HALO HVAC

AHU Condition Report

20 Bank Street

Reference: Q1734/2107

BESA BUILDING ENGINEERING SERVICES ASSOCIATION SSIP CHAS Constructionline Associate Member

20 Bank Street

Air Handling Unit - Condition Report

Report approved by

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Reference: Q1734//2107

Executive Summary

Client: Bank Street

Location: 20 Bank Street, London E14 4SG

Date Surveyed: (external survey – unable to switch off units for internal investigation) 14.05.2025

Morgan Stanley

About:

20 Bank Street is a prominent commercial office building located in the heart of Canary Wharf, London. Known for its modern design and prime location within one of the city's leading business districts, the building offers high-specification office space across multiple floors. As part of ongoing efforts to optimize building performance and sustainability, WSP consultants are currently undertaking feasibility reviews for the refurbishment of the air handling units (AHUs). This assessment aims to enhance energy efficiency, extend the lifespan of existing systems, and ensure continued compliance with current environmental standards.

Morgan Stanley has established a strong global reputation for its Environmental, Social, and Governance (ESG) leadership, with a particular focus on reducing carbon emissions across its operations. The firm has publicly committed to achieving net-zero financed emissions by 2050 and net-zero operational emissions by 2030. To support these goals, Morgan Stanley implements a comprehensive sustainability strategy that prioritizes energy efficiency, responsible resource use, and the retrofitting of existing assets wherever feasible—minimizing embodied carbon associated with full equipment replacement.

In the context of 20 Bank Street, this ESG framework provides compelling leverage for pursuing refurbishment of the air handling units (AHUs) rather than complete replacement. Refurbishment aligns with circular economy principles by extending the life of existing equipment, significantly reducing the carbon impact associated with manufacturing, transporting, and installing new systems. By choosing a refurbishment-first approach, Morgan Stanley not only upholds its own decarbonisation commitments but also sets a precedent for responsible asset management in high-performance commercial buildings. Supporting this route reinforces the firm's position as a sustainability leader in the financial sector, while also offering potential cost savings and minimizing operational disruption.

The HALO AHU condition report key

HALO HVAC

The HALO AHU condition report key is accurate and consistent, it refers to an industry consensus view of 'common classifications' for building engineering services, bringing together the Chartered Institution of Building Services Engineers (**CIBSE**), the Royal Institution of Chartered Surveyors (**RICS**), the Building Engineering Services Association (**BESA**) and the Government Functional Standard for Property **(GOV.UK).**

- CIBSE Guide M, Appendix 12.A1: indicative economic life expectancy
- CIBSE Guide M 13, Engineering condition surveys
- BESA SFG20 task schedules
- RICS NRM 3: asset description
- Facilities Management Standard 002: Asset Data

Each AHU is given a condition rating of GREEN, AMBER, or RED to provide a clear overview.

- Fully functioning at the time of survey.
- Components operating correctly and in good condition, identified ongoing maintenance.
- All the components within the AHU are still within their life expectancy according to CIBSE guide M Appendix 12.A1: Indicative economic life expectancy.

- Functioning at time of survey, however condition indicates that remedial works are required.
- Additional maintenance required.
- Some components are approaching the end of their life expectancy according to CIBSE guide M Appendix 12.A1: Indicative economic life expectancy.

- Unit not functioning or operational at time of survey.
- Faulty or damaged components that require replacement.
- Standard maintenance not enough to bring unit to workable condition.
- The components have exceeded their life expectancy according to CIBSE guide M Appendix 12.A1: Indicative economic life expectancy.

HALO AHU condition reports are warrantable for the use of clients, facilities managers, contractors, and consultants to provide the structured asset information needed for the implementation of building information management, and to validate a clear capital-allocation or improvement strategy during the operational phase of asset life.

Compendium:

Initial Feasibility Review of AHU Refurbishment at 20 Bank Street, London E14 4SG

Overview:
In May 2025, undertook an initial feasibility review to assess the potential for refurbishing four air handling units (AHUs) at 20 Bank Street, London E14 4SG. The scope of this initial review was limited to an external inspection and visual observation through service windows.

Inspection Summary:
The preliminary evaluation revealed no immediate structural or mechanical failures that would preclude refurbishment. The AHUs appear to be in a condition that supports further investment, with wear and component ageing typical of their lifecycle but manageable through modern refurbishment methods.

Conclusion from Initial Review: *Refurbishment does appear to be a viable option, pending a more detailed internal assessment.*

Energy Efficiency Enhancement – Run-Around Coil Integration:

Given the size and type of the existing air handling units, the integration of a run-around coil system presents itself as a technically straightforward and cost-effective opportunity to enhance thermal energy recovery and overall system efficiency.

