Cooling Tower Specification
Lyons Ferry Straw Pulp Plant
15NA0050-650-1420-216

Prepared For: Columbia Pulp

Submitted By:

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Appendix A: 15NA0050-16S43-001 Motor Specification

1 BACKGROUND

Columbia Pulp LLC is constructing a 400 tpd straw pulp plant near the Lyons Ferry crossing on the Snake River in Washington State, plant address is:

Lyons Ferry Straw Pulp Plant
1351 Highway 261
Starbuck, Washington 99359

The plant will produce unbleached pulp in the form of wet lap for manufacture of paper and molded products. One of the by-products of the pulping process, known as "Co-product" will also be sold and used in a number of applications, including de-icing, dust suppression, etc. The plant is scheduled to go into operation by Q1 2019.

Allnorth Consultants Ltd (Allnorth) requires a fixed price quotation for the supply, delivery, and erection supervision of a Cooling Tower as defined in this specification.

2 VENDOR SCOPE OF SUPPLY

Design, manufacture, test, prepare for shipment, deliver to site and supervise erection of a cooling tower including ancillary equipment as specified in this specification.

Provide rates for on-site assistance during installation, start-up and commissioning. Vendor to specify the extent of on-site assistance that is recommended for the installation of their equipment.

Project preference is for a shop built and tested Cooling Tower (can be multi cell) however a field erected and tested cooling tower will be considered if it improves the economics.

The scope of supply shall include, but is not limited to, the following items:

1. Complete site specific documentation including approval drawings, certified drawings, control narratives, operating manuals, and maintenance manuals;
2. Completed equipment data sheets for all supplied equipment;
3. Galvanized construction for factory assembled units;
4. Lifting lugs for erection and maintenance;
5. 150# RF ANSI flange connections;
6. Motors as required meeting project motor specification 15NA0050-16S43-001;
7. Vibration monitors complete with DPDT dry alarm contacts;
8. All process instrumentation in Vendor scope will be as follows, pneumatic control valves with 4-20mA HART capable positioners, analog instruments 4-20mA with HART, discrete instruments 24VDC DPDT dry contacts. All instrumentation will be supplied with completed datasheets;
9. All steel and structural components required to support equipment on Purchaser supplied concrete foundations;
10. Access platform as required;

11. Complete handrails painted safety yellow as required;
12. Any required joining materials will be provided by the Vendor;
13. Spare parts required for 1 year of operation;
14. Special tools and accessories for maintenance of the equipment;

3 PURCHASER'S RESPONSIBILITY

The following items are outside of the Vendor's scope of supply and will be provided by the Purchaser or Others:

1. Offloading and storage at site;
2. Concrete foundation;
3. Cooled water pump station;
4. Erection labor;
5. Utilities such as power, water, and air;
6. Electrical disconnects, wiring, conduit, and lighting external to the equipment;
7. Piping, pipe supports, insulation, valves, and fittings external to the equipment;
8. Instrumentation external to the equipment;
9. Automation Equipment including MCCs, Logic Controllers, HMIs;
10. Start-up and commissioning.

4 TERMINAL POINTS

1. All terminal flanges shall be to ASME standard.
2. Where valves, instrumentation and associated equipment are supplied loose, they shall also be considered as terminal points.
3. Connections to terminal points will be made by the purchaser.

5 DESIGN CRITERIA

The proposed cooling tower system shall be designed for the following conditions.

Design Heat Rejection Rate	77 MM BTU/hr
Design Cooling Water Flow rate	6,600 USGPM
Design Cooling Water Inlet Temperature	109 °F
Design Cooling Water Outlet Temperature	85 °F
Design Wet Bulb Temperature (summer)	76 °F
Design Approach (summer)	9 °F
Design Dry Bulb Temperature (winter)	18 °F

6 DESIGN INFORMATION

Plant Elevation	584 ft above sea level
No. of Towers Required	One
No. of Cells	Vendor to advise based on lowest anticipated lifecycle cost
Makeup Water Source	Process Water supply (well water)
Makeup Water pH	6.5 to 7.5

7 WIND LOADING & SEISMIC DESIGN

Wind design speed (risk category II)	110 mph
Seismic	Ss = 0.330g S1 = 0.190g SDS = 0.339g

8 PROPOSAL SUBMISSIONS

- Vendors are to provide proposals by November 23, 2017.
- Certified drawings suitable for the design of the Cooling Tower foundations are required 4 weeks after award.
- Equipment is required on site no later than May 18, 2018.
- Proposals should be addressed to:

  Larry Tantalo (e-mail Larry.Tantalo@columbiapulp.com)

- Technical inquiries can be directed to:

  Steve Noble (e-mail snoble@allnorth.com)

  Phone 778-734-2225

Appendix A

Motor General Specification
15NA0050-14S43-001
Lyons Ferry Straw Pulp Plant

Prepared For: Columbia Pulp

Submitted By:
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Created by: Reviewed by: Approved by:

Christopher Mathie, P.Eng Jaco Krüger, P.Eng Mark Skovmose, P.E

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1 SCOPE

This Motor General Specification provides technical requirements for the design and selection of electric motors for general industrial service.

This document is intended to supplement the equipment datasheet - in the event of a conflict between this specification and the equipment datasheet, the datasheet shall govern. Where government or regulatory requirements conflict with this specification or with the equipment datasheet, the most rigid requirement shall govern. Any deviation from this specification must be submitted (in writing) to the Owner or the Owner's representative for approval prior to the commencement of any work.

2 DESIGN REQUIREMENTS

2.1 Motor Specification

1. Motors up to and including 350 HP shall be:
    - 460 VAC, 3 phase, 60 Hz;
    - Squirrel cage, induction type, 1.15 service factor (minimum);
    - F-1 assembly;
    - Severe duty, corrosion resistant TEFC enclosure;
    - Premium Efficiency;
    - Designed for inverter operation;
    - Meet or exceed requirements of IEEE std. 841-1994;
    - Supplied with greaseable anti-friction bearing with the fittings piped to the top of the frame and drains installed.
2. Motors 350 HP and larger shall normally be:
    - 4160 VAC, 3 phase, 60 Hz;
    - TEFC enclosure, NEMA Design B;
    - 1.15 service factor, continuous duty;
    - F-1 assembly;
    - Super Premium Efficiency;
    - Meet or exceed requirements of NEMA MG-1-2016;
    - Normal starting torque and designed for full voltage starting;
    - Supplied complete with 240 VAC space heater, thermostat, and bearing thermocouples;
    - Insulation shall be Class F (VPI) depending upon frame size.
3. All motors 100 HP and larger shall utilize a soft start or be controlled by a VFD.
4. All motors shall have anti-friction bearings that are suited to their application (ball bearings for direct coupled, roller bearings for belt drive applications).
5. All motors controlled by a VFD must meet or exceed requirements of NEMA MG-1-2016, Part 31.
6. All motors shall have bearing retaining caps.
7. All motors shall have stainless steel nameplates with stainless steel fasteners.

8. All motors shall have cast iron, oversized terminal boxes with gaskets and threaded conduit hubs.

9. All motors shall have cast iron frames and end bells.

10. All motors shall be sized to the next largest available standard HP rating greater than the maximum expected mechanical load.

11. All totally enclosed motors shall have drain plugs.

12. All motors shall be standard NEMA sizes unless pre-approved by the Engineer.