



Where: Stockholm, Sweden

Product: 2x AQY 1 Micro Air Quality Monitors

Installed: July – August 2019

Result: Real-time air quality data helps establish community health and safety around busy shopping centre sites, in line with Health Building Standards WELLTM and RESETTM

Air monitoring helps Swedish shopping centres improve customer focus, health, and wellbeing

THE CUSTOMER



ZED is a healthy building, sustainability, and building physics consultancy firm headquartered in Leeds, United Kingdom. Working across all construction sectors throughout the UK, Europe, and Worldwide, ZED offers best-in-class building performance advice and evaluation. Their suite of services includes building physics, air quality, concept design, and planning support, as well as sustainability and wellbeing consultancy.



The Grosvenor Group is one of the world's largest privately-owned international property firms, with four regional Operating Companies under their umbrella (Grosvenor Britain & Ireland, Grosvenor Americas, Grosvenor Asia Pacific, and Grosvenor Europe). Grosvenor has been active in Sweden since acquiring a prime hypermarket in Helsingborg in April 2011. Their local portfolio now includes six shopping centres (five in Stockholm and one in Malmö). Skärholmen Centrum, one of Sweden's leading shopping centres, was acquired in 2015 on behalf of the Retail Centres V (Sweden) fund. Lidingö Centrum, Grosvenor's first wholly owned acquisition, was purchased in early 2018.



SKHLM Skarholmen shopping centre in Stockholm, Sweden. ZED conducted air quality analysis using Aeroqual products across both high traffic and pedestrian zones, measuring particulate matter and overall air pollution to improve community wellbeing. Photo credit: used with permission from ZED

THE PROBLEM

ZED and Grosvenor Group sought to help establish the factors for understanding air quality relating to health and productivity, with a view to the social impact that air quality can have on the local community, shoppers, and staff.

- CO₂ can stop shoppers searching for the right product, focusing on price, or selecting the first available option if fatigued, reducing the time spent in-store.
- Tired shoppers are less likely to continue shopping or dine within the centre.
- Humidity-induced issues can also cause discomfort, impacting user experience.
- Reduced energy can cause shop assistants to reduce output and productivity throughout the day. Absenteeism can also increase.

In addition to monitoring air quality, ZED was commissioned to explore the working pattern of the ventilation systems. This included looking at how they operate, delivering clean air into the building, as well as rationalizing the running times of the system, energy, and carbon emissions.

"We designed the project to identify potential high impact zones in and around the shopping centres. For example, some parts of the SKHLM centre are adjacent to a multi-story car park and freeway," says ZED director, Will Procter.

"We also wanted to evaluate areas where the public spends more time, for example, seated areas & places where people socialize."

THE SOLUTION

ZED monitored the air quality in and around the shopping centres throughout the summer holiday period, gathering 14,551 data entries (alongside site analysis of the ventilation systems, footfall, and building operation information). This provided an overview of overall air quality and a sound understanding of the factors influencing building operation.

Two sides of the centre are exposed to high levels of traffic, while the other entrances offer entirely pedestrianized or low emission/pollution zones. Outdoor sensors were located near a high traffic/pollution zone, with an additional unit placed towards the pedestrian entrance location.

"We chose Aeroqual because the product matched the parameters on the guidelines for European standards as well as the Healthy Building Standards WELLTM and RESETTM", says Procter.

"We liked the size of the Aeroqual unit and that it was easy to install and connect up to the cloud to gather real-time data."

"It was useful to be able to analyze the data we were collecting in Sweden from our base in the UK. Aeroqual's product was also a fit with the nature of the project, which took place over four weeks. It was effective, within the project budget, and it's something we can install and then take down to use on other projects down the line."



ZED used Aeroqual AQY 1 Micro Air Quality Monitors to conduct real-time air quality analysis of busy shopping centres.

Sensor 1 – High Traffic Zone: Consultants strategically positioned the first external sensor near the high traffic area, which is also the entrance point to the public transport drop-off zone. Particulates in this high traffic area over the four weeks were, on average, below WHO daily and annual limits for exposure.

Sensor 2 – Pedestrian Zone: Consultants positioned the second sensor over the plant room, adjacent to one of the primary public zones, with walkways, restaurants, and businesses located nearby. As expected, the air quality in this area was consistently better than the location of sensor 1, with levels supporting good air quality around the zone where people also meet and actively commute around the suburb. Air quality in this area is consistently performing better than all global and regional standard benchmarks.



Sensor view from AQY 1 Micro Air Quality Monitors in high traffic zone outside SKHLM Skarholmen.

The general air quality is of a good level, supporting WHO findings that Sweden, Stockholm, and surrounding areas have some of the cleanest air conditions in Europe, with no reduced life factors attributed to poor air quality.

During this period, 1,036,850 people visited the centre, averaging 29,000 per day.

EVALUATION

“Based on the time of year and relatively low occupancy levels, the air quality recorded by the equipment was of a high level, in line with global studies towards AQ in Stockholm.”

“That said, we need to consider a full-year cycle, as increased vehicle occupation and lower ambient air temperatures over the colder months can impact the local pollution levels.”

ZED will continue to monitor conditions inside and out, providing the client with a complete picture of annual air quality.

“The main thing we picked up was that the operation of the ventilation system was running at capacity, which exceeded what was required. This resulted in a significant energy-saving opportunity for the client.”

The conclusion from our pilot scheme is that over the summer monitoring period, conditions for comfort, health, and productivity remained at a high level. In all cases, air quality levels exceeded the rigorous standards set by the healthy building certification schemes, WELL™ and RESET™.