



MERCED IRRIGATION DISTRICT
MID-IFB-2018-16
Tainter Gate Hoist Assembly

Notice is hereby given that the Merced Irrigation District (MID) calls for an Invitation for Bids (IFB) to furnish a Tainter Gate Hoist Assembly.

1. The bid specifications contained in the Equipment Bid Form provides in detail the District's requirements for the equipment. Equipment Bid Forms are available by contacting Merced Irrigation District in writing at Ms. Annmarie Felsing, 744 W. 20th Street, Merced, California 95340, by telephone at (209) 354-2817, or by email at AFelsing@mercedid.org.
2. Each bid shall be made on the Equipment Bid Form furnished by Merced Irrigation District.
3. The bid amount shall include the furnishing of all labor, supervision, equipment, supplies, transportation, taxes, fees, and all other items necessary to perform the work and services requested.
4. Bid documents must be received in a sealed, opaque envelope clearly labeled with "Tainter Gate Hoist Assembly" and the name of the Bidder printed on the outside of the envelope. Bids received unsealed or unlabeled will not be considered. Bids submitted by facsimile (fax) transmission or by email will not be considered. Any bids received after the bid submittal deadline specified below shall be returned to the bidder unopened.
5. Bids may be delivered to Merced Irrigation District, 744 W. 20th Street, Merced, California, 95340, either by mail or in person. To be considered, bids must be **received** by the MID no later than **2:00 pm on Tuesday, January 8, 2019.**
6. If awarded, this IFB will be awarded by January 22, 2019. An award letter will be sent out at that time.
7. The successful bidder will be required to furnish Tainter Gate Hoist Assembly meeting the Bid Specifications no later than 2:00 p.m. Friday, March 22, 2019.

Peter Wade, P.E., Hydro Department Manager
Merced Irrigation District

EQUIPMENT BID FORM
MID-IFB-2018-16 - Tainter Gate Hoist Assembly
MERCED IRRIGATION DISTRICT

I. BID ITEM

The Merced Irrigation District is requesting bids for a brand new Tainter Gate Hoist Assembly.

II. MINIMUM BID SPECIFICATIONS

Refer to Attachment A for the technical specification describing the minimum bid specifications for the equipment being procured by this IFB.

Product Manuals and Documentation

Three bound copies of all product manuals including manuals for additional equipment shall be provided with the equipment. Additionally, one set of digital documents shall be submitted either on Flash Drive or CD, with the digital documents being in PDF format.

Delivery and Installation

The equipment shall be delivered to the New Exchequer Hydroelectric Operations Facility at Lake McClure, 9188 Village Drive, Snelling, CA 95369. If the shipped Tainter Gate Hoist Assembly weighs no more than 3,000 pounds, then the District can unload it; otherwise, the supplier should provide for unloading and of the equipment within a MID storage area. Prior to delivery, the supplier shall identify and specify if and/or how any space heaters that are supplied with the equipment must be energized while the equipment is in storage and prior to MID installing and putting the equipment into service: Space, electrical, and anchoring requirements will be coordinated no less than one month in advance of supplier's delivery schedule.

Schedule

The Tainter Gate Hoist Assemblies shall be delivered to the District no later than 2:00 p.m. on Friday, March 22, 2019. With the Bid the supplier shall submit a written schedule detailing major milestones. For scheduling purposes supplier shall use two (2) weeks after date of bid submission as anticipated award date. Any significant deviation from this award assumption will result in a revised schedule submittal requirement by the supplier.

Warranty

All equipment provided shall be warrantied against defects in manufacturing or installation for a period of no less than one year from installation and first operation. The District expects to install the equipment sometime between April 1, 2019, and March 31, 2020.

