Branch Hill House – Technical Response to Council Energy & Sustainability Comments

31st January 2020

1.1 Envision have set out a technical response to comments raised by Camden Council in their email dated 14th January 2020 (Senior Sustainability Officer – Gabriel Berry-Khan) in relation to the development at Branch Hill House.

1.2 The application seeks the; "Change of use of Branch Hill House from care home (Use Class C2) to residential (Use Class C3) to provide 34 residential units and associated external alterations, demolition of the 1960s care home extension and erection of replacement building, including basement, comprising residential accommodation (Use Class C3), ancillary plant, access and servicing and car parking."

Section 1 - Ground Source Heat Pump Comments

1.3 The applicant notes the development is currently at pre-planning RIBA Design Stage 2 and therefore no detailed-design has been undertaken at this point on the ground-source heat pump selection.

1.4 The responses below have been provided by both Envision and Kensa (the shared-ground loop array GSHP heat pump provider). Appendix I contains correspondence with them:

1. ***Outline system design showing system seasonal efficiencies, seasonal COP, and modelled heat provision matched against demand profile.***

   The original Energy Statement (P19496.RP005.A) did provide system details (including efficiencies) in Appendix IV. To further clarify, properties with 3kW Kensa Shoebox GSHP: 3.19 for space heating and 2.44 for DHW properties with 6kW Kensa Shoebox GSHP: 3.01 for space heating and 2.32 for DHW.

   The current modelled annual space heating demand for all properties combined is 168,369 kWh/year and the current modelled annual DHW demand for all properties combined is 72,772 kWh/year. The shared ground loop GSHP system is designed to provide all of this demand from GSHP with no other heating source.

   Note – further heat demand modelling will be undertaken at Stage 3 detail design to verify system capacity can serve space & DHW demand, and if required system capacities will be adjusted accordingly.

2. ***Evidence that industry quality assurance standards are proposed for the design and installation, e.g. the GSHPA Technical Standards for Vertical Boreholes.***

   Kensa Contracting employs a Certified GeoExchange Designer to carry out all its GSHP designs. This is a qualification from the International Ground Source Heat Pump Association (IGSHPA). There are only a handful of such designers in the UK.

In addition, Kensa Contracting Ltd is an MCS (microgeneration certification scheme) accredited heat pump installer and so all aspects of the design will comply with this UK quality standard.

During the design and installation of our GSHP projects, Kensa and its partners always make reference to the following quality and standards publications that are specifically applicable to GSHP installations:

- IGSHPA: General code of practice for closed loop installations
- GSHPA: Vertical Borehole Standards
- Environment Agency: Environmental good practice guide for ground source heating and cooling
- MCS: MIS 3005 Heat Pump Systems
- BDA (British Drilling Association): Code of Safe Drilling Practice; Guidance on Managing the Risk of Hazardous Gases when drilling or piling near coal

3. ***Lifetime operation, maintenance and management plan***

It is expected that the ground array will be owned by the management company responsible for the maintenance and servicing of all communal areas of the development. As there are no moving mechanical parts in the ground array, servicing and maintenance requirements are very low. Typically, the glycol in the array should be checked on a regular basis (e.g. every two to five years). Other than that, there is very little that is required. The management company could appoint Kensa Contracting Ltd to carry out this servicing or use any other competent company.

The equipment inside each flat is likely to be the responsibility of the homeowners (in much the same way that a gas boiler in a house is the responsibility of the home owner). Like any heating system, these will benefit from regular servicing but this is not mandatory to maintain the standard product warranty from Kensa Heat Pumps. At the point of purchase, it might be possible to provide the homeowners with an option to purchase a servicing/maintenance plan if this is desired.

4. ***Proposed apartment heat distribution systems - details of GSHP-compatible radiators or underfloor heating***

The GSHP system is compatible with any suitable wet-based heat emitter system, e.g. underfloor heating, radiators or fan-coil unit. At this point, underfloor heating has been assumed. During Stage 3 detail-design, the chosen heat emitter will be designed to provide sufficient heat to the rooms on the coldest day of the year to maintain comfortable internal temperatures at these water flow temperatures. This will all be designed in line with CIBSE & MCS requirements.

Section 2 – Sustainability Comments

1. ***A pre-implementation condition to demonstrate the water consumption target and evidence should be secured.***

   The applicant notes the development is currently at RIBA Stage 2 design. Water efficiency targets can be committed to at planning, and stipulated in the Stage 3 MEP Specification for the tender period.

