

Case Study

## AHU Refurbishment

Five Star Hotel. Mayfair, London.



## The challenge...

Our client said, “We are an award-winning, 5-star hotel with a deep commitment to holistic wellness of all staff and our guests. We want to separate ourselves from venues that are not heated, air-conditioned, or ventilated well, as this will make guests’ stay unpleasant, especially at our large crowd events. We want our guests to know we are superior to others.”

This London, Mayfair based hotel operates 24/7/365, therefore we had to deliver this project with zero disruption.

All works had to be completed over only 2 evenings and scheduled to allow for ventilation to continue during daytime hours.

The AHU required a deep clean, new coil installations, pipe work modifications, rust treatments, new filtration systems, fan upgrades, damper remediations, new anti-leakage seals, with full commissioning, and BMS integrations.

# The HALO HVAC solution

## 1 Fan upgrade & AHU remodelling

Higher efficiencies therefore significant energy & CO2e savings, with no maintainable components such as belts and pulleys.

## 2 Heating & Cooling coil upgrade

The coils within the system had suffered with degradation and were towards the end of their life. With limited access space the new efficient coil arrangement was predesigned and built within the AHU.

## 3 New high-efficiency filtration system - improved IAQ

We installed a new high-quality air filtration system designed to effectively capture and remove airborne contaminants. Compliant to ISO 16890-1:2016,

## 4 Lower noise

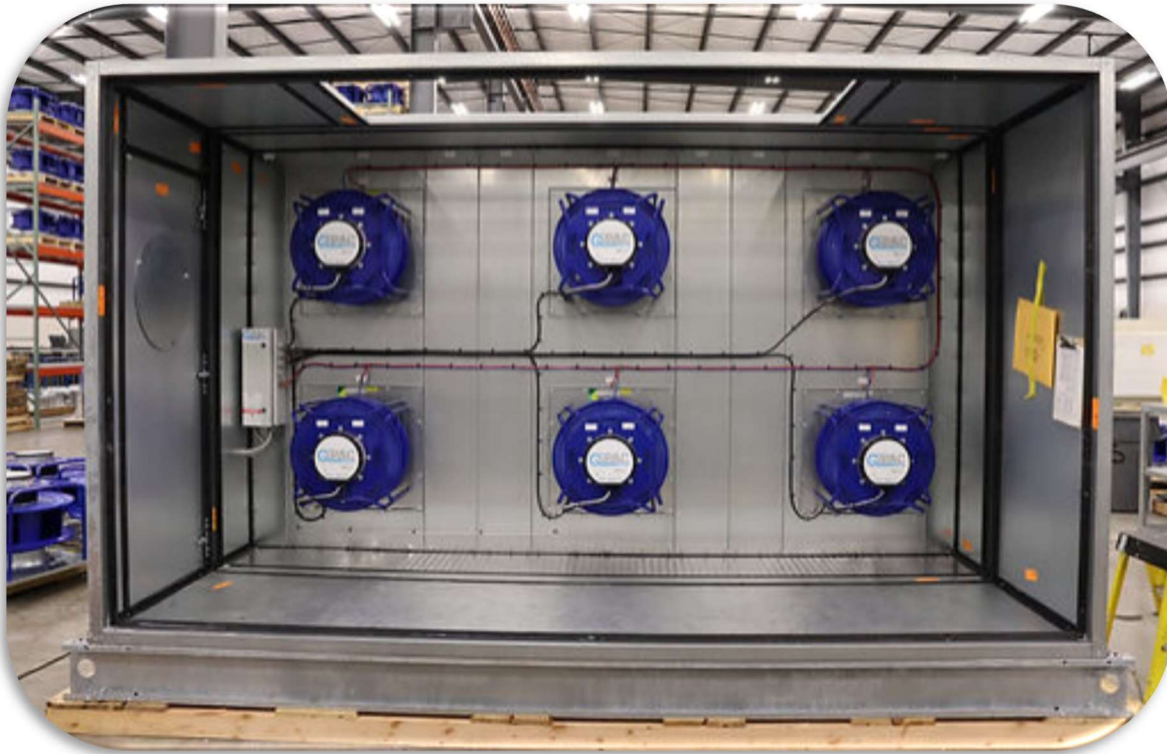
With AHU remodelling and the new fans proven psychoacoustics, the AHU now generates less noise thanks to better flow conditions.

## 5 AHU (Asset Life Extension)

The air handling unit had suffered with a lack of maintenance and required a full refurbishment, enabling improved maintenance, compliance, efficiency, and value to the asset in its entirety.

