156 West End Lane, West Hampstead
2015/6455/P (23rd June 2017)

Planning Conditions 21 & 22

Combined Heat and Power (CHP) – Proposed details, NO2 emissions and stack details

Author: Alex Sear

Checker: Oliver Riley

Approver: Justin Fletcher

Report Number: EMS070-A2D-REP-M -01

Rev No	Comments	Author	Checker	Date
01	First Issue	AS	OR	28/11/2019
02	Final Issue	AS	OR	17/12/2019

1. Introduction

Purpose of this report and overview of supplied information

Planning permission for the demolition of existing buildings and the comprehensive redevelopment of 156 West End Lane, West Hampstead was approved by the London Borough of Camden in June 2017 (reference no. 2015/6455/P). This report has been prepared by Silver EMS and provides the necessary detail to discharge Conditions 21 and 22 of that planning permission.

Condition 21 states:

Prior to commencement of any development other than site clearance & preparation, full details of the proposed combined heat and power unit (CHP) plant and confirmation that the plant will comply with the Mayor's emission standards as set out in the Mayor's Sustainable Design and Construction SPG, and details of any necessary NO2 abatement mechanisms shall be submitted to and approved in writing by the Local Planning Authority.

Condition 22 states:

Prior to commencement of any development other than site clearance & preparation on site, full details of the combined heat and power unit (CHP) stack and its height relative to the mechanical ventilation air inlet locations shall be submitted to and approved by the local planning authority in writing. Air inlet locations should be located away from roads and the CHP stack to protect internal air quality.

This report provides the following information to discharge conditions 21 and 22:

- **Appendix A:** Manufacturers information on the proposed CHP units: 2No.SAV XRGI 20 models from SAV have been selected (Condition 21).
- **Appendix B:** Manufacturers information on CHP highlighting the NO2 emissions and how they meet the Mayor's Sustainable Design and Construction SPG (Condition 21). The CHP level of NO2 emissions is substantially below the threshold within the SPG, and the units contain a catalytic converter, therefore no NO2 abatement is necessary.
- **Appendix C:** CHP stack requirements and location relative to air-inlet locations (Condition 22).

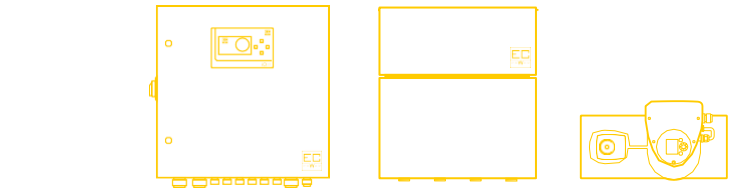
Overview of CHP strategy

In support of the application 2015/6455/P, Silver EMS prepared a revised Energy Statement (June 2016) and a Sustainability and Energy Addendum (September 2016). These documents outlined the use of both CHP and PV to meet the required CO2 reduction target of 35%.

The proposed CHP units: 2No. "SAV XRGI20 units" (Please refer to Appendix A) will produce 39kWt thermal (each). The emissions produced from these units is less than that stated in Mayor's Sustainable Design and Construction SPG (Please refer to Appendix B).

The CHP units will be located in the lower ground floor of the east building (Please refer to Appendix C) and the flues (stacks) associated with these units will discharge at roof level. The flues will discharge between 1.5m and 2.5m above roof level (depending on a detailed flue design by a flue specialist) There are no air inlets located on the roof, eliminating the risk of the flue gasses contaminating any ventilation intakes.

Appendix 1:
CHP INFORMATION: MODEL XRGI 20 - SAV



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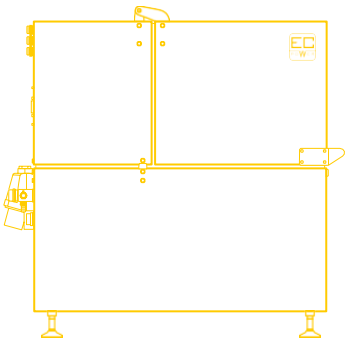

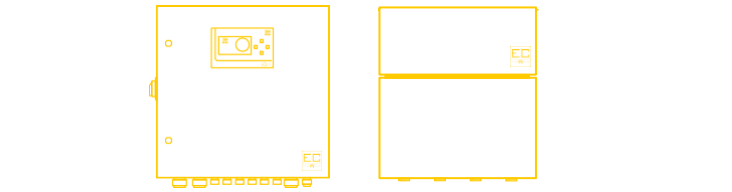

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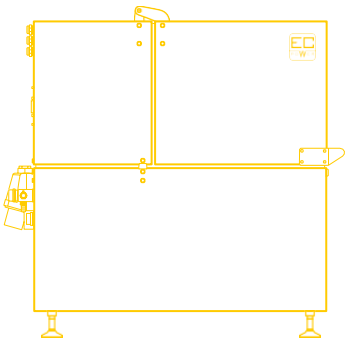

XRGI® 20

TECHNICAL DATA

TECHNIC AL DATA FOR THE XRG I® 20

Product data sheet in accordance with Regulation (EU) No. 811/2013; 813/2013, Dated 26.09.2019

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The XRGI® is a combined heat and power plant (CHP) that works on the principle of cogeneration.

An XRGI® system consists of three main components – the Power Unit, Q-Heat Distributor and the iQ-Control Panel.

In addition, you can also extend your XRGI® system with a storage tank with a capacity of 500, 800 or 1,000 litres for optimum operation.

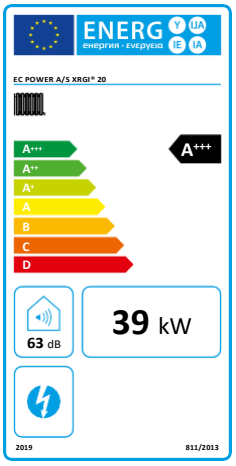
ORDERING D ATA

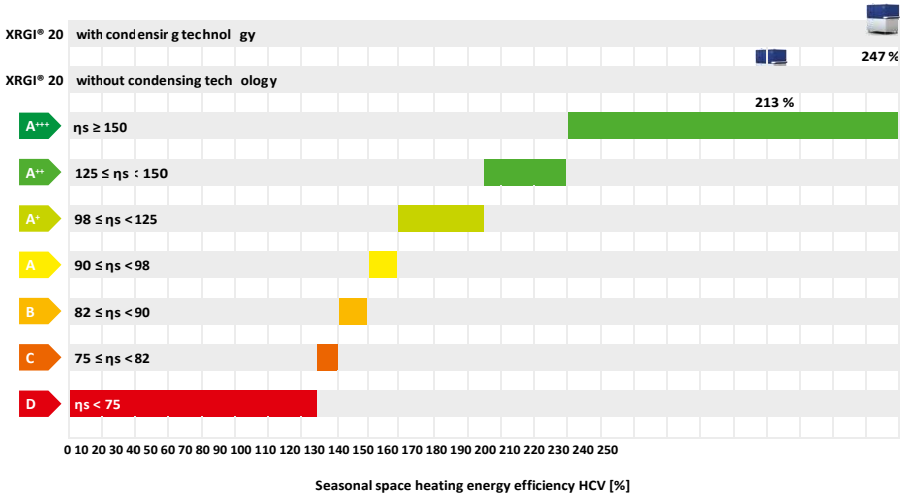
Supplier's name or trademark	EC POWER	
Supplier's model identifier	**XRGI® 20 without condensing technology[1]**	**XRGI® 20 with condensing technology[1]**
Article number	X200001	X200001+K000105
Modules	Power Unit, iQ20-Control Panel, Q80-Heat Distributor	Power Unit, iQ20-Control Panel, Q80-Heat Distributor + Condensing and exhaust gas heat exchanger BW8+

