



PURCHASE AGREEMENT

THIS AGREEMENT is made and entered into this ____ day of _____, 2019, by and between the **CITY OF BILLINGS, MONTANA**, a municipal corporation organized and existing under the laws of the State of Montana, P.O. Box 1178, Billings, Montana 59103, hereinafter referred to as “City,” and, **Enviro-Care**, hereinafter referred to as “Seller.”

In consideration of the mutual covenants and agreements herein contained, the receipt and sufficiency whereof being hereby acknowledged, the parties hereto agree as follows:

1. **PRODUCT PURCHASED:** Seller agrees to sell and City agrees to purchase the goods (“Product”) as described below and per written City’s specifications and Seller’s proposal attached hereto as Exhibit “A,” which are incorporated into this agreement by this reference. The Product being purchased consists of:

<u>Item</u>	<u>Price</u>
Perforated Filter Screen FSM FRS2 – 1000x60/6	\$148,988.00

2. **Price:** The City agrees to pay One Hundred Forty Eight Thousand Nine Hundred Eighty Eight and No/100 Dollars (\$148,988.00) as the purchase price. All prices are inclusive of any applicable local, state or federal taxes that may be applied to the product to be purchased. The purchase price is free on board at the place of delivery and Seller may not impose any additional, shipping, delivery or storage charges.

3. **Delivery and Payment:** Seller agrees to deliver the above-described goods or product to City by December 31, 2019 unless otherwise provided in this Agreement. Delivery will occur at **City of Billings, MT Water Reclamation Facility** or at a place otherwise selected by City. Upon delivery, City may inspect the goods or product to ensure that it meets City specifications, and Seller may obtain specifications from City upon request. If the Product meets City specifications, City shall tender the purchase price stated above to Seller through the City’s normal claim process.

4. **Specifications:** Seller agrees that this Product complies with the City’s specifications provided to Seller and with the Seller’s proposal thereto as accepted by the City. Unless otherwise agreed to by the City, the City’s specifications govern and control in the event of inconsistencies with the Seller’s response to the same.



5. **Indemnity, Insurance and Bonds:** Seller agrees to indemnify, defend and save City, its officers, agents and employees harmless from any and all losses, damage and liability occasioned by, growing out of, or in any way arising or resulting from any intentional or negligent act on the part of Seller or its agents or employees. **For this purpose, Contractor shall provide City with proof of both Commercial General liability and automobile insurance each issued by a reliable company or companies for personal injury and property damage, in an amount not less than \$1.5 million per occurrence. The City shall be named as an additional insured on all policies other than professional liability and worker's comp. The insurance must be in a form suitable to City.**

Seller shall furnish an approved Performance Bond and a Labor and Materials Payment Bond, each in the amount of one hundred percent (100%) of the contract amount.

6. **Nondiscrimination:** Seller agrees that all hiring by Seller of persons performing this Agreement will be on the basis of merit and qualification and will not discriminate on the basis of race, color, religion, creed, political ideas, sex, age, marital status, physical or mental disability, or national origin.

The Contractor and subcontractor shall abide by the requirements of 41 CFR 60-300.5(a) and 41 CFR 60-741.5(a), which prohibit discrimination against qualified protected veterans and/or qualified individuals on the basis of disability, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified protected veterans and individuals with disabilities.

7. **Default and Termination:** If Seller fails to deliver the goods or product as set forth in Paragraphs 2 and 3 above, or violates any provision of this Agreement, or if the goods or product fails to meet City's specifications, City may, at its option, declare the Seller in default and immediately cancel and rescind this Agreement. Thereafter, City may procure substitute goods or product to replace the goods or product described herein. In such event, Seller is liable to City for the difference between the price set forth herein and the price paid by City for replacement goods or product. Additionally, the City may pursue any other remedy it has at law or in equity.

8. **Warranty:** Unless superseded or supplemented by an express warranty, Seller represents and warrants that the Product are covered by implied warranties for merchantability and fitness for the particular purpose for which they have been purchased.

9. **Assignment:** Seller may not assign this Agreement or any of its rights hereunder without the express written consent of City.



10. **Entire Agreement:** This Agreement, including its appendices, if any, is the entire understanding between the parties relating to the subject matter contained herein. No agent or representative of either party has authority to make any representations, statements, warranties or agreements not herein expressed and all modifications or amendments of this agreement, including the appendices, must be in writing and signed by an authorized representative of each of the parties hereto.

11. **Governing Law and Venue:** This Agreement shall be construed and enforced in accordance with the laws of the State of Montana. Venue for any suit between the parties arising out of this Agreement shall be the State of Montana Thirteenth Judicial District Court, Yellowstone County.

IN WITNESS WHEREOF, the parties hereto have executed this instrument the day and year first above written.

CITY OF BILLINGS, MONTANA

SELLER (Print Business Name Above)

By _____
WILLIAM A. COLE
MAYOR

By _____

Print Name _____

Print Title _____

APPROVED AS TO FORM

By _____
BRENT BROOKS, City Attorney

Scope of Supply

Project:

City of Billings, MT

W.O 19-34: Water Reclamation Facility Headworks Screen Procurement

Specification:

46 21 53 Perforated Plate Screens – May 2019

Equipment:

FSM FRS2 -1000x60/6 Perforated
Filter Screen

*(IDENTICAL to the three (3) existing
units)*



Represented By:

The Coombs Hopkins Company

Scott Forsling

Phone: 435-659-7199

Email: scott@coombshopkins.com

Regional Sales Manager:

Enviro-Care

Alan Spratt

Phone: 224-302-0304

Email: aspratt@enviro-care.com



Project No.: WEC216316

June 5, 2019



1570 St. Paul Avenue - Gurnee IL 60031

P: 815.636.8306

F: 847.672.7968

www.enviro-care.com

SPECIFICATION: 46 21 53 – Perforated Plate Screens

ADDENDA: None

ITEM: "A" - One (1) FSM Perforated Filter Screen Model FRS2 - 1000 x 60/6.

- FSM is the original equipment manufacturer (OEM) for the existing three (3) FSM Perforated Filter Screens currently operating at the Billings WRF and therefore is the only manufacturer that can provide and guarantee the supply of an *IDENTICAL* unit as required per Section 46 21 53 – Paragraph 1.1.A.2.



EQUIPMENT NUMBER: HWB-SCRN-4

BASIS OF DESIGN (EACH)

Application:	Municipal Wastewater
Average Annual Flow (Per Screen, 2 Screens in Service):	8.5 mgd
Average Wet Weather Flow (Per Screen):	13 mgd
Peak Flow (Per Screen, 3 Screens in Service):	20 mgd
Downstream Water Level:	3.5 feet @ peak flow
Headloss:	12 inches @ PF with 20% blinding
Screen Perforated Opening:	6 mm
Angle of Screen:	60 degrees from horizontal
Channel Width:	4.0 feet
Channel Depth:	7.5 feet
Floor Recess:	6-inches
Discharge Height:	3.5 feet above finished floor elevation
Maximum Screen Height:	9.0 feet above finished floor elevation
Wash Water:	15 gpm at 40 – 60 psi

PERFORATED PANEL TRAVELING BELT SCREEN (EACH)

- Fully automatic self-cleaning FSM screen complete with all appurtenances – 304L stainless steel.
- Main frame constructed from type 304L stainless steel.
- Flanged baseplate with pivot assembly for mounting screen assembly to top of channel – 304L stainless steel. Pivot assembly allows screen to be pivoted out of channel.
- Screen support rails from UHMW-PE provided front and back on each side of frame.
- Replaceable UHMW-PE seals mounted to each side of frame.

