Discharge of Ground Source Heat Pump Condition 22

Branch Hill House, New Hampstead, London

Prepared for Almax Group
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envision

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1. SUMMARY OVERVIEW

1.1 Envision has been appointed by Almax Group to discharge Condition 22 of planning permission 2019/6354/P for the installed ground source heat pumps (GSHP(s)) which requires:

> ***"Prior to commencements of works, details, drawings, and data sheets showing the location, Seasonal Performance Factor of at least 2.5 and Be Green stage carbon saving of the ground source heat pumps and associated equipment to be installed on the building, shall have been submitted to and approved by the Local Planning Authority in writing. The measures shall include the installation of metering details including estimated costs to occupants and commitment to monitor performance of the system post construction. A site-specific lifetime maintenance schedule for each system, including safe access arrangements, shall be provided. The equipment shall be installed in full accordance with the details approved by the Local Planning Authority and permanently retained and maintained thereafter.***

1.2 This note and appendices explains how the above conditions for GSHPs installed on the site have been met during Stage 3+ design.

Summary of Results

1.3 In accordance with Condition 22 and following design development at RIBA Stage 3, the development is expected to achieve a Seasonal Performance factor of 3.29, greater than the required value of at least 2.5. This finding is explained further in this report.

1.4 For the 'Be Green' stage carbon saving of GSHPs, a 'Discharge of Energy & Sustainability conditions' report has been prepared and submitted alongside this report. It is shown to offset 39.22 tonnes of CO2 per annum.

1.5 The metering details will include estimated costs to applicants and display metering that will be recorded annually to monitor the performance of the system post-construction. This also allows for ease in keeping up with regular maintenance per annum and aligns with policies in the 'Be Seen' stage of the energy hierarchy from the London Plan Policy SI 2 - 'Minimising greenhouse gas emissions'.

1.6 The development is therefore deemed to be in full accordance with Condition 22 of planning permission 2019/6354/P and approved by the Local Planning Authority in writing.

GSHP Technical Information

1.7 The GSHPs and associated equipment to be installed in this development are from the Kensa series ground source heat pumps and a Kensa GSHP Servicing Maintenance Warranty Overview - prepared and provided in Appendix I - details the overview of servicing, maintenance, and warranty for a Kensa shared GSHP system.

1.8 The GSHP used has an ambient shared ground loop array which runs in very deep boreholes drilled into the ground and each apartment will have its own individual heat pump/hot water cylinder. This means that although the loop is shared across all apartments, tenants manage and pay their own bills.

1.9 The heat pump/hot water cylinder(s) will be installed in the tenants' demise MEP cupboards, with pipework to the required rooms for hot water and heating services. Detailed further in Appendix I is the full lifetime maintenance schedule, with the technical information for the GSHPs and the associated equipment prepared and provided in Appendix II.

1.10 All information in this report has been provided by Kensa who are designing the ambient loop pipework, hydraulics, boreholes, heat pump sizing and cylinder sizing.

Proposed ambient loop pipework route.

1.11 The ambient loop pipework from the ground loop array will connect to multiple demises. The routes for the pipework ensures that staircases and lift shafts are avoided and the pipework does not pass through multiple demises. The MEP cupboard in the tenants' demise will be utilised for installing the heat pumps.

1.12 Pipework is distributed from the external ground loop array, into the plantroom and at high level via the risers to each apartments' MEP cupboard.

1.13 The locations of the heat pumps are provided in Appendix III.

Seasonal Performance Factor

1.14 To obtain an actual Seasonal Performance Factor (SPF) of at least 2.5, the total energy output and total energy inputs will be measured via appropriate metering. Dividing the total output by the input will provide the actual in use SPF. As part of the London Plan 'Energy Assessment Guidance' with regards to heat pumps, a 'high specification of energy efficiency' is expected to ensure that the system 'operates efficiently and to reduce peak electricity demand'. The expected SPF value calculated by Kensa for their system is 3.29.

1.15 This shows that following design development at RIBA Stage 3, the development is expected to achieve a Seasonal Performance factor of 3.29, greater than the required value of at least 2.5 for Condition 22.

'Be Green' carbon saving

1.16 For the 'Be Green' stage carbon saving of GSHPs, an energy report has been prepared and submitted with the planning. It is shown to offset 39.22 tonnes CO2 per annum.

'Be Seen' energy monitoring guidance and measures for performance monitoring

1.17 In accordance with the 'Be Seen' post construction monitoring requirement of London Plan Policy SI 2 'Minimising GHG emissions', for a minimum of 5 years, monitoring and annual reporting of energy demand and carbon emissions will be measured as part of the energy strategy. To monitor the performance of the GSHPs, measures including a heat pump specific electric meter and heat meter will be installed as per the drawing in Appendix IV.

1.18 The monitoring will provide insight into the SPF and if it increases or decreases during usage and real tenant occupancy. It will also ensure that the actual carbon performance is meeting the expected performance approved during the planning stage, aligning with the 'Be Seen' policy.

1.19 The metering details will include estimated costs to occupants and display metering that will be recorded annually to monitor the performance of the system post-construction. This also allows for ease in keeping up with regular maintenance per annum.

1.20 The estimated costs to occupants will include the fuel used in the system, incentives, electricity sales (if applicable), plant replacement, an annual maintenance schedule, and overhead costs. These are shown below in Figure 1.1.

Fig 1.1 – Average Running Costs

Unit	Average Running Cost	Incentives	Electricity Sales	Estimated Plant Replacement (@year 20)	Annual Maintenance (Approx.)	Annual Overheads (Approx.)
Typical Unit	£392.65	N/A	N/A	£3,000	£300	£100

APPENDIX I – KENSA GSHP SERVICING, MAINTENANCE, WARRANTY OVERVIEW

APPENDIX II – KENSA PLANT INFORMATION

APPENDIX III – DRAWINGS

APPENDIX IV – HEAT PUMP - METERING