E r P-L ABEL D ATA [2]

Seasonal space heating energy efficiency class			
Rated heat output	P_{rated}	39 kW	45 kW
Seasonal space heating energy efficiency; HCV [3]	η_s	213 %	247 %
Sound power level, indoors	L_{WA}	63 dB	63 dB
Electrical efficiency; in accordance with heating value LCV [3]	$\eta_{el\ CHP100+SUP\ 0}$	33 %	33 %
All special precautions to be taken during assembly, installation or service		Refer to Commissioning and Service Manual	Refer to Commissioning and Service Manual

[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.
[2] The values were rounded in accordance with the requirements governing product data sheets by Regulation (EU) No. 811/2013; 813/2013.
[3] HCV = higher calorific value, LCV = lower calorific value





OUTPUT

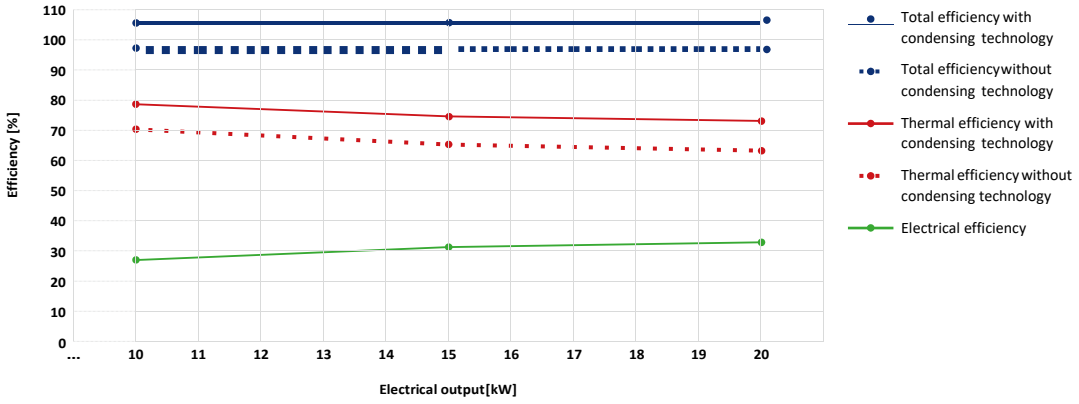
XRGI® system		XRGI® 20 without condensing technology[1]			XRGI® 20 with condensing technology[1]		
Power modulation*		50 %	75 %	100 %	50 %	75 %	100 %
Electrical output, modulating*	kW	10.0	15.0	20.0	10.0	15.0	20.0
Thermal output, modulating*	kW	26.1	31.4	38.7	29.3	35.9	44.7
Power consumption, gas in accordance with LCV [2]	kW	37.1	48.1	61.1	37.1	48.1	61.1
Electrical own demand, production	kW	0.078	0.078	0.078	0.083	0.082	0.081
Electrical own demand, stand-by	kW	0.025			0.025		

EFFICIENCIES & OPERATING PARAMETERS

Power modulation*			50 %	75 %	100 %	50 %	75 %	100 %
Electrical efficiency	in accordance with LCV[2]	%	26.9	31.1	32.7	26.9	31.1	32.7
Thermal efficiency	in accordance with LCV[2]	%	70.4	65.4	63.4	78.8	74.6	73.2
Total efficiency	in accordance with LCV[2]	%	97.3	96.5	96.1	105.7	105.7	105.9
Seasonal space heating energy efficiency in operating mode [3,4]	η_{son}	%	217			251		

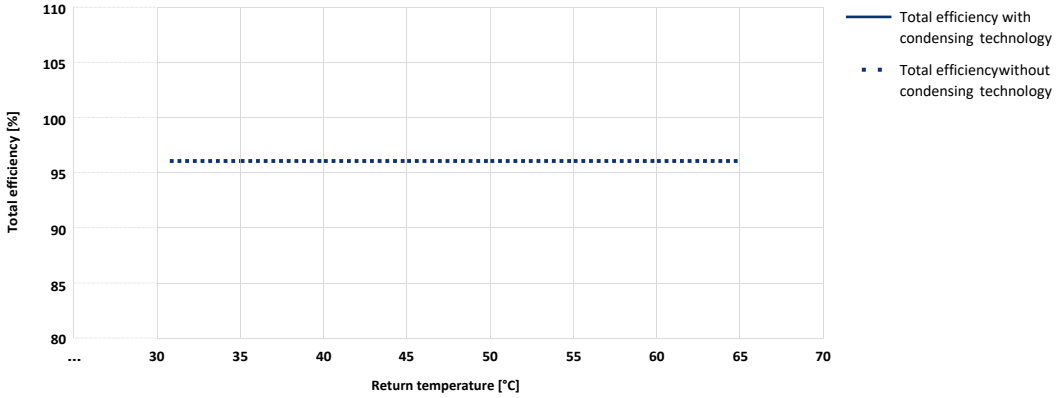
POWER MODULATION

Continuous modulation of 10 – 20 kW in power-controlled mode



TOTAL EFFICIENCY AT FULL LOAD

XRGI® 20 total efficiency / return temperature



* Continuous modulation in power-controlled mode

[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.

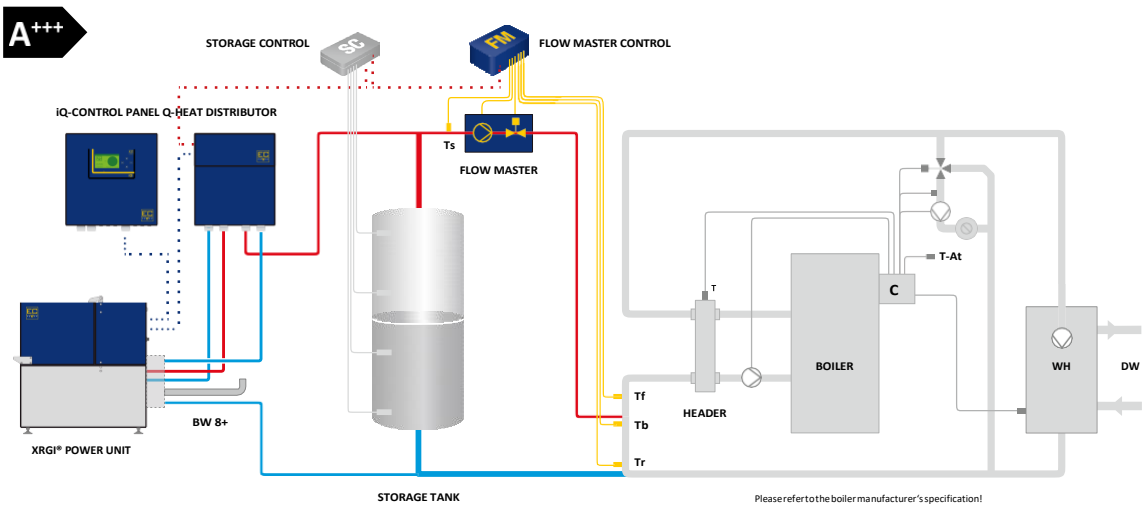
[2] LCV = lower calorific value

[3] This values are based on independent, certified and authorised inspection bodies. Test reports are available upon request.