<p>BIDDERS: Bid prices quoted below MUST include all applicable taxes and all related fees, including, but not limited to, sales tax, tire fees (if applicable), and transfer fees (if applicable), and permitting fees (if applicable). Merced Irrigation District is not exempt from sales taxes or any other applicable fees. Bids will be firm for 45 days, from date of IFB close.</p>
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III. EXCEPTIONS

Bidder shall explain any and all exceptions identified in Section II, above (attach additional sheets if necessary). Bidder shall submit with the Bid any technical submittal(s) associated with a request for substitution of the specification articles, devices, equipment, products, materials, fixtures, patented processes, forms, methods, or types of construction.

IV. BID

I agree to furnish Merced Irrigation District with the equipment specified on this Equipment Bid Form for the Prices indicated below:

1. SUBTOTAL for Tainter Gate Hoist Assembly	\$
2. Additional Equipment	\$
3. Delivery and temporary storage set up, if applicable.	\$
Total Bid Price	\$

BIDDER:

Supplier Name: _____

Contact Name: _____

Address: _____

City / State / Zip: _____

Phone Number: _____ Fax Number: _____

Email Address: _____

V. CERTIFICATION

In submitting this bid, I understand that Merced Irrigation District reserves the right to reject any and all bids and/or reject any and all items of such bids and/or waive any irregularities in a bid. By signature on this bid document, I agree that the equipment specified above will be delivered by 2:00 p.m. Friday, March 22, 2019. I certify that I am an authorized agent for the above supplier.

Signed: _____ Title: _____

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VI. BID SUBMITTAL

Please submit your bid in a SEALED, OPAQUE envelop labeled with “Tainter Gate Hoist Assembly” and the name of the Bidder printed on the outside of the envelope.

Refer to the section titled “Minimum Bid Specifications” for what is the minimum the Bid shall contain. Bids received unsealed or unlabeled will not be considered. Bids submitted by facsimile (fax) transmission or email will not be considered. Any bids received after the bid submittal deadline specified below shall be returned to the bidder unopened. Bids must be submitted by the time and date specified above in the IFB Notice on page 1, Item 5. Submit bids as specified in the IFB Notice to Merced Irrigation District, 744 W. 20th Street, Merced, California, 95340.

VII. QUESTIONS

Should a bidder find discrepancies in, or omissions from, the specifications contained herein, or should bidder be in doubt as to their meeting, he or she shall at once notify Ms. Annmarie Felsing, Purchasing Analyst, at (209) 354-2817 or AFelsing@mercedid.org, and should it be found necessary, a written addendum will posted on the MID website.

No representative of Merced Irrigation District is authorized to give oral instructions, interpretations, or explanations of these specifications, and a submission of a bid constitutes agreement by the bidder that he or she has placed no reliance on any such oral instruction, interpretation, or explanation. Oral instructions may, however, be given by Merced Irrigation District upon inquiry by a bidder to direct the bidder’s attention to the location in the specifications or IFB that cover the subject of the inquiry.

Please refer all questions regarding this Equipment Bid Form or the specifications contained herein to Ms. Annmarie Felsing, Purchasing Analyst, in writing at AFelsing@mercedid.org.

ATTACHMENT A

PROCUREMENT SPECIFICATION – TAINTER GATE HOIST ASSEMBLY

PART 1 -- GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall provide miscellaneous metalwork and appurtenances, complete and in place, as indicated in accordance with the Contract Documents.

B. Background

At the site, there exists three spillway gates that are hoisted by equipment on two hoisting platforms. The spillway gate hoisting equipment, as detailed in Part 2 – Products, is to be installed to mate the pinion gear with the existing bull gear which is attached to the hoisting shaft. All products detailed in this document are directly associated with the gate hoisting operations. See Attachment B for a layout drawing of the system.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Descriptions of these designations are listed below.

