Part 1 General

1.1 REFERENCES

.1 American Society of Heating Refrigeration and Air-Conditioning Engineers (ASHRAE)

.1 Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings.

.2 Electrical Equipment Manufacturers Advisory Council (EEMAC)

.3 Canadian Standards Association (CSA International)

.1 CSA-B214, Installation Code for Hydronic Heating Systems.

.4 National Electrical Manufacturers' Association (NEMA)

.1 NEMA MG 1-, Motors and Generators.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for pump, circulator, and equipment, and include product characteristics, performance criteria, physical size, finish and limitations indicate point of operation, and final location in field assembly.

.3 Shop Drawings:

.4 Submit manufacturer's detailed composite wiring diagrams for control systems showing factory installed wiring and equipment on packaged equipment or required for controlling devices or ancillaries, accessories and controllers.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance and operation data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 MAINTENANCE

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

Part 2 Products

2.1 IN-LINE CIRCULATORS

.1 Volute: Bronze radially split, with screwed or flanged design suction and discharge connections.

.2 Impeller: stainless steel.

.3 Shaft: stainless steel with bronze sleeve bearing, integral thrust collar.

.4 Seal assembly: mechanical for service to 135 degrees C.

.5 Capacity: 4.3Lps with 8 meter head.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install hydronic pumps to: CSA-B214.

.2 In line circulators: install as indicated by flow arrows.

.1 Support at inlet and outlet flanges or unions.

.3 Ensure that pump body does not support piping or equipment.

.1 Provide stanchions or hangers for this purpose.

.2 Refer to manufacturer's installation instructions for details.

.4 Pipe drain tapping to floor drain.

.5 Install volute venting pet cock in accessible location.

.6 Check rotation prior to start-up.

.7 Install pressure gauge test cocks.

3.3 START-UP

.1 General:

.1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: General Requirements; supplemented as specified herein.

.2 In accordance with manufacturer's recommendations.

.2 Procedures:

.1 Before starting pump, check that cooling water system over-temperature and other protective devices are installed and operative.

.2 After starting pump, check for proper, safe operation.

.3 Check installation, operation of mechanical seals, packing gland type seals. Adjust as necessary.

.4 Run-in pumps for 12 continuous hours minimum.

.5 Verify operation of over-temperature and other protective devices under low- and no-flow condition.

.6 Eliminate air from scroll casing.

.7 Eliminate cavitation, flashing and air entrainment.

.8 Measure pressure drop across strainer when clean and with flow rates as finally set.

.9 Replace seals if pump used to degrease system or if pump used for temporary heat.

.10 Verify lubricating oil levels.

3.4 PERFORMANCE VERIFICATION (PV)

.1 General:

.1 Verify performance in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: General Requirements, supplemented as specified herein.

.2 Verify that manufacturer's performance curves are accurate.

.3 Ensure valves on pump suction and discharge provide tight shut-off.

.4 Mark points of design and actual performance at design conditions as finally set upon completion of TAB.

.5 Commissioning Reports: in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements reports supplemented as specified herein. Reports to include:

.1 Record of point(s) of actual performance at maximum and minimum conditions and for single and parallel operation as finally set at completion of commissioning on pump curves.

.2 Pump performance curves (family of curves).

3.5 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION