Part 1 General

1.1 RELATED REQUIREMENTS

.1 Common Work Results for HVAC — Section 23 05 00

.2 Mechanical Spare Parts and Maintenance Materials — Section 23 05 02

1.2 PRODUCT OPTIONS AND SUBSTITUTIONS

.1 Refer to Division 01 for requirements pertaining to product options and substitutions.

1.3 ABBREVIATIONS

.1 NPSHR - Net Positive Suction Head Required.

.2 EEMAC - Electrical Equipment Manufacturers Association of Canada.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 Comply with requirements of Section 01 33 10.

.2 Submit following information:

.1 Certified pump performance curves showing performance characteristics with system operating point plotted and NPSHR curve.

.2 Details of drive motor.

.3 Details of drive assembly, including the rated capacity of the drive at the specified r/min.

.4 Details of bearings including manufacturer's ratings of full load operating hours.

.5 Details of pump seals, listing maximum operating temperatures and material limitations.

.6 Complete data showing pump materials, dimensional data and ratings.

Part 2 Products

2.1 PUMPS - GENERAL

.1 Balance all rotating parts.

.2 Pump construction to permit complete servicing without disassembly of piping or motor connections.

.3 Pump operating speed of 1750 r/min unless stated otherwise.

.4 Pump Connections: flanged pump connections.

2.2 IN-LINE CIRCULATOR PUMPS

.1 Type: horizontal mount, centrifugal, close coupled, mounted in-line.

.2 Casing: cast iron, volute, rated for 860 kPa working pressure. Bronze for domestic hot and cold water services.

.3 Impeller: bronze or cadmium plated steel.

.4 Shaft: carbon steel alloy with integral thrust collar.

.5 Bearings: bronze with spiral grooves to convey lubricant the entire length of the bushing.

.6 Seals: spring loaded carbon rotating washer complete with rubber bellow held against a stationary floating satellite seat and seat ring.

.7 Motor: to specifications provided in Section 23 05 13 and Pump Schedule.

Part 3 Execution

3.1 INSTALLATION

.1 Provide drains for bases and stuffing boxes, piped to and discharging into floor drains.

.2 Provide air cocks and drain connection on horizontal pump casings.

.3 Provide pipe size shut-off valve and strainer on suction, pipe size spring loaded check valve and valve for throttling on discharge. Factory designed combination valve inlet and discharge fittings may be used if certified by pump manufacturer.

.4 Decrease from pipe size with long radius reducing elbows or reducers. Install to Hydraulic Institute recommended practices.

.5 Support pipe adjacent to pump such that no weight is carried on pump casings. Provide supports under elbows on pump suction and discharge lines 100 mm and over.

.6 Where pipe rises more than 1000 mm before being supported, use spring type supports on systems operating at more than 50°C differential from ambient temperature for lines 75 mm and over. Refer to Section 15205, Mechanical Vibration Control.

.7 Prior to start-up, align and certify pumps with a flexible coupled drive using a qualified millwright. Submit report.

.8 Support "in-line" circulators directly from inlet and discharge pipe. Do not use flexible connections.

.9 Install pumps to allow maintenance and removal of component parts.

3.2 PERFORMANCE

.1 Ensure pumps operate at specified system fluid temperatures without vapour binding and cavitation, are non-overloading in parallel or individual operation and operate within 75% of the maximum published efficiency unless noted otherwise.

.2 Provide pumps labelled on the drawings to the performance and quality standards scheduled herewith.

3.3 START-UP AND ACCEPTANCE

.1 Submit pre-system start-up check list including:

.1 Clean inlet strainers.

.2 Confirm pump rotation correct.

.3 Ensure air is bled.

.4 Confirm expansion tank charged.

.5 Check voltage to motor.

.6 Confirm chemical treatment completed.

.7 Check and adjust bearing lubrication oil levels.

.2 Submit certification from pump manufacturer confirming that pump installation is consistent with manufacturer's recommendations.

.3 Operate, adjust, measure and balance system performance to requirements of Section 23 08 83.

.4 Verify system operating performance. Shave impellers as directed by the Consultant to suit system operating characteristics.

.5 Change pump seals on all pump equipment used for temporary heat.

3.4 PUMP SCHEDULE

.1 Refer to Schedule provided on the drawings.

END OF SECTION