

**APPENDIX B**  
**HURST BOILER PROPOSAL**  
Modification to Stationary Source Permit to Operate  
Columbia Forest Products  
100 Paul Road, SW  
Chatham, Virginia 24531  
Registration No. 30120  
SECOR PN: B2OT.CFP01.VA  
May 27, 2005



**HURST BOILER & WELDING CO., INC.**

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PROPOSAL NO: 110304-300/300

**300 HORSEPOWER / 300 PSIG DESIGN  
WOOD WASTE FIRED STEAM BOILERS  
(10,350 POUNDS OF STEAM PER HOUR)**

FOR

**COLUMBIA FOREST PRODUCTS**

POST OFFICE DRAWER F  
CHATHAM, VIRGINIA 24531

ATTENTION: MR. DOANE COWAN

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**GENERAL SPECIFICATIONS**  
**300 HORSEPOWER BOILER / 300 PSIG DESIGN**

1. Scope of Equipment: 300 Horsepower / 300 psig  
Design Wood Waste Fired Boiler
2. Fuel Requirements: 1½" x 1½" x 5/8" or less in size  
and 20% by weight or less in moisture  
content.
3. Approximate Fuel Usage at  
Maximum Firing Rate: 1,536lbs. per hour based on  
10% moisture content.
4. Boiler Rating: 300 Boiler horsepower  
(20,700 lbs. of steam per hour from  
and at 212° f)
5. Boiler Pressure: 300 psig design.  
Maximum recommended  
operating pressure is  
275 psig
6. Boiler Design: High Pressure Hybrid  
(Fire Tube/Water Tube Design)  
Built in accordance with the ASME  
Code



## 1.1 ENGINEERING SERVICES

Hurst Boiler & Welding Co., Inc. will supply all required design and specifications for the proposed equipment.

Engineering will include:

1. Boiler room/storage layout drawings for locating new equipment.
2. Foundation details for proposed waste fired boiler based on 2000 PSF soil conditions.
3. Assistance in completing and filing of boiler's environmental emission permit.
4. All required installation prints and specifications required to install the proposed equipment.
5. Two (2) sets of operating and maintenance manuals.



## 1.2 SYSTEM START-UP

When installation is complete, Hurst Boiler & Welding Co., Inc. will start the equipment and train personnel on the proper maintenance and operation of the system to include:

1. Check out of all system components to assure proper rotation, alignment, sequencing, function, etc.
2. Start-up of the system to test operation of controls, conveyors and other related equipment.
3. Adjustment of controls to provide efficient operation of all boiler functions.
4. Start-up of the equipment with mill personnel to familiarize them with proper operation and maintenance procedures
5. Hurst Boiler & Welding Co., Inc.'s personnel will be on site until all equipment is started-up and operating to the satisfaction of the Purchaser. Start-up services are a part of this proposal, and no additional charges will be billed to the Purchaser for these services.
6. Hurst Boiler & Welding Co., Inc. start-up personnel will be on site for a minimum of ten days.



## 2.1 WOOD FUEL GASIFIER

Substoichiometric wood fuel gasifier to include:

1. Metering bin complete with AC-type variable speed controller.
2. Pneumatic stoker fed.
3. Cast refractory grates with angle and tee bars
4. Substoichiometric combustion air system to include:
  - Dual belt driven blowers with VFD, TEFC motor and OSHA belt guard.
  - Zoned undergrate plenum.
5. Gasification chamber casing to include:
  - Furnace front of ½" steel plate.
  - Furnace sides and rear of 1/4" steel plate reinforced with angle and channel irons
  - Chamber lining of:
    - 9" refractory wall, and radiant arch with a service temperature of: 3000F.
    - 2" "M" block, service temperature of: 1900F.
    - 2" mineral wool, service temperature: 1200F.
6. Three air cooled observation ports with heat shields and tinted site glasses,
7. Four cast iron overfire access doors with heat shield and lockable handles.
8. Undergrate access doors.
9. Skids and support assembly.



## 2.2 WOOD GAS BURNER

For the combustion of fuel gas Hurst Boiler & Welding Co., Inc. will furnish:

1. Combustion air system to include:
  - Belt driven blower with VFD, TEFC motor and OSHA belt guard.
  - Prefabricated combustion air duct work for interconnection of blower to zoned air port plenum.
2. Combustion chamber casing complete with the following:
  - Casing of 1/4" steel plate with inlet and outlet flanges and angle and channel iron reinforcement.
  - Chamber lining of:
    - 9" refractory wall, and radiant arch with a service temperature: 3000F.
    - 2" "M" block, service temperature: 1900F.
    - 2" mineral, wool, service temperature: 1200F.



### 2.3 PRESSURE VESSEL

Hurst Hybrid boiler with extended waterwall radiant section designed for efficient heat recovery from solid fuel combustion. Unit built in strict accordance with the ASME Code and stamped, and rated at no less than 6.5 square feet of heating surface per boiler horsepower.

The generator (firetube) section includes:

1. Front and rear smoke boxes complete with twin hinged air tight doors. The doors on the Hurst boiler are internally insulated and incorporate an abrasion resistant shield on the interior of the doors.
2. Steam, water inspection and blowdown openings.
3. Lugs for connecting support structure.

The radiant (watertube) section includes:

1. ½" front plate and rear plate.
2. Support assembly for attaching to combustion chamber casing.
3. Blowdown openings on each lower drum.
4. Flanged inspection openings on the end of each drum.

Both the generator and radiant sections of the Hybrid boiler are insulated with 2" of high density fiberglass and clad with 22 gauge "Paint-Grip" zinc coated steel jacket material and galvanized screws for attachment and joining.