- Replaceable bottom seals – UHMW-PE, Buna-N rubber, and triple layer polyester brush with 304L stainless steel adjustable holder.
- Perforated filter screen elements with 1/4" (6 mm nominal) perforations from 3 mm thick (12 gauge) from type 304L stainless steel, bolted to drive chain with 304 stainless steel bolt ny-lock nuts and washers.
- Stainless steel screen drive chain from 304 stainless steel with hardened bushings, and pins from stainless steel.
- Stainless steel chain and screen elements driven by two (2) drive shaft mounted stainless steel sprockets with minimum thickness of 0.75 inches.
- Lower rotating guide sprockets from type 304 stainless steel with life seal bushings and a stainless steel stub shaft.
- Drive tensioners – 304 stainless steel.
- Drive system to include a SEW-Eurodrive two-speed/single winding motor 3.0/1.5 HP 1800/900 rpm TEFC (Class 1, Division 2) gearedrive motor suitable for 460V/3/60 electrical supply.
- Nylon screen cleaning brush, automatic self-adjusting, with stainless steel drive shaft and 2.0 HP 1760 rpm TEFC (Class 1, Division 2) SEW-Eurodrive geared motor suitable for 460V/3/60 electrical supply.
- Rotary Deflector from type 304L stainless steel on back side of screen.
- Internal spray system to clean internal surfaces of screen panel from stainless steel with brass nozzles; complete with manual ball valve and NEMA 4X 120vac solenoid valve.
- Removable 304L stainless steel odor control enclosures/covers with clear plexiglass view panels as specified.
- Screenings discharge hood/chute, hinged from type 304L stainless steel with clear plexiglass view panels as specified. Complete with polypropylene inspection hatches on each side.
- Anchor bolts – 304 stainless steel.
- Fasteners – 304 stainless steel.
- Shop surface preparation, stainless steel FULL DIP PASSIVATION.

CONTROL PANEL AND INSTRUMENTATION (EACH)

- Control panels and instrumentation to be provided by others, not Enviro-Care.

SPARE PARTS (TOTAL)

- One (1) set of bottom sprockets.
- One (1) set of top sprockets.
- One (1) set of tension frame bearings.
- One (1) complete set of replacement drive chain with master link connection pieces.
- One (1) perforated plate panel.
- One (1) complete rotating brush assembly.
- One (1) set of side and bottom curved seals.
- One (1) lower brush seal with rubber.

- One (1) of each motor (integral to gear reducer spare).
- One (1) of each gear reducer.

FIELD SERVICE (TOTAL)

- Site service of one (1) trip for a total of two (2) days for installation inspection, startup and operator training.

CLARIFICATIONS/COMMENTS

- 1.4.A.5: For clarification, the screen discharge height will be 3.5 feet identical to the three (3) FSM FRS2 1000x60/6 Perforated Filter Screens currently operating at the Billings WRF. Per Paragraph 1.1.A.2 the new screen is to be identical to the existing equipment currently operating at the Billings WWTP.
- 2.4.E.4: For clarification, we will provide a discharge hood identical to the three (3) FSM FRS2 1000x60/6 Perforated Filter Screens currently operating at the Billings WRF. The discharge hood described is specific for the new model FSM FRS3 perforated plate screen and cannot be installed on the older model FSM FRS2 perforated plate screen.

OPTIONAL ITEMS

- None.

NOTE: ANY ITEM NOT LISTED ABOVE TO BE FURNISHED BY OTHERS.

EXCLUSIONS

Taxes, electrical wiring, conduit or electrical equipment, piping, valves, or fittings, shimming material, lubricating oil or grease, shop or field painting, field welding, erection, hoist or lifting apparatus, detail shop fabrication drawings, unloading, storage, concrete work, civil design, grating, platforms, stairs, hand railing, dumpster (except as specifically noted).

This proposal section has been reviewed for accuracy and is approved for issue:

By: Beth Emmelot Date: June 5, 2019

PRICING

Item	Equipment	Price
A	One (1) FSM Perforated Filter Screen Model FRS2 1000 x 60/6.	\$ 148,988.00

Validity:

Prices are valid for a period of 30 days from the date of this proposal.

Warranty Statement and Term:

Enviro-Care Company, Inc. warrants the supplied equipment to the original end user against defects in workmanship or material under normal use and service in compliance with the original design specifications and the maintenance requirements and instructions as found in the Operations & Maintenance Manual. All Enviro-Care supplied equipment is warranted twenty-four (24) months from date of start-up or thirty (30) months from date of shipment, whichever occurs first.

Warranty Exclusions:

This warranty does not cover costs for standard and/or scheduled maintenance performed, nor does it cover consumables and Enviro-Care parts that, by virtue of their operation, require replacement through normal wear (aka: Wear Parts), unless a defect in material or workmanship can be determined by Enviro-Care. Wear parts are defined as brushes, rollers, spray nozzles, drum seals and other items specifically identified in the Operations & Maintenance Manual.

Warranty Coverage:

Enviro-Care's liability is limited to the supply or repair of defective parts returned, freight prepaid by buyer to a location specified by Enviro-Care. Repaired or replacement parts will be shipped to buyer prepaid via standard ground freight. Express or expedited shipments will be at the expense of the buyer.

Exclusions and Exceptions:

This Warranty excludes damage or wear to equipment caused by misapplication of product, improper maintenance, accident, abuse, unauthorized alteration or repair, Acts of God, or installation or operation that is non-compliant with Enviro-Care installation and operations instructions.

Limited Liability:

Enviro-Care shall not under any circumstances be liable for any incidental or consequential damages arising from loss, damage to property, personal injury or other damage or losses owing to the failure of Enviro-Care's equipment. The liability of Enviro-Care Company, Inc. is limited as set forth above within the time period set forth above.

Term: 15% with Submittal Approval
 80% Net 30 Days after Shipment
 5% Net 30 days after Startup. Startup not to exceed 180 days from equipment delivery.

Taxes: No sales or use taxes have been included in our pricing.

Freight: Prices quoted are F.O. B. shipping point with freight allowed to a readily accessible location nearest jobsite. Any claims for damage or loss in shipment to be initiated by purchaser.

Submittals: Full submittals will be supplied approximately **4 to 6 weeks** after receipt and acceptance of purchase order at the Enviro-Care offices.

Shipment: Shipment time is approximately **18 to 20 weeks** after receipt of approved submittal is received at the Enviro-Care offices. Under no circumstances will verbal approval be accepted.

Additional Field Service: This service may be scheduled at \$1,250.00 per day plus expenses or is available through a yearly service contract.

Material of Construction: Enviro-Care is providing the equipment from the type of material specified for this project. If from 304L stainless steel the concentration of chloride and hydrogen sulfide (H₂S) in the equipment operating environment shall be kept below the following values:

- Chloride <200 mg/L
- Hydrogen Sulfide (H₂S) <6ppm

If not already done so, Enviro-Care can provide the equipment from 316L stainless steel for a price adder for environments that exceed the values noted above.

