

Edwards-Knox Biomass Boiler Summary

Jon Montan, Nov. 10, 2009

The biomass boiler is manufactured by Hurst Boilers (<http://www.hurstboiler.com/>) of Coolidge, Georgia.

It projected to save EK about \$120,000 per year compared to oil. With state assistance, fully funded, no payback. Without assistance, it would have been a 15-year payback. The unit will base load, with existing oil as back up and for shoulder season in a separate boiler house.

Hot water is looped to the School and Bus Garage. Once heat is delivered to buildings, it is zoned from there on. Fuels can be any biomass that can fit through a 2-inch screen (dimension eyeballed).

Fuel is deposited on a walking floor or adjacent slab for later transfer to the walking floor. The WF conveys the fuel to an inclined shaker chute with 2-inch screen. Oversize items continue and are collected. Fuel is conveyed via auger to metering bin then by auger into primary combustion chamber. Fuel emerges from base of combustion chamber as it is pushed up by feed auger, similar to residential pellet stoves. This creates an “air seal” of fuel between the combustion area and the fuel metering, preventing burn-back.

Underfire air gasifies fuel and overfire air burns the gasses. Firetube heat recovery on top with exhaust passing through heat exchanger for combustion air pre-heating. Then

through cyclone and to atmosphere. Compressed air pulses for firetube soot cleaning. Induced draft fan located before stack to atmosphere.

Bottom ash is removed manually on a periodic basis. Fly ash collects in drums below cyclone. Boiler is controlled by sensing loop temperature.

Will have silos for pellets or corn. Could also burn grass in Tom Lee-size pellets in theory. Briquettes that are hockey-puck size appear to be too large.

Boiler room will operate under negative pressure. Fugitive dust should be drawn into combustion air intakes.

Contact is John Daniels, Superintendent of Buildings and Grounds. Happy to show off the system. He is open to using grass biomass but wants to make sure that Cl content will not void the warrantee.

Construction to be completed by end of 2009. First firing in January. Open house in February.

Uncomplicated fuel and ash handling makes this look very reliable to me.

The consultant was:

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Photos from Nov.10 attached. Building unfinished, but easier to see boiler.

Edwards Knox Biomass boiler.doc



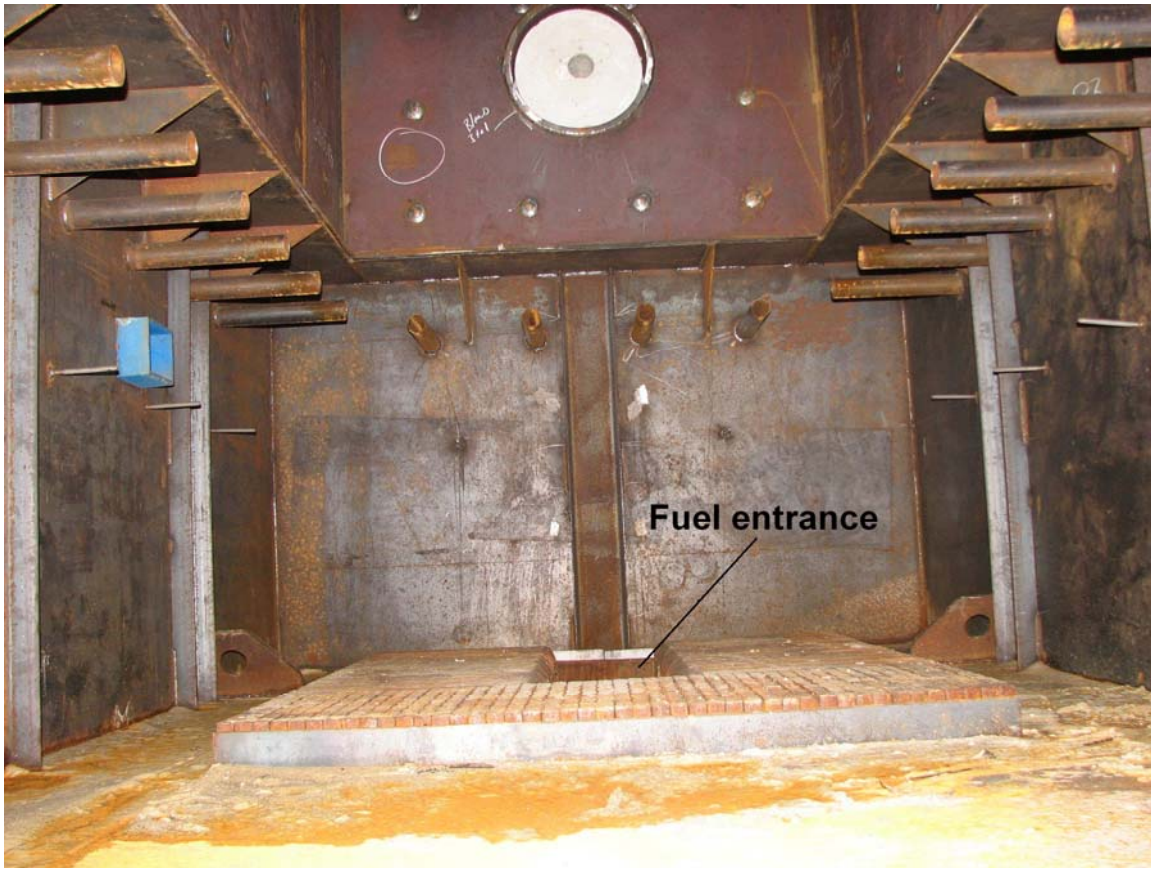
Fuel delivery area (walls not yet poured and no roof.
Walking floor not installed.)



Vibratory fuel conveyor and screen -- not in final position
(approx. 2-in. square screen – eyeball estimate)



Hurst Boiler showing (1)fuel feed-in (not fully assembled), (2)exhaust gas heat exchanger for (3)pre-heated combustion air, (4)cyclone, (5) induced draft fan. No walls or roof yet.



Inside combustion chamber. No firebrick installed yet except around fuel feed-in. Manual ash removal.



Above-ground hot water and return line to bus garage (similar to school building). Above ground was chosen because leaks underground are difficult and time-consuming to fix.