Abbey Road – Phase 1

BS 1536

Statement to Satisfy Planning Condition 60 - CHP

Attached is drawing no: MBS 1536-F/1 which indicated the energy centre layout. There is sufficient access height and circulation space for the purpose of installation, system expansion, maintenance and replacement of the energy generation in order to supply heating / hot water to all residential and commercial units within all three phases of all development.

Space is indicated on the drawing for the additional boiler and larger CHP unit.

A catalytic converter is not required due to the NOx level assumed for CHP plant by the Hilson Moran Air Quality Assessment compared to the actual NOx emissions of the CHP we are using.

With reference to the documents attached:

- NOx emissions assumed for Air Quality Assessment report, with catalytic converter fitted, was 250mg.Nm3(g/s)
- NOx emissions for the proposed Shenton Micro Series T20V1 *without* catalytic converter, is 95mg/Nm3(g/s)

Considering that the Air Quality Assessment recommended a catalytic converter be used to lower the NOx emissions to 250mg/Nm3(g/s), a figure that our proposed CHP is well below anyway, our position would be that a catalytic convertor for this particular CHP is not required to satisfy the recommendations of the AQA, and hence the planning condition.

Attached is drawing no: BS 1536/3 which indicates the district heating pipework installed to a pit outside the building for the future connection to phases 2 and 3.

Please note the supply authorities will not permit the electricity generated by the CHP to serve more than one building. This will therefore be connected to the Phase 1 Landlord's service. Any excess will be distributed to the grid.

3.4 Point Source Emissions

The development is anticipated to include a CHP plant to provide electricity whilst using the waste heat for domestic hot water. The CHP plant was included in the ADMS-Roads assessment and modelled as a point source emission. The details of the CHP plant that was modelled in ADMS-Roads are given in Table 3.2.

Table 3.2: Details of the CHP plant.

Model	Ener G E150	
Size	152	kWe
Flue Temperature	120	°C
Efflux velocity	7.5	m/s
NOx emissions	3798 (0.431)	mg/Nm^3 (g/s)
NOx emissions with catalytic converter	250 (0.028)	mg/Nm^3 (g/s)
CO emissions	2088 (0.237)	mg/Nm^3 (g/s)
CO emissions with catalytic converter	350 (0.040)	mg/Nm^3 (g/s)
Flue diameter	140	mm

Additional gas fired condensing boilers are to be provided to meet the additional space heating load. These are to be low-NOx boilers, as described in Table 3.3. All 3 boilers were modelled in ADMS-Roads as one flue (as ADMS-Roads has a maximum of 3 point sources) in addition to the CHP plant.

Table 3.3: Details of the boilers.

Boiler output	1000	kW
Number	3	
Emissions (mg/kWh):		
NOx	35	
CO	15	
Flue gas:		
Efflux velocity	7.5	m/s
Temperature (worst case scenario)	49	C
Mass flow rate	1565.00	kg/h
Volumetric flow rate	1466.73	m3/h
Volumetric flow rate	0.41	m3/s
Estimated flue diameter	200.00	mm
Estimated flue area	0.03	m2
Estimated eflux velocity	12.97	m/s
Per boiler:		
NOx Emissions	0.0097	g/s
CO Emissions	0.0042	g/s

Micro Series Features

The TEDOM Micro series of CHP units are machines for the combined production heat and power in terms of gas combustion. Basic features of the Micro series of units are: high efficiency, compact design, long life-time of oil filling and service interval. Due to all characteristics mentioned, these products are used as modern power sources for heating small buildings of many types.

According to statement of notified body certificate certifying conformity of Micro series products with requests of directive 2009/142/EC (government regulation no. 22/2003 Col.) was edited. TEDOM is also the holder of QMS and EMS Certificates.

TEDOM CHP Unit Merits:

- Automatic air-fuel ratio control - this method of reducing emissions is in the standard supply of CHP unit.
- CHP units are equipped with digital engine-management which optimises engine operation.
- CHP units form easily connect-able compact complex.
- By use of acoustic enclosure, CHP units are characterized by low noise output.
- Ability to adapt to different temperature gradients of heating systems.
- Due to modular arrangement of control system, the number of binary and analogue inputs for monitoring and controlling following devices can be extended easily.
- Basic signals for CHP unit control (external emergency stop, external start, etc) can be connected to the customer's terminal box.
- Units are functionally tested for operation in production plant.
- TEDOM CHP units are continuously innovated from the knowledge of previous projects.

Design	Sound Enclosure
Operation	AP - asynchronous, parallel with mains
Fuel	Natural gas

Basic Technical Data

Design	Standard	With Condenser
Electrical output	20 kW	20 kW
Heat output	42.0 kW	48.2 kW
Fuel input	65.5 kW	65.5 kW
Electrical efficiency	30.5 %	30.5 %
Heat efficiency	64.0 %	73.6 %
Total efficiency (fuel use)	94.5 %	104.1 %(1)
Fuel consumption at 100% output	6.9 m³/h	6.9 m³/h
Fuel consumption at 75% output	5.5 m³/h	5.5 m³/h
Fuel consumption at 50% output	4.4 m³/h	4.4 m³/h

Basic technical data above is valid for standard conditions according to the 'Technical Instructions' document.

The minimum permanent electric output is 50% of nominal output.

Gas consumption is expressed under standard conditions (15°C, 101,325 kPa).

Technical data is specified for temperatures 65/85°C.

(1) Valid for return water temperature 35°C.

Emissions

Emissions	CO	NO_x
At 5% of O_2 in exhaust gas	300 mg/Nm³	95 mg/Nm³