Please issue Purchase Orders to:

Enviro-Care
1570 St Paul Avenue
Gurnee, IL 60031

Attn: Stephen Rioux
Phone: 224-302-0308
Email: srioux@enviro-care.com



City of Billings

BILLINGS, MT

W.O. 19-34: Water Reclamation Facility Headworks Screen Procurement

Contract Documents and Specifications

May 2019

HDR Project No. 233305

SECTION 01 33 00
SUBMITTALS

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PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mechanics and administration of the submittal process for:
 - a. Shop Drawings.
 - b. Samples.
 - c. Informational submittals.
 - 2. General content requirements for Shop Drawings.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Bidding Requirements, Contract Forms and Conditions of the Contract.
 - 2. Division 01 - General Requirements.
 - 3. Section 01 33 04 – Operations and Maintenance Manuals.
 - 4. Section 46 21 53 – Perforated Plate Screens.

1.2 DEFINITIONS

- A. Shop Drawings:
 - 1. See General Conditions.
 - 2. Product data and samples are Shop Drawing information.
- B. Informational Submittals:
 - 1. Submittals other than Shop Drawings and samples required by the Contract Documents that do not require review and/or approval by the Engineer.
 - 2. Representative types of informational submittal items include but are not limited to:
 - a. Installed equipment and systems performance test reports.
 - b. Manufacturer's installation certification letters.
 - c. Warranties.
 - d. Service agreements.
 - 3. For-Information-Only submittals upon which the Engineer is not expected to conduct review or take responsive action may be so identified in the Contract Documents.

1.3 PREPARATION OF SUBMITTALS

- A. General:
 - 1. All submittals and all pages of all copies of a submittal shall be completely legible.
 - 2. Submittals which, in the Engineer's sole opinion, are illegible will be returned without review.
 - 3. Minimize extraneous information for equipment and products not relevant to the submittal.
 - 4. Supplies written comments on the submittal drawings shall be in **GREEN**.
 - 5. **SHOP DRAWINGS ARE REQUIRED TO BE SUBMITTED ELECTRONICALLY IN BLACK AND WHITE. COLOR ONLY TO BE USED IF REQUIRED FOR CLARITY.**
 - a. Maximum electronic file size is 10 megabytes for transmittal via email. Electronic files larger than 10 megabytes can be broken up for emailing or copied onto HDR's FTP site or guest transfer drive with follow up by and email notice indicating delivery of the shop drawing.
- B. Shop Drawings, Product Data, and Samples:
 - 1. Scope of any submittal and letter of transmittal:
 - a. Limited to one (1) Specification Section.
 - b. Submittals with more than one Specification section included will be rejected.

- 1 c. Do not submit under any Specification Section entitled (in part) "Basic Requirements"
- 2 unless the product or material submitted is specified, in total, in a "Basic Requirements"
- 3 Specification Section.
- 4 2. Numbering letter of transmittal:
- 5 a. Include as prefix the Specification Section number followed by a series number, "-xx",
- 6 beginning with "01" and increasing sequentially with each additional transmittal for that
- 7 Specification Section.
- 8 b. If more than one (1) submittal under any Specification Section, assign consecutive
- 9 series numbers to subsequent transmittal letters.
- 10 3. Describing transmittal contents:
- 11 a. Provide listing of each component or item in submittal capable of receiving an
- 12 independent review action.
- 13 b. Identify for each item:
- 14 1) Manufacturer and Manufacturer's Drawing or data number.
- 15 2) Contract Document tag number(s).
- 16 3) Unique page numbers for each page of each separate item.
- 17 c. When submitting "or-equal" items that are not the products of named manufacturers,
- 18 include the words "or-equal" in the item description.
- 19 4. Supplier's certification of review and approval:
- 20 a. Supplier shall execute Exhibit AA, Supplier's Submittal Certification form, to indicate
- 21 Supplier has reviewed and approved the submittal contents.
- 22 1) Clearly identify the person who reviewed the submittal and the date it was
- 23 reviewed."
- 24 b. Submittals containing multiple independent items shall be prepared with each item
- 25 listed on the letter of transmittal or on an index sheet for all items listing the discrete
- 26 page numbers for each page of each item, which shall be stamped with the Supplier's
- 27 review and approval stamp.
- 28 1) Each independent item shall have a cover sheet with the transmittal number and
- 29 item number recorded.
- 30 a) Provide clear space of 3 IN SQ for Engineer stamping.
- 31 2) Individual pages or sheets of independent items shall be numbered in a manner that
- 32 permits the entire contents of a particular item to be readily recognized and
- 33 associated with Supplier's certification.
- 34 5. Resubmittals:
- 35 a. Number with original Specification Section and series number with a suffix letter
- 36 starting with "A" on a (new) duplicate transmittal form.
- 37 b. Do not increase the scope of any prior transmittal.
- 38 c. Provide cover letter indicating how each "B", "C", or "D" Action from previous
- 39 submittal was addressed and where the correction is found in the resubmittal.
- 40 d. Account for all components of prior transmittal.
- 41 1) If items in prior transmittal received "A" or "B" Action code, list them and indicate
- 42 "A" or "B" as appropriate.
- 43 a) Do not include submittal information for items listed with prior "A" or "B"
- 44 Action in resubmittal.
- 45 2) Indicate "Outstanding-To Be Resubmitted At a Later Date" for any prior "C" or
- 46 "D" Action item not included in resubmittal.
- 47 a) Obtain Engineer's approval to exclude items.
- 48 6. Supplier shall not use red color for marks on transmittals.
- 49 a. Duplicate all marks on all copies transmitted, and ensure marks are photocopy
- 50 reproducible.
- 51 b. Engineer will use red marks or enclose marks in a cloud.
- 52 7. Transmittal contents:
- 53 a. Coordinate and identify Shop Drawing contents so that all items can be easily verified
- 54 by the Engineer.

