

1. Design Report

At application stage, the applicant has to submit a detailed Design Report that clearly addresses the following:

1. Details of Design Engineer;
2. Description of Scope of Works;
3. Submission of Drawings;
4. Compliance with relevant Building Regulations;
5. Compliance with relevant Health and Safety Regulations;
6. Compliance with relevant Fire Safety Regulations;
7. Compliance with relevant Planning Regulations;
8. Compliance with relevant Environmental Licencing and
9. Level of Design Warranty.

Specifically, for each of the previous points the following contents must be included in the Design Report:

1.1 Details of Design Engineer

a. Credentials of Design Engineer

- Name of individual
- Evidence of level 8 qualification and competence in (biomass) design
- Detail of registration as Chartered with a Reputed Engineering Body
- Name of company Design Engineer is working for (or if they are working as a self-employed engineer)
- Copy of PI insurance in name of company (or individuals name if they are self-employed)
- Terms of engagement

b. Appointment and Commitment of Design Engineer

The design engineer must present evidence of appointment (of either the named design engineer or the company employing the design engineer) by the applicant to design the heating system. This must be counter signed by both applicant & design engineer

The design engineer will include a confirmation within the design report that states:

- The name of the applicant
- The address of the proposed installation and heat use.
- The SSRH application number
- The buildings/process that the biomass installation is designed to heat
- Confirmation that in their professional opinion the proposed heat installation including biomass boiler, and the full scope of works (as described in point 2 below) is fit for purpose.

2.1 Description of Scope of Works

a. Scope of Works

At a minimum, the design report is setting out the design intent and should include the following:

- Summary evidence of a methodical design approach having been undertaken to ensure that the heating system is appropriately dimensioned and sized. Heat Loads must be matched to heat sources to ensure the maximum cost benefit can be achieved, while preventing inefficiencies due to system over or under-sizing, resulting in inaccurate payment of premiums.
- Heat meters must be matched to heat loads and consequent pipework flowrates and temperatures to ensure accuracy. The following are good design practice steps:
 - Determine the system loads and locations to ensure accurate thermal sizing.
 - Generate initial hydronic design, with pipework sizes, flowrate and heat source sizes to ensure correct dimensioning.
 - Refine this base to a robust system design, to ensure a reliable system with long service life.
 - Provision heat meters according to the above generated design to match system characteristics and achieve the best accuracy.
- Summary description of the scope of works (the plant room, the heat generation, distribution and emission equipment and all supporting infrastructure, fuel storage, fuel intake, electrical installation, ventilation, metering location, and any other elements relevant to the complete heat system)
- A clear description of the whole heating system identifying old and new components.
- A set of drawings as described in section 3 below
- Design life including opinion on durability of the complete heating system.
- The basis of the proposed design, i.e. operating conditions, heat use/delivery profile (annual cycle of heat use including peak load), design life, inclusion of top up and / or back-up heating systems,
- Confirm if the design should address heat loss through buildings
- Statement of compliance with the TSORG;

b. Description of buildings to be heated by the biomass installation

A general description of the buildings and the specific areas to be heated by the biomass installation and their function

c. Size of biomass installation

The Design Report will explain the size of the proposed biomass boiler(s) and an explanation as to how they were sized.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

d. Flues

The Design report will include a calculation to describe the proposed flue(s) for the biomass installation and an explanation as to how it was sized.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

e. Fuel Storage and unloading

The Design report will include description as to what fuels the system is designed to burn and how it will be unloaded into the fuel store and the storage conditions of the fuel. The Design Report will also include the frequency of fuel delivery and will address the Health and Safety requirements for the fuel storage building.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

f. **Estimated Project Costs**

The Design report will include an estimation of the total costs necessary for the conversion from the existing fossil fuel heating system to the new renewable heating system.

1.3 **Submission of the following sets of Drawings:**

Each drawing must include the following:

- Title of drawing
- SSRH application number
- Date
- Name of the Design Engineer

A schedule of drawings typically as follows;