What is a Run-Around Coil System?
A run-around coil system uses two coils—one in the supply air stream and one in the exhaust air stream—connected by a closed-loop piping system containing a heat transfer fluid. A circulating pump transfers recovered thermal energy from the exhaust air to pre-condition incoming air, thereby improving energy efficiency and reducing operational costs.

Suitability:
- The AHUs' current configuration and spatial layout appear to support the integration of such systems without major rework.
- Minimal impact is expected on existing ductwork and service zones.

Regulatory & Efficiency Considerations:
In line with UK Building Regulations Part L (Non-Domestic) and the Non-Domestic Building Services Compliance Guide, heat recovery systems must demonstrate a minimum thermal efficiency of 50%.

Run-around coil systems should be designed for a minimum of 40% efficiency, though 50–60% can be achieved with optimised control strategies and high-performance coil geometry.

The system should comply with BS EN 13053, ensuring suitable heat recovery class (H1 or better), and meet operational requirements for static pressure, fan energy use, and freeze protection.

Air Handling Unit conditions;

Office Primary Air Handling Unit – **South & North**

Overview of Primary Air Handling Units (AHU/R-01 & AHU/R-02)

Two primary air handling units, designated AHU/R-01 and AHU/R-02, are installed at roof level and are manufactured by Holland and Holland Ltd circa 20 years ago. These units are designed to condition and deliver outside air to serve the building's office spaces from Ground Level up to Level 12. They play a critical role in providing tempered and filtered fresh air to the on-floor fan rooms, ensuring suitable indoor environmental quality across all occupied levels.

Key Components and Features

Each AHU incorporates the following components:

- **Fire-rated Isolation Damper**: Provides fire compartmentation and isolates the unit in the event of a fire or when the unit is offline.
- **Inlet Attenuation**: Reduces noise from incoming outside air to maintain acceptable acoustic performance.
- **Panel Filters & Bag Filters**: Provide multi-stage particulate filtration, ensuring a high level of indoor air quality by removing dust, pollen, and other airborne contaminants.
- **Reticulated Foam Filter**: Installed downstream of the humidification system for additional filtration.
- **Heat Recovery Coil**: Allows recovery of thermal energy from the condenser water system or back-up boiler during periods of low ambient temperature or when humidification is required.
- **Cooling Coil**: Provides mechanical cooling to condition incoming outside air during warmer periods.
- **Evaporative Humidification System**: Previously included rotary atomisers for moisture control, complete with UV sterilisation and integrated control panel. ***Note**: It is understood that this humidification system is now considered redundant and may be removed in future works or decommissioned.*

1. **Original design is for two Twin Supply Fans**: Provide redundancy and ensure reliable air delivery under varying load conditions. *There has been a new fan wall installed as covered in this report pages 8 -10.*
2. **Access Sections**: Facilitate routine inspection and maintenance of internal components.
3. **Outlet Attenuation**: Minimises discharge noise into the ductwork system.

System Operation and Airflow Path;
Office Primary Air Handling Unit – **South & North**

Outside air is drawn into the units through dedicated air intake wells located at the roof level. The air passes through successive stages of attenuation and filtration before being thermally conditioned:

1. **Filtration**: Air is first treated by panel and bag filters to remove particulates.
2. **Heating/Cooling**: Air then passes over the heat recovery and cooling coils, where it is either pre-heated using recovered heat from the condenser or back-up boiler systems, or cooled via the chilled water system, depending on ambient and internal demands.
3. **Humidification** (where applicable): Previously, the air would be humidified using rotary atomisers in each unit, though this function is now believed to be redundant.
4. **Final Filtration**: A reticulated foam filter ensures any remaining impurities are removed.
5. **Air Delivery**: The conditioned air is then pushed by twin supply fans through outlet attenuators and into the primary supply ductwork.

Each AHU connects to a fire-rated vertical riser, which delivers the conditioned outside air to on-floor fan rooms located on each level of the building. Within each fan room:

- The outside air is passed through a motorised fire/smoke damper and volume control damper**.** These dampers:
    - Provide air regulation,
    - Automatically close upon activation of the smoke extract system for fire safety.

The fan rooms act as plenums, where outside air is mixed with recirculated return air from the office spaces. This mixed air is then drawn into the on-floor air handling units, which provide final stage heating, cooling, and distribution to the office zones.

O&M and Documentation Review;
Office Primary Air Handling Unit – **South & North**

Fan Performance Shortcomings

Following our initial site inspection, Halo HVAC has conducted a thorough review of all available documentation relating to the existing AHU installations. It has since come to light that the recently upgraded EBM fan arrays installed within the units are not fit for purpose when assessed against the required performance criteria for this application.