- 1 b. Provide submittal information or marks defining specific equipment or materials
- 2 utilized on the Project.
- 3 1) Generalized product information, not clearly defining specific equipment or
- 4 materials to be provided, will be rejected.
- 5 c. Identify equipment or material project use, tag number, Drawing detail reference,
- 6 weight, and other Project specific information.
- 7 d. Provide sufficient information together with technical cuts and technical data to allow
- 8 an evaluation to be made to determine that the item submitted is in compliance with the
- 9 Contract Documents.
- 10 e. Do not modify the manufacturer's documentation or data except as specified herein.
- 11 f. Submit items such as equipment brochures, cuts of fixtures, product data sheets or
- 12 catalog sheets not exceeding 11 x 17 IN pages.
- 13 1) Indicate exact item or model and all options proposed by arrow and leader.
- 14 g. When a Shop Drawing submittal is called for in any Specification Section, include as
- 15 appropriate, scaled details, sizes, dimensions, performance characteristics, capacities,
- 16 test data, anchoring details, installation instructions, storage and handling instructions,
- 17 color charts, layout Drawings, rough-in diagrams, wiring diagrams, controls, weights
- 18 and other pertinent data in addition to information specifically stipulated in the
- 19 Specification Section.
- 20 1) Arrange data and performance information in format similar to that provided in
- 21 Contract Documents.
- 22 2) Provide, at minimum, the detail specified in the Contract Documents.
- 23 h. If proposed equipment or materials deviate from the Contract Drawings or
- 24 Specifications in any way, clearly note the deviation and justify the said deviation in
- 25 detail in a separate letter immediately following transmittal sheet. Any deviation from
- 26 plans or specifications not depicted in the submittal or included but not clearly noted by
- 27 the Supplier may not have been reviewed. Review by the Engineer shall not serve to
- 28 relieve the Supplier of the contractual responsibility for any error or deviation from
- 29 contract requirements.
- 30 8. Samples:
- 31 a. Identification:
- 32 1) Identify sample as to transmittal number, manufacturer, item, use, type, project
- 33 designation, tag number, Specification Section or Drawing detail reference, color,
- 34 range, texture, finish and other pertinent data.
- 35 2) If identifying information cannot be marked directly on sample without defacing or
- 36 adversely altering samples, provide a durable tag with identifying information
- 37 securely attached to the sample.
- 38 b. Include application specific brochures, and installation instructions.
- 39 c. Provide Supplier's review and approval certification stamp or Supplier's Submittal
- 40 Certification form as indication of Supplier's checking and verification of dimensions
- 41 and coordination with interrelated work.
- 42 d. Resubmit revised samples of rejected items.
- 43 C. Informational Submittals:
- 44 1. Prepare in the format and detail specified in Specification requiring the informational
- 45 submittal.

46 **1.4 TRANSMITTAL OF SUBMITTALS**

- 47 A. Shop Drawings and Samples:
- 48 1. Transmit all submittals to:
- 49 2. Craig Habben: craig.habben@hdrinc.com
- 50 3. Utilize two (2) copies of attached Exhibit A to transmit all Shop Drawings and samples.
- 51 B. Informational Submittals:
- 52 1. Transmit under Supplier's standard letter of transmittal or letterhead.

- 1 2. Submit in triplicate or as specified in individual Specification Section.
- 2 3. Transmit to:
- 3 4. Craig Habben: craig.habben@hdrinc.com
- 4 C. Electronic Transmission of Submittals:
- 5 1. Transmittals shall be made electronically.
- 6 a. Use email.
- 7 2. Provide documents in Adobe Acrobat Portable Document Format (PDF), latest version.
- 8 3. Create one (1) PDF file for each equipment Operation and Maintenance Manual.
- 9 4. Do not password protect or lock the PDF document.
- 10 5. Drawings or other graphics must be converted to PDF file format from the original drawing
- 11 file format and made part of the PDF document.
- 12 a. Scanning of drawings is to be used only where actual file conversion is not possible and
- 13 drawings must be scanned at a resolution of 300 dpi or greater.
- 14 b. Required signatures may be applied prior to scanning for transmittal.
- 15 6. Electronic drawings shall be formatted to be at full-scale (or half-scale when printed to
- 16 11x17).
- 17 a. Do not reduce drawings by more than 50% in size.
- 18 b. Reduced drawings shall be clearly marked "HALF-SIZE" and shall scale accurately at
- 19 that size.
- 20 7. Rotate sheets that are normally viewed in landscape mode so that when the PDF file is
- 21 opened the sheet is in the appropriate position for viewing.
- 22 8. Create bookmarks in the bookmarks panel for the Operation and Maintenance Manual
- 23 cover, the Table of Contents and each major section of the Table of Contents.
- 24 9. Using Adobe Acrobat Standard or Adobe Acrobat Professional, set the PDF document
- 25 properties, initial view as follows:
- 26 a. Select File → Properties → Initial View.
- 27 b. Select the Navigation tab: Bookmarks Panel and Page.
- 28 c. Select the Page layout: Single Page.
- 29 d. Select the Magnification: Fit Page.
- 30 e. Select Open to page: 1.
- 31 f. Set the file to open to the cover page with bookmarks to the left, and the first bookmark
- 32 linked to the cover page.
- 33 10. Set the PDF file "Fast Web View" option to open the first several pages of the document
- 34 while the rest of the document continues to load.
- 35 a. To do this:
- 36 1) Select Edit → Preferences → Documents → Save Settings.
- 37 2) Check the Save As optimizes for Fast Web View box.
- 38 11. File naming conventions:
- 39 a. File names shall use a "ten dot three" convention (XXXXXX-YY-Z.PDF) where
- 40 XXXXXX is the Specification Section number, YY is the Shop Drawing Root number
- 41 and Z is an ID number used to designate the associated volume.
- 42 12. Labeling:
- 43 a. As a minimum, include the following labeling on all CD-ROM discs and jewel cases:
- 44 1) Project Name.
- 45 2) Equipment Name and Project Tag Number.
- 46 3) Project Specification Section.
- 47 4) Manufacturer Name.
- 48 5) Vendor Name.
- 49 13. Binding:
- 50 a. Include labeled CD(s) in labeled jewel case(s).
- 51 1) Bind jewel cases in standard three-ring binder Jewel Case Page(s), inserted at the
- 52 front of the Final paper copy submittal.
- 53 2) Jewel Case Page(s) to have means for securing Jewel Case(s) to prevent loss (e.g.,
- 54 flap and strap).

1 **1.5 ENGINEER'S REVIEW ACTION**

2 A. Shop Drawings and Samples:

- 3 1. Items within transmittals will be reviewed for overall design intent and will receive one (1)
 4 of the following actions:
 5 a. A - FURNISH AS SUBMITTED.
 6 b. B - FURNISH AS NOTED (BY ENGINEER).
 7 c. C - REVISE AND RESUBMIT.
 8 d. D - REJECTED.
 9 e. E - ENGINEER'S REVIEW NOT REQUIRED.
- 10 2. Submittals returned with Action "A" or "B" are considered ready for fabrication and
 11 installation.
 12 a. If for any reason a submittal that has an "A" or "B" Action is resubmitted, it must be
 13 accompanied by a letter defining the changes that have been made and the reason for
 14 the resubmittal.
 15 b. Destroy or conspicuously mark "SUPERSEDED" all documents having previously
 16 received "A" or "B" Action that are superseded by a resubmittal.
- 17 3. Submittals with Action "A" or "B" combined with Action "C" (Revise and Resubmit) or
 18 "D" (Rejected) will be individually analyzed giving consideration as follows:
 19 a. The portion of the submittal given "C" or "D" will not be distributed (unless previously
 20 agreed to otherwise at the Preconstruction Conference).
 21 1) One (1) copy or the one (1) transparency of the "C" or "D" Drawings will be
 22 marked up and returned to the Supplier.
 23 a) Correct and resubmit items so marked.
 24 b. Items marked "A" or "B" will be fully distributed.
 25 c. If a portion of the items or system proposed are acceptable, however, the major part of
 26 the individual Drawings or documents are incomplete or require revision, the entire
 27 submittal may be given "C" or "D" Action.
 28 1) This is at the sole discretion of the Engineer.
 29 2) In this case, some Drawings may contain relatively few or no comments or the
 30 statement, "Resubmit to maintain a complete package."
 31 3) Distribution to the Owner and field will not be made (unless previously agreed to
 32 otherwise).
- 33 4. Failure to include any specific information specified under the submittal paragraphs of the
 34 Specifications will result in the submittal being returned to the Supplier with "C" or "D"
 35 Action.
- 36 5. Calculations required in individual Specification Sections will be received for information
 37 purposes only, as evidence calculations have been stamped by the professional as defined in
 38 the specifications and for limited purpose of checking conformance with given performance
 39 and design criteria. The Engineer is not responsible for checking the accuracy of the
 40 calculations and the calculations will be returned stamped "E. Engineer's Review Not
 41 Required" to acknowledge receipt.
- 42 6. Supplier shall furnish required submittals with sufficient information and accuracy to obtain
 43 required approval of an item with no more than three submittals. Engineer will record
 44 Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample,
 45 or other item requiring approval, and Supplier shall be responsible for Engineer's charges to
 46 Owner for such time. Owner may impose a set-off against payments due to Supplier to
 47 secure reimbursement for such charges.
- 48 7. Transmittals of submittals which the Engineer considers as "Not Required" submittal
 49 information, which is supplemental to but not essential to prior submitted information, or
 50 items of information in a transmittal which have been reviewed and received "A" or "B"
 51 action in a prior submittal, will be returned with action "E. Engineer's Review Not
 52 Required."
- 53 8. Samples may be retained for comparison purposes.
 54 a. Remove samples when directed.