The pressure vessel will be manufactured by Hurst Boiler & Welding Co., Inc. and guaranteed to be free from defects in materials and workmanship for a period of one year.





## 2.4 BOILER TRIM AND LIMIT CONTROLS

1. Relief valves per ASME Code.
2. Boiler bottom blowdown valves.
  - Two (2) in generator section, quick-opening.
  - Two (2) in radiant section, quick-opening.
  - One (1) slow opening.
3. Surface blowdown valves consisting of one (1) needle and one (1) check.
4. Main steam valving, angle non-return, pp spool and gate per ASME. 20' steam line necessary for the installation of the steam flow transmitter will be provided.
5. Chemical feed valves consisting of one (1) gate and two (2) check valves.
6. Steam pressure gauge with pigtail and gauge cock.
7. Boiler feedwater valving to include: globe valve, two (2) check valves and stop valve.
8. Quick fill valves consisting of one (1) check and one (1) globe.
9. Low water limits:
  - Primary: Probe type with tricocks, gauge glass and pump controller.
  - Secondary: Probe type. (Probe type high water cut-off)
10. Pressure limits include:
  - Opening limit.
  - High pressure limit.
  - Low pressure limit.
  - 4-20 milliamp pressure transmitter for fuel feed/combination air modulation.



11. Blowdown Separator:

One blowdown separator built in accordance with the ASME Code to include:

- Blowdown inlet (screwed).
- Drain (flanged).
- Vent (flanged).
- Exhaust stack (flanged) to vent above building roof line.

12. Access Platforms:

Platforms and ladders will be provided to access:

- Rear smoke box.
- Water column.
- Feedwater valve train.
- Deaerator

13. Soot blowers, fixed zone, air with necessary piping, header and valving.

14. Necessary pipe and fittings for the installation of the above trim.

15. One steam flow meter with totalizer and transmitter.



## 2.5 POLLUTION CONTROL AND INDUCED DRAFT EQUIPMENT

**HURST BOILER & WELDING CO., INC. GUARANTEES THIS PLANT NOT TO EXCEED THE EMISSION RATE OF .25#/ MILLION BTU INPUT OR MEET STATE EPA STANDARDS, WHICHEVER IS GREATER.**

Pollution control and induced draft system consisting of:

1. Flanged breeching, prefabricated of angle iron reinforced 3/16" steel plate for routing flue gas from boiler to combustion air heater.
2. Dry mechanical multiple cyclone flyash arrestor with 9" diameter clones, collection hopper, rotary airlock discharge valve and flyash conveyor.
3. Flanged transition of angle iron reinforced 3/16" steel plate for routing flue gas to induced draft fan from multicyclone into induced draft fan.
4. Centrifugal type induced draft fan designed for combustion air service complete with pillow block roller bearings (located outside hot gas stream), heavy duty shaft with heat slinger, VFD, TEFC motor, belt drive and OSHA belt guard.
5. Flanged transition and self supporting stack constructed of 3/16" steel plate to exhaust spent gasses 40' above grade.



## 2.6 DEAERATING BOILER FEEDWATER SYSTEM

17,000 pph, Packaged deaerating boiler feedwater system to include:

- 10' support structure
- Factory insulation and jacketing
- Dual boiler feedwater pumps with motors
- Pump suction piping with valving and strainers
- Water gauge glass set
- Over flow trap
- McDonnell Miller high and low water switches
- ASME safety relief valves
- Vent and vacuum breaker
- Steam pressure reducing valve, Fisher pneumatic
- Freshwater make-up valve, Fisher pneumatic
- Tank drain valve
- Pressure gauge
- Thermometer
- Electrical control panel to include:
  - Prewired control panel
  - Pump selector switch
  - Pump running lights, two each
  - Pump motor starters
  - Step down control transformer



## 2.7 ELECTRICAL CONTROL SYSTEM

An integrated control system housed in a free standing, pre wired panel for automatic operation will be provided to include:

### 1. Control Panel

- NEMA 12 control enclosure
- Enclosure prefabricated of 10 gauge plate, primed and painted interior and exterior.
- Main disconnect
- Cooling as required, air to air exchanger
- Unit provides for lock out / tag out compliance

### 2. Processor

- Allen Bradley ControlLogix / 1756 System processor
- Power supply
- Rack
- Communication modules
- Input / output modules

### 3. Graphics Interface

Allen Bradley RS View runtime package to represent system required parameters and variables running on a desktop computer. Operator interface is through this interface.

### 4. Drives, Variable Frequency

- Allen Bradley PowerFlex 70 and 700 480v drives
- Input line reactors
- DeviceNet communication to processor
- Variable frequency drives will be provided for:
  - Metering bin drive
  - Underfire combustion air fan
  - Overfire combustion air fan
  - Induced draft fan



5. Field Disconnects

-Local motor disconnects are provided at each motor

6. Wiring

Control enclosure is completely wired, shop tested and includes terminal strip terminations, ready for connection to field devices

7. The control system incorporates equipment mounted, 4-20 milliamp transmitters for controlling/monitoring:

- Steam flow
- Steam pressure
- Boiler water level
- Deaerator water level
- Deaerator steam pressure

8. Limits and Alarms:

-Primary boiler low water	Limit/Alarm	Auto. reset
-Secondary boiler low water	Limit/Alarm	Man. reset
-High water cut-off	Limit/Alarm	Auto. reset
-Low boiler steam pressure	Alarm	Auto. reset
-High boiler steam pressure	Limit/Alarm	Auto. reset
-Low draft (Furnace)	Limit/Alarm	Auto. reset
-High temperature (Furnace)	Limit/Alarm	Auto. reset

