



Clare County Council

Technical Specifications

Summary

The boiler was installed in September 2007 and commissioned in January 2008.

This system is a 540kW Kob Pyrot biomass boiler, burning woodchip. The woodchip is stored in an adjacent 130m³ subterranean silo with a usable volume of 85m³ woodchip, which is automatically fed into the boiler via a fuel transfer auger. The system operates with a gas boiler acting as a secondary backup heat supply.



Spring-Operated Extraction System

The wood fuel is conveyed from the silo by means of a sweep mechanism with two profile articulated arms that fill an auger through recesses in the bottom. When the silo is full, the arms settle on a cup washer. They are driven by a worm-gear motor to the extraction auger via an angular gear to the sweeping mechanism. The spring operated extraction system is best suited for round spaces.

Sluice Valve

A fire protection device is installed in the downpipe to mechanically separate the furnace and the fuel store. The sluice valve is opened with a motor and is closed by spring action.

KOB PYROT Rotation Heating System – The Boiler

The PYROT Rotation Heating System (patent no: EP 0 905 442 B1) was developed for automatic incineration of all dry to moist wood fuels (remnant wood, pellets and forest woodchips to a maximum moisture content of 35-40%). It is characterised by high efficiencies and perfect incineration at all load levels. It has been tested and approved in accordance with the latest quality criteria as per EN 303-5 heating boilers for solid fuels, CE-certification in accordance with the European Machinery Directive.