[4] Efficiency at rated heat output as per the delegated Commission Regulation (EU) No. 811/2013; 813/2013

HYDRAULIC INTEGRATION

Principle circuit diagram: Series circuit with injection – boiler with header



More principle circuit diagrams and information can be found in the EC POWER„Hydraulic Solutions“.

NOTE:
If products from other companies are used in the system in addition to EC Power products, EC POWER assumes no liability for the accuracy of the energy efficiency class calculation for the entire system.

XRGI® system		XRGI® 20 without condensing technology[1]	XRGI® 20 with condensing technology[1]
Flow temperature, constant	°C	~ 85	~ 85
Return temperature, variable	°C	5-75	5-75

FUELS

Natural gas (all qualities), propane, butane	yes	yes

EXHAUST GAS

Power modulation			50 %	75 %	100 %	50 %	75 %	100 %
Max. exhaust gas temperature		°C	-	-	120	-	-	90
Condensate		kg/h	-	-	-	4.0	4.7	5.9
Emissions (Test data at max. output)	CO < 50	mg/Nm³	15			26		
	NOx, pond, HCV [2,3] < 240	mg/kWh	19			10		

SOUND

Sound pressure level at a distance of up to 1 m (based on surroundings)	dB(A)	49

POWER CONNECTION

Voltage, 3 phases + N + Earth	V	400
Frequency	Hz	50

SERVICE

Service interval (operating hours)	Hours	6,000

DIMENSIONS AND WEIGHT

		XRGI® 20 Power Unit	Q80-Heat Distributor	iQ20-Control Panel
Dimensions, W x H x D	mm	750 x 1,170 x 1,120	550 x 600 x 295	600 x 600 x 210
Footprint	m²	0.84	wall mounted	wall mounted
Weight	kg	680	44	40

* Continuous modulation in power-controlled mode
[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.
[2] as per the delegated Commission Regulation (EU) No. 811/2013; 813/2013
[3] HCV = higher calorific value

Deviations in values depend on the ambient and operating conditions, tolerance +/- 5 %.

Subject to technical modifications, deviations from design and errors.

TECHNIC AL DATA FOR THE XRG I® 20 WITH FLO W M ASTER

(Temperature control, Class II = 2 %)

Product data sheet in accordance with Regulation (EU) No. 811/2013; 813/2013, Dated 26.09.2019

Figure shows FM type 350

A+++

The Flow Master including Flow Master Control regulates the supply of heat from the XRGI® and from the storage tank to the consumer network. This technology enables a significantly higher heat output to be temporarily made available to the consumer side. This allows peaks of heat demand to be handled by the XRGI®, thereby extending its service life and increasing electricity production.

The 4 models can deliver a heat output of 50, 150, 250 or 350 at a ΔT of 20 K.

ORDERING D ATA

Supplier's name or trademark	EC POWER	
Supplier's model identifier	**XRGI® 20 without condensing technology[1]**	**XRGI® 20 with condensing technology[1]**
Article number	X200001	X200001+K000105
Modules	Power Unit, iQ20-Control Panel, Q80-Heat Distributor	Power Unit, iQ20-Control Panel, Q80-Heat Distributor + Condensing and exhaust gas heat exchanger BW8+

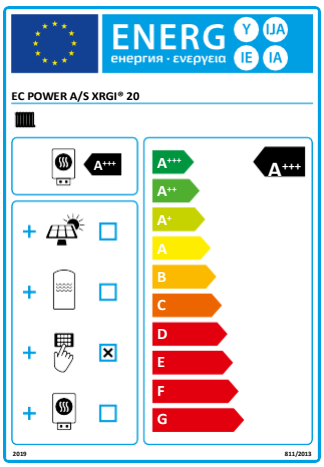
Supplier's model identifier	Flow Master including Flow Master Control			
FM-type (Temperature control, Class II = 2 %) 2	**FM 50**	**FM 150**	**FM 250**	**FM 350**
Article number	17D1130	17D1131	17D1132	17D1133

E r P-L ABEL D ATA [2]

Seasonal space heating energy efficiency class of package	A+++	A+++
Seasonal space heating energy efficiency of package	215 % 5	249 %

[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.

[2] The values were rounded in accordance with the requirements governing product data sheets by Regulation (EU) No. 811/2013.



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as this efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

Seasonal space heating energy efficiency of the space heater with cogeneration — 1 — 213 %

Temperaturecontrol (From fiche of temperature control): Class I = 1 %, Class II = 2 % , Class III = 1,5 %, Class IV = 2 %, Class V = 3 % , Class VI = 4 %, Class VII = 3,5 %, Class VIII = 5 % , — 2 — + 2 %

Supplementary boiler (From fiche of boiler): Seasonal space heating energy efficiency in % — 3 — ( ) -'I') x 'II' = − %

Solar contribution (From fiche of solar device)

Collector size (in m²)	Tank volume (in m³)	Collector efficiency (in %)	Tank rating A⁺= 0,95, A = 0,91, B = 0,86, C = 0,83, D-G = 0,81	
('III' x	+'IV' x	) x 0,7 x (	/ 100) x	= + % 4

Seasonal space heating energy efficiency of package — 5 — 215 %

Seasonal space heating energy efficiency class of package

G	F	E	D	C	B	A	A+	A++	A+++
< 30 %	≥ 30 %	≥ 34 %	≥ 36 %	≥ 75 %	≥ 82 %	≥ 90 %	≥ 98 %	≥ 125 %	≥ 150 %

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XRGI® 20

TECHNICAL DATA

Appendix 2:
NO2 emissions - Confirmation from SAV

Alex Sear

From: Adrian Rogers <Adrian.Rogers@sav-systems.com>
Sent: 27 November 2019 16:24
To: Alex Sear
Cc: Glen Peters
Subject: RE: 2No. XRGI 20 CHP units for West End Lane
Attachments: GLA Sustainable Design & Construction SPG - APPENDIX 7 - CHP NOX.pdf; SAV-Data Sheet LoadTracker XRGI 20 - October 2019.pdf; NOx conversions - from EC Power 11.2018.pdf; Flue system and ventilation requirements for LoadTracker CHP_ 01.08.2019.pdf

Hi Alex,

Regarding condition 21:
GLA Sustainable Design & Construction SPG - APPENDIX 7 details the "Emission Standards for Solid Biomass Boilers and CHP Plant in the Thermal Input range 50kWth – 20 MWth".

Thermal input means Net fuel (gas) input to the CHP.
The NOx emission limits contained in the standard are:

- Band A: 250 mg/Nm^3
- Band B: 95 mg/Nm^3

The XRGI 20 has a NOx emission of 19mg/kWh (as shown on the attached datasheet), this is equivalent to 18mg/Nm^3 (Normalised m^3) as per the attached conversion sheet, so the XRGI 20 easily complies with the GLA's requirements. Each CHP contains a factory-fitted catalytic convertor, so no further abatement is required.

I've attached our flue documentation for **condition 22**.