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

ANSI B18.2.1	(1981) Square and Hex Bolts and Screws (Inch Series) Including Hex Cap Screws and Lag Screws
ANSI B18.2.2	(1987) Square and Hex Nuts
ANSI B18.21.1	(1990) Lock Washer
ANSI B18.22.1	(1965) Plain Washers

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 53/A53-01	Pipe, Steel, Black and Hot-dipped Zinc-coated Welded and Seamless
ASTM A123/A123M-01a	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A193/A193M-01b	Alloy-steel and Stainless Steel Bolting Materials for High-temperature Service

ASTM A276-02	Stainless Steel Bars and Shapes
ASTM A516/A516M-01	Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-temperature Service
ASTM B111/98e1	Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock
ASTM B171/B171M-99e2	Copper-Alloy Plate and Sheet for Pressure Vessels, Condensers, and Heat Exchangers,

AMERICAN GEAR MANUFACTURERS ASSOCIATION

AGMA 6013	Standard for Industrial Enclosed Gear Drives - Global
AGMA 6113	Standard for Industrial Enclosed Gear Drives (Metric Edition)
AGMA 6123	Design Manual for Enclosed Epicyclic Gear Drives

1.3 GENERAL REQUIREMENTS

A. **Standard Products**

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the specified products. The gearboxes, brakemotor, and holding brake shall be duplicates of a proven design that has been in satisfactory use at least two years prior to bid opening.

B. **Installation**

The hoisting equipment shall be in working order requiring no modification by the installer.

PART 2 -- PRODUCTS

2.1 GENERAL

Materials and equipment shall conform to these specifications and shall be the products of manufacturers regularly engaged in the manufacture of such products. Materials differing in minor respect from that specified are subject to approval by the Contracting Engineer, such differences shall be clearly stated. Any materials required which are not covered in these specifications shall conform to applicable American Society for Testing Materials; or the American National Standards Institute; or American Gear Manufacturers Association. In cases where material is not covered by one of the listed specification groups, the CONTRACTOR shall furnish the highest commercial grade of material or product available with Contracting Engineer approval. A total of three spillway gate hoist systems are to be acquired, identical in design to allow for interchangeability.

2.2 BOLTS, NUTS, STUDS, AND WASHERS

Threaded bolts and studs shall conform to the requirements ANSI B18.2.1. Threaded nuts shall conform to ANSI B18.2.2. Lock and plain washers shall conform respectively to ANSI B18.21.1 and ANSI B18.22.1.

2.3 GEARBOXES

A. General

Sumitomo combination drive PHD9060P4-BL-224 / LHYJS-4A100-G2-14 or equivalent shall be used. The combination drive consists of a parallel gearbox and right-angle gearbox. The combination drive shall meet the following ratings: input power of no less than 5 HP and a torque rating of no less than 225,000 in-lbs (75,000 in-lbs with a service factor of 3).

The gearboxes shall be designed to meet AGMA quality specifications. The manufacturer will provide the gear pitch line velocity at 100% motor speed and the appropriate size and shape of each gearbox stage.

The manufacturer shall state explicitly the AGMA balancing specifications.

The manufacturer shall state explicitly the AGMA noise and vibration specifications.

B. Parallel Speed Reducer (Large Gearbox)

Not including the attached components or shafts, the width of the parallel gearbox shall be no wider than 20 inches and no longer than 58 inches.

Each parallel gearbox shall have 2 input and 2 output shafts. Each parallel gearbox shall have a cover over one of the output shafts; two shall have the left-hand side output shaft covered and one shall have the right-hand side output shaft covered. Shafts without integral gear shall be ANSI 4140 material or equivalent. Output shaft length shall be long enough to mount the 4-inch face pinion gear securely, per keyed gear and gear shrink fit best practices.

C. Right Angle Speed Reducer (Small Gearbox)

The right angle, spiral bevel gear portion of the reducer shall be designed to have 200% momentary intermittent shock load capacity. The material of the gear housing shall be cast iron.

Bevel gears should be hardened, cyclo-paloid gear teeth, with finished tip relief and tooth profile by HPG lapping or grinding.

Input shaft size and configuration shall be compatible with the motor.