- 1 b. Include in bid all costs of furnishing and removing samples.
- 2 9. Approved samples submitted or constructed, constitute criteria for judging completed work.
- 3 a. Finished work or items not equal to samples will be rejected.

4 **PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)**

5 **PART 3 - EXECUTION - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)**

6 **END OF SECTION**



EXHIBIT A Shop Drawing Transmittal No.

(Spec Section) (Series)

Project Name:		Date Received:
Project Owner:		Checked By:
Supplier:	HDR Engineering, Inc.	Log Page:
Address:	Address:	HDR No.:
		Spec Section:
		Drawing/Detail No.:
Attn:	Attn:	1st. Sub ReSub.
Date Transmitted:	Previous Transmittal Date:	

Item No.	No. Copies	Description	Manufacturer	Mfr/Vendor Dwg or Data No.	Action Taken*

Remarks:

* The Action designated above is in accordance with the following legend:

<p>A - Furnish as Submitted</p> <p>B - Furnish as Noted</p> <p>C - Revise and Submit</p> <ol style="list-style-type: none"> 1. Not enough information for review. 2. No reproduces submitted. 3. Copies illegible. 4. Not enough copies submitted. 5. Wrong sequence number. 6. Wrong resubmittal number. 7. Wrong spec. section. 8. Wrong form used. 9. See comments. <p>D - Rejected</p>	<p>E - Engineer's review not required</p> <ol style="list-style-type: none"> 1. Submittal not required. 2. Supplemental Information. Submittal retained for informational purposes only. 3. Information reviewed and approved on prior submittal. 4. See comments. 5. Delegated Design - Submittal received as requested by the Contract Documents. The Engineer did not review the engineering or technical content of the submittal. <p>Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Any deviation from plans or specifications not depicted in the submittal or included but not clearly noted by the Supplier may not have been reviewed. Review by the Engineer shall not serve to relieve the Supplier of the contractual responsibility for any error or deviation from contract requirements.</p>
---	---

Comments:

By	Date
Distribution: Supplier File Field Owner Other	

1



EXHIBIT AA

Supplier's Submittal Certification

Shop Drawing Transmittal No.: _____

Contract/Project Name: _____

Company Name: _____

has

1. reviewed and coordinated this Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
2. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
3. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
4. determined and verified all information relative to Supplier's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

This Submittal **does not** contain any variations from the requirements of the Contract Documents.

This Submittal **does** contain variations from the requirements of the Contract Documents. A separate description of said variations and a justification for them is provided in an attachment hereto identified as:

"Shop Drawing Transmittal No. _____ Variation and Justification Documentation"

Insert picture file or electronic signature of Authorized Representative

Authorized Representative

Date

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SECTION 01 33 04
OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Administration of the submittal process for Operation and Maintenance Manuals.
 - 2. Content requirements for Operation and Maintenance Manuals.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Section 01 33 00 – Submittals.
 - 2. Section 46 21 53 – Perforate Plate Screens.

1.2 DEFINITIONS

- A. Equipment Operation and Maintenance Manuals:
 - 1. Contain the technical information required for proper installation, operation and maintenance of process, electrical and mechanical equipment and systems.

1.3 SUBMITTALS

- A. Operation and Maintenance Manuals:
 - 1. Draft and final electronic copies.
 - 2. Final paper copies: Two (2).

1.4 SUBMITTAL SCHEDULE

- A. Draft Operation and Maintenance Manuals:
 - 1. Submit approvable draft manuals in electronic format (PDF) within 30 days following approval of the respective Shop Drawing.
 - a. Include placeholders or fly sheet pages where information is not final or is missing from the draft manual.
- B. Final Operation and Maintenance Manuals:
 - 1. Final approval of Operation and Maintenance Manuals in electronic format (PDF) must be obtained 45 days prior to equipment start-up.
 - 2. Provide paper copies and CD-ROMs of approved final Operation and Maintenance Manuals in electronic format (PDF), a minimum of 30 days prior to equipment start-up.
 - 3. Issue addenda to Final Approved Operation and Maintenance Manual to include:
 - a. Equipment field testing data.
 - b. Equipment start-up reports.

1.5 PREPARATION OF SUBMITTALS

- A. General:
 - 1. All pages of the Operation and Maintenance Manual submittal shall be legible.
 - a. Submittals which, in the Engineer's sole opinion, are illegible will be rejected without review.
 - 2. Identify each equipment item in a manner consistent with names and identification numbers used in the Contract Documents, not the manufacturer's catalog numbers.
 - 3. Neatly type any data not furnished in printed form.
 - 4. Operation and Maintenance Manuals are provided for Owner's use, to be reproduced and distributed as training and reference materials within Owner's organization.
 - a. This requirement is:
 - 1) Applicable to both paper copy and electronic files.
 - 2) Applicable to materials containing copyright notice as well as those with no copyright notice.