## 6 Project delivery ★★★★★

Hotels operate 24/7 therefore we had to deliver this project with minimal disruption. We completed all works in 2 evenings, whilst allowing the AHU to still perform its function during daytime hours.



## Fan Upgrade & AHU Remodelling

Prior to installation Halo HVAC validated all technical aspects of the system, designed structural modifications of the AHU, pre-wired all fans, along with Internal-rotor motor PM/EC technology that boasts an efficiency of IE6, exceeding motor energy efficiency classes set by both the International Electrotechnical Commission and European Efficiency.

The new maintenance-free fans were installed into the Air Handling Unit, for both supply and extract air streams. Along with bespoke manufactured reinforced bulk heads and fan openings for a seamless installation.

This combines three solutions in a way that previously seemed almost impossible: Reliability, outstanding system efficiency with high-power density for environmental control and 15-20-year extended life cycle for each AHU.

[www.halohvac.co.uk/case-studies](http://www.halohvac.co.uk/case-studies) for GoPro footage of this and other fan installations.



Energy Saving

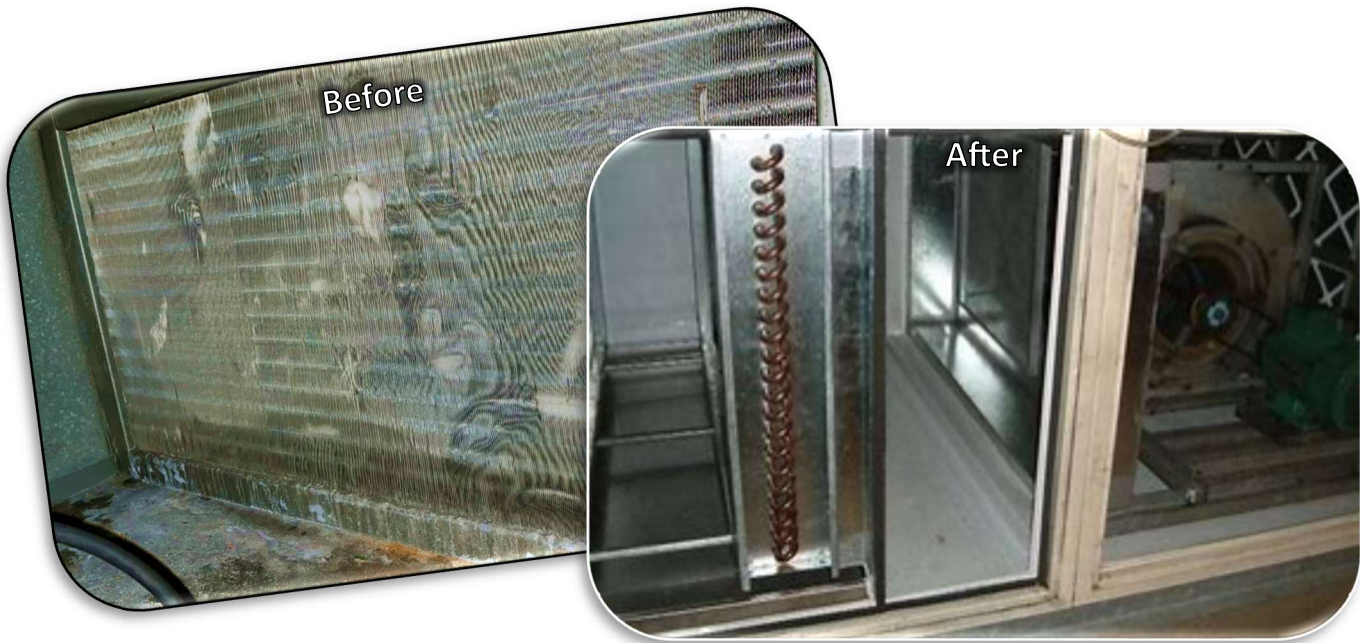


Life cycle improved



Reliability





## Heating & Cooling coil upgrade

Prior to the upgrade, our technical survey engineer identified microbial contamination, rust, a coil capacity issue, off coil temperature issues, blockages and a failed condensate drip tray and drain.

We designed a new coil process that involved the calculation of peak heating & cooling loads, specification of system and equipment configuration, calculation of annual performance, whilst taking into perspective noise, humidity and IAQ.

Our engineers supplied and installed replacement coils. To do this, the AHU cover panels were removed, as necessary. Unsecured the existing coils and removed them from the air handling units. The area vacated by the redundant coils was then thoroughly cleaned with anti-microbial cleaner that produces zero VOCs, and rust treatment was applied where applicable.

The new coils were positioned into the air handling units and secured as required. New pipework connections installed. All panels were refitted with new anti-leakage seals, all redundant coil materials were removed from the site in line with ISO14001.



