DWA

BUILDING SERVICES CONSULTING ENGINEERS

20 Red Lion Street
Demonstration of Compliance with Environmental and Sustainability Planning Requirements

The following constitutes a concise summary of assumptions and standards laid out in revision T2 of the *Sustainability and Energy Report* compiled by GDM Partnership for 20 Red Lion Street, London, WC1R 4PQ on 14th February 2019.

Such a summary is intended exclusively for the administrative purpose of tracking proof of compliance. For any other use, reference should always be made to the original source.

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Broad objectives:

	Subject	Item	Proof	Person(s)
1.0.0	General			
1.0.1		Maximise energy demand reduction		
1.0.2		Include passive design measures wherever practical to control heat gains		

For the whole scheme:

2.1.0	Architectural			
2.1.1		Air permeability lower than 10	Air test required.	
2.1.2		Window U and G-values in accordance with table 4.2.1	GB265-TS1-DG1 window composition for all windows and doors not part of curtain wall and for curtain walls on 1st to 3rd floor front elevations. U_g of 1 W/m^{2}K and g of 0.37. GB265-TS1-DG2 window composition for 1st to 3rd floor front elevations for curved parts. U_g of 1 W/m^{2}K and g of 0.37. GB265-TS1-DG3 window composition for 6th floor and ground floor reception screens. U_g of 1 W/m^{2}K and g of 0.36. GB265-TS1-DG7 window composition for all windows and doors with duplex spacer bars (Georgian bars) due to thermal stress. U_g of 1 W/m^{2}k and g of 0.37. Refer to:- */glazing/GB265-TS1-DG1.pdf* */glazing/GB265-TS1-DG2.pdf* */glazing/GB265-TS27-DG3+D4 new.pdf* */glazing/GB265-TS28-DG all.pdf*	Glassbox
2.1.3		Glazing with more than 70% light transmission factor	GB265-TS1-DG1, as per item 2.1.2, with a light transmission factor of 69%. GB265-TS1-DG2, as per item 2.1.2, with a light transmission factor of 69%. GB265-TS1-DG3, as per item 2.1.2, with a light transmission factor of 69%.	Glassbox

			GB265-TS1-DG7, as per item 2.1.2, with a light transmission factor of 67%. Refer to:- */glazing/GB265-TS1-DG1.pdf* */glazing/GB265-TS1-DG2.pdf* */glazing/GB265-TS27-DG3+D4 new.pdf* */glazing/GB265-TS28-DG all.pdf*	
2.1.4		Space made available within the basement for future connection to a district energy source scheme	Refer to:- */drawings/18024-L(53)-01-B.pdf*	
2.2.0	Mechanical			
2.2.1		High efficiency heating services	One (1) Worcester-Bosch GB-162 65kW boiler with seasonal efficiency of 95.5%. Refer to:- */boiler/GB162 V2 65kW - Data Sheet.pdf* Two (2) Ormandy 700 litre CA cylinders with standing conductive heat loss of 2.37kWh per day. Refer to:- */calorifiers/Ormandy - Calorifier Tech Sub - 20RLS (Rev.A).pdf* */calorifiers/Re- Standing losses - 700 Litre Vertical HWS Cylinder Type CA.msg* One (1) Mitsubishi Electric PURY-EP-350-YLM-A1 condenser linked to PFFY-P32-VLRMM-E. Season energy efficiency ratio of 6.56 and coefficient of performance of 5.38. Refer to:- */condensers/PURY-EP350YLM-A1 Citi Multi Condenser - Product information sheet (2015-04).pdf* Twelve (12) Mitsubishi Electric PURY-EP-350-YLM-A1 condenser linked to PFFY-P50-VLRMM-E. Season energy efficiency ratio of 6.56 and coefficient of performance of 5.38. Refer to:- */condensers/PURY-EP350YLM-A1 Citi Multi Condenser - Product information sheet (2015-04).pdf*	DWA

			One (1) Mitsubishi Electric PUHZ-ZRP-140-VKA-3R1 condenser linked to PEAD-M140-JA. Season energy efficiency ratio of 5.2 and seasonal coefficient of performance of 4.0. Refer to:- */condensers/PUHZ-ZRP-V-YKA3 Series condenser - Product Information Sheet.pdf* One hundred and one (101) Mitsubishi Electric PFFY-P50-VLRMM-E fan coil unit. Refer to:- */fan coil units/PFFY-P20-63 VLRMM-E Series FCU - Technical & Service Manual (n.d.).pdf* Six (6) Mitsubishi Electric PEFY-P50-VMA-E2 fan coil unit. Refer to:- */fan coil units/PEFY-P-VMA-E2 FCU - Technical & service manual (2018-09).pdf* Eleven (11) Mitsubishi Electric PFFY-P32-VLRMM-E fan coil unit. Refer to:- */fan coil units/PFFY-P20-63 VLRMM-E Series FCU - Technical & Service Manual (n.d.).pdf* One (1) Mitsubishi Electric PEAD-M140-JA fan coil unit. Refer to:- */fan coil units/PEAD-M35-140JA R32 Power inverter 1Ph - Information Sheet (2017-05).pdf*	
2.2.2		High efficiency hot water services	Boiler and calorifiers as per item 2.2.1.	DWA
2.2.3		Heat recovery on ventilation systems	Fourteen (14) Mitsubishi Electric LGH-100RVX-E heat recovery ventilation unit with specific fan power of 1.51 assuming static pressure of 170Pa. Actual static pressure expected to be less, refer to:- */heat recovery ventilation units/LGH-100RVX-E Lossnay – Datasheet.pdf*	