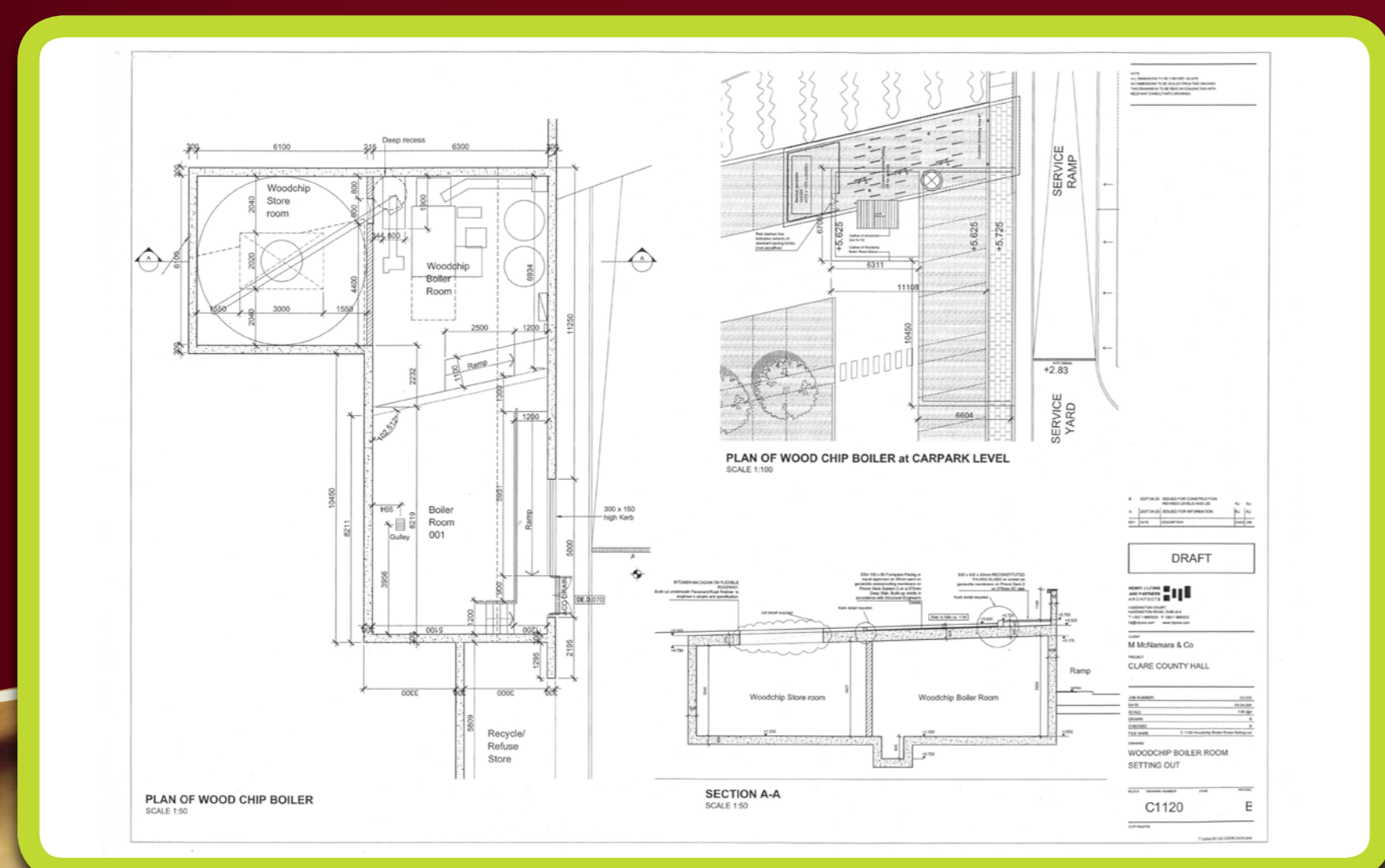
How It Functions

The feed auger conveys the material to be burned diagonally from below into the firing system. The holding devices for the burn-back sensor and the thermal extinguishing valve are situated on the conveyor pipe. Above the auger, there is a metering container with a light barrier to ascertain the level of the fuel isolating layer required.



The material is ignited automatically by an electric heat gun. The gasification of the fuel is carried out on a feed grate moved by a worm-gear motor. The ash falls into an ash bin below. The fire block is lined with highly refractory insulation and fired refractory concrete elements.

The combustion gases rising from the fire block are swept up by the rotating secondary airflow brought to bear by the rotation blower and burned out completely in the round combustion chamber.



Clare County Council Schematics

The thermal energy from the combustion gases is transmitted to the boiler water in a horizontally positioned pipe-type heat exchanger. The boiler is heavily insulated, with access through the boiler door on the end side.

A flue gas recirculation system reduces the temperature in the fire box while maintaining the highest possible degree of efficiency. This increases the service life of the uncooled refractory elements in the incineration zone. The ratio of recirculated gas to fresh air is geared precisely to the material to be burned. A mechanical flow volume regulator provides a constant ratio of the quantity of recirculated gas to fresh air over the entire output range.

The exhaust fan is specially designed for wood heating operation and is very quiet. The motor has a solid, heat resistant design with a heat dissipation hub and is spring-supported.

Exhaust Gas De-Duster

The function of the exhaust gas de-duster is to minimise dust emissions. The de-duster itself is completely insulated and provided with three lids, for cleaning purposes. The crude gas space is cleaned via the cleaning lid on the side. The clean gas chamber is cleaned via the top or rear cleaning lid. The ash container, which is provided with a trolley, connects to the de-duster by quick-action fasteners and moves out simply for emptying.

Pneumatic Cleaning System

The system provides auger de-ashing from the ash chamber for the fire block into an externally situated movable galvanised ash bin (standard 240 litres). A light barrier control system keeps the level of the ashes constantly over the auger. As a result, the ash in the ash pan under the incineration system can burn out, and in normal operation only cool ash that has burned out is conveyed to the container.

The amount of ash generated by the wood-fuelled boilers is generally less than 1.0% of the weight of the woodchips consumed by the boiler. The ash is removed as part of the heat supply agreement and will be spread in plantations as a fertiliser.

Ecotronic Control System

A microprocessor control system adjusts the heat output of the furnace in a modulating fashion. It allows:

- Automatic ignition
- Output and control circuits with modulating output operation (25%-100%)
- Air-conducted by means of a speed-regulated exhaust fan, depending on the forward flow temperature
- Re-supplying of fuel by the feed auger from the metering container with an isolating layer
- Refilling of the metering container with the use of a level monitoring system
- Limitation and distribution of the mass burning in the fire box by means of a level monitoring system in the fire box along with movement of the feed grate
- Optimised air supply through motor-operated air vents for the best possible incineration using a lambda sensor
- Upholding the return flow temperature with the boiler mixer provides for a long service life of the boiler.

Operation of the control system is carried out by means of a control panel with a membrane keyboard and plain language display. All the operational data can be read on the display. The set points for all the important parameters can be entered using the keyboard. Malfunctions are displayed in plain language and indicated in the order of their occurrence.