Kind regards,

Adrian Rogers
Product Manager - CHP

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E adrian.rogers@sav-systems.com

Datasheet showing conversion as set out in email above:

ErP NOx emission limits vs. third party test results (dry;wet)

Reference: Commission Regulation (EU) No. 813/2013

	NOx,pond,GCV		NOx		O_2		NOx		O_2
	mg/kWh	to ppm	ppm	to mg/Nm³	%		mg/Nm3		%
XRGI 6	< 240	(230;217)	< 97	(93;89)	8,1		< 236,2	(227;214)	5,0
XRGI 9	< 240	(53;55)	< 152	(34;37)	0,0		< 239,7	(52;54)	5,0
XRGI 15	< 240	(209;184)	< 94	(82;73)	7,8		< 235,9	(205;181)	5,0
XRGI 20	< 240	(19;10)	< 152	(13;7)	0,0		< 239,7	(18;10)	5,0

APPENDIX 7: EMISSIONS STANDARDS FOR SOLID BIOMASS AND CHP PLANT

Developments are to meet these emission standards along with the 'air quality neutral' benchmark values. Where meeting these emission standards still does not allow the air quality neutral benchmarks to be met, further reduction or offsetting measures would be required.

The emission standards are 'end-of-pipe' concentrations expressed at specific reference conditions for temperature, pressure, oxygen and moisture content. Compliance with these standards should be demonstrated based on monitoring undertaken on the actual installed plant or, where this does not exist at planning application stage, based on manufacturer guaranteed performance levels supported by type approval monitoring undertaken by the equipment supplier. At the very least, a statement of intent to only include combustion plant within the development that meets these standards must be made at application stage. Providing further details on actual installed combustion plant and emissions performance prior to full operation of the development should be made compulsory by way of planning condition. It is not permissible for emission factors (e.g. g/kWh, g/GJ etc) to be converted into an equivalent concentration for compliance purposes.

Emission Standards for Solid Biomass Boilers and CHP Plant in the Thermal Input range 50kWth – 20 MWth

To deliver both reductions in carbon dioxide emissions and improve air quality a tiered approach has been developed for applicable emission standards. This approach is based upon differentiation according to the baseline air quality in the area of development and will be dependent upon whether or not the development falls into the two tiers defined below.

Band	Applicable Range	
	Baseline Annual Mean NO2 and PM10	**Baseline 24-Hour Mean PM10**
Band A	> 5% below national objective	> 1-day less than national objective
Band B	Between 5% below or above national objective	1 day below or above national objective

The emission standards below are target minimum standards. If an assessment indicates that significant air quality effects may occur even when meeting the emission standards, additional measures (such as stack height increase, enforcement of more stringent standards etc.) should be considered in order to produce an acceptable level of impact.

Emission Standards for Solid Biomass Boilers and CHP Plant in the Thermal Input Range 50kWth to less than 20MWth for development in Band A

Combustion Appliance[A]	Pollutant/ Parameter	Emission Standard at Reference O2 (mg Nm-3)	Equivalent Concentration at 0% O2 (mg Nm^{-3})	Likely Technique Required to Meet Emission Standard
Spark ignition engine (natural gas/biogas)[B]	NO_x	250	329	Advanced lean burn operation (lean burn engines) NSCR (rich burn engines)
Compression ignition engine (diesel/bio-diesel) [B]	NO_x	400	526	SCR
Gas turbine [C]	NO_x	50	177	None above standard technology for modern turbines
Solid biomass boiler (including those involved in CHP applications) [D]	NO_x	275	386	Modern boiler with staged combustion and automatic control
	PM	25	35	Modern boiler with staged combustion and automatic control including cyclone/ multicyclone
All (stack heat release less than 1MW)[E]	Stack discharge velocity	10 ms^{-1}	N/A	Appropriate design of stack discharge diameter to achieve required velocity
All (stack heat release greater than or equal to 1MW) [E]	Stack discharge velocity	15 ms^{-1}	N/A	Appropriate design of stack discharge diameter to achieve required velocity

Notes:

[A] Combustion appliances operating less than 500 hours per annum are exempt from these standards

[B] Emission standard quoted at reference conditions 273K, 101.3kPa, 5% O_2, dry gas

[C] Emission standard quoted at reference conditions 273K, 101.3kPa, 15% O_2, dry gas

[D] Emission standard quoted at reference conditions 273K, 101.3kPa, 6% O_2, dry gas

[E] The stack heat release can be calculated as per equation (3) in the D1 guidance note:

$$Q = \frac{V\left(1 - \frac{283}{T}\right)}{2.9}$$

Where:
Q = Stack heat release (MW)
V = Volume flow of stack gases at discharge conditions (Am^3s^{-1})
T = Discharge temperature (K)

N.B. Stacks should discharge vertically upwards and be unimpeded by any fixture on top of the stack (e.g., rain cowls, 'China-man Hats')

Emission Standards for Solid Biomass Boilers and CHP Plant in Thermal Input Range 50kWth to less than 20MWth for development in Band B

Combustion Appliance[A]	Pollutant/ Parameter	Emission Standard at Reference O_2 (mg Nm^{-3})	Equivalent Concentration at 0% O_2 (mg Nm^{-3})	Likely Technique Required to Meet Emission Standard
Spark ignition engine (natural gas/biogas)[B]	NO_x	95	125	SCR (lean burn engines) NSCR (rich burn engines)
Compression ignition engine (diesel/bio-diesel)[B]	NO_x	400	526	SCR
Gas turbine[C]	NO_x	20	71	Latest generation DLN burners and / or SCR
Solid biomass boiler < 1MWth input (including those involved in CHP applications)[D]	NO_x	180	252	Modern boiler with staged combustion, automatic control and/ or SNCR
	PM	5	7	Fabric/ceramic filter
Solid biomass boiler ≥ $1MW_{th}$ input (including those involved in CHP applications)[D]	NO_x	125	175	Modern boiler with staged combustion, automatic control and/ or SNCR
	PM	5	7	Fabric/ceramic filter
All (stack heat release less than 1MW)[E]	Stack discharge velocity	10 ms^{-1}	N/A	Appropriate design of stack discharge diameter to achieve required velocity
All (stack heat release greater than or equal to 1MW) [E]	Stack discharge velocity	15 ms^{-1}	N/A	Appropriate design of stack discharge diameter to achieve required velocity

Notes:

[A] Combustion appliances operating less than 500 hours per annum are exempt from these standards

[B] Emission standard quoted at reference conditions 273K, 101.3kPa, 5% O_2, dry gas

[C] Emission standard quoted at reference conditions 273K, 101.3kPa, 15% O_2, dry gas