D. Gears

The gear material shall be chromium molybdenum steel, AISI 4340, or equivalent case-hardened steel. Involute form teeth shall be produced by the continuous hobbing process using 25 degree pressure angle hobs with protuberance for optimum tooth profile.

The gears and pinions shall be gas carburized to achieve a surface hardness of Rockwell "C" Scale 58-62.

Helical tooth profiles shall be finish ground to a minimum quality level of 10+ as specified in AGMA standard 390.03.

In addition to rating the gears according to ANSI/AGMA 6113, AGMA 6013 or AGMA 6123 as applicable, gear stresses shall not exceed 80 percent of yield strength for any overload, motor stall, or engine overload condition. No less than 90 percent of motor rated torque shall be used for the motor stall condition.

E. Housings

Housings shall be ductile iron in accordance with either ANSI or JIS standard materials. Fabricated housings shall be stress-relieved after welding and before machining to ensure dimensional stability.

The exterior shall be painted with the manufacturer's standard coating system. Color shall be dark green. The housing shall have an oil fill connection and a drain connection with a magnetic plug.

The housing shall have inspection holes with cover plates located above the maximum oil level to permit viewing of gear teeth allowing evaluation of the contact patterns of each gear mesh and to allow inspection of internal features of the lubrication system.

F. Bearings

All bearings shall be International Standard Organization (ISO) anti-friction type and shall permit the customer to purchase any international equivalent bearing as a direct replacement. These shall be rated for loads associated with gearbox rating.

G. Seals

Standard oil seals shall be Buna N dual lip, spring loaded type, and shall permit customer to purchase any international equivalent seal as a direct replacement. Vertical down output shafts shall have a drywell design seal.

The input shaft shall have a lip seal to prevent leakage of oil and exclude dirt. Lip seals shall utilize hardened steel wear sleeves to preclude shaft repair or replacement if the seal wears the shaft.

H. **Speed Reduction**

Speed reduction shall be achieved by a combination of a variable ratio cycloidal speed reducer and a fixed ratio right angle spiral bevel speed reducer to deliver a reduction of 3050:1.

I. **Mounting**

The assembled speed reducer shall be of a shaft mounted design that uses a tapered helix, keyless, flanged bushing system with two splits for clamping concentricity. The bushing shall be machined from 4340H or higher-grade steel material. The driven shaft shall contact at least 75% of the bushing's total length. The speed reducer shall not require a key for securing it to the shaft.

J. **Lubrication**

The input and output sections shall be lubricated from a shared oil sump reservoir filled with environmentally-friendly oil. Lubricant additives shall be used as recommended by the reducer manufacturer. Lubricant used for the hydrodynamic thrust bearing shall be suitable for the bearing.

2.4 PINION GEAR

The gear shall be a keyed, spur-type, 32 teeth, 2 D.P, 4-inch face, a 14.5 pressure angle, made from AISI 4140, or equivalent case-hardened steel heat treated with oil quench and tempered, with a Rockwell "C" hardness between 55 and 62. The gear shall be shrunk fit to the low speed shaft with a diameter of 125 mm. The pinion gear shall be placed as close to the body of the parallel gearbox as possible.

2.5 BRAKE MOTOR

The brake motor shall meet the following electrical requirements: 5 HP, 1800 RPM, 3/60/230/460V, TENV, NEMA Design B, 13.4/6.7 Amps, 184TC frame, continuous duty, Class F Max Guard Insulation, with an aluminum frame, brand name of Baldor or equivalent.

On the opposite drive end, Marathon will mount a Stearns NEMA 2 25# brake with a through shaft. The shaft shall be flush with the brake housing and will be flat to use with a 7/8" socket.

2.6 MANUAL HOIST OPERATION

In an emergency, manual hoisting shall be possible by either attaching an electric drill or handwheel to the high speed shaft that shall extend through the brakemotor. A total of

one electric drill and three handwheels shall be provided; one handwheel for each spillway gate hoist assembly.

