

FORM N: DETAILED SPECIFICATIONS

SUPPLY, DELIVERY AND ON-SITE INSPECTIONS OF NEWPCC SUBMERSIBLE PUMPING EQUIPMENT

1. INSTRUCTIONS FOR COMPLETION OF SPECIFICATIONS

- 1.1 All items in these specifications should be answered indicating compliance or non-compliance.
- 1.2 **Bidder/Proponents shall fill in specifications and state “yes”, “no” where indicated for compliance and state the “deviation”,** or give a reply where requested to do so. Deviations and/or equivalents shall be clearly stated and fully detailed. Deviations and/or equivalents will be considered subject to evaluation. In every instance where a brand name or design specifications is used, the City will also consider deviations and/or equivalents.
- 1.3 Lengthy explanations of deviations may be included in a separate document and must reference the appropriate Detailed Specification.
- 1.4 Each Bidder/Proponent is required to fill in every blank. Failure to do so may be used as a basis for rejection of bid/proposal.
- 1.5 It will be the responsibility of the Bidder/Proponent to inform the City of any errors or omissions in these Detailed Specifications, for under this Contract, the Contractor shall be held responsible to ensure that the manufacturer will be responsible for the design, performance, reliability and satisfactory operational function of the unit.

2. DESCRIPTION OF EQUIPMENT

- 2.1 These specifications describe the pumping equipment, instruments and other equipment and features as specified herein.
- 2.2 The pumping equipment and instruments shall be new. Refurbished equipment will not be acceptable.
- 2.3 The pumping equipment and all other items/components shall be the manufacturer's latest model. The equipment shall be furnished complete and ready for operation. Any parts or accessories not specifically mentioned, but which are required to complete and place the equipment and associated attachments in successful operation shall be furnished as though specifically mentioned in these specifications. The equipment and associated attachments, and all parts thereof, shall conform in strength and quality of material and workmanship, to the best standards and engineering practice of the industry.
- 2.4 The ratings specified herein merely state the minimum values acceptable to the City, not implying that those values are sufficient for the design of the particular equipment being bid/Proposed.

3. OTHER SPECIFICATIONS AND STANDARDS

- 3.1 All applicable CSA and ANSI Hydraulic Institute Standards for Pumping Equipment form an integral part of the pump specifications and shall have precedence in any conflict concerning minimum acceptable standards.
- 3.2 The pumps shall comply with the applicable standards and regulations:
 - CSA C22.2 – Canadian Electrical Code
 - CSA C22.2 No. 100 – Motors and Generators
 - ANSI/HI 14.4-Rotodynamic Pumps for Installation, Operation, and Maintenance
 - ANSI/HI 14.6-2022 Rotodynamic Pumps for Hydraulic Performance Acceptance Tests
 - ANSI/HI 9.6.1-2017 Rotodynamic Pumps Guideline for NPSH Margin
 - ANSI/HI 9.6.2-2021 Rotodynamic Pumps for Assessment of Applied Nozzle Loads
 - ANSI/HI 9.6.3-2017 Rotodynamic (Centrifugal and Vertical) Pumps - Guideline for Allowable Operating Region
 - ANSI/HI 9.6.4-2022 Rotodynamic Pumps for Vibration Measurement and Allowable Values
 - ANSI/HI 9.6.5-2016 Rotodynamic Pumps Guideline for Condition Monitoring

ANSI/HI 40.6 Methods for Rotodynamic Pump Efficiency Testing

Manitoba Building Code: https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=31/2011

3.3 The completed unit shall include a Canadian Certification label (CSA, cUL) shown on the equipment nameplate.

4. REFERENCES

Bidder to provide five (5) references where this equipment of similar size is used in a working 'Class 4' wastewater treatment facility (serving a population of over 50,000). State the application, model type of pump used, how long pump has been in service, customer and contact information (names, phone numbers and email)

4.1 Reference 1:

4.2 Reference 2:

4.3 Reference 3:

4.4 Reference 4:

4.5 Reference 5:

5. MAKE & MODEL PUMP 1 [Specification Ref E5.3.1 & E5.4]

- 5.1 Pump Manufacturer Being Bid State _____
- 5.2 Pump Full Model Number Being Bid State _____
- 5.3 Motor Manufacturer Being Bid State _____
- 5.4 Motor Full Model Number Being Bid State _____

6. MAKE & MODEL PUMP 2 [Specification Ref E5.3.2 & E5.4]

- 6.1 Pump Manufacturer Being Bid State _____
- 6.2 Pump Full Model Number Being Bid State _____
- 6.3 Motor Manufacturer Being Bid State _____
- 6.4 Motor Full Model Number Being Bid State _____

