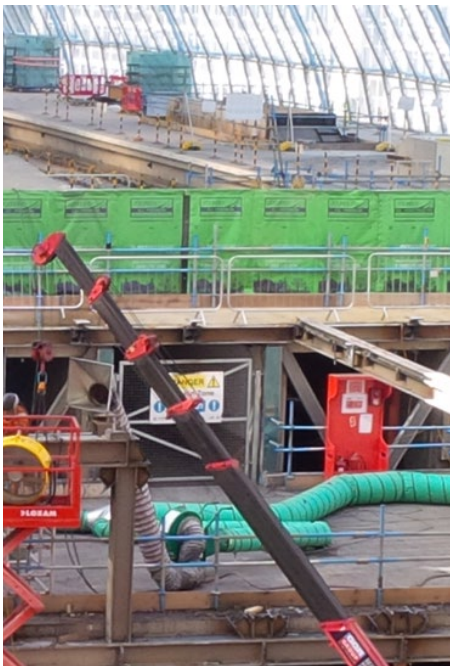
- Containment of flying stones in hydrodemolition process
- Attenuation and absorption at source of noise from the hydro-demolition process
- Control of noise breakout from the whole site to minimise the impact to the general public using the main station concourse

" We have used acoustic barriers for our hydrodemolition works to ensure noise levels are reduced to allowable tolerances. The quilts proved very effective as we managed to carry out the hydrodemolition close to the station concourse while ensuring noise levels were acceptable to the station management."

Mohamad Kheirallah,
Skanska Engineer

Minimising noise from demolition works

As new higher-performance trains to the suburbs were to be introduced, the rail line needed to be upgraded accordingly. This included the installation of new buffer stops that fitted the required standards. Skanksa, said to be the fifth largest construction and development company in the world, was commissioned to remove the old termination points of the rail line. This was done using hydrodemolition – a very noisy process where the old concrete is blasted off the steel reinforcement by high-pressure water jets.



The RVT solution

Protecting the general public and station workers from noise resulting from major demolition and construction work was of paramount importance, particularly given the station needed to function as normal, and passengers able to complete their journeys with minimal disruption.

The primary contractor (Skanska) enclosed the area of works with a bespoke scaffold frame which was then wrapped with Soundex acoustic quilts (pictured above left). This enclosure contained the hydrodemolition process and follow-up works where the metal reinforcement was cut away.

The whole area of works within the station also needed to be separated from the main public concourse by a noise-control barrier using the Soundex acoustic quilt (pictured above right). Independently tested and certified to BS EN standards, Soundex offers the highest attenuation in the industry with noise reduction up to 35.6dB. The Velcro connections enable the construction of a virtually unbroken noise barrier, constructed from materials that are fire and water resistant.

Key benefits of RVT Solution

- Effective capture of fumes and smoke at source using a bespoke solution
- Extraction achieved via a centrifugal fan and long lengths of flexible ducting
- A safe environment achieved under challenging conditions
- Client's responsibility to ensure maintenance of good air quality for workers and the public fulfilled.

"The RVT Group came out to advise me and then arrived onsite with the ventilation units, which were installed by an engineer, free of charge. We were all very impressed. At least once a week, RVT would contact me to check whether everything was OK with the equipment. I was very happy dealing with RVT and would recommend them"

Gary Bracebridge,
Site Manager,
Coleman & Company Ltd

Ensuring safety by maintaining good air quality

The specialist demolition contractors Coleman & Co had the task of stripping out the old international station, including the removal of lifts, travellators and escalators. Burning equipment, using oxygen and propane, was used to cut out the escalators and a large area of steel decking. Fumes from this cutting process posed a problem as these collected in the work area and spread further into the station, posing a health and safety risk.

Good air quality needed to be maintained due to the other trades working nearby and the 'live' station, with rail staff and members of the public passing by on the other side of the hoarding. At first the client hired standard fans, but soon discovered, as the work progressed, that these were insufficient to deal with the amount of fume and smoke generated. As a result, they approached the RVT Group.

The RVT solution

RVT supplied slightly modified capture hoods (pictured above left) to capture the fumes at source and extract these to outside areas, away from the station. A key modification was the addition of magnetic feet to allow the hoods to be attached to the steelwork that was being cut out.

For the work within the lift and travellator areas, RVT supplied a 450CF fan with a bespoke hood (pictured above right) to draw fumes up the shafts and discharge these outside the station. The kit was considerably more effective than the banks of small fans that were previously used.

Similarly, when Skanska needed to cut the steel reinforcement of the old buffer stops, a high-powered ventilation system was used to remove the fumes and create a negative pressure within the enclosure, to prevent any fumes from escaping. This ventilation system also ensured there was adequate replacement fresh air supplied within the enclosure.