CONTRACTOR TENDER BID FORM

Project: T-MCC-2411 **Name:** Supply of Sluice Gate

Closing Date: December 12, 2024 **Closing Time:** 2:00pm

The Municipality is looking to purchase a Stainless-Steel Sluice Gate that meets the following general requirements:

a) Dimensions: 40in x 40in
b) Design Pressure (On/Off): 10.0ft/10.0ft
c) Installation depth: 9.50ft
d) Self contained frame, Single Non-rising Stem
e) Mounting: Face of Wall with Wide Flange
f) Material: 304L stainless steel
g) Seal on 4 sides constructed from UHMWPE
h) Operator: Square nut and yoke mounted submersible gearbox
i) Certification: AWWA C561-14
j) Gate must fit in existing structure without modification as a direct replacement for existing equipment.

Please refer to Schedule A for a complete list of specifications.

Bidders may propose alternatives. Proposed alternatives must be requested 5 days prior to close of tender. The Municipality is under no obligation to accept proposed alternatives. Alternatives may be considered if they improve cost, performance, delivery schedule, or any other reason deemed favorable to the Municipality.

Issuing an Invitation implies no obligation on the Municipality of the County of Cumberland to accept any bid, or a portion of any Bid submitted. The lowest of any bid will not necessarily be accepted.

Pricing must include all fees and charges. **Pricing must exclude HST**.

QUOTE & COMPANY INFORMATION

Quote amount: $_____ Delivery Time: _____

Company Name: _____

Contact Name: _____

Contact Number: _____

Signature: _____

*A quote on company letterhead must accompany this signed document.

Quotes can be:

E-mailed to**: procurement@cumberlandcounty.ns.ca**

Delivered in person to**: 1395 Blair Lake Rd, Upper Nappan**

The Municipality of the County of Cumberland follows the Atlantic Standard Terms & Conditions for Goods and Services. Any discrepancy between this document and the Atlantic Standard Terms and Conditions; the Atlantic Standard Terms and Conditions shall prevail. Failure to comply with these Terms and Conditions could cause the Bidder's Bid to be disqualified.

SCHEDULE A

STAINLESS STEEL SLIDE GATES

GENERAL

SCOPE OF WORK

This section covers stainless steel slide gates with 4 sides sealing for submerged applications and their associated accessories for operation. The contractor shall furnish all labor, materials, equipment and incidentals required to install and field test the gates shown on the Contract Drawings and specified herein.

REFERENCES

Definitions

Design Head: The maximum differential head that will be applied on the gate under worst case conditions, measured from the gate invert.

Seating Head: Head applied on a wall mounted gate, in the direction that pushes the gate against the wall it is installed on.

Unseating Head: Head applied on a wall mounted gate in the direction pulling the gate away from the wall it is installed on.

Operating Head: The highest differential head that is to be applied on the gate when it needs to be operated, measured from the gate invert.

Reference Standards

ANSI/AWWA C561 – Fabricated Stainless Steel Slide Gates.

ANSI/AWWA C542 – Electric Motor Actuators for Valves and Slide Gates.

ASTM A240/A240M – Standard Specification for Chromium and Chromium Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.

ASTM A276 – Standard Specification for Stainless Steel Bars and Shapes.

ASTM A582/A582M - Standard Specification for Free-Machining Stainless Steel Bars.

ASTM A790/790M - Standard Specification for Seamless and Welded Ferritic / Austenitic Stainless Steel Pipe.

ASTM B179 - Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes.

ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.

ASTM D4020 - Standard Specification for Ultra-High-Molecular-Weight Polyethylene Molding and Extrusion Materials.

ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

SUBMITTALS

Drawings

The slide gates manufacturer shall submit, for acceptance by the purchaser, general arrangement drawings of the equipment supplied under this section. Drawings must indicate all dimensions that will allow the contractor to ensure coordination with dimensions of the installation environment. Drawings will also show sufficient details to determine compliance with the requirements, including the stainless steel plate thickness used for all components. Drawings shall also include certification that the slide gates supplied meet all requirements of the latest edition of AWWA C561.

Design Calculations

The gate manufacturer shall submit, for acceptance by the purchaser, design calculations demonstrating compliance with the design requirements of these specifications and those of the latest edition of AWWA C561. In particular, calculations shall be submitted for the following gate components:

- Slide
- Seat contact pressure
- Frame
- Yoke
- Stem, stem connection
- Lifting nut
- Manual actuator operating force
- Electric actuator load
- Anchors

Test Reports

The gate manufacturer shall submit upon request, for information, the leakage and operation test reports specific to the actual gates that are being supplied demonstrating their compliance with the maximum leakage rate and maximum operating force allowed.