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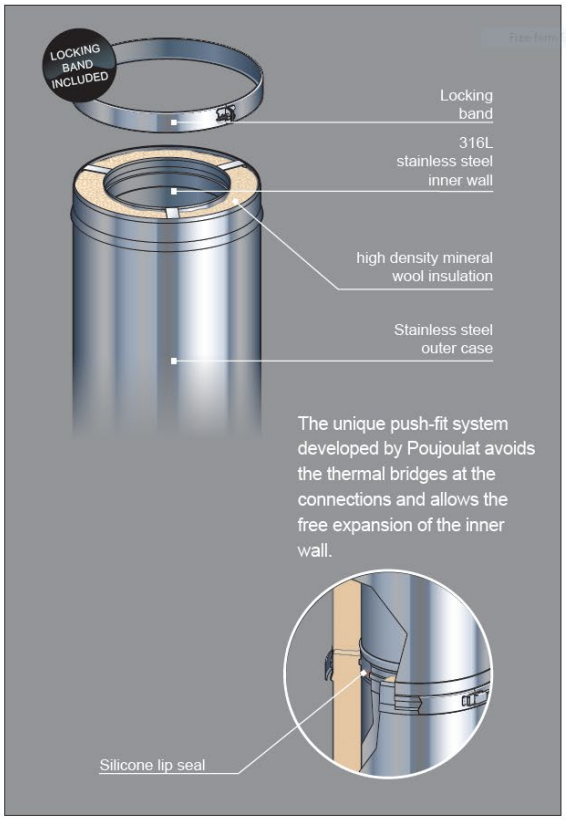
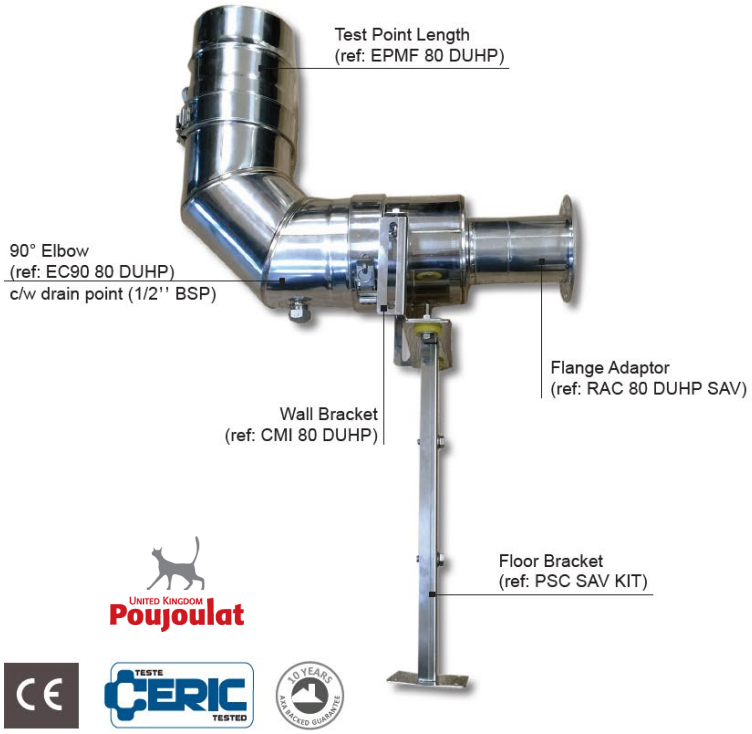
N.B. Stacks should discharge vertically upwards and be unimpeded by any fixture on top of the stack (e.g., rain cowls, 'China-man Hats')

Appendix 3:
CHP Flue Requirements and Location Details

1.1 LoadTracker CHP Flue Connection Kit

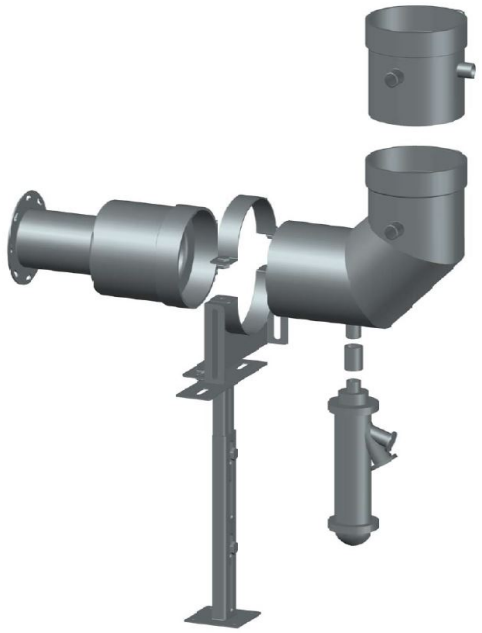
A stainless steel flue connection kit is supplied with each LoadTracker CHP Power Unit.





The kit uses '**Poujoulat THERM+ CHP'** twin wall 316L stainless steel flue. 80mm inside diameter, 130mm outside diameter, insulated with 25mm thick high density mineral wool.

Joints feature silicone rubber seals. The overall length of flue provided is 550 mm.



Parts Supplied	Quantity
Flange Adaptor	1
90° Elbow c/w ½" BSP Drain	1
Test Point Length	1
Floor Bracket	1
Wall Bracket	1
Condensate Siphon & Hose	1
½" BSP Stainless Socket	1

UK CUSTOMER SUPPORT CENTRE
SAV Systems, Scandia House, Boundary Road, Woking, Surrey GU215BX
Tel: +44 (0)1483 771910 Web: www.sav-systems.com E-mail: info@sav-systems.com

1.1 LoadTracker CHP Flue Connection Kit

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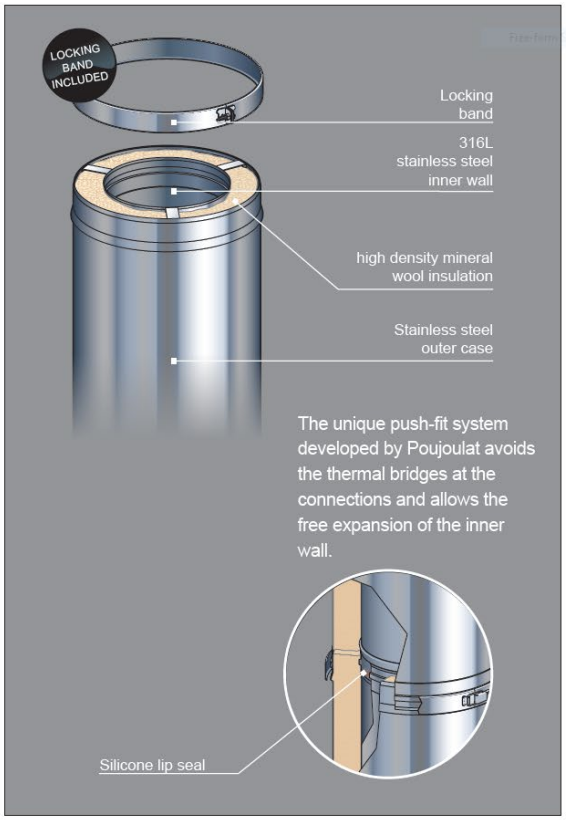
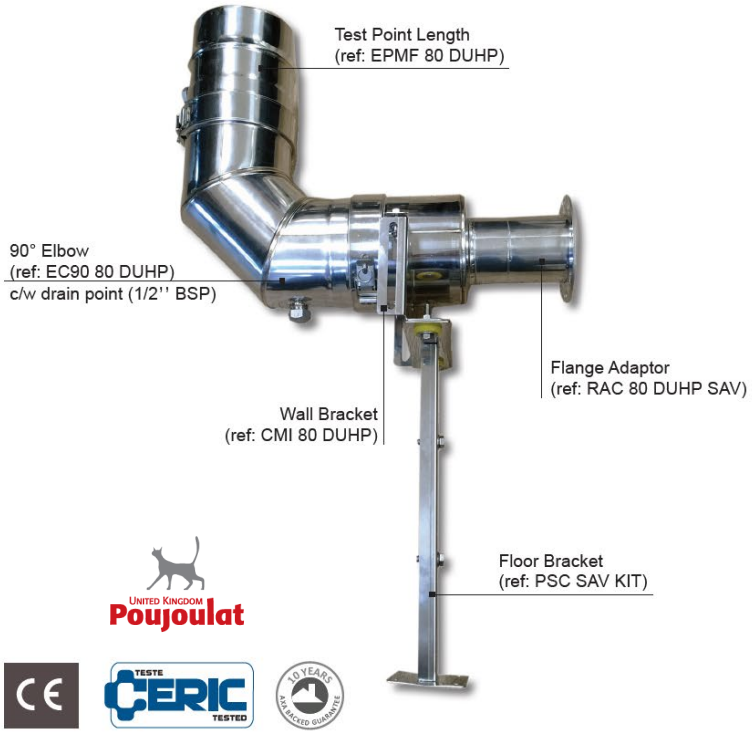
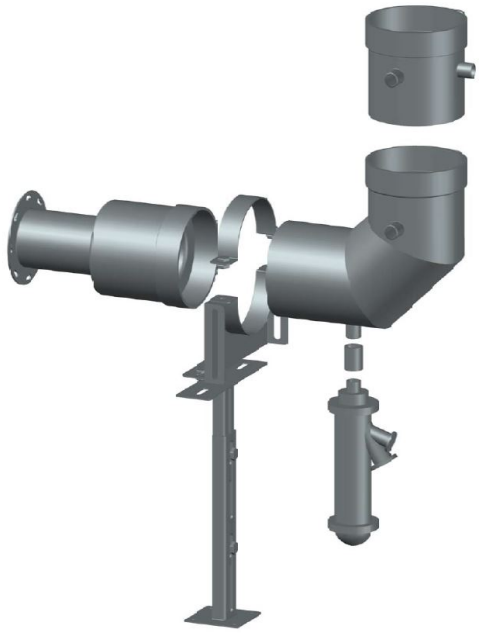