For electric drill operation, a Makita XFD061 18 volt LXT Lithium-Ion Brushless Cordless Drill, or equivalent, shall be acquired. Equivalent models must be cordless with at least a 3 Ah battery, and capable of delivering at least 300 in-lbs of torque.

For handwheel operation, an electro-mechanical key interlocking device, shall be provided to lock the handwheel in place to prevent accidental motor operation when the handwheel is being used. A protective key cap shall be provided to prevent rain from entering the key hole. The maximum torque required on the handwheel shaft under the most adverse conditions shall not exceed 60 ft-lbs, and the maximum force required on the rim of the handwheel shall not exceed 40 pounds. An arrow and either the word "Open" or "Close" shall be permanently cast on the handwheel to indicate the direction to turn said handwheel. An operating nut 1-15/16 inches square at the top and 2 inches square at the bottom and 1-3/4 inches high shall be cast integrally with the handwheel, or fastened permanently thereto, as a projection of the hub.

2.7 HOLDING BRAKE

The holding brake shall be Ringspann HS Brake EV018, or equivalent, spring activated, electromagnetically released, with a 200 mm brake disc or a brake disk capable of at least 180 Nm of braking torque and at least a clamping force of 2900 N.

2.8 SPARE PARTS

At a minimum, the CONTRACTOR shall provide the following consumable parts:

1. Full set of replacement seals
2. Replacement brake pads for both the motor brake and holding brake

PART 3 -- ASSEMBLY

Before shipping, the brakemotor shall be mounted to the right angle gearbox, brake disk mounted to high speed shaft opposite of the brakemotor, the right angle gearbox mounted to the parallel gearbox, and the pinion gear on the low speed shaft of the parallel gearbox.

PART 4 -- TESTS REQUIRED

4.1 OPERATIONAL TEST

The minimum acceptable test is to be performed at the manufacturer's facility and shall test the system with no loads up to maximum speed. A minimum of 14 day notice shall be provided to allow for witness to arrange travel for test.

PART 5 -- SUBMITTALS

The time of submittals shall be as indicated. The CONTRACTOR shall send submittals to the Contracting Engineer for subsequent review. If equivalent products are pursued in lieu of the recommended products, the CONTRACTOR shall submit relevant product information to the Contracting Engineer for review and approval prior to manufacturing.

5.1 DRAWINGS

Detail drawings of the pinion gear, gearbox, handwheel, full assembly (including gearboxes, brakemotor, emergency brake), and a layout of each components anchorage shall be submitted. Detail drawings consisting of a complete list of equipment and material, including manufacturer's descriptive and technical literature, performance charts and curves, and installation instructions. Drawings shall show proposed layout and anchorage of equipment and appurtenances and equipment relationship to other parts of the work including clearances for maintenance and operation, a minimum of 14 days prior to fabrication.

5.2 CUT SHEETS

Cut sheets of the gearboxes, brakemotor, and the holding brake shall be submitted a minimum of 14 days prior to fabrication.

PART 6 -- OPERATING CONDITIONS

The estimated temperature range where the hoisting equipment is to be installed is approximately 0 to 120 deg F. The equipment must be able to operate properly within this temperature range.

PART 7 -- OPERATION AND MAINTENANCE MANUALS

Three complete copies of the Operation and Maintenance Manual will be required. The manuals shall include instructions on the installation, operation, maintenance, repair, troubleshooting, and warranty of the systems. They shall also include diagrams listing all system components, part numbers, and a list of recommended spare parts.

Also included shall be the name, phone and fax numbers, and email address of the contractor, manufacturer, and a distributor where spare parts can be purchased.