7. PUMP DETAILS PUMP 1 [Specification Ref E5.3.1]

- 7.1 Rated Speed Flow @ 22m head (Bidder to fill in) _____ L/s Efficiency: _____ %
- 7.2 Rated Speed Flow @ 26m head (Bidder to fill in) _____ L/s
- 7.3 Rated Speed Flow @ 21m head (Bidder to fill in) _____ L/s
- 7.4 Reduced Speed Design 300L/s @ 14m head (Bidder to fill in) _____ RPM Efficiency: _____ %
- 7.5 Maximum rated power less than 400HP at rated speed? (Bidder to answer YES / NO) _____
- 7.6 Rotation (CW viewed from above) (Bidder to answer YES / NO) _____
- 7.7 Type of Impeller/material (Bidder to fill in) _____
- 7.8 Type of Mechanical Seal Provided (Bidder to fill in) _____
- 7.9 Seal water required per day (Bidder to fill in) _____ Ltr
- 7.10 Specified and suitable for Wastewater (Bidder to answer YES / NO) _____
- 7.11 Solid Passing Capability (sphere diameter) (Bidder to fill in) _____ mm
- 7.12 Nominal Diameter of Pump Suction (Bidder to fill in) _____ mm (inch)
- 7.13 Nominal Diameter of Pump Discharge (Bidder to fill in) _____ mm (inch)
- 7.14 Motor and pump mounts and support brackets included (Bidder to answer YES / NO) _____
- 7.15 Pump Approval for Canada (Bidder to answer CSA / cUL / NO) _____
- 7.16 Certified Canada Service Shop (Bidder to list City & Province) _____
- 7.17 Wastewater Operation Compatible (Bidder to answer YES / NO) _____
- 7.18 Provide Explanation on Any Deviations Required:

8. PUMP DETAILS PUMP 2 [Specification Ref E5.3.2]

- 8.1 Flow Rate Design @ 20m head (Bidder to fill in) _____ L/s Efficiency: _____ %
- 8.2 Flow Rate Shut-off @ 41m head (Bidder to fill in) _____ L/s
- 8.3 Reduced Speed Design 115L/s @ 16m head (Bidder to fill in) _____ RPM Efficiency: _____ %
- 8.4 Maximum rated power less than 200HP at rated speed? (Bidder to answer YES / NO) _____
- 8.5 Rotation (CW viewed from above) (Bidder to fill in) _____
- 8.6 Type / Material (Bidder to fill in) _____
- 8.7 Type of Mechanical Seal Provided (Bidder to fill in) _____
- 8.8 Seal water required per day (Bidder to fill in) _____ Ltr
- 8.9 Specified and suitable for WasteWater (Bidder to answer YES / NO) _____
- 8.10 Solid Passing Capability (sphere diameter) (Bidder to fill in) _____ mm
- 8.11 Nominal Diameter of Pump Suction (Bidder to fill in) _____ mm (inch)
- 8.12 Nominal Diameter of Pump Discharge (Bidder to fill in) _____ mm (inch)
- 8.13 Motor and pump mounts and support brackets included (Bidder to answer YES / NO) _____
- 8.14 Pump Approval for Canada (Bidder to answer CSA / cUL / NO) _____
- 8.15 Certified Canada Service Shop (Bidder to list City & Province) _____
- 8.16 Wastewater Operation Compatible (Bidder to answer YES / NO) _____

8.17 Provide Explanation on Any Deviations Required:

9. PUMP 1 MOTOR DETAILS *[Specification Ref E5.4]*

- 9.1 Motor Enclosure (Bidder to fill in) _____
- 9.2 Power Supply (Bidder to fill in) _____ VAC ___ Ph ___ Hz
- 9.3 Power Rating (Bidder to fill in) _____ HP
- 9.4 Approximate Full Load Amps (Bidder to fill in) _____ A
- 9.5 Premium (High) efficiency (Bidder to answer YES / NO) _____
- 9.6 Approximate Efficiency (Bidder to fill in) _____ %
- 9.7 Approximate Power Factor (Bidder to fill in) _____
- 9.8 Service Factor (Bidder to fill in) _____
- 9.9 Nominal Speed (Bidder to fill in) _____ RPM
- 9.10 Starts per Hour Compatible (Bidder to fill in) _____
- 9.11 VFD Operation Compatible (Bidder to answer YES / NO) _____
- 9.12 Mount and standoff bracket included (Bidder to answer YES / NO) _____
- 9.13 Bypass RVMS Operation Compatible (Bidder to answer YES / NO) _____
- 9.14 Provide Explanation on Any Deviations Required:

PUMP 2 MOTOR DETAILS

[Specification Ref E5.4]

- 9.15 Motor Enclosure (Bidder to fill in) _____
- 9.16 Power Supply (Bidder to fill in) _____ VAC ___ Ph ___ Hz
- 9.17 Power Rating (Bidder to fill in) _____ HP
- 9.18 Approximate Full Load Amps (Bidder to fill in) _____ A
- 9.19 Premium (High) efficiency (Bidder to answer YES / NO) _____
- 9.20 Approximate Efficiency (Bidder to fill in) _____ %
- 9.21 Approximate Power Factor (Bidder to fill in) _____
- 9.22 Service Factor (Bidder to fill in) _____
- 9.23 Nominal Speed (Bidder to fill in) _____ RPM
- 9.24 Starts per Hour Compatible (Bidder to fill in) _____
- 9.25 VFD Operation Compatible (Bidder to answer YES / NO) _____
- 9.26 Mount and standoff bracket included (Bidder to answer YES / NO) _____
- 9.27 Provide Explanation on Any Deviations Required:

10. INSTRUMENT DETAILS [Specification Ref E5.5]

10.1 Pump and Motor external Bearing Temperature Sensors (8 total)

Manufacturer (Bidder to fill in) _____
Model (Bidder to fill in) _____
Measured Variable Range (Bidder to fill in) _____
Output Signal (Bidder to fill in) _____

10.2 Pump Winding Temperature Sensors (from manufacture)

Manufacturer (Bidder to fill in) _____
Model (Bidder to fill in) _____
Measured Variable Range (Bidder to fill in) _____
Output Signal (Bidder to fill in) _____

10.3 Pump Stator Temperature Sensors (from manufacture)

Manufacturer (Bidder to fill in) _____
Model (Bidder to fill in) _____
Measured Variable Range (Bidder to fill in) _____
Output Signal (Bidder to fill in) _____

10.4 Pump and motor external Vibration Sensors (8 total)

Manufacturer (Bidder to fill in) _____
Model (Bidder to fill in) _____
Measured Variable Range (Bidder to fill in) _____
Output Signal (Bidder to fill in) _____
XY Axis (Bidder to fill in) _____

10.5 Provide Explanation on Any Deviations Required:

11. ACCESSORIES [Specification Ref E7]

11.1 Vibration Analysis Equipment (Bidder to Specify Manufacturer & Model) _____
11.2 Motor Port Drilled? (Bidder to answer YES / NO) _____
11.3 Pump Port Drilled? (Bidder to answer YES / NO) _____
11.4 Necessary Equipment Mounts Installed? (Bidder to answer YES / NO) _____

12. TOOLS, ACCESSORIES & SPARE PARTS [Specification Ref E8]

12.1 Special Tools (list) _____ (Bidder to indicate total quantity) P1:___P2:___
12.2 Special Tools (list) _____ (Bidder to indicate total quantity) P1:___P2:___
12.3 Spare Impellers (Trimmed to Size) (Bidder to indicate total quantity) P1:___P2:___
12.4 Spare Wear Rings / Plates (Bidder to indicate total quantity) P1:___P2:___
12.5 Spare Mechanical Seals (Bidder to indicate total quantity) P1:___P2:___
12.6 Spare Pump Shafts (Bidder to indicate total quantity) P1:___P2:___
12.7 Spare Pump Volute and Casing Gaskets (Bidder to indicate total quantity) P1:___P2:___

- 12.8 Spare Lower Bearings (Pump Side) (Bidder to indicate total quantity) P1: __ P2: __
- 12.9 Spare Upper Bearings (Motor Side) (Bidder to indicate total quantity) P1: __ P2: __
- 12.10 Motor Shaft Grounding ring (Bidder to indicate total quantity) P1: __ P2: __
- 12.11 Pumps compatible with Packing and Double Mechanical Seal? (Bidder indicate Yes/No) P1: __ P2: __
 - 12.11.1 If No, are the pumps supplied with an alternate backplate compatible with packing and double mechanical seals? (Bidder to indicate Yes/No) P1: __ P2: __
 - 12.11.2 Alternate Backplate or Bracket Compatible with Double Mechanical Cartridge Seal to be listed among other spare parts below.
- 12.12 Other Spare Parts (list) _____ (Bidder to indicate total quantity) P1: __ P2: __
- 12.13 Other Spare Parts (list) _____ (Bidder to indicate total quantity) P1: __ P2: __
- 12.14 Provide Explanation on any Deviations Required:

13. MANUFACTURER PARTS WARRANTY [Specification Ref E13]

- 13.1 The Supplier shall provide all detailed published Warranty information (including all exclusions) at the time of bid of the equipment. State the following [example. Replacement – 18 or 12 Months]:
- 13.2 Lower Bearings (Motor Side) State P1: _____ P2: _____
- 13.3 Upper Bearings (Pump Side) State P1: _____ P2: _____
- 13.4 Wear Rings State P1: _____ P2: _____
- 13.5 Mechanical Seals State P1: _____ P2: _____
- 13.6 Impellers State P1: _____ P2: _____
- 13.7 Pump Shaft Guard State _____
- 13.8 Provide any additional manufacturer parts warranty information:

14. MANUFACTURER PUMPS, MOTOR, ASSEMBLY AND ASSOCIATED EQUIPMENT WARRANTY [Specification Ref E13]

- 14.1 The Supplier shall state all provided Warranty information (including all exclusions) at the time of bid of the equipment. (Warranty specified in tender 879-2023 - 24 from delivery or 12 Months from substantial performance]:
- 14.2 Electric Motors State _____
- 14.3 Mechanical Pumps State _____
- 14.4 Mechanical Pump Drive Shafts State _____
- 14.5 Vibration instruments State _____
- 14.6 Temperature instruments State _____
- 14.7 Motor Shaft Grounding Rings State _____
- 14.8 Provide any additional manufacturer warranty information:
