

INTRODUCTION

Slender Winter Partnership Ltd have been employed by the client team to develop the initial Mechanical and Electrical services strategy for the refurbishment proposed at Athlone House – Hampstead. It is proposed to take the existing building fabric with new build extensions to provide an efficient, modern residence for the potential Client household.

All mechanical and electrical services involved with the existing building will be removed, including the incoming main supplies and new statutory main supplies will be provided to suit the demands of the property from the existing infrastructure within the Public Highway.

OUTLINE OF ENGINEERING SERVICES

Heating for the building is proposed to be mainly provided by the utilisation of a ground source heat pump, positioned adjacent the new and existing entrance driveway as indicated Appendix A in this report.

This system will use embedded close loop thermal piles to extract heat from the subterranean layers below the driveway and via the use of a reverse cycle heat pump, provide medium temperature hot water to a substantial amount of underfloor heating systems throughout the property. This system will also be used to preheat the cold water feed distribution to the hot water domestic system to make use of the renewable ground source potential.

A small gas fired boiler will also be provided to boost the hot water for the domestic use in the house to normal operating temperatures and will also be used as a back up to the ground source system, should it require to be boosted or as standby if there is any failures within the primary heating system.

Boiler flues will be taken to roof level as indicated on the Architects drawings, utilising proposed existing and new flue routes to reconstructed chimney pots.

Comfort cooling is proposed through parts of the house, primarily the bedroom accommodation and activity areas within the basement. This will be based on a variable, refrigerant flow system via recirculating fan coil units which will be connected to water cooled condensing systems situated within the basement plantroom and heat from these systems will either be utilised within the underfloor heating circuit or discharged into the ground via the ground source thermal loops in the summer months, to replenish the ground source system for winter use.

Primary mechanical ventilation shall be provided to the sanitary and wet areas, either discharging via the loft space at roof level or locally at lower ground/basement level in accordance with the requirements of the Building Regulations Part F.

Mechanical ventilation and fresh air provision shall be allowed to the basement occupied areas, again to comply with the building regulation requirement and discharged through ground ducts to appropriate zones and planters within the overall landscaping scheme adjacent to the terrace.

The swimming pool ventilation system shall be a packaged heat pump unit utilising reclaimed heat from the dehumidification process to help heat the pool and spa water on a continuous basis.

Fresh air intake and discharged air will be ducted through ground ducts, again to planting areas and external terrace features to provide the necessary ventilation outlets and inlets away from the Main House.

Kitchen extract from both professional and family kitchens shall utilise both existing and new chimney routes to roof level where within the interior loft space provided above the second floor, treated kitchen extract fans will be provided to discharge to roof level.

In addition to the ground source heat pump renewable energy strategy, Photovoltaic (PV Panels) will be provided on the flat roof sections at roof level to comply with the required onsite generation capability included within the initial design SAP calculations which are provided for information at the rear of this report within Appendix B. In conjunction with these energy calculations, a domestic BREEAM assessment has been undertaken by an external assessor with the design team utilising the outputs of the energy calculations to achieve an excellent BREEAM rating as required for this property.

Further design development subject to planning conditions and requirements will be undertaken and submitted to the Council as required, together with an external acoustic noise survey report which is also being provided as part of the initial planning assessment to provide any acoustic levels to be allowed for associated with the mechanical and electrical engineering services plant at the appropriate point. This is submitted separately from this report within the overall submission package.