Upon reviewing the manufacturer's technical data sheets, it is evident that the installed fan models are unable to simultaneously achieve the necessary airflow volumes (measured in m^3/h) and system static pressures (Pa) required to deliver optimal performance under the current design conditions. Specifically:

The fan performance curves indicate that at the required duty points (combination of volume and pressure), the fans are operating beyond their best efficiency point (BEP), resulting in reduced system efficiency and potential long-term strain on the motors. There is insufficient static pressure allowance to overcome system resistances such as filtration, coil pressure drops, and duct losses, particularly during periods of high external demand.

This shortfall restricts not only operational effectiveness but also future efficiency upgrades such as the implementation of heat recovery (e.g., run-around coil systems), which inherently introduce additional pressure drop into the system.

Energy Saving Analysis

This is based on original design documentation that states the design duty as 42m3/s @ 1989Pa, this appears to have been achieved via 2 x RZR 13-1000 (DIDW, backward curve, belt drive fans) operating on a duty share basis. The fans were installed midway through the unit so in a Type A installation (free inlet / free outlet + diffuser plate), it would appear from the design data that the fans were selected as a Type B installation (free inlet / ducted outlet) so there will be a slight difference in the dynamic pressure. However, the shaft power and the static efficiency would be the same in both instances.

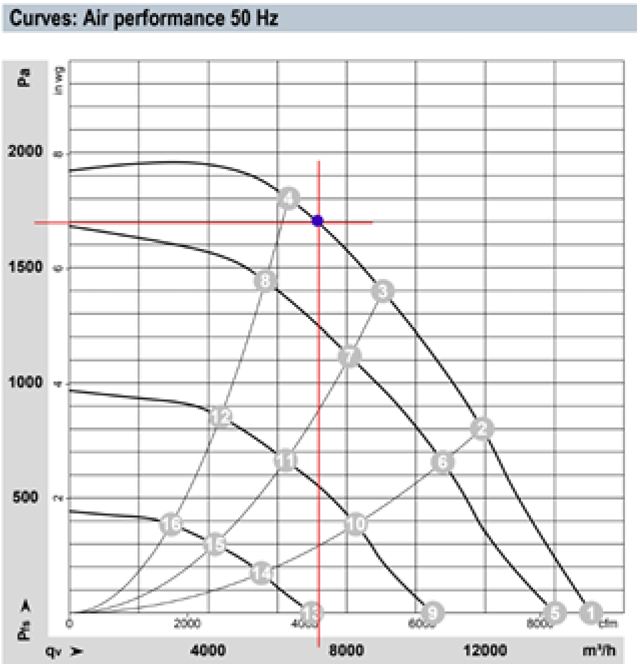
Technical data of the fan: RZR 13-1000 — fulfills the ErP r

Description	Value	Dimen
Installation acc. DIN 24163 Part 1	A	
Reference density (Rho1)	1.20	kg/m^3
Medium temperature (t)	20	C
Air flow rate (V)	21.0000	m^3/s
Total pressure rise (dp_t)	2151	Pa
Dynamic pressure at discharge (pd_2)	162	Pa
Static pressure rise (dp_{fa})	1989	Pa
Fan speed (n_v) 1)	1169	min^{-1}
Power on fan shaft (P_w)	52.7	kW
Absorbed power of the system (P_1) with V-belt / flat belt drive	56.5 / 55.7	kW
Total efficiency (ETA_t)	86	%
Static efficiency (ETA_{fa})	79	%

This results in a static system efficiency of the existing fans of 71.9%, the design document states that the starting method as Star/Delta and if an inverter was fitted at a later stage then the static system efficiency would reduce to 70.6% (assuming an inverter efficiency of 98.2%).

If the design duty and commissioned duty were similar then no significant energy savings would not have been realised – given the fact the peak efficiency on an EC fan is 71 – 71.5%. Even if we assume the higher figure as an optimal selection then the energy saving would have been 1.25% compared to the original system assuming an inverter was fitted but 0.6% more than the original system assuming that an inverter was not fitted.

From the information provided it would seem that the EC fan upgrade involved the installation of 21 x K3G450-PB24-01, after reviewing the below fan curve and assuming a required duty of 2m3/s (7200m3/h) @ 1989Pa per fan it is questionable that original duty can be achieved even with the fan operating at full speed.



The maximum achievable static pressure at 2m3/s will be circa 1700Pa. Any additional system pressure will result in a loss of volume as the duty point travels left along the full speed curve.

There are various reasons why the duty may have been different to the original design duty, including, but not limited to:

- The external pressure of the installed system was lower than the design estimation meaning that the static pressure was less than the 1989Pa used in the selection.
- There has been a subsequent change in the system (e.g. adaptation of the ductwork).

- A change in the AHU components or the removal of redundant components prior to the EC upgrade.

- An agreed reduction in the volume required, it may have been the case that the existing system never exceed a certain frequency and this was used as the basis of the retrofit rather than the full design duty.