2. ***The materials standards for both the refurbished and new parts should really be improved in line with CPG guidance – e.g. all timber FSC/PEFC-rated, high % of timber products likewise rated; specification of highly rated (e.g. 'A') materials BRE Green Guide; minimum target for recycled and recyclable construction materials/fittings; etc.***

   The applicant has confirmed a further commitment to the following material performance measures:

   - At least three of the key elements of the building envelope (external walls, windows roof, upper floor slabs, internal walls, floor finishes/coverings) are to achieve a rating of A+ to C in the Building Research Establishment (BRE) The Green Guide of specification;
   - 100% of timber is to be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of Forestry Certification (PEFC) scheme.
   - 50% of timber products are to be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of Forestry Certification (PEFC) scheme.
   - No construction or insulation materials are to be used which will release toxins into the internal and external environment, including those that deplete stratospheric ozone.

Sam Wallis | Envision

From: Stuart Gadsden <stuart.gadsden@kensaengineering.com>
Sent: 29 January 2020 15:28
To: Sam Wallis | Envision
Subject: Re: 200122: Branch Hill House - GSHP Information

Sorry Sam. Missed my Monday afternoon deadline for this.

It's important to note that we haven't carried out detailed design for this project. Therefore, no detailed modelling exists. However, I've tried to provide as much information as possible. Also note that you may wish to add more detail about radiators/underfloor heating if you have it as that has been outside the scope of what I've looked at. Please also check you agree with what I've said about maintenance as this will depend on how the flats are finally managed. I suspect Camden Council wouldn't ask these questions if this was a gas boiler system!

The system design is a shared ground loop solution (sometimes referred to as an ambient loop or fifth generation district heating). Kensa Contracting have now installed over 2000 GSHP on shared ground loop arrays. The expected seasonal efficiencies are as follows:

- properties with 3kW Kensa Shoebox GSHP: 3.19 for space heating and 2.44 for DHW
- properties with 6kW Kensa Shoebox GSHP: 3.01 for space heating and 2.32 for DHW

The current modelled annual space heating demand for all properties combined is 168,369 kWh/year and the current modelled annual DHW demand for all properties combined is 72,772 kWh/year. The shared ground loop GSHP system is designed to provide all of this demand from GSHP with no other heating source.

Kensa Contracting employs a Certified GeoExchange Designer to carry out all its GSHP designs. This is a qualification from the International Ground Source Heat Pump Association (IGSHPA). There are only a handful of such designers in the UK.

In addition, Kensa Contracting Ltd is an MCS (microgeneration certification scheme) accredited heat pump installer and so all aspects of the design will comply with this UK quality standard.

During the design and installation of our GSHP projects, Kensa and its partners always make reference to the following quality and standards publications that are specifically applicable to GSHP installations:

- IGSHPA: General code of practice for closed loop installations
- GSHPA: Vertical Borehole Standards
- Environment Agency: Environmental good practice guide for ground source heating and cooling
- MCS: MIS 3005 Heat Pump Systems
- BDA (British Drilling Association): Code of Safe Drilling Practice; Guidance on Managing the Risk of Hazardous Gases when drilling or piling near coal

It is expected that the ground array will be owned by the management company responsible for the maintenance and servicing of all communal areas of the development. As there are no moving mechanical parts in the ground array, servicing and maintenance requirements are very low. Typically, the glycol in the array should be checked on a regular basis (e.g. every two to five years). Other than that, there is very little that is required. The management company could appoint Kensa Contracting Ltd to carry out this servicing or use any other competent company.

The equipment inside each flat is likely to be the responsibility of the homeowners (in much the same way that a gas boiler in a house is the responsibility of the home owner). Like any heating system, these will benefit from regular servicing but this is not mandatory to maintain the standard product warranty from Kensa Heat Pumps. At the point

of purchase, it might be possible to provide the homeowners with an option to purchase a servicing/maintenance plan if this is desired.

The internal heating distribution system will be designed to operate efficiently with a ground source heat pump. The current proposal is that the design temperatures will be 45 deg C flow and 40 deg C return. The heat emitters will be designed to provide sufficient heat to the rooms on the coldest day of the year to maintain comfortable internal temperatures at these water flow temperatures. This will all be designed in line with MCS requirements. The GSHP system is compatible with any suitable wet based heat emitter system e.g. underfloor heating, radiators, fan coil units, etc.

Hope the above is helpful. Let me know if anything is unclear or you need further information. Happy to attend a meeting with Camden Council to allay their fears if that would be of help.

Cheers
Stuart

On Mon, 27 Jan 2020 at 12:58, Sam Wallis | Envision <swallis@envisioneco.com> wrote:

> Stuart,
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> Perfect – many thanks
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