mechanical and electrical consulting engineers

THE MET BUILDING – PODIUM AND TOWER – STATEMENT ON THE HVAC SERVICES – EXISTING AND PROPOSED WORKS

ENERGY STRATEGY

The energy strategy for the building is directed in this instance by Building Regulation L2B-2013 with replacement elements to L2A-2013 to cover :

- Daikin 3-pipe VRF AC air source heat pumps with heat recovery with increased energy efficiency ratios.
- Local heat recovery ventilation systems replacing ventilation systems without heat recovery.
- LED lighting with daylight saving and PIR detection.
- Hot water to showers from air source heat pumps.

Due to the existing low floor to ceiling heights in the property, the HVAC plant is predominantly localised with air louvres built into the perimeter to facilitate this arrangement. This was a consequence of the original design of the property, which we are repeating with equipment of significantly higher energy efficient operation.

We assessed alternative means of HVAC plant application but the configuration of the property, verified the perimeter arrangement of 3 pipe VRF AC heat pump systems and heat recovery ventilation units as localised equipment with external plant allocated to the tower and podium roof levels to suit.

The podium roof houses the external VRF AC heat pump condensers and centre podium heat recovery ventilation units, which can only be located local to the areas of use, due to limitations on service lengths from indoor to outdoor units. Therefore the podium roof plant is discreetly located on the podium level roof. The property retail units comprising 2x banks and 1x chemist which have small duty HVAC plant, that can only be located externally at the podium roof due to the limited service routes required for the selected plant as applicable to this type of space. The retail plant is being replaced with new plant of higher energy efficiency operation.

The existing tower plant will be either retained to serve both the current occupied spaces or replaced for the refurbished floors, with new plant of higher efficiency and heat recovery for lower carbon emissions.

Further details on the existing and proposed plant is provided below with plans appended to this note, as referenced.

EXISTING PODIUM AND TOWER ROOF PLANT

We have attached the existing podium roof plant layouts for both the east and west podium (MC05/5294/RD-06 and RD-08). The existing west podium plant incorporated the HSBC and Nat West retail unit HVAC plant to the Percy Street side of the podium roof adjacent the residential properties on an open layout.

The central podium office areas were served from external VRF AC condensers and heat recovery ventilation units on both the east and west podium roof areas to supplement the perimeter AC systems served from the top roof and the local ventilation units which utilise the external air louvres at low level at each floor in the property. This is the inherent HVAC design in the building with no central HVAC plant.

The top roof houses the VRF AC condensers that serve the tower and podium perimeter areas as shown on both the attached existing roof plan (drawing MC03-4642-M-RD09 as Scan 001) and

proposed roof plan (1462-400-10-T2). The roof also houses the toilet ventilation unit, standby generator and boiler room plant.

PROPOSED NEW PODIUM AND TOWER ROOF PLANT

We have attached the proposed podium roof plant layout – 1462-400-09-T3, which identifies the following :

- The HSBC and Nat West HVAC plant will be moved away from the residential properties onto the Tottenham Court Road/East side of the Podium roof.
- The small split system AC heat pump condensers which serve the central offices of the Podium floors will be located to the Tottenham Court Road/East side and the Percy Street/West side in purpose made open top enclosures (i.e. on both the east and west podium spaces). These smaller AC heat pump systems have limited pipe lengths from indoor to outdoor units and the local heat recovery ventilation units have limited air resistance to volume flow, so could not be fitted on the top roof due to the physical restraints on the distance involved. Central plant would also require additional space which is not currently available, additional roof loading and the requirement to provide additional riser space within and through the part tenant occupied property.
- The podium floors receive mechanical fresh air ventilation from local perimeter HRVU's with the centre offices served by heat recovery ventilation units located in the louvred podium roof enclosures. These systems are decentralised and have limited ductwork runs on equipment air resistance.
- The tower roof includes the new and retained VRF AC condenser plant, in addition to tower tenants server room AC condensers, replacement toilet extract air fan and the retained standby generator and boiler room plant covering common space heating and hot water services.

SUMMARY

The above covers the need for HVAC equipment at podium roof level which is concurrent with the existing building design for independent HVAC systems to each floor, which enables flexibility in tenant occupation times on a floor by floor basis to minimise energy usage, enable provision of heat recovery equipment and provide lower carbon emission levels for the building.

The tower roof as identified above cannot be used for the podium roof plant due to the original building design for localised AC systems and mechanical ventilation equipment to maximise the limited floor to ceiling heights in the property and to work within the physical constraints on the available operating lengths of pipework and ductwork on these localised types of HVAC systems.

Philip Kinsella BSc(Hons) CEng MIMechE MCIBSE
CIBSE Accredited Low Carbon Consultant, Low Carbon Energy Assessor
& TM44 Air Conditioning Inspector
Managing Director
GLP Consulting Engineers Ltd