The following identification shall be inscribed on the covers:

OPERATING AND MAINTENANCE INSTRUCTIONS

Spill Gates 1-3 Hoisting Machinery

Merced Falls Dam

Name of the Contractor

Contract Number

ATTACHMENT B

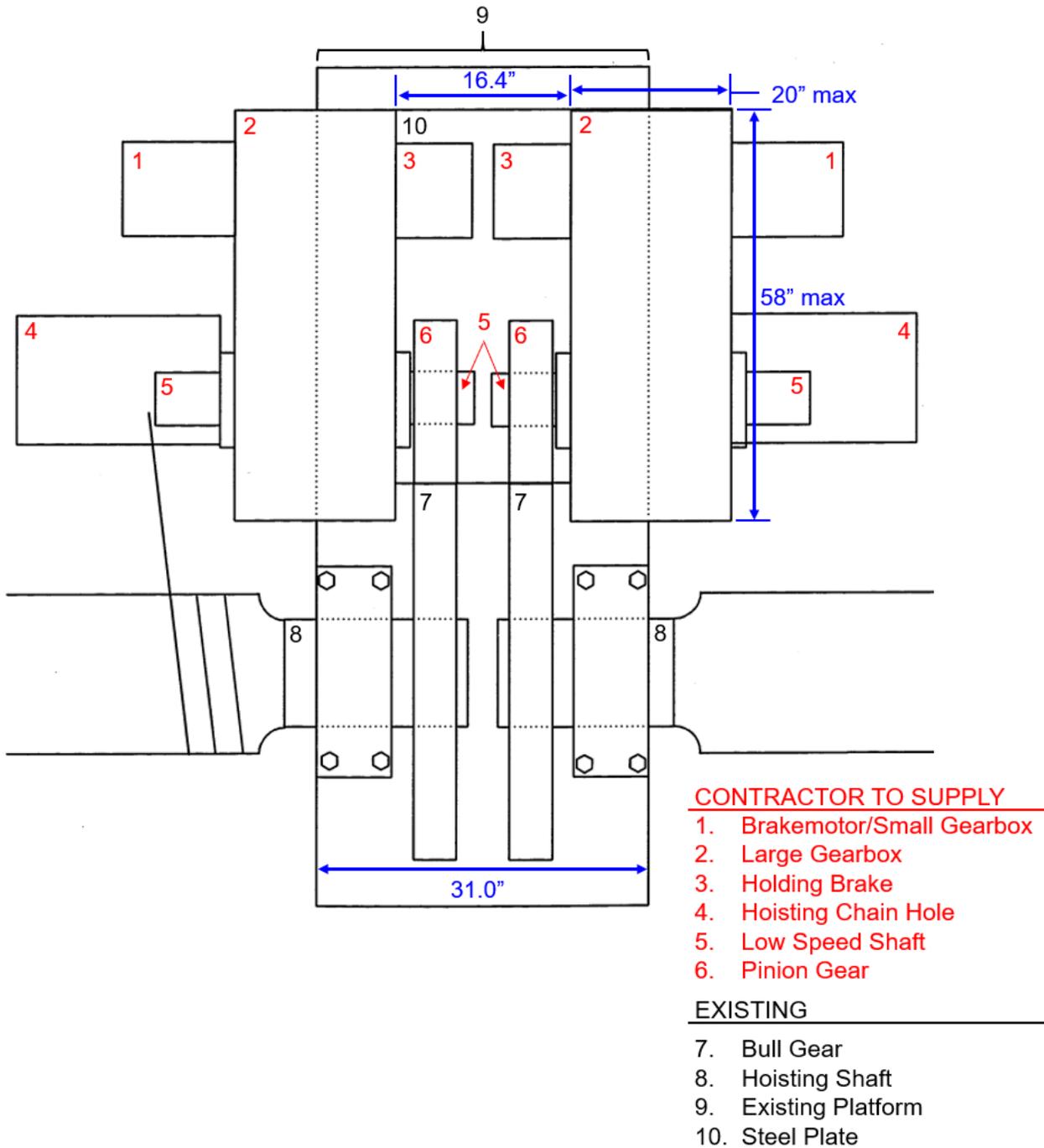


Figure 1 – Layout plan view of spillway gate hoisting equipment as situated on-site.