Occupant Comfort



No Bad Smells



Efficiency



## New high-efficiency filtration system – Improved IAQ

Although we have been known to utilise IAQ technologies such as UVGI, ionic and ozone treatment, to improve indoor air quality (IAQ). Considering the nature of this five-star hotels function, the likelihood of potential side-effects and down time is much lower with a suitably designed and maintained high-efficiency filtration system.

The system we developed and installed has ease and simplicity of maintenance at the forefront. We installed a new high-quality air filtration system designed to effectively capture and remove airborne contaminants. To ensure the hotels deep commitment to holistic wellness of all staff and guests, the new filtration system is compliant to ISO 16890-1:2016, EN 779:2012, DIN 53438-3 (F1) and OEKO-TEX® 100.

With Halo HVAC IOT it is possible to continuously remote monitor IAQ and accurately adjust based on live data to guarantee a consistent maintenance schedule.



Improved IAQ



Remote Monitoring for PPM



Well-being



## Lower Noise

When we begin the strategic design of a new fan system, our engineers design it so that the fan speed, and the vibration caused by the rotational speed, does not cause the system to operate in a region of resonance, we achieve this through the calculation of the systems overall psychoacoustics.

With this project being a five-star hotel, peace and quiet is one certainty the guests want to experience. The result with our installation achieved a reduction of 11 dB(A) LpA. This was enabled thanks to upgrading the fans to a new system that uses no belts or pulleys with better air flow conditions, new reinforced fan bulk heads for less vibration, new anti-leak seals, new efficient heating & cooling coils and the use of noise reducing baffle and separation plates.



Reduced Noise



Guest Retention



Increased Bookings



## AHU (asset) life extension

Issues arising from AHUs ageing present key challenges for building services.

Technological advances and ever-changing compliance requirements, means that there are many air handling units operating beyond their originally conceived application. As HVAC equipment ages, increased challenges to maintaining integrity require to be managed – coinciding with potential declining financial value. This may be a result of cumulative degradation over time such as neglect, corrosion, rust, microbial growth, and environmental conditions such as serving a greater occupancy than when the AHU was first designed, and therefore the AHU doesn't achieve the airflow and thermal conditions required. Where like for like replacements is no longer suitable due to either obsolescence or changes in engineering standards Halo HVAC will have a solution.

Over time, this air handling unit suffered with degradation, largely due to a lack of maintenance and required fan, coil and filter remediation, a full service, a deep clean, including VOC free rust treatment, new doors, air leakage seals throughout, and damper repairs to meet compliance.

Additionally, upgrading an AHU prevents unforeseen downtime, improved maintenance, compliance, efficiency, and added value to the asset in its entirety. Halo HVAC conducts asset audits, covering planned preventative maintenance, monitoring, risk management, and financial evaluation including return on investments.



Added Value



Compliance



Enhancing credibility





## Project Delivery ☆☆☆☆☆

Hotels operate 24/7 therefore we had to deliver this project with minimal disruption. We completed all works in 2 evenings and staged the works to allow for ventilation to continue during daytime hours.

The system deep clean, new coil installations, pipe work modifications and rust treatments were conducted and commissioned on the first evening. The new filtration systems, fan upgrades, damper remediation, new anti-leakage seals and commissioning, and BMS integrations were carried out the following evening.

To enable an efficient “hassle-free” project delivery, and apart from the coils that were custom built within the unit, most components were pre-designed and fabricated off site. Ensuring safety, compliance, and risk mitigation to support an impeccable project delivery. This process enabled us to maximise on site time and guarantee the health and safety of everyone throughout the entirety of this project.