The kit uses '**Poujoulat THERM+ CHP'** twin wall 316L stainless steel flue. 80mm inside diameter, 130mm outside diameter, insulated with 25mm thick high density mineral wool.

Joints feature silicone rubber seals. The overall length of flue provided is 550 mm.



Parts Supplied	Quantity
Flange Adaptor	1
90° Elbow c/w ½" BSP Drain	1
Test Point Length	1
Floor Bracket	1
Wall Bracket	1
Condensate Siphon & Hose	1
½" BSP Stainless Socket	1

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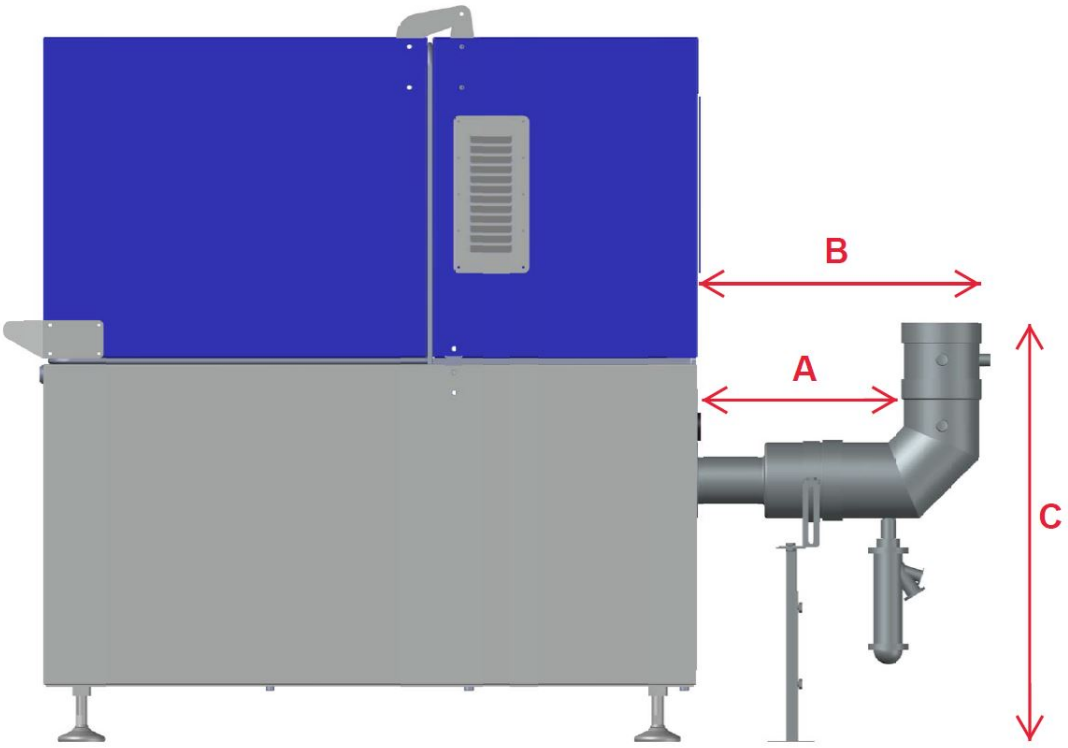
Tel: +44 (0)1483 771910 Web: www.sav-systems.com E-mail: info@sav-systems.com



Dimension **A**: Approx. 340 mm (Maintenance clearance)
Dimension **B**: Approx. 485 mm
Dimension **C**: Approx. 680 – 730 mm (CHP has adjustable height legs)

1.2 Flue Specification

Beyond the CHP Flue Connection Kit, an approved **Pressure Rating H1:T160:Wet** flue meeting CHP requirements must be installed. The installer can use a flue system from the manufacturer of their choice, this is not supplied by SAV.

1.3 Flue Systems for Multiple LoadTracker CHP Units

Multi-CHP installations can have the flue systems from all CHP units joined together to a common terminal.

NOTE: CHP flue should not be combined with boiler flue.

Guidance on flue installation can be found in Gas Utilization Procedures **IGE/UP/3** and **IGE/UP/10**

1.4 Flue Terminations

Flue terminations must comply with the current building regulations and local authority requirements.

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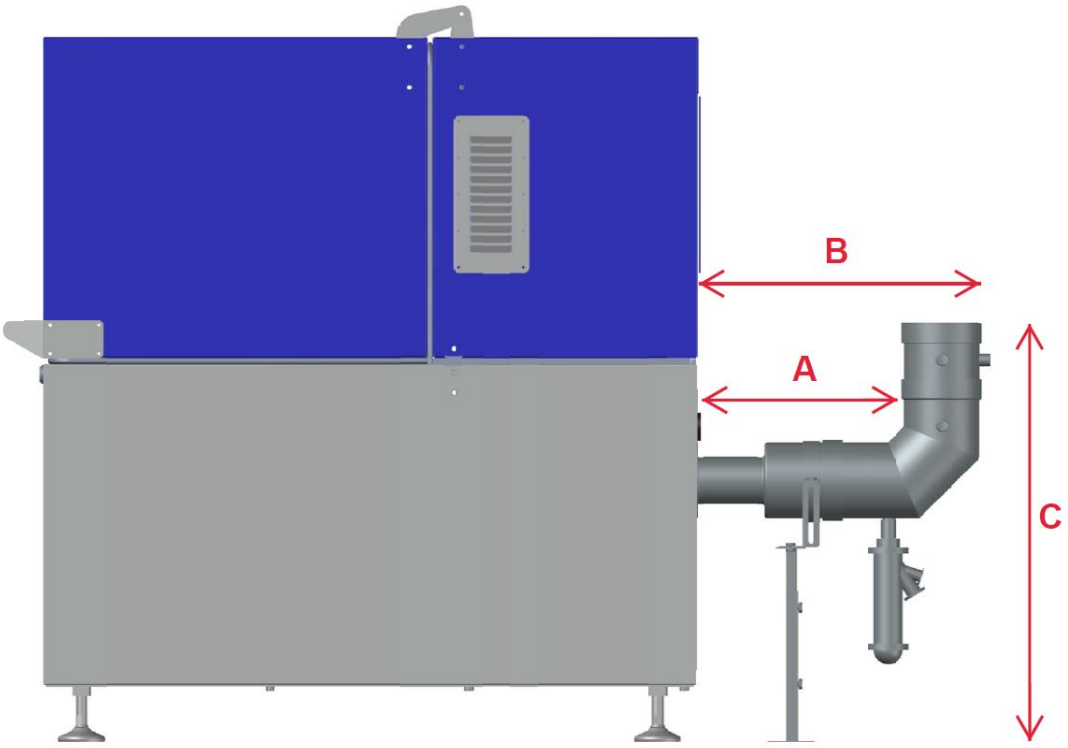

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1.5 Exhaust Gas Characteristics

	Temperature (max.)	Mass flow rate	Volumetric flow
XRGI 6	100°C	40 kg/h (= 11.2 g/s)	44 m^3/h (= 12 l/s)
XRGI 9	100°C	39 kg/h (= 10.8 g/s)	42 m^3/h (= 12 l/s)
XRGI 15	120°C	95 kg/h (= 26.4 g/s)	109 m^3/h (= 30 l/s)
XRGI 20	120°C	80 kg/h (= 22.2 g/s)	92 m^3/h (= 26 l/s)

1.6 Back Pressure Limits

The back pressure within the flue system shouldn't exceed 10 mbar, or 1 kPa (100 mm water)

During the engine start up, there is a very short pressure peak of up to 50 mbar (5 kPa), so LoadTracker CHP systems require **H1:T160:Wet** (condensing) class flue. This is a pressure tightness class of up to 50 mbar (5 kPa).

There are no limits to the length of the flue system as long as back pressure is kept low and the flue diameter is large enough. Please contact your flue specialist for further information.

Due to the temperature of the flue gases (up to 120˚C), it is not uncommon for a considerable amount of condensate to collect in the flue. It is essential that the condensate collector, siphon & drain are installed at the lowest point to prevent running difficulties. These are supplied with the Flue Connection Kit.

2.1 Ventilation Requirements

The LoadTracker CHP takes its combustion air from within the plant room. XRGI 6 / XRGI 9 units displace 800 litres/minute and XRGI 15 / XRGI 20 units displace 1650 litres/minute.

The ventilation provisions need to be calculated in accordance with British Standard **BS 6644:2011** for non-domestic installations.

The high and low level ventilation should be direct to outside air on the same wall. The vertical distance between high and low level ventilation should be as great as possible to achieve convection airflow.

NOTE: SAV cannot calculate ventilation requirements for projects, as all the equipment in a plant room needs to be considered.

References & Standards

IGEM UP/3	Gas fuelled spark ignition and dual fuel engines.
IGEM UP/10	Installation of flued gas appliances in industrial and commercial premises.
BS 6644:2011	Specification for the installation and maintenance of gas-fired hot water boilers of rated inputs between 70 kW (net) and 1.8 MW (net) (2nd and 3rd family gases)

Rev:07/2019

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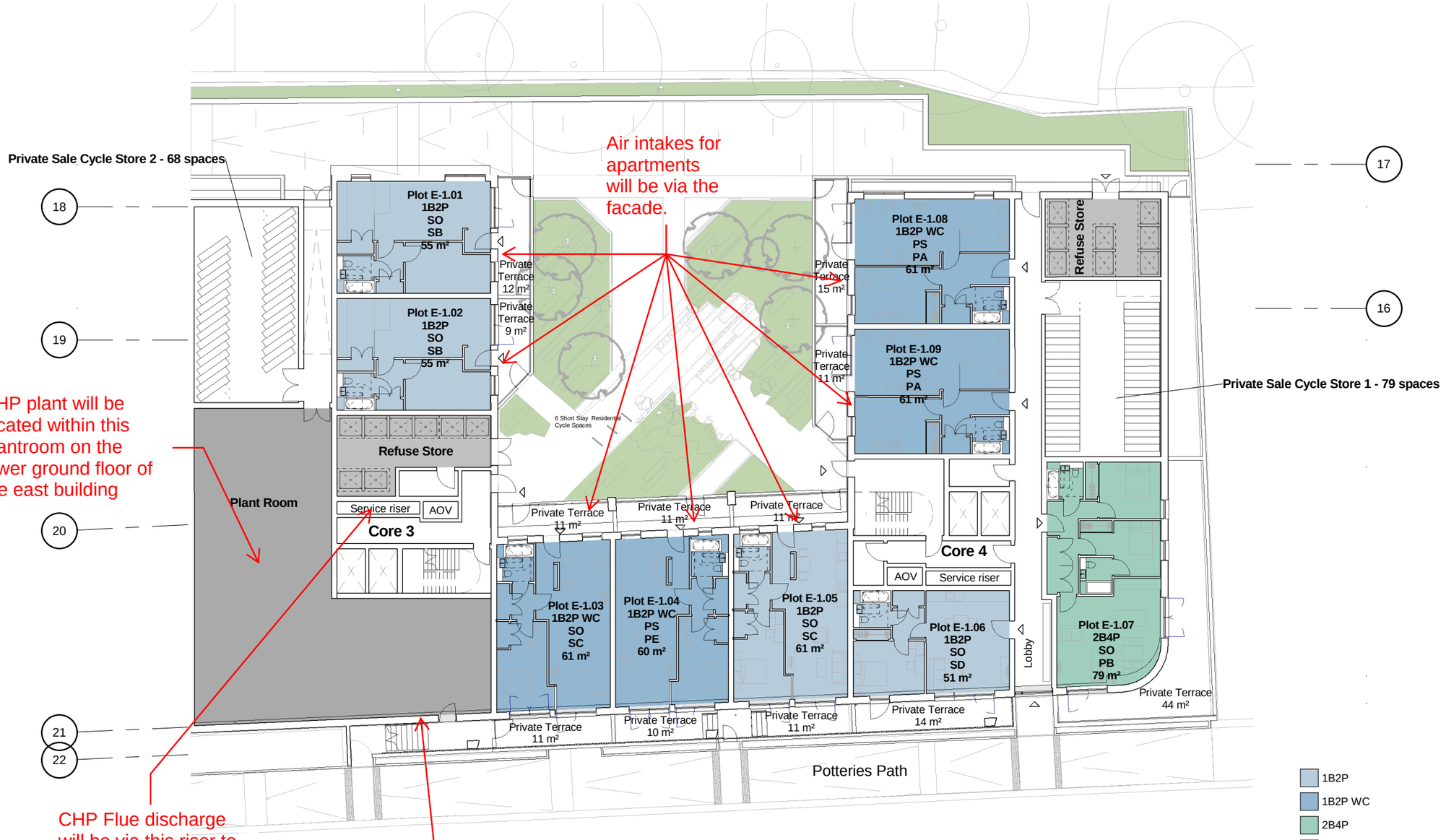

1B2P
1B2P WC
2B4P
Plant Room
Refuse Store

1B2P - 1 Bed 2 person flat
2B4P - 2 Bed 4 Person flat
3B5P - 3 Bed 5 person flat
AR - Affordable rented
SO - Shared ownership
PS - Private sale
WC - Wheelchair flat

Note: affordable rented wheelchair flats are fully adapted unless they are 'active elderly' in which case they are adaptable to wheelchair standards. All shared ownership wheelchair units are adaptable.