Installation, Operation and Maintenance Manual

The gate manufacturer shall provide a manual containing the instructions for installation, operation and maintenance of the slide gates. The manual shall also contain the detailed information on the terms of the 5 year warranty on the products.

QUALITY ASSURANCE

Qualifications

The gates supplied under this section shall be standard products of a manufacturer regularly engaged in the design and manufacturing of water control gates. The specifications are based on FONTAINE-AQUANOX Series 20 Slide Gates manufactured by ISE Metal Inc.

Standards and Certifications

The gates supplied under this section shall conform to all requirements of the latest edition of ANSI/AWWA C561. The slide gate manufacturer must maintain an ISO-9001 certification and also a company certification for its welding operations from the CWB or AWS.

DELIVERY

The manufacturer shall use due and customary care in preparing the gates and accessories for shipment. Self contained frame gates shall be shipped assembled with stem and manual operator. When shipping several gates together, every item shipped separately must be clearly marked to the gate it belongs to.

WARRANTY

The slide gates and manual operating accessories shall be covered by a five (5) year warranty from the manufacturer against defects in materials, design and workmanship. The warranty period will start from the date of delivery of the equipment to the installation site.

PRODUCTS

EQUIPMENT

Manufacturers

Gates supplied shall be FONTAINE-AQUANOX Series 20 Slide Gates. or approved equal.

Description

The gates shall be upwards opening of the 4 sides sealing type designed for submergence in water or wastewater applications. They shall have flow control capability by allowing only flow through the open area in partial opening situations. As specified in the gate schedule, each gate shall be either open-frame or self-contained-frame design and either rising or non-rising stem configuration.

Performance and Design

Slide

The slide consisting of a flat plate with welded reinforcing ribs shall be designed to withstand the design head specified in the gate schedule with a maximum deflection of 1/720 of the gate opening width or 1/16 in (1.6mm) whichever is less and with stresses in the slide limited to 25% of the ultimate tensile, compressive, and shear strength and 50% of the yield strength, whichever is less.

Minimum material thickness of all members of the slide shall be ¼ in (6mm).

Frame

The gate frame shall be made of formed plates or structural members creating the clear opening of the specified dimensions in a rigid one-piece unit. The mounting and bolting flange of the frame to the wall shall be separate and independent from the seating and sealing plane of the slide.

The bottom of the frame will be of the flush invert type.

Stresses in the frame under design head shall not exceed 25% of the ultimate tensile, compressive, and shear strength and 50% of the yield strength, whichever is less.

Minimum material thickness of all members of the frame shall be ¼ in (6mm).

Yoke

Gates specified as self-contained design shall include a yoke consisting of a beam made of formed plates or structural members mounted on top of the frame to permit mounting of the actuator with proper stem alignment by the use of slotted holes in both direction.

The yoke shall be sized to limit deflection under the design load to a maximum of 1/360 of the gate opening width or ¼ in (6mm) whichever is less. The yoke design load must be considered as the vertical thrust generated by a 80 lbs (356 N) force on the crank or handwheel (for a manual actuator) or by the actuator in locked rotor condition (for an electric actuator).

Per the latest edition of AWWA C561, the stresses in the yoke generated by the design load shall not exceed (for a manual actuator) 25% of the ultimate tensile, compressive, and shear strength and 50% of the yield strength, whichever is less, or (for an electric actuator) 2/3 of the yield strength.

Guiding and Seating

The slide shall seat and travel on guides made of ultra high molecular weight polyethylene (UHMWPE) designed to perform for the life of the slide gate without replacement.

The slide shall be kept in positive contact with the guides on both its upstream and downstream faces, all along its travel in the gate clear opening by an elastomeric cord. Above the gate clear opening, the guides shall extend high enough to ensure that the slide is supported on a minimum of 1/2 of its height when fully opened.

The low friction guides shall be secured to the frame by bolted retainers permitting field adjustment of the contact pressure with the slide.

Gates frames designed as channel shaped guides with added UHWPE pads simply bolted inside the channel, not providing adjustment of the slide contact pressure by bolts will not be allowed.

The surface of contact on the side seats shall be large enough to limit the stress under the design head to 600 psi (4137 KPa) without considering the top and bottom seats as load bearing.

Sealing

The guides combined with the elastomeric cord will provide sealing on both sides of the opening.

The compression cord shall push and close the UHMWPE seal as the gate opens to prevent grit and dirt to penetrate the guiding slot. Wide channel shaped guiding slots allowing accumulation of dirt and grit will not be accepted.

Sealing at the top section of the gate will also be achieved with a UHMWPE seat maintained in contact by an elastomeric cord.

At the gate invert, the slide shall close on a flush invert rubber seat/seal secured in the bottom member of the gate frame. Bottom seals attached to the slide and rubbing against the side seals will not be allowed, nor will rubber seals that are not flush bottom.