100% Health & Safety



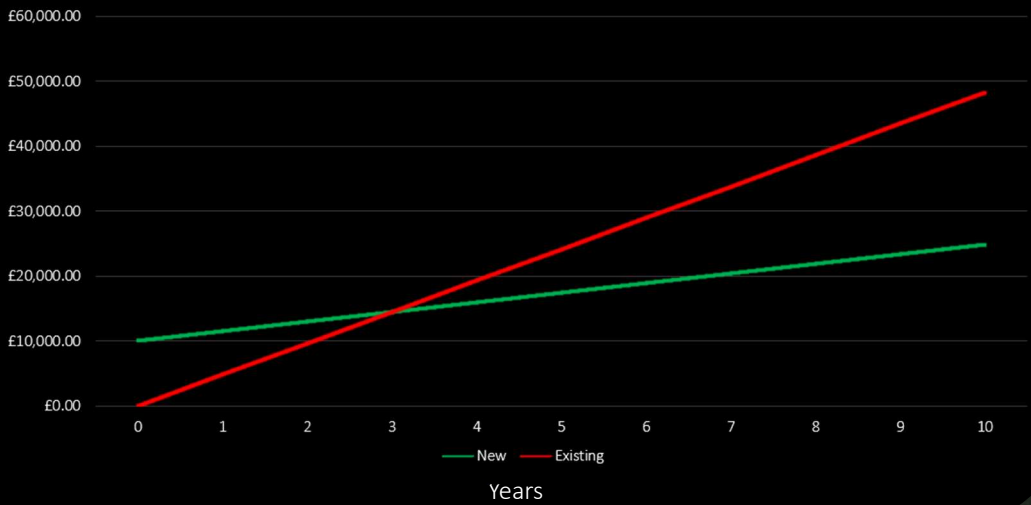
Zero Disruption



Delivered on Time

# Energy Saving Report

Running Cost



Equivalent CO<sub>2</sub>e reduction to one and half diesel cars off the road, that each travel over 7600 miles a year, every year.

2.5 tonnes

The total amount of CO<sub>2</sub>e reduced by implementing the Halo HVAC solution is fourteen and a half tonnes!

110 trees

The equivalent to 110 fully grown trees absorbing their average of 21Kg of CO<sub>2</sub> a year.



2.5 years

By implementing the HALO HVAC solution, the estimated return on investment for the end client is 2.5 years.

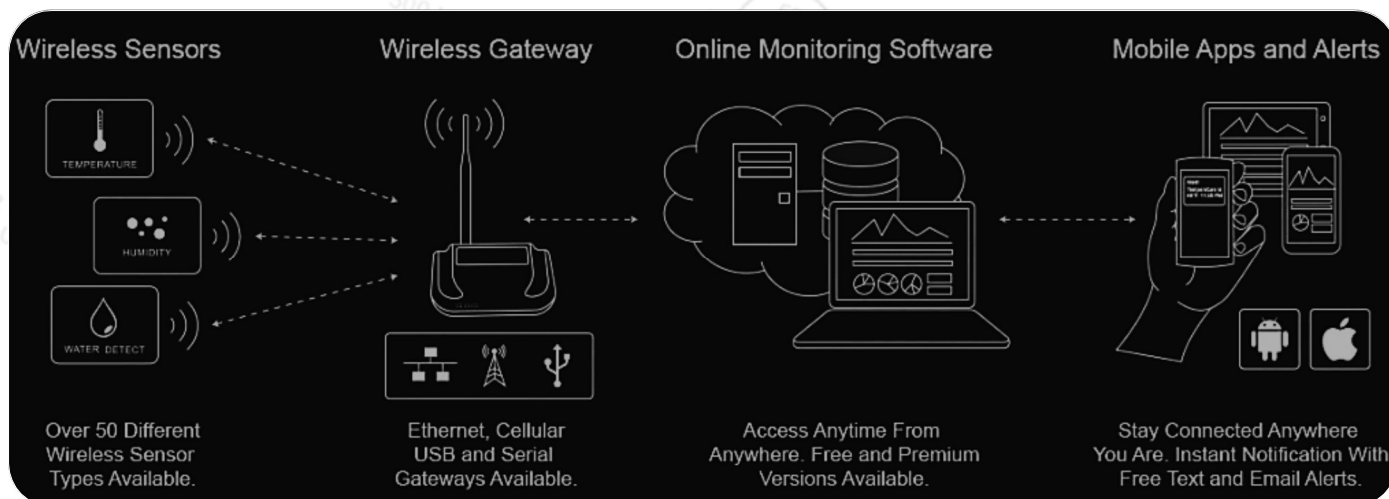




# HALO HVAC

WIRELESS IOT SENSORS

With our range of wireless sensors and secure internet gateways, we enable you to intelligently monitor and control the performance of Air Handling Units.



Our wireless sensors and secure internet gateways notify you about abnormal HVAC events, energy use and temperatures, system degradation, humidity, air pollutants, air pressure, water, vibration, velocity, motion, security & much more. We tell you the exact energy consumption in kWh of each individual component of your HVAC system, in real time or over a period, remotely.

To learn more visit [www.halohvac.co.uk](http://www.halohvac.co.uk)







# HALO HVAC

A H U R E F U R B I S H M E N T


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Registered in England. 14987798. Halo HVAC Ltd, 128 City Road, London, United Kingdom, EC1V 2NX

 0207 117 2087

 [info@halohvac.co.uk](mailto:info@halohvac.co.uk)

 [www.halohvac.co.uk](http://www.halohvac.co.uk)

 Halo HVAC Ltd, London, EC1V 2NX