APPENDIX A SITE PLAN

APPENDIX A:
Site Plan



APPENDIX B

SAP ENERGY CALCULATIONS

APPENDIX B SAP Energy Calculations

SAP Input

Property Details: PROPOSED_Athlone House

Address: Athlone House, Hampstead Lane, LONDON, N6 4RU
Located in: England
Region: Thames valley
UPRN: 7404741078
Date of assessment: 28 March 2016
Date of certificate: 05 April 2016
Assessment type: New extension to existing dwelling
Transaction type: Not sale or rental
Tenure type: Owner-occupied
Related party disclosure: No related party
Thermal Mass Parameter: Indicative Value Medium
Water use <= 125 litres/person/day: True
PCDF Version: 391

Property description:

Dwelling type: House
Detachment: Detached
Year Completed: 2016

Floor Location:

Floor area:

Storey height:

Basement floor 143 m²
 Floor 1 1270 m²
 Floor 2 780 m²
 Floor 3 120 m²
 Floor 4 30 m²
 Living area: 153 m² (fraction 0.065)
 Front of dwelling faces: North

Opening types:

Name	Source:	Material	Glazing	Argon:	Frame:
N/door	Manufacturer	Solid	low-E, En = 0.1, soft coat	Yes	Wood
W/door	Manufacturer	Solid	low-E, En = 0.1, soft coat	Yes	Wood
N/window	Manufacturer	Windows	double-glazed	Yes	
E/window	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S/window	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
W/window	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
West Pool elevation	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
East Pool elevation	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
Glass Roof Grand Hallway	Manufacturer	Roof Windows	double-glazed	Yes	Metal, thermal break
Pool wing Rooflights	Manufacturer	Roof Windows	double-glazed	Yes	Metal, thermal break
Skylight over atrium	Manufacturer	Roof Windows	double-glazed	Yes	Metal, thermal break
Boot Kitch Staff Rooflight	Manufacturer	Roof Windows	double-glazed	Yes	Metal, thermal break

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
N/door	6mm mm	0.7	0.68	1.8	6	1
W/door	6mm mm	0.7	0.68	1.8	4	1
N/window	6mm	0.7	0.68	1.8	122	1
E/window	16mm or more	0.7	0.68	1.8	64	1
S/window	6mm	0.7	0.68	1.8	90	1
W/window	16mm or more	0.7	0.68	1.8	105	1
West Pool elevation	16mm or more	0.7	0.68	1.4	130	1
East Pool elevation	16mm or more	0.7	0.68	1.4	30	1
Glass Roof Grand Hallway	12mm	0.8	0.76	1.4	27	1
Pool wing Rooflights	12mm	0.8	0.76	1.4	25	1
Skylight over atrium	12mm	0.8	0.76	1.4	5.4	1

SAP Input

Boot Kitch Staff Rooflight	12mm	0.8	0.76	1.4	8.7	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
N/door		Wall	North	0	0	
W/door		W/Wall	West	0	0	
N/window		N/Wall	North	0	0	
E/window		E/Wall	East	0	0	
S/window		S/Wall	South	0	0	
W/window		W/Wall	West	0	0	
West Pool elevation		W/Wall	West	0	0	
East Pool elevation		E/Wall	East	0	0	
Glass Roof Grand Hallway		Second Floor Roof	Horizontal	0	0	
Pool wing Rooflights		New Ground Floor Roof	Horizontal	0	0	
Skylight over atrium		Second Floor Roof	Horizontal	1.8	3	
Boot Kitch Staff Rooflight		Second Floor Roof	Horizontal	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
External Elements							
E/Wall	476	94	382	0.28	0	False	N/A
W/Wall	453	239	214	0.28	0	False	N/A
N/Wall	288	122	166	0.28	0	False	N/A
S/Wall	330	90	240	0.28	0	False	N/A
Basement Wall	100	0	100	0.28	0	False	N/A
New Ground Floor Roof	528	25	503	0.14	0		N/A
Second Floor Roof	240	41.1	198.9	0.14	0		N/A
Third Floor Roof	550	0	550	0.14	0		N/A
Fourth Floor	40	0	40	0.14	0		N/A
BF	143			0.2			N/A
GF	1127			0.2			N/A
Internal Elements							
Party Elements							

Thermal bridges:

Thermal bridges: No information on thermal bridging ($\gamma=0.15$) ($\gamma=0.15$)

Ventilation:

Pressure test: Yes (As built)
 Ventilation: Balanced with heat recovery
 Number of wet rooms: Kitchen + 4
 Ductwork: Insulation, rigid
 Approved Installation Scheme: True
 Number of chimneys: 11 (main: 0, secondary: 11, other: 0)
 Number of open flues: 0
 Number of fans: 0
 Number of passive stacks: 0
 Number of sides sheltered: 0
 Pressure test: 7 (Assessed dwelling is tested)

Main heating system:

Main heating system: Heat pumps with radiators or underfloor heating
 Electric heat pumps
 Fuel: Electricity
 Info Source: SAP Tables
 SAP Table: 211
 Ground source heat pump with flow temperature $\leq 35^{\circ}\text{C}$
 Underfloor heating, pipes in insulated timber floor

SAP Input

Central heating pump : 2012 or earlier
Design flow temperature: Design flow temperature ≤ 35°C
Unknown
Boiler interlock: Yes

Main heating Control:

Main heating Control: Time and temperature zone control by suitable arrangement of plumbing and electrical services
Control code: 2207

Secondary heating system:

Secondary heating system: Room heaters
Solid fuel room heaters
Fuel : wood logs
Info Source: SAP Tables
Open fire in grate
HETAS Approved

Space cooling system:

Space cooling system: Split/multiple systems
Energy label class: A
Compressor control: Systems with variable speed compressors
Cooled area: 722 (fraction 0.308)

Water heating:

Water heating: From main heating system
Water code: 901
Fuel : Electricity
Hot water cylinder
Cylinder volume: 1000 litres
Cylinder insulation: Factory 75 mm
Primary pipework insulation: True
Cylinderstat: True
Cylinder in heated space: True
Solar panel: False

Others:

Electricity tariff: Standard Tariff
In Smoke Control Area: Unknown
Conservatory: No conservatory
Low energy lights: 75%
Terrain type: Dense urban
EPC language: English
Wind turbine: No
Photovoltaics: Photovoltaic 1
Installed Peak power: 9
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: South
Assess Zero Carbon Home: No

SAP WorkSheet: New extension to existing dwelling

User Details:

Assessor Name: **Stroma Number:**
Software Name: Stroma FSAP 2012 **Software Version:** Version: 1.0.3.4
Property Address: PROPOSED_Athlone House

Address : Athlone House, Hampstead Lane, LONDON, N6 4RU

1. Overall dwelling dimensions:

	Area(m ²)		Av. Height(m)		Volume(m ³)
Basement	143 (1a)	x	3 (2a)	=	429 (3a)
Ground floor	1270 (1b)	x	4 (2b)	=	5080 (3b)
First floor	780 (1c)	x	3 (2c)	=	2340 (3c)
Second floor	120 (1d)	x	3 (2d)	=	360 (3d)
Third floor	30 (1e)	x	3 (2e)	=	90 (3e)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+.....(1n)	2343 (4)				
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)+.....(3n) =		8299 (5)

2. Ventilation rate:

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	11	0	11	440 (6a)
Number of open flues	0	0	0	0	0 (6b)
Number of intermittent fans				0	0 (7a)
Number of passive vents				0	0 (7b)
Number of flueless gas fires				0	0 (7c)

Air changes per hour

Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	440	+ (5) =	0.05 (8)
<i>If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)</i>			
Number of storeys in the dwelling (ns)			0 (9)
Additional infiltration		[(9)-1]x0.1 =	0 (10)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction <i>if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35</i>			0 (11)
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0			0 (12)
If no draught lobby, enter 0.05, else enter 0			0 (13)
Percentage of windows and doors draught stripped			0 (14)
Window infiltration	0.25 - [0.2 x (14) + 100] =		0 (15)
Infiltration rate	(8) + (10) + (11) + (12) + (13) + (15) =		0 (16)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area			7 (17)
If based on air permeability value, then (18) = [(17) + 20]÷(8), otherwise (18) = (16)			0.4 (18)
<i>Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used</i>			
Number of sides sheltered			0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =		1 (20)
Infiltration rate incorporating shelter factor	(21) = (18) x (20) =		0.4 (21)