- 1 5. Notify supplier and/or manufacturer of the intended use of Operations and Maintenance
2 Manuals provided under the Contract.
- 3 B. Operation and Maintenance Manual Format and Delivery:
- 4 1. Draft electronic submittals:
- 5 a. Provide manual in Adobe Acrobat Portable Document Format (PDF), latest version.
6 b. Create one (1) PDF file for each equipment Operation and Maintenance Manual.
7 c. Do not password protect or lock the PDF document.
8 d. Drawings or other graphics must be converted to PDF file format from the original
9 drawing file format and made part of the PDF document.
10 e. Scanning of drawings is to be used only where actual file conversion is not possible and
11 drawings must be scanned at a resolution of 300 dpi or greater.
12 f. Rotate sheets that are normally viewed in landscape mode so that when the PDF file is
13 opened the sheet is in the appropriate position for viewing.
14 g. Create bookmarks in the bookmarks panel for the Operation and Maintenance Manual
15 cover, the Table of Contents and each major section of the Table of Contents.
16 h. Using Adobe Acrobat Standard or Adobe Acrobat Professional, set the PDF document
17 properties, initial view as follows:
18 1) Select File → Properties → Initial View.
19 2) Select the Navigation tab: Bookmarks Panel and Page.
20 3) Select the Page layout: Single Page.
21 4) Select the Magnification: Fit Page.
22 5) Select Open to page: 1.
23 6) Set the file to open to the cover page of the manual with bookmarks to the left, and
24 the first bookmark linked to the cover page.
25 i. Set the PDF file "Fast Web View" option to open the first several pages of the
26 document while the rest of the document continues to load.
27 1) To do this:
28 a) Select Edit → Preferences → Documents → Save Settings.
29 b) Check the Save As optimizes for Fast Web View box.
30 j. PDF file naming convention:
31 1) Use the Specification Section number, the manufacturer's name and the equipment
32 description, separated by underscores.
33 2) Example: 46 21 53_Peforated Plate Screens.pdf.
34 3) Do not put spaces in the file name.
- 35 2. Final electronic submittals:
- 36 a. Submit two (2) copies in PDF file format on two (2) CD-ROM discs (one (1) copy per
37 CD-ROM), each secured in a jewel case.
38 b. CD-ROM Labeling:
39 1) Provide the following printed labeling on all CD-ROM discs:
40 a) Project name.
41 b) Specification Section.
42 c) Equipment names and summary of tag(s) covered.
43 d) Manufacturer name.
44 e) Date (month, year).
45 c. CD-ROM Jewel Case Holder:
46 1) Insert jewel cases containing labeled CD-ROM discs in three-ring binder holder
47 (C-Line Products, www.c-lineproducts.com stock number CLI-61968 or
48 equivalent) at the front of each final paper copy.
- 49 3. Final paper copy submittals:
- 50 a. Quantity: Provide two (2) copies.
51 b. Paper: 8.5 x 11 IN or 11 x 17 IN bright white, 20 pound paper with standard three-hole
52 punching.
53 c. 3-Ring Binder:
54 1) Provide D-ring binder with clear vinyl sleeves (i.e. view binder) on front and spine.

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- 2) Insert binder title sheet with the following information under the front and spine sleeves:
 - a) Project name.
 - b) Specification Section.
 - c) Equipment names and summary of tag(s) covered.
 - d) Manufacturer name.
 - e) Date (month, year).
 - 3) Provide plastic sheet lifters prior to first page and following last page.
 - d. Drawings:
 - 1) Provide all drawings at 11 x 17 IN size, triple folded and three-hole punched for insertion into manual.
 - 2) Where reduction is not practical to ensure readability, fold larger drawings separately and place in three-hole punched vinyl envelopes inserted into the binder.
 - 3) Identify vinyl envelopes with drawing numbers.
 - e. Use plastic coated dividers to tab each section of each manual in accordance with the Table of Contents.
- C. Equipment Operation and Maintenance Manual Content:
- 1. Provide a cover page as the first page of each manual with the following information:
 - a. Manufacturer(s) Name and Contact Information.
 - b. Vendor's Name and Contact Information.
 - c. Date (month, year).
 - d. Project Owner and Project Name.
 - e. Specification Section.
 - f. Project Equipment Tag Numbers.
 - g. Model Numbers.
 - h. Engineer's Name.
 - 2. Provide a Table of Contents for each manual.
 - 3. Provide Equipment Record sheets as follows:
 - a. Printed copies of the Equipment Record (Exhibits B1, B2 and B3), as the first tab following the Table of Contents.
 - b. Exhibits B1-B3 are available as Fillable PDF Form documents from the Engineer.
 - c. Each section of the Equipment Record must be completed in detail; simply referencing the related equipment Operation and Maintenance Manual sections for nameplate, maintenance, spare parts or lubricant information is not acceptable.
 - d. For equipment involving separate components (for example, a motor and gearbox), a fully completed Equipment Record is required for each component.
 - e. Submittals that do not include the Equipment Record(s) will be rejected without further content review.
 - 4. Provide a printed copy of the Manufacturer's Field Services report following the Equipment Record sheets.
 - 5. Provide the following detailed information, as applicable:
 - a. Use equipment tag numbers from the Contract Documents to identify equipment and system components.
 - b. Equipment function, normal and limiting operating characteristics.
 - c. Instructions for assembly, disassembly, installation, alignment, adjustment, and inspection.
 - d. Operating instructions for start-up, normal operation, control, shutdown, and emergency conditions.
 - e. Lubrication and maintenance instructions.
 - f. Troubleshooting guide.
 - g. Mark each sheet to clearly identify specific products and component parts and data applicable to the installation for the Project; delete or cross out information that does not specifically apply to the Project.
 - h. Parts lists:
 - 1) A parts list and identification number of each component part of the equipment.

- 1 2) Exploded view or plan and section views of the equipment with a detailed parts
- 2 callout matching the parts list.
- 3 3) A list of recommended spare parts.
- 4 4) List of spare parts provided as specified in the associated Specification Section.
- 5 5) A list of any special storage precautions which may be required for all spare parts.
- 6 i. General arrangement, cross-section, and assembly drawings.
- 7 j. Electrical diagrams, including elementary diagrams, wiring diagrams, connection
- 8 diagrams, and interconnection diagrams.
- 9 k. Test data and performance curves.
- 10 l. As-constructed fabrication or layout drawings and wiring diagrams.
- 11 m. Copy of the equipment manufacturer's warranty meeting the requirements of the
- 12 Contract.
- 13 n. Copy of any service contracts provided for the specific piece of equipment as part of
- 14 the Contract.
- 15 6. Additional information as required in the associated equipment or system Specification
- 16 Section.

17 **1.6 TRANSMITTAL OF SUBMITTALS**

- 18 A. Operation and Maintenance Manuals.
- 19 1. Transmit all submittals to:
- 20 a. The address specified in Specification Section 01 33 00 - SUBMITTALS.
- 21 2. Transmittal form: Use Operation and Maintenance Manual Transmittal, Exhibit A.
- 22 3. Transmittal numbering:
- 23 a. Number each submittal with the Specification Section number followed by a series
- 24 number beginning with "-01" and increasing sequentially with each additional
- 25 transmittal, followed by "-OM" (for example: 46 21 53-01-OM).
- 26 4. Submit draft and final Operation and Maintenance Manual in electronic format (PDF) to
- 27 Engineer, until manual is approved.

28 **1.7 ENGINEER'S REVIEW ACTION**

- 29 A. Draft Electronic (PDF) Submittals:
- 30 1. Engineer will review and indicate one of the following review actions:
- 31 a. A - ACCEPTABLE
- 32 b. B - FURNISH AS NOTED
- 33 c. C - REVISE AND RESUBMIT
- 34 d. D - REJECTED
- 35 2. Submittals marked as Acceptable or Furnish As Noted will be retained; however, the
- 36 transmittal form will be returned with a request for the final paper and electronic documents
- 37 to be submitted.
- 38 3. Copies of submittals marked as Revise and Resubmit or Rejected will be returned with the
- 39 transmittal form marked to indicate deficient areas.
- 40 4. Resubmit until approved.
- 41 B. Final Paper Copy Submittals:
- 42 1. Engineer will review and indicate one (1) of the following review actions:
- 43 a. A - ACCEPTABLE
- 44 b. D - REJECTED
- 45 2. Submittals marked as Acceptable will be retained with the transmittal form returned as
- 46 noted.
- 47 3. Submittals marked as Rejected will be returned with the transmittal form marked to indicate
- 48 deficient areas.
- 49 4. Resubmit until approved.