NOTES

-Do not scale from this drawing, except for planning purposes.
-Check all dimensions on site.
-Subject to survey.
-Subject to site inspection.
-Site boundary lines are indicative only.

	Rev	Date	By	Description
	H	24.11.16	EMF	Cycle spaces added
	G	02.08.16	AB	Revisions following planners comments.
	F	09.05.16	JV	Flat layouts revised to improve daylighting. Elevations updated follwing planners comments.
	E	08/03/2016	AB	Units lost from 5th floor of private block. Adjustments to tenure of remaining units to maintain affordable/ private ratio.
	D	21/12/2015	AB	Scale note added
	C	16/12/2015	AB	Some amenity areas added.
	B	10/12/15	AB	Room areas added
	A	19/11/15	AB	Key and notes added
	-	13/11/15	AB	Planning Issue

Revision Schedule

key plan

a2dominion

project
156 WEST END LANE
WEST HAMPSTEAD

title
LOWER GROUND FLOOR PLAN - EAST BUILDING

drawing status: PLANNING
contract no.:
scale: 1 : 250 @ A3
client ref.: A2 DOMINION
date: 11/05/15
drawn by: Author
checked by: Checker
project no.: 13119
drawing number: PL(-1)P009
revision: PH

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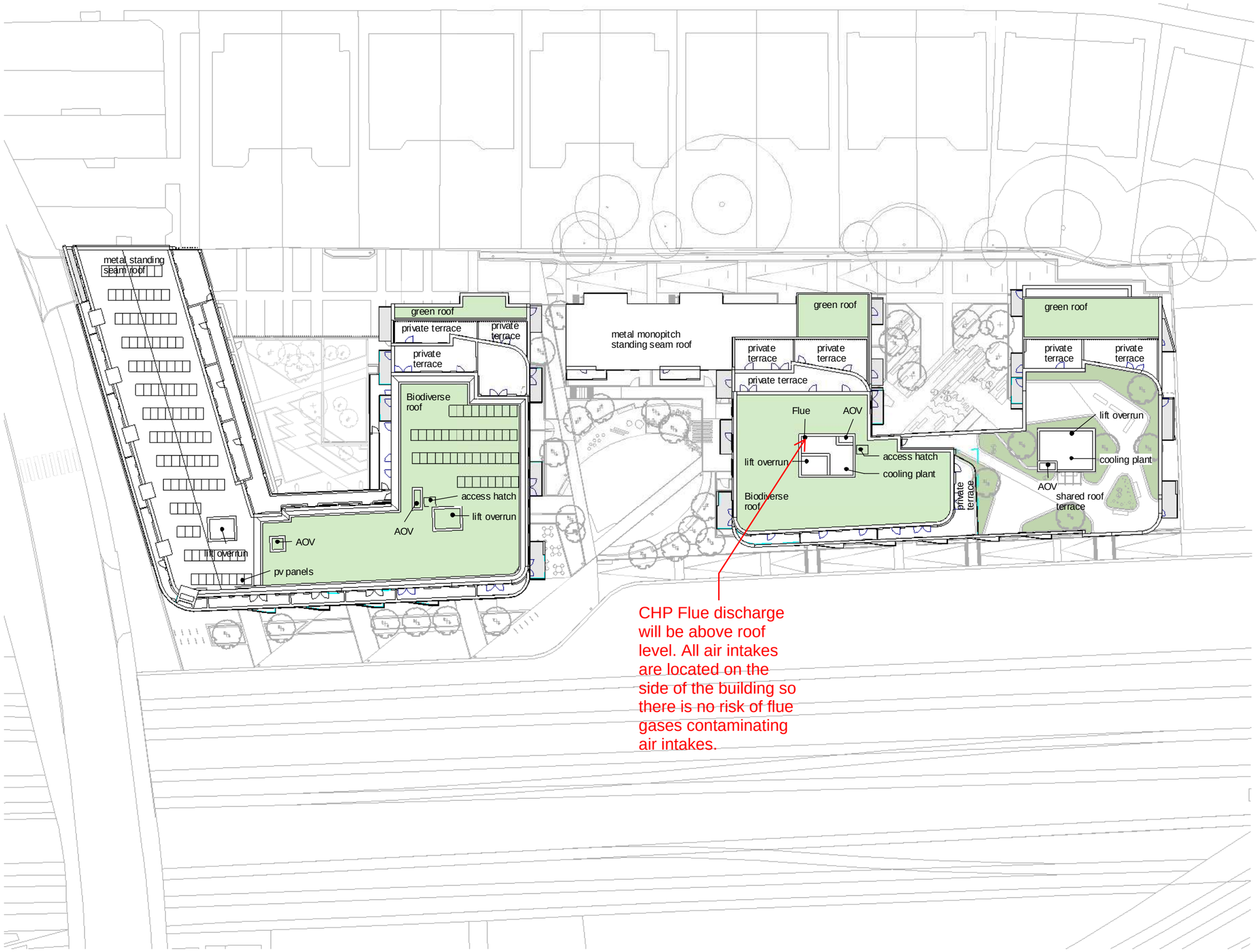

1 06 - Sixth Floor
1 : 500

NOTES

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- Subject to site inspection.
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Rev	Date	By	Description
K	08.06.16	AB	Planning resubmission
J	13/11/15	AB	Planning Issue
I	04/09/15	AB	Changes to mix and in line with elevations. South facing blaconies to private block replaced with wintergardens and enlarging flat areas. Service risers added.
H	21/07/15	AB	Minor corrections, detail added to flats
G	16/07/15	AB	Changes to layout as clouded to enable reduction of bulk on upper storeys and pull building away from Lymington Road
F	24/06/15		Revisions as clouded. General amendments to mix to acheive target affordable/ private split.
E	17/06/15		NIA areas shown
D	29/04/15		Vehicle access and servicing arrangements revised, no 1 bed private sale units above 3rd floor, detail added generally.
C	17/04/15		Minor adjustments to sizes of units to affordable block, and plant
B	16/04/15		Mix adjusted, servicing requirements incorporated
A	01/04/15		Start-Up Units added, unit mix amended.
-	25/03/15		First Issue

Revision Schedule

key plan

project
156 WEST END LANE
WEST HAMPSTEAD

title
ROOF PLAN

drawing status
PLANNING

contract no.	scale
	1 : 500 @ A3
client ref.	date
A2 DOMINION	25/03/15
drawn by	checked by
AFG	AM

project no.	drawing number	revision
13119	SK(06)P003	PK

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