Under the design seating or unseating head specified in the gate schedule, the slide gates shall restrict leakage to a maximum of 0.04 gpm/ft (0.5 l/min/m) of clear opening perimeter. Manufacturer shall be able to demonstrate that the sealing system will retain its performance even after 25,000 operating cycles.

Stem Connection

In the case of gates with rising stems, the stem or its extension will be connected to the slide by means of a pinned connection. For gates with non-rising stems, the connection to the slide shall be by means of a threaded thrust nut matching the stem threads.

Stem connection design shall limit the stress under the design load to a maximum of 25% of the ultimate tensile, compressive, and shear strength and 50% of the yield strength. The stem connection design load shall be the thrust and torque developed when a 80lbs (356N) efforts is applied the crank or handwheel (for a manual actuator), or 1.5 times the thrust and torque developed with the actuator in stalled condition (for electric motors).

Stem

The stem configuration shall be rising or non-rising according to the type specified in the schedule. The threads shall be machine rolled ACME left hand threads with double entry to minimize the number of turns required for operation and provide gate opening by counterclockwise rotation of the manual actuator. Surface finish of the machined threads will be 32 micro inch (0.813 µm) or better.

For manually operated gates with rising stem, the stem shall be equipped with an adjustable stop collar to prevent over-closing the gate and potentially damaging components.

The stem shall be sized so that its critical buckling load (as determined by the Euler column formula) is higher than the design compression load, defined as the vertical force developed by a 80lbs (356N) effort applied on the crank or handwheel (for a manual actuator), or 1.5 times the thrust and torque developed with the actuator in stalled condition (for electric motors).

Couplings

The required stem extensions shall be joined together or to the threaded stem by means of a bolted connection, passing through both pipe and stem.

Stem guides

Guides will be provided as required to meet the stem buckling design criteria and positioned per the manufacturer's recommendations to ensure that the length to radius of gyration ratio (l/r) does not exceed 200. The guides shall incorporate a UHMWPE bushing supported by a stainless steel wall bracket adjustable in both horizontal directions.

Manual Actuators

Operation

Manual actuator of the proper type and mounting location, as listed in the gate schedule or shown on the drawings, shall be provided by the gate manufacturer.

The effort required on the manual device to operate the gates shall not exceed 40 lbs (178 N), while to start the gate in motion from the fully closed position with the design pressure, the required effort shall not exceed 60 lbs (267 N).

Indication of the opening direction of rotation shall be clearly marked in a permanent manner on the handwheel or crank.

Handwheel

The handwheel shall be removable and have a minimum diameter of 16” (406mm). It shall drive the lift nut directly or via the extension pipe of self-contained gates or it shall engage the input shaft of the gearbox, when specified.

Crank Operated Gearboxes

The gearbox, comprising a lift nut and thrust bearing assembly (as described below), shall be fully enclosed in a casted housing with seals around the lift nut and around the input pinion shaft. The input pinion shaft shall be supported on ball or tapered roller bearings.

The removable crank, equipped with a revolving grip shall engage on the input shaft of the gearbox and have a minimum radius of 12” (305mm).

Square Nut Actuator

The square nut shall be 2” x 2” (50mm x 50mm) designed for mounting in the floor box supplied by the contractor and designed to accommodate a standard T-wrench. T-Wrench shall be supplied by the gate manufacturer in the quantity required by the gate schedule.

Actuator Lift Nut and Thrust Bearings

All gates shall include a thrust bearing assembly comprising a threaded bronze lift nut to engage the operating stem. This assembly must be enclosed in a machined stainless steel housing or be an integral part of the gearbox when supplied.

Needle roller thrust bearings shall be provided above and below the lift nut to support the operating efforts in closing and opening the gate.

The length of thread engagement shall be sufficient to ensure that the maximum pressure on the projected area of thread contact does not exceed 2000 psi (13,8 MPa) at normal maximum operating load and that the PV (pressure velocity) factor does not exceed 30,000. The PV factor is calculated by multiplying the pressure on the projected area of thread contact in psi by the surface velocity in ft/min at the pitch diameter of the threads. For non-rising stem gates, the actuator lift nut shall be keyed to prevent rotation relative to the threaded stem.

Mounting

The thrust bearing assembly or the gearbox shall be mounted on the yoke of the gate for all gates specified as self-contained or on a pedestal for gates specified as non self-contained.

Pedestal height shall be such that the handwheel or input shaft of the gearbox is located approximately 36” (900mm) above the operating floor.