2.2.4		High efficiency ASHP providing both heating and cooling via VRF	Condensers and fan coil units as per item 2.2.1.	
2.2.5		Permit easy future connection to a district energy network	Boiler is located in close proximity to street, easily accessible for future connection should the possibility arise for integration within a district energy network.	DWA
2.2.6		Individual MVHR units for office spaces	Heat recovery ventilation units as per item 2.2.3.	DWA
2.2.7		Separate central extract fan for WCs with SFP of 0.5W/ls^{-1}	One (1) Nuaire AVT-6R extract fan located on roof with specific fan power of 0.5W/ls^{-1}. Refer to:- */extract fans/ Nuaire AVT6R Extract Fan data sheet.pdf*	Nuaire
2.2.8		Dedicated shower and WC extract fan for basement with SFP of 0.5W/ls^{-1}	One (1) Nuaire AVT-4 extract fan within basement ceiling void, with specific fan power of 0.5W/ls^{-1}. Refer to:- */extract fans/Nuaire AVT4 Extract Fan.pdf*	Nuaire
2.2.9		New gas fired water heaters, with an efficiency of 95% and located in lower ground floor plant room, for the provision of domestic hot water services	Boiler as per item 2.2.1.	DWA
2.2.10		Cooling plant seasonal efficiency of 8.42 for offices, basement to 5th floor	Fan coil units and condensers as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	Mitsubishi Electric
2.2.11		Cooling plant seasonal efficiency of 7.87 for office, 6th floor	Daikin RYYQ10T condenser with ESEER of 7.20. Refer to:- */AET UFH AC/AET UFH AC - Data sheet.pdf* */AET UFH AC/Daikin RYYQ10T condesner - user guide.pdf*	AET

2.2.12		Cooling plant seasonal efficiency of 5.2 for reception	Fan coil units and condensers as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	Mitsubishi Electric
2.2.13		Heating services for offices, basement to 5th floor, provided by ASHP with SCOP of 6.30	Fan coil units and condensers as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	Mitsubishi Electric
2.2.14		Heating services for 6th floor office provided by plant with SCOP of 5.55	AET UFH AC system as per item 2.2.11.	AET
2.2.15		Heating services for reception provided by ASHP with SCOP of 4.00	Fan coil units and condensers as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	Mitsubishi Electric
2.2.16		Local fan coil units connected to heating and cooling system	Fan coil units as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	DWA
2.2.17		Central, air cooled chillers.	Design adopted heat recovery VRF system as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	

2.2.18		Central AHU providing minimum fresh air to office areas	Design adopted heat recovery VRF system as per item 2.2.1. Refer to:- */fan coil units/18024-M-SCH-01 VRV FCU Equipment Schedule.pdf* */condensers/18024-M-SCH-02 VRV Outdoor Unit Equipment Schedule (Rev.B).pdf* *Details from item 2.2.1.*	
2.3.1	Electrical			
2.3.2		High efficiency LED lighting systems		Falcon
2.3.3		Occupancy controls on lighting		Falcon
2.3.4		Daylight dimming controls on lighting		Falcon
2.3.5		Zoning arrangement of the daylight sensors will be no more than 5m from the façade		Falcon
2.3.6		High efficiency LED lighting		Falcon
2.3.7		Intelligent lighting control system including control modules, area control units, presence/solar detectors and scene setting switches		Falcon
2.3.8		New luminaires electrically supported from the new local tenant's and landlord's distribution boards		Falcon
2.3.9		Dimming system to maintain the design illuminance on the working plane		Falcon
2.3.10		85 luminaire lumens per circuit watt lighting efficacy		Falcon

Specific to the existing building:

	Subject	Item	Proof	Person(s)
3.1.0	Architectural			
3.1.1		Improved fabric and insulation to L2B 2013 standards. Exact standards described in section 4.2.1		
3.1.2		Window replacement	Glazing as per item 2.1.2. Refer to:- */glazing/GB265-TS1-DG1.pdf* */glazing/GB265-TS1-DG2.pdf* */glazing/GB265-TS27-DG3+D4 new.pdf* */glazing/GB265-TS28-DG all.pdf*	Glassbox
3.1.3		Improved air tightness		

Specific to the new extension:

4.1.0	Architectural			
4.1.1		High thermal performance of proposed fabric characteristics		
4.1.2		Low thermal transmittance of new thermal elements		
4.1.3		Low air infiltration rate for new construction, 8m^3/hr/m^2 at 50Pa		
4.2.1	Electrical			
4.2.2		30m^2 of photovoltaic panels	Microgeneration certification scheme.	Falcon