1 PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

2 PART 3 - EXECUTION - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

3 END OF SECTION

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EXHIBIT B1

Equipment Record

Equipment Data and Spare Parts Summary

Project Name			Specification Section:		
Equipment Name			Year Installed:		
Project Equipment Tag No(s).					
Equipment Manufacturer				Project/Order No.	
Address				Phone	
Fax		Web Site		E-mail	
Local Vendor/Service Center					
Address				Phone	
Fax		Web Site		E-mail	

MECHANICAL NAMEPLATE DATA

Equip.			Serial No.		
Make			Model No.		
ID No.	Frame No.	HP	RPM	Cap.	
Size	TDH	Imp. Sz.	CFM	PSI	
Other:					

ELECTRICAL NAMEPLATE DATA

Equip.			Serial No.					
Make			Model No.					
ID No.	Frame No.	HP	V.	Amp.	HZ	PH	RPM	SF
Duty	Code	Ins. Cl.	Type	NEMA	C Amb.	Temp. Rise	Rating	
Other:								

SPARE PARTS PROVIDED PER CONTRACT

Part No.	Part Name	Quantity

RECOMMENDED SPARE PARTS

Part No.	Part Name	Quantity

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EXHIBIT B3

Equipment Record

Lubrication Summary

Equipment Description	Project Equip. Tag No(s).
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Lubricant Point						
	Lubricant Type	Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					
Lubricant Point						
	Lubricant Type	Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					
Lubricant Point						
	Lubricant Type	Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					
Lubricant Point						
	Lubricant Type	Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					
Lubricant Point						
	Lubricant Type	Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					
Lubricant Point						
	Lubricant Type	Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					

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SECTION 46 21 53
PERFORATED PLATE SCREENS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mechanically cleaned influent perforated plate screen, motor, gear reducers, and lifting attachments to ensure proper coordination, compatibility, and operation of the system.
 - 2. The equipment specified herein is intended to be identical to existing equipment currently in operation at the Billings Water Reclamation Facility. All components of the new equipment shall be identical to existing equipment unless specifically noted by the supplier and approved by the engineer during the Shop Drawing phase prior to equipment fabrication and delivery. Owner reserves the right to install existing spare part inventory on new equipment to verify compatibility at their discretion. In the event existing spare part components are not compatible with new equipment, supplier will provide new, matching equipment, at no additional cost to the Owner.
- B. Tag Numbers.
 - 1. Perforated Plate Screen No. 4: HWB-SCRN-4.
- C. Related Sections include but are not necessarily limited to:
 - 1. Section 01 33 00 – Submittals.
 - 2. Section 01 33 04 – Operations and Maintenance Manuals.
- D. Description:
 - 1. One perforated plate Influent Screen as specified herein will be installed in the Headworks Building.
 - 2. The new Influent Screen shall remove debris from the raw wastewater and deposit it into an existing sluice. The deposited screenings will then be sluiced to the existing washer compactors.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Bearing Manufacturers Association (ABMA):
 - 2. American Gear Manufacturers Association (AGMA).
 - 3. American Iron and Steel Institute (AISI):
 - a. Steel Products Manual.
 - 4. All structural stainless steel components shall conform to the requirements of “Specifications for the Design, Fabrication, and Erection of Structural Steel Buildings” published by the American Institute of Steel Construction (AISC).
 - 5. American National Standards Institute (ANSI).
 - 6. American Society of Mechanical Engineers (ASME):
 - a. B1.20.1, Screw Threads - Pipe Threads, General Purpose (Inch).
 - b. B16.1, Gray Iron Pipe Flanges and Flanged Fittings (Classes 25, 125 and 250).
 - 7. American Society of Testing and Materials International (ASTM):
 - a. A193, Standard for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - b. A194, Standard for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service, or Both.
 - c. A320, Standard for Alloy Steel Bolting Materials for Low Temperature Service.
 - d. A380, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.

- 1 e. A480/A480M-90, General Requirements for Flat-Rolled Stainless and Heat Resisting
- 2 Steel Plate, Sheet, and Strip.
- 3 f. C881, Standard for Epoxy-Resin-Base Bonding Systems for Concrete.
- 4 g. C882, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With
- 5 Concrete by Slant Shear.
- 6 h. D648, Standard Test Method for Deflection Temperature of Plastics under Flexural
- 7 Load in the Edgewise Position.
- 8 i. D695, Standard Test Method for Compressive Properties of Rigid Plastics.
- 9 8. National Electrical Manufacturers Association (NEMA):
- 10 a. 250, Enclosures for Electrical Equipment.
- 11 b. ICS 6, Enclosures for Industrial Control and Systems.
- 12 c. MG1, Motors and Generators.
- 13 9. National Fire Protection Association (NFPA):
- 14 a. 70, National Electric Code (NEC).
- 15 b. 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities.
- 16 10. Occupational Safety and Health Administration (OSHA).
- 17 11. Underwriters Laboratory (UL):
- 18 a. Standard for Safety Industrial Control Equipment.
- 19 B. Responsibilities and Qualifications:
- 20 1. All equipment provided under this Specification Section shall be obtained from a single
- 21 manufacturer who shall assume full responsibility for designing and furnishing a complete
- 22 and operational influent screening.
- 23 a. The manufacturer shall be the source of information on all equipment furnished
- 24 regardless of the manufacturing source of that equipment.
- 25 2. Manufacturer's qualifications:
- 26 a. Manufacturer shall have experience in manufacturing in-channel, perforated plate
- 27 traveling belt screen equipment of similar size and configuration to the equipment
- 28 specified herein in service in USA.
- 29 3. Statements of qualification: Professional structural engineer.
- 30 4. The Contract Documents represent the minimum acceptable standards for equipment for this
- 31 Project.
- 32 a. All equipment will conform fully in every respect to the requirements of the respective
- 33 parts and sections of the Drawings and Specifications.
- 34 C. Definitions:
- 35 1. Screen Height: The height between the operating floor and the top of the perforated plate
- 36 screens.
- 37 2. Discharge Height: The height between the operating floor and the screenings discharge.
- 38 3. Head Loss: Total difference in elevation of the water level upstream of the upstream
- 39 screening elements and downstream of the downstream return elements.
- 40 4. Percent Blinded: Percentage of submerged area of partially blinded perforations relative to
- 41 total area of non-blinded perforations.
- 42 5. Maximum Differential Head: Maximum difference in elevation of the water level upstream
- 43 and downstream of the upstream screening elements that the screen will experience during
- 44 emergency conditions (i.e. screen fully plugged).
- 45 6. Capture Efficiency: Percentage of material larger than screen perforation size captured by
- 46 the screen.
- 47 7. Screen Angle: Angle of screen frame incline from horizontal plane parallel with mounting
- 48 floor.

49 **1.3 SUBMITTALS**

- 50 A. Shop Drawings:
- 51 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of
- 52 the submittal process.
- 53 2. Product technical data including:
- 54 a. Acknowledgement that products submitted meet requirements of standards referenced.