- A different fan reference was installed with different performance characteristics that could achieve the required duty.

It is important to ascertain the actual system conditions (determination of the system line) in conjunction with a definitive statement as to the required air volume before any consideration relating to additional energy saving potential can be made.

Any post upgrade validation reports can be used to form a basis of any analysis in the first instance, alternatively the performance of the system, as it is now, can be reviewed, including static pressure observations across the fan bulkhead, and volumetric measurement using the calibrated inlet nozzle (normally fitted to most EC fan) and associated k factor.

Upon determination of the existing performance / duty it is important for a third party verification as to its suitability in line with the building use and/or occupancy requirements before any further analysis of additional energy savings can be conducted.

Request for Further Internal Access & Air Flow Validations:

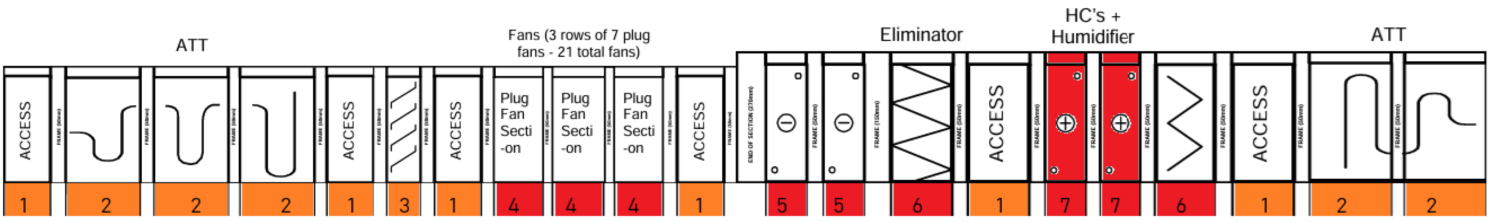
To confirm viability with precision, Halo HVAC requests out-of-hours access to the site. This will enable safe shutdown of the AHUs, permitting a full internal inspection. Our focus areas would include:

- Mechanical condition of fans and drive assemblies
- Coil condition and fouling levels
- Frame integrity and air leakage
- Control panels and BMS integration points
- Energy recovery potential
- Contamination or corrosion of internal panels and plenums
- Filtration upgrades
- Validations

Condition Report Scores;

Office Primary Air Handling Unit – **South & North**

(AHU/R-01 & AHU/R-02) colour coded section by section



1. Access Sections

AHU Access Sections – Condition Assessment and Recommendations

Asset Description:
In accordance with RICS NRM 3 and Facilities Management Standard 002: Asset Data, the access sections of the air handling unit (AHU) comprise hinged panels with integrated viewing windows and locking mechanisms, designed to facilitate routine maintenance and inspection of internal components.

Current Condition:
A visual and physical inspection, following the principles of CIBSE Guide M, Section 13 (Engineering Condition Surveys), found the access sections to be in overall fair condition. Hinges and locks are operational, and access windows are intact, offering adequate visibility into the unit's interior. Access provision aligns with good practice for maintainability and safety, with no major obstructions identified.

However, minor surface rust was observed on some hinge components and panel edges, suggesting superficial corrosion. Additionally, a light accumulation of dirt and dust was noted around the window frames and along panel seals.

Indicative Life Expectancy:
As referenced in CIBSE Guide M, Appendix 12.A1, access covers and associated hardware typically have an indicative economic life expectancy of 15–20 years, depending on usage, environment, and maintenance. The current condition suggests the components remain serviceable and within their expected life span, though some preventative maintenance is advisable.

Maintenance Requirements:
In line with the BESA SFG20 task schedules, the following actions are recommended:

- Clean access panels, seals, and window surrounds to prevent build-up of particulate matter that may degrade gaskets or viewing clarity.
- Treat visible areas of rust with a suitable corrosion inhibitor and recoat as required.
- Lubricate hinges and locking mechanisms to ensure continued ease of use and prevent long-term wear.
- Monitor seals and gaskets for degradation during future inspections.

Conclusion:

While the AHU access sections currently provide satisfactory access with secure, operable hinges and locks, minor cleaning and corrosion treatment are recommended to preserve function and extend the service life of these components. Possible new portholes and door seals required. No immediate major remedial works are required beyond routine maintenance.

2. Attenuators

AHU Attenuators – Condition Assessment and Recommendations

Asset Description:
In accordance with *RICS NRM 3* and *Facilities Management Standard 002: Asset Data*, attenuators within the Air Handling Unit (AHU) are passive acoustic components designed to reduce airflow noise transmission. They typically consist of perforated baffles and sound-absorbing materials enclosed within sheet metal casings.