- A drawing or aerial image of the site, differentiating existing buildings or structures and proposed new buildings or structures as part of the biomass installation;
- A drawing or aerial image of the site, with lines around the various buildings to show what is part of the biomass installation (boiler room, fuel store, flue, access roads and associated elements) and what is associated with the heat user(s);
- A plan, elevation and cross section of the biomass installation boiler room including fuel store, flue, access roads and associated elements, indicating which elements (if any) are existing and which are proposed.
- If any part of the biomass installation is to be in an existing building, drawings should show the current layout and use of the building and the proposed change of use
- A schematic showing the proposed heating system
 - o All elements of the schematic described above, clarifying if existing boilers have been removed or are being retained as top up and / or back-up heating systems.
 - o The new biomass boiler(s), noting their size and fuel type;
 - o Any buffer tanks or thermal stores;
 - o Any heat exchangers to be installed between the biomass installation and the existing heating system;
 - o Proposed points of connection between the new and existing elements
 - o Details of secondary system components such as magnetic filters, air and dirt separators', expansion and system filling control, pipework types and materials;
 - o Proposed areas of inspection
 - o Location of the proposed heat meter(s) and method of calculating eligible heat use
 - o Location and type of all remote temperature sensors, including end to end cable routes, method of sensor fixing and retention.
 - o Details of how heat meters will be replaced in service. This process can be greatly simplified and accelerated by the provision of isolation valves on installation of the meter, at either end of the flowmeter component.
 - o Details to support the integrity of the metering design including prevention of the inadvertent removal or omission of a sensor which (tamper evidence), detection of sensor failure or any failure in the metering arrangement.
 - o Environmental considerations must taken into account where heat meters may be exposed to chemical, corrosive environments, wash-down spray, direct sunlight or

outdoor weather. The design should include details of any necessary protection for the meters or sensors (e.g. splash protection, knock protection, etc).

- A second schematic of any existing heating system that will be connected to the proposed biomass installation. This schematic, should at a minimum, include:
 - o Existing boilers noting their size and fuel type;
 - o The main header(s) of the heating system
 - o Any circuits off the header(s) and a description as to what they heat

1.4 Compliance with Relevant Building Regulations

Confirmation from the Design Engineer that they understand the principles of the BCAR (Building Control Amendment Regulations), their opinion as to whether BCAR is relevant to the building and completed heating system, including requirements for a commencement notice, the need to appoint an Assigned Certifier and the costs associated BCAR.

The Design Engineer will provide an initial opinion as to whether the existing building(s), or proposed building(s) and associated heating system(s):

- Required BCAR
- May require BCAR
- Does not required BCAR

If they conclude that BCAR is required, a Certificate of Completion from Building Control will be required to be attached to the commissioning report. No further action is required at this stage.

If the Design Engineer feels that BCAR may not be relevant, they must undertake to clarify this, in writing, with the Building Control Section of the local authority, and will at completion stage demonstrate compliance with any requirements of the building control authority.

Where the Design Engineer concludes that BCAR is not relevant, the Design Engineer will ensure the proposed design (plant, structure, access etc.) will be compliant with building regulations. The Design Engineer will conduct a non-intrusive assessment of the building and existing heating system, will justify why a non-intrusive assessment is sufficient and list any upgrades required to bring the building into line with the current building regulations. . Any necessary upgrade must be addressed in the design with an appropriate design solution.

Where a BCAR certificate of completion is not required this section of the design and subsequent completion will be known as the 'Building Regulations report'.

In all cases, whether BCAR is relevant or not, the Design Engineer will recommend necessary testing & inspection.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

1.5 Compliance with Relevant Health and Safety Regulations

The Design Engineer will review the Health and Safety Authority's guidance and, if necessary, appoint a Project Supervisor Design Stage (PSDP).

The Design Engineer will undertake Stage 1 Design Risk Assessments to ensure relevant Health & Safety legislation is incorporated into the design, installation, operation and maintenance of the new installation and into any key systems upon which the new installation depends.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

1.6 Compliance with Relevant Fire Safety Regulations

The Design Engineer will provide an Opinion as to whether the proposed biomass installation will require a fire safety certificate.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

1.7 Compliance with Relevant Planning Regulations

The Design Engineer will provide an initial opinion as to whether the existing building(s), or proposed building(s) and associated heating system(s):

- Required Planning Permission
- May require Planning Permission
- Does not required Planning

If they conclude that Planning Permission is required, a Certificate of permission granted by the competent authority must be included in the Design Report. No further action is required at this stage.

If the Design Engineer thinks that planning permission is not required, they must undertake to clarify this, in writing, with the competent local authority, and will at completion stage demonstrate compliance with any requirements of planning regulations.

If Planning Permission is not required, the Design Engineer must justify in the Design Report why Planning Permission is not required.

If any part of the biomass installation (boiler room, fuel store, flue, access roads and associated elements) uses an existing structure, the design report, will make a specific Opinion on whether a change of use is required.