Where shown on the drawings or when specified, a wall bracket shall be supplied to support the pedestal. The pedestal wall bracket shall be designed and supplied by the gate manufacturer to ensure that it can resist to all operating efforts of the gate based on the same design calculation criteria used for the yoke.

Stem Cover

All rising stem gates, weather manual or motorized shall be equipped with a clear stem cover with a closed top and ventilation hole. The cover shall bear graduation in both inches and centimeters to indicate the position of the gate.

Motorized Actuators

When required by the gate schedule or the drawings, motorized actuators shall be supplied as specified in specification section _____. Actuators shall be Rotork IQ3 or Auma SA series, for ON/OFF duty and have the characteristics indicated in the schedule shown below in this section.

Anchor Bolts

The quantity, size and location of anchor bolts shall be determined by the gate manufacturer and shown on the submittal drawings. The minimum required load capacity of the anchors used for design must also be indicated on the drawings.

Materials

Slide, Frame and Yoke	Stainless Steel	ASTM A240, grade 316L or 304L
Side Seal/Guides and Top Seal	Ultra High Molecular Weight Polyethylene (UHMWPE)	ASTM D4020
Flush Invert Bottom Seal	Ethylene Propylene (EPDM)	ASTM D2000
Compression Cord	Ethylene Propylene (EPDM)	ASTM D2000
Wall Gasket	Ethylene Propylene (EPDM)	ASTM D2000
Bolts and Hardware	Stainless Steel	ASTM F593, grade 316
Stem	Stainless Steel	ASTM A582, grade 316 or 304
Thrust Nut and Lift Nut	Aluminum Bronze or Manganese Bronze	ASTM B505, C95800 ASTM B584, C86300
Stem Couplings	Stainless Steel	ASTM A582, grade 316
Stem Guide Bracket	Stainless Steel	ASTM A582, grade 316
Stem Guide Bushing	Ultra High Molecular Weight Polyethylene (UHMWPE)	ASTM D4020
Handwheel	Cast Aluminum	ASTM B179
Crank	Aluminum	ASTM B209, 6061-T6
Pedestal	Stainless Steel	ASTM F593, grade 316
Gearbox Housing	Cast Iron	ASTM A48 35B/40B
Square Nut	Cast Aluminum	ASTM B179
Stem Cover	Clear PVC	
Stem Cover Cap	PVC	

FACTORY TESTS

The gates shall be tested in the factory for leakage and for operating force. Leakage shall be measured at the unseating design pressure. Operating force shall be measured with and without the design pressure. Factory test reports shall be available on request for all gates supplied.

EXECUTION

INSTALLATION

It is the responsibility of the Contractor to handle, store and install the gates in strict accordance with the manufacturer's instructions and recommendations. The Contractor shall review the installation drawings and instructions before proceeding to the installation of the gates.

The gate assemblies must be installed on a true vertical plane, square and plumb. The operating stem shall be accurately aligned with the gate guides and properly greased.

FIELD TESTING

After installation, the gates must be field tested by the Contractor, in the presence of the Engineer and Owner, to ensure compliance with the requirements of these specifications. Each gate shall be operated on its complete open-close cycle to confirm operation without binding, scraping or distorting. Operating effort on the crank, handwheel or T-wrench shall be observed or measured. In the case of motorized actuators, the operating torque shall be noted, and the initial set-up of each actuator shall be done in accordance with the instructions in the manual.

Each gate shall be water tested by the Contractor and sealing performance shall be observed.

The Contractor shall supply a detailed report of the field tests to the Engineer for review.

STAINLESS STEEL SLIDE GATES SCHEDULE

Item	ID TAG	Qty	SIZE (W x H) (inches)	DESIGN HEAD (ft) Seat.	Uns.	FRAME TYPE	STEM TYPE	ACTUATOR TYPE	ACTUATOR MOUNTING	T-WRENCH Yes/No – Qty

ABBREVIATIONS:

FRAME TYPES:

- SC: Self-Contained
- NSC: Non Self-Contained

ACTUATOR TYPES:

- H: Handwheel
- GC: Gearbox and Crank
- GH: Gearbox and Handwheel
- EM: Electric Motor Actuator
- SN: Square Nut

ACTUATOR MOUNTING:

- P: Pedestal Mounted
- PB: Pedestal Mounted with Wall Bracket
- F: Floor Box
- Y: Yoke Mounted

ELECTRIC MOTOR ACTUATOR CHARACTERISTICS

Item	ID TAG	Qty	ENCLOSURE RATING	POWER SUPPLY	CONTROLS VOLTAGE	INTEGRAL CONTROLS	POSTION TRANS-MITTER	POSI-TIONNER

ABBREVIATIONS:

ENCLOSURE RATINGS:

- WT: Watertight IP68/NEMA 4&6
- EX: Explosion Proof

END OF SECTION