Current Condition:
A limited inspection was carried out via existing portholes, in line with the methodology outlined in *CIBSE Guide M, Section 13 (Engineering Condition Surveys)*. Due to the inaccessibility of internal sections and absence of dedicated access panels, only partial visual assessment was possible.

From the accessible viewpoints, the attenuator surfaces appeared intact with no evidence of structural damage or dislodgement of internal acoustic baffles. However, minor surface rust was observed on some external metalwork and mounting points, likely due to long-term exposure to humid airflow conditions.

Indicative Life Expectancy:
Referencing *CIBSE Guide M, Appendix 12.A1*, attenuators have an indicative economic life expectancy of approximately 15–25 years depending on material specification, environmental exposure, and maintenance frequency. The observed condition suggests that the attenuators remain within their expected serviceable life.

Maintenance Requirements:
In alignment with *BESA SFG20 task schedules*, the following minor maintenance action is recommended:

- Treat visible rust spots with a suitable corrosion inhibitor and apply protective coating to prevent progression.
- Continue routine visual inspections via portholes, and consider improved access for future detailed assessments during major maintenance cycles.

Conclusion:
Although full access to the attenuators was not possible, the limited inspection via porthole indicates they are structurally sound and generally fit for continued service. Minor corrosion treatment is advised to prevent long-term material degradation, but no immediate repairs or replacements are required at this time. However, in line with certain guidance such as *CIBSE Guide M*, full replacement of the attenuators could be considered where justified by lifecycle planning, access limitations, or broader refurbishment works.

3. Damper

AHU Damper – Condition Assessment and Recommendations

Asset Description:

As described under RICS NRM 3 and Facilities Management Standard 002: Asset Data, the damper observed within the AHU assembly is a mechanical component used to regulate airflow within the ductwork system. Its function may include control, isolation, or, potentially, fire/smoke containment, though this could not be confirmed through external inspection alone.

Current Condition:

A limited visual inspection was conducted via external portholes in line with CIBSE Guide M, Section 13 (Engineering Condition Surveys). The visible portion of the damper assembly shows no immediate signs of mechanical failure. The frame appears stable, and no obstructions or severe corrosion were observed from the accessible viewing point.

However, without a full internal inspection, we are unable to determine:

- The damper's actuation method (manual, motorised, fusible link, or otherwise)
- Whether it is intended for fire/smoke protection or standard airflow control

Fire/Smoke Damper Considerations:

In the absence of clear labelling or access to internal components, the classification of the damper as a fire or smoke control device remains unconfirmed. This is a critical issue as regulations concerning such components have evolved in recent years:

- BS 9999:2017 and BS 9991:2015 (amended 2021) outline current design, maintenance, and commissioning responsibilities for fire safety systems, including dampers.
- BS EN 12101-8 governs smoke control dampers, requiring CE-marked and third-party-certified components in specific scenarios.

Regulatory Reform (Fire Safety) Order 2005 and updates under the Fire Safety Act 2021 emphasize that Responsible Persons must ensure fire and smoke dampers are subject to suitable routine inspection and testing, often annually, and that access must be provided for this purpose.

Failure to identify or maintain a potential fire/smoke damper could represent a non-compliance issue under these regulations.

Indicative Life Expectancy:

Based on CIBSE Guide M, Appendix 12.A1, the typical economic life expectancy of control or isolation dampers ranges from 15–25 years depending on material, usage, and environment. Fire/smoke dampers may require earlier replacement if testing access is restricted or compliance certification cannot be assured.

Maintenance Requirements:

- Per BESA SFG20 schedules and industry best practices, the following is recommended:
- Conduct a full internal inspection to confirm damper type, function, and condition.
- If confirmed as a fire/smoke damper, ensure compliance with current fire safety regulations including access provision, actuation testing, and certification.
- Treat any visible corrosion to prevent operational impairment.
- Consider replacement if the damper is outdated, non-compliant, or lacks test access.

Conclusion:

The damper appears in fair visual condition from an external standpoint, with no immediate defects noted. However, due to limited access, its exact function—particularly whether it serves a fire or smoke safety role—remains unclear. Given evolving fire safety regulations, and the critical importance of damper classification and testability, further investigation is required. If it is confirmed as a fire or smoke damper, full compliance with current standards may necessitate its replacement or upgrade, particularly if access or certification cannot be achieved through reasonable means.

4. Fans

As covered on pages (8-10)

Following our initial site inspection, Halo HVAC has conducted a thorough review of all available documentation relating to the existing AHU installations. It has since come to light that the recently upgraded EBM fan arrays installed within the units are not fit for purpose when assessed against the required performance criteria for this application.

Upon reviewing the manufacturer's technical data sheets, it is evident that the installed fan models are unable to simultaneously achieve the necessary airflow volumes (measured in m^3/h) and system static pressures (Pa) required to deliver optimal performance under the current design conditions.