The Design Report will confirm the design takes into account existing planning conditions.

This task could be based on information contained in an ancillary report(s) (see Section 1.10)

1.8 Compliance with Relevant Environmental Licencing

If the site has an EPA licence, confirmation that the Design Engineer has reviewed this and confirms that the proposed biomass installation and any top-up or back-up heating systems, all comply with the licence.

If the site does not have an EPA licence, the Design Engineer will confirm that none is required and justify why is not required.

The Design Engineer should identify whether other licences or permits are relevant (e.g. Waste licence, MCP registration, etc) to the Design Report and whether the Client requires any such licences or permits.

The Design Report will include a tick box of potential licences to be signed by the applicant.

1.9 Level of Design Warranty

The Design Report will summarise the scope and key conditions of the design warranty to be provided to the Applicant

The Design Engineer must confirm that he/she has explained to the Applicant all the items and their implications addressed in the Design Report so that Design Report will be signed by the Design Engineer and by the Applicant.

1.10 Ancillary Reports

If the Design Engineer does not have the competency to do a particular task, it could be conducted by another engineer (with the same qualifications as described above). In this case the other engineer will confirm they are taking responsibility for this element of the design and produce an 'ancillary report'. The Design Report will include a summary of their finding(s) and attach the ancillary report as an appendix.

1.11 Subsequent clarification of design detail

The design submitted at application stage must address all the elements described above however it is recognised that in some projects some specific details or supporting documents may not be readily available at Application Stage and it may be appropriate to develop and submit some design detail after project approval and before project commissioning. Examples in this regard might include confirmation of grant of planning permission or grant of environmental licence. Where any such issue applies the design report must identify the issue to be clarified and the process to deliver clarification.

2. Commissioning Report

After the biomass installation is commissioned, and prior to an inspection by SEAI, the Design Engineer to provide the following to SEAI in support of the Declaration of Completion:

2.1 Report

The Design Engineer will review the completed biomass installation in line with the final design and the design report submitted at application stage, and comment on any instances where the commissioned project varies from that proposed in the final design and the design report.

Where there are any variations, they will comment on whether they feel these are immaterial or if they are material, how they impact on the design and if necessary, what corrective action is required.

2.2 Scope and Drawings

The following as built AutoCAD drawings of the biomass installation:

- A plan, elevation and at least one cross section of the biomass installation, indicating which elements (if any) were existing and which are new.
- A schematic and P&ID of the completed heating system that should, at a minimum, include:
 - o All boilers noting their size and fuel type;
 - o The main header(s) of the heating system
 - o Any circuits off the header(s) and a description as to what they heat
 - o Any buffer tanks or thermal stores;
 - o Any heat exchangers installed between the biomass installation and the existing heating system;
 - o Actual points of connection between the new and existing elements

- The locations of the heat meter(s), their specification and method of calculating eligible heat use;
- Confirmation aeration and de-sludging has been incorporated into the design as appropriate
- A drawing showing any variations in the design to those submitted in the final design and the Design Report

Each drawing must include the following:

- Title of drawing
- SSRH application number
- Date
- Name of the Design Engineer

2.3 Building Regulations

For any BCAR buildings, a Certificate of Completion signed by the Builder and the Assigned Certifier

For any non BCAR buildings confirmation from the Design Engineer that the final design (plant, structure, access etc..) is compliant with relevant building regulations, that any measures detailed in the 'Building Regulations Report' remain valid in the light if the final design and were completed as instructed. If additional measures were identified, that these have been completed too.

2.4 Planning permission

Declaration by the Design Engineer that the biomass installation was constructed in accordance with the planning permission and that all the changes (change of use, change of fuel type) have been addressed.

2.5 Fire Safety Certificate

A copy of the fire safety certificate for the biomass installation (if one was required) will be included in the Commissioning Report together with the evidence that the Local Fire Officer has been informed of the existence of the installation

2.6 Health and Safety

Confirmation of the name and contact details of the PSDP and PSCS where they were appointed, if they were required, and evidence that the users received Health and Safety training.

Confirmation that all design information necessary for the compilation of the Safety File has been completed and handed to the Applicant.

2.7 Confirmation by the Design Engineer

The design engineer will include a confirmation within the commissioning report that states:

- The name of the applicant
- The SSRH application number
- The buildings/process that the biomass installation is designed to heat
- Confirmation that in their professional opinion the biomass boiler (as described in the commissioning report) is built according to the design report