5. Cooling Coils

AHU Cooling Coils – Condition Assessment and Recommendations

Asset Description:

In accordance with RICS NRM 3 and Facilities Management Standard 002: Asset Data, cooling coils within the Air Handling Unit (AHU) are heat exchange elements responsible for reducing air temperature via chilled water or DX refrigerant. They are typically constructed from copper tubing with aluminium fins and integrated within the AHU casing.

Current Condition:

A visual inspection was undertaken in line with CIBSE Guide M, Section 13 (Engineering Condition Surveys). The cooling coils were found to be generally intact, with no immediate signs of fin collapse, heavy fouling, or mechanical damage. However, some surface corrosion was noted on the coil headers and surrounding frame, and there is minor dust accumulation across fin surfaces.

Water-side connections appeared aged, and no visible recent maintenance or servicing labels were present. While airflow was not restricted at the time of inspection, coil efficiency may be compromised without regular cleaning or flushing of internal water circuits.

Indicative Life Expectancy:

According to CIBSE Guide M, Appendix 12.A1, the indicative economic life expectancy for cooling coils is typically 15–20 years, subject to environmental conditions, water treatment quality, and maintenance history.

Based on the visual assessment and known age of the unit (where available), the cooling coils appear to be at or beyond their recommended economic life expectancy. This increases the risk of reduced thermal performance, internal fouling, and potential coil failure.

Maintenance Requirements:

In accordance with BESA SFG20 task schedules, the following actions are advised:

- Clean coil fins using appropriate non-corrosive methods to improve thermal performance.
- Inspect and, if possible, flush the internal coil circuit to remove potential scaling or biological fouling.
- Assess the condition of insulation and pipework for degradation or leaks.

- Conduct performance testing (temperature differential and pressure drop) to assess coil effectiveness.
- Begin lifecycle planning for coil replacement due to age and observed condition.

Conclusion:
The AHU cooling coils are exhibiting signs of age-related wear and surface corrosion. While currently operational, they are likely at or beyond their expected service life per CIBSE Guide M. Without intervention, performance deterioration and risk of failure will increase. As such, proactive maintenance and monitoring are essential, and coil replacement should be considered as part of forward lifecycle planning.

6. Eliminators

AHU Moisture Carryover Eliminators – Condition Assessment and Recommendations

Asset Description:
Moisture eliminators—also referred to as carryover eliminators or droplet separators—are passive components typically installed downstream of cooling and occasionally heating coils to prevent condensate or moisture droplets from being entrained into the airstream. In accordance with RICS NRM 3 and Facilities Management Standard 002: Asset Data, these are classified as part of the coil assembly or air treatment section and are essential for maintaining downstream air quality and preventing corrosion or microbial growth within ductwork.

Current Condition:
A visual inspection was carried out following CIBSE Guide M, Section 13 (Engineering Condition Surveys). Moisture eliminators were present downstream of the cooling coil and, in some cases, also after the heating coil (where applicable).

From the accessible view, the eliminator blades appear intact and undamaged, with no signs of deformation or displacement. However, some dust accumulation and minor surface corrosion were observed, particularly near mounting frames and support structures. No signs of excessive moisture bypass or staining were evident on adjacent components.

Indicative Life Expectancy:
As per CIBSE Guide M, Appendix 12.A1, moisture eliminators are considered passive components with an indicative economic life expectancy of approximately 15–20 years, depending on material type, air quality, and maintenance practices.

Given the visual condition and presumed original installation date, the eliminators are likely approaching or have exceeded their expected service life. Although still operational, efficiency in moisture separation may be reduced due to accumulated dirt or corrosion, which can impair airflow or droplet capture efficiency.

Maintenance Requirements:
- In line with BESA SFG20 task schedules, the following maintenance actions are recommended:
- Clean eliminator blades and surrounding housing using appropriate vacuuming or low-pressure washing methods to remove dust and contaminants
- Inspect for any signs of biofilm or microbial growth, especially in areas where moisture is retained.
- Assess structural integrity of supports and fastenings for corrosion or fatigue.
- Consider full replacement if corrosion is advanced or if eliminators are contributing to downstream moisture issues.

Conclusion:

The moisture carryover eliminators associated with the AHU's heating and cooling coils remain in place and visually intact, but show signs of age and wear, including minor corrosion and dust accumulation. Given their likely age, they are approaching or beyond their guidance-based economic life expectancy as per CIBSE Guide M. While no immediate operational issues are evident, a programme of cleaning and ongoing monitoring is advised, with consideration given to replacement during future coil refurbishment or lifecycle upgrades to ensure continued air quality protection and compliance with best practice.

7. Heating Coils

AHU Heating Coils – Condition Assessment and Recommendations

Asset Description:
Heating coils within the Air Handling Unit (AHU) are responsible for increasing the temperature of the airstream using hot water or steam. As per RICS NRM 3 and Facilities Management Standard 002: Asset Data, these coils typically consist of copper tubes with aluminium fins, enclosed in a steel frame and installed within the supply or reheat section of the AHU.

Current Condition:
A visual inspection was carried out in line with CIBSE Guide M, Section 13 (Engineering Condition Surveys). The heating coil appears generally intact, with no signs of significant fin damage, dislodgement, or blockage. However, signs of surface corrosion were observed on the coil headers and mounting frame, and moderate dust accumulation was present on the fin surface.

No visible signs of water leakage or staining were observed in the surrounding area. However, the pipework insulation was found to be aged and showing signs of wear, which may reduce energy efficiency and should be monitored.

Indicative Life Expectancy:
According to CIBSE Guide M, Appendix 12.A1, heating coils typically have an indicative economic life expectancy of 15–20 years, depending on factors such as water quality, usage frequency, and maintenance. Based on the inspection findings and the known or estimated age of the AHU, the heating coil appears to be at or beyond its recommended economic service life.

While still operational, components at this age are more susceptible to internal fouling, efficiency loss, and eventual failure of tube joints or headers due to corrosion fatigue.

Maintenance Requirements:

- Following BESA SFG20 task schedules, the following actions are recommended:
- Clean the coil fins to remove dust and debris, improving heat transfer efficiency.
- Check and, if necessary, replace or repair aged insulation on heating pipework.
- Inspect for corrosion or leakage at joints, headers, and connections.
- Conduct thermal performance testing (flow and return temperature comparison, pressure drop) to evaluate coil effectiveness.
- Plan for coil replacement as part of a future refurbishment or lifecycle upgrade strategy.

Conclusion:
The heating coil within the AHU is currently functional, with no critical defects observed. However, signs of surface corrosion and dust accumulation—combined with the age of the component—suggest that it is likely at or beyond its CIBSE Guide M indicative economic life expectancy. Proactive maintenance is required to maintain efficiency, and replacement should be considered in the near term as part of planned capital works or a broader AHU refurbishment programme.

AHU Condition report recommendations:

🔧 Refurbishment & Maintenance Recommendations for AHUs (AHU/R-01 & AHU/R-02)

1. Internal Access & Performance Validation

Urgency: High

- Schedule out-of-hours access for full internal inspection.
- Conduct airflow validation and pressure drop analysis using calibrated equipment.
- Confirm actual system duty to benchmark existing performance against design intent.
- Use third-party verification to assess system suitability for current occupancy.

2. Fan System Rectification

Urgency: High

- Reassess and reselect fan arrays to meet required airflow and static pressure duty points.
- If EC fans remain viable, select alternative models that operate within optimal fan curves.
- Consider hybrid fan wall design to accommodate pressure drop from future energy recovery systems (e.g. run-around coils).
- Ensure VSDs/inverters are correctly specified and tuned for efficiency and motor protection.

3. Run-Around Coil Integration for Heat Recovery

Urgency: Medium-High, Part L compliance

- Design and integrate run-around coil system to achieve at least 50% recovery efficiency.
- Ensure compliance with BS EN 13053, and verify fan selection allows for additional pressure loss.
- Include controls upgrade for modulated pump operation and seasonal optimization.
- Leverage carbon reduction calculations to support ROI and ESG reporting.

4. Cooling Coil

Urgency: High

- Replace cooling Coil

5. Heating Coil

Urgency: High

- Replace Heating Coil

6. Damper Identification and Compliance Upgrade

Urgency: High

- Conduct full internal inspection to confirm damper type (fire/smoke vs control).
- If classified as fire/smoke dampers:
- Ensure access provisions are compliant with BS 9999 / BS 12101-8.
- Undertake CE/UKCA marking review and certification update.
- Consider replacement if inaccessible or untestable.

7. Access Panel & Door Seal Restoration

Urgency: Low-Medium

- Clean panels and gaskets to prevent particulate ingress.
- Treat rust and repaint hinge areas.
- Lubricate hinges and locks.
- Replace any degraded door seals or viewing windows as needed.

8. Attenuator Monitoring & Future Access Improvement
Urgency: Low

- Treat visible corrosion on attenuator mounts.
- Maintain visual inspections through portholes.
- Plan improved access design for future major maintenance cycles.
- Consider replacement during lifecycle upgrades where acoustic performance is critical.

9. Moisture Eliminator Cleaning and Replacement Planning
Urgency: High

- Replace eliminators

10. Ongoing Monitoring & BMS Integration Audit
Urgency: Medium

- Validate that all AHU components (coils, dampers, fans) are correctly interfaced with the BMS.
- Review control strategies to ensure energy-efficient operation, including night set-back and demand-led modulation.
- Install condition-based monitoring sensors (optional, advanced ESG tracking).

10. Filtration Upgrade
Urgency: Medium - High

The current AHUs are equipped with panel filters and bag filters, forming a multi-stage particulate filtration system. Additionally, reticulated foam filters are installed downstream of the humidification section.

While these provide a baseline level of air purification, there is a clear opportunity to upgrade to higher-efficiency, low-resistance filters to:

- Enhance indoor air quality (IAQ)
- Reduce airborne particulate transmission (beneficial for occupant health and ESG reporting)
- Improve equipment protection (downstream coils and fans)
- Support WELL Building Standard and RESET Air principles where applicable

Conclusion

- Unit not functioning or operational at time of survey.
- Faulty or damaged components that require replacement.
- Standard maintenance not enough to bring unit to workable condition.
- The components have exceeded their life expectancy according to CIBSE guide M Appendix 12.A1: Indicative economic life expectancy.

Conclusion & Recommendation: Air Handling Unit (AHU) Refurbishment at 20 Bank Street

After thorough review of the AHU systems at 20 Bank Street, it is clear that refurbishment is not only a viable solution but the optimal path forward. It makes sense from a technical, economic, and environmental perspective.

Why AHU Refurbishment Is the Best Option

1. Regulatory Compliance

Part L of UK Building Regulations requires thermal energy recovery of at least 50 percent. Integration of run-around coil systems as part of refurbishment can achieve this while aligning with BS EN 13053 for AHU classification and performance. Fire and smoke damper upgrades will ensure compliance with BS 9999, BS EN 12101-8, and the Fire Safety Act 2021, protecting building occupants and fulfilling statutory responsibilities.

2. Reduced Downtime

Refurbishment can be phased, targeted, and executed out of hours, which greatly minimizes operational disruption. This avoids the long lead times and extensive shutdowns typically required for full AHU replacement or major plant alterations.

3. Cost Efficiency

AHU refurbishment offers a significant cost saving, often 40 to 60 percent compared to full replacement. This includes:
- Reuse of major components and casing
- Avoidance of structural and crane access modifications
- Minimal disruption to BMS controls and existing ductwork

4. Extended Asset Life

Core components such as cooling and heating coils, fans, and filtration systems are at or near end of life, but casing and frame structures remain serviceable. Strategic replacement of degraded parts combined with performance validation can extend AHU service life by 10 to 15 years and support lifecycle cost planning.

5. Carbon Reduction and ESG Alignment

Refurbishment supports Morgan Stanley's net zero commitment in several ways:
• Reducing embodied carbon associated with manufacturing and transporting new AHUs
• Extending equipment life in line with circular economy principles
• Enabling energy recovery and efficient control upgrades that reduce operational carbon emissions
This approach also supports ESG and WELL standards, enhancing indoor air quality and demonstrating responsible asset management.

6. Energy Efficiency

Installing a run-around coil system can deliver up to 60 percent energy recovery, reducing heating and cooling loads. Fan systems will be resized and recalibrated to improve efficiency and correct current mismatches with system resistance. Control strategy upgrades, including BMS audits and demand-led modulation, will further reduce energy consumption.

7. Building and Asset Integrity

Inspection of the existing AHUs confirms no critical failures and supports refurbishment as a practical approach. Structural components including access sections and attenuators are in fair to good condition with only minor corrosion and wear. A full internal inspection and airflow validation, conducted during scheduled out-of-hours access, will help define the final scope of work.

8. Strategic Maintenance and Compliance Planning

Refurbishment will achieve the following:
• Upgrade filtration to support WELL and RESET Air standards
• Ensure dampers and controls meet current fire and building regulations
• Enable condition-based monitoring and improved ESG reporting
This also supports smarter capital planning, with non-critical components scheduled for future upgrades.

Recommended Refurbishment Package Includes

- A full internal investigation of each component
- Airflow validations

- Fan replacement or upgrade to meet required airflow and pressure
- New heating and cooling coils
- Integration of a run-around coil heat recovery system
- Upgrade of BMS controls and validation of integration
- Damper inspection and replacement if needed
- Replacement of moisture eliminators
- Restoration of access panels and door seals & Corrosion treatment
- Filtration upgrade for better air quality and energy performance
- Full airflow and pressure testing

Final Statement

AHU refurbishment offers a strategic, regulation-compliant, and ESG-aligned solution at 20 Bank Street. It delivers maximum value by reducing carbon emissions and energy use, avoiding unnecessary costs, and minimizing disruption to building operations. It also extends the life of key plant assets and supports Morgan Stanley's leadership in sustainable property management.

Refurbishment is not just the most practical choice. It is the most responsible and forward-thinking one, and offers the same warranties as a brand new unit without the huge costs.

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