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- b. Manufacturer's installation instructions.
- c. Manufacturer's catalog information, descriptive literature, specifications, and identification of materials for construction.
- 3. Detailed Structural, Mechanical, and Electrical Drawings showing equipment fabrications and interface with other items including:
 - a. Dimensions, size, and locations of connections to other work.
 - b. Details of attachment and support in channel.
- 4. Gear output torque.
- 5. Hydraulic calculations and flow curves for the proposed screen verifying that the screen is capable of processing the peak flow.
- 6. Complete motor nameplate data, as defined by NEMA, motor manufacturer, and motor modifications.
- 7. Functional description of internal and external instrumentation and controls including list of parameters monitored, controlled, or alarmed.
- 8. Shop painting systems, including manufacturer's descriptive technical catalog literature and specifications.
- 9. External utility requirements for air, water, power, drain, etc., for each component.
- 10. Spare parts list.
- 11. Training course outlines.
- 12. Certifications:
 - a. Manufacturer's Certificate of Compliance of factory-applied coating system.
 - b. Manufacturer's Certificate of Proper Installation.
- 13. Test reports:
 - a. Written factory test report of inspection.
 - b. Field functional test reports.
- 14. Structural calculations showing that the screen can operate under the specified Maximum Differential Head with the specified deflection and factor of safety:
 - a. The calculations are to be stamped, dated, and signed by a currently registered professional engineer in structural engineering.
- 15. Head loss calculations for the influent screens at peak influent flow assuming a zero percent blinded condition, and a 20 percent blinded condition:
 - a. Factory or field test data for screens similar in size and flow loading demonstrating the accuracy of the head loss calculation used.
- 16. Describe the method of checking and adjusting drive chain tension.
- 17. Drawings showing the proposed screens in plan and section installed in the Plant, at a scale of no smaller than 1/4 IN equals one FT:
 - a. Label all components.
 - b. Show dimensions and total weight of the screen.
 - c. All dimensions of existing structure are to be field verified by the Vendor.
 - d. Provide fabrication and installation details, including details of access/view panels in the screen cover and frame.
 - e. Provide details of the area at the bottom of the screen to show how the screen will pick up large objects off the channel floor, assuming a six-inch channel step-down at base of screen.
 - f. Provide details of the bottom of the screen that shows the method employed to prevent buildup of grit and small stones beneath the screen and to prevent wear on the screen elements.
- 18. Flow rate and pressure of spray water system for each screen.
- 19. Detailed specifications including a complete description of screen materials (type, thickness, load rating, etc.).
- 20. A recommended list of spare parts (indicate if for each screen, or for the entire set of screens).
- 21. Catalog cuts of all components including valves, tubing, switches, etc.
- 22. Certification of equipment frame, roller, and bearing design safety factor.
- 23. Electric motor operator data, including Vendor's catalog information, complete dimensional data, drive unit size, calculations substantiating selection.
- 24. Provide factory testing procedure and setup as specified in paragraph 1.05 A.

- 1 25. Anchorage calculations and details.
- 2 26. Installation instructions.
- 3 B. Reports and Forms:
- 4 1. Factory test report.
- 5 2. Field test reports. Operation and Maintenance Manuals:
- 6 1. See Specification Section 01 33 04 for requirements for:
- 7 a. The mechanics and administration of the submittal process.
- 8 b. The content of Operation and Maintenance Manuals.
- 9 2. Operation and Maintenance Manual, including routine maintenance requirements prior to
- 10 plant start-up.
- 11 D. Informational Submittals:
- 12 1. Provide structural design calculations by a Professional structural engineer to support the
- 13 structural design of the screen and anchors to withstand the worst case load on the screen at
- 14 maximum upstream water level in the channel with no water in the downstream channel.
- 15 2. Special shipping, storage and protection, and handling instructions.
- 16 3. See Specification Section 01 33 00 for requirements for:
- 17 a. The mechanics and administration of the submittal process.

18 **1.4 DESIGN REQUIREMENTS**

- 19 A. Performance and Configuration Requirements for Influent Screens:
- 20
- 1. Number of Influent Screens: 1 each.
- 2. Screen Angle: 60 Degrees.
- 3. Maximum Screen Height: 9.0 FT, above finished floor elevation of 3093.10.
- 4. Discharge Outlet Opening Size: Max 4 FT Long, Min 4 FT Wide.
- 5. Discharge Height: 4.5 FT, above finished floor elevation.
- 6. Average Annual Flow (Per Screen): 8.5 mgd.
- 7. Average Wet Weather Flow (Per Screen): 13 mgd.
- 8. Peak Flow (Per Screen, 3 Screens in Service): 20 mgd.
- 9. Channel Width: 4.0 FT.
- 10. Channel Depth: 7.5 FT.
- 11. Water Depth Downstream of Screen at Average Wet Weather Flow: 3.3 FT.
- 12. Water Depth Downstream of Screen at Peak Flow: 3.5 FT.
- 13. Maximum Head Losses across Screen at Peak Flow:
- 14 a. Zero percent blinded: 0.65 FT.
- 15 b. 20 percent blinded: 1.0 FT.
- 16 14. Screen Panel Perforation Diameter: 6 mm.
- 17 15. Maximum Differential Head: 1 FT.
- 18 16. Area of each Screen below the Operating Floor: 9.6 SQ FT.
- 19 B. Equipment Anchoring:
- 20 1. Equipment shall be designed to resist seismic forces as required by the 2012 Uniform
- 21 Building Code.

24 **1.5 SOURCE QUALITY CONTROL**

- 25 A. Factory Tests:
- 26 1. Prior to shipment conduct factory tests on each screen.
- 27 2. The Vendor shall submit a description of the proposed testing procedure to the City at least
- 28 10 weeks in advance of the proposed testing date. In addition, the Vendor shall provide the
- 29 City with at least 4 weeks advance written notice of the date and location of the factory tests.
- 30 3. Tests shall address the following items as a minimum:

- 1 a. Running test with minimum of four hours of continuous operation.
- 2 b. Functional test of the field panel operation.
- 3 c. Demonstrate that all equipment is capable of continuous operation in satisfactory
- 4 manner without mechanical or electrical defects or operational difficulties.
- 5 d. If necessary, repeat tasks until satisfactory results are obtained.
- 6 e. Produce a test report containing quantitative results in the form of data or charts.
- 7 4. The test results shall be signed and certified by an officer of the Vendor.

8 **1.6 ENVIRONMENTAL CONDITIONS**

- 9 A. The screen will be installed indoors in the Headworks Building at the City Billings WRF,
- 10 Billings, MT.
- 11 B. Elevation is approximately 3,100 feet above mean sea level.
- 12 C. All screens shall be rated for installation in a Class I, Division 2 location.
- 13 1. Equipment, electrical assemblies, related electrical wiring, instrumentation, controls, and
- 14 system components shall FULLY comply with specific NEC requirements related to area
- 15 classification and to NEMA 250 and ICS-6 designations specified herein.
- 16 2. All equipment supplied under this contract shall be suitable for operation in a Class I,
- 17 Division 2 area classification, except for field panels to be located in unclassified areas as
- 18 specified.
- 19 D. 15 gpm of plant process wash water under 50 to 100 psig of supply pressure will be provided to
- 20 the influent screens.

21 **1.7 SPARE PARTS**

- 22 A. The items listed in this paragraph are representative of the spare parts required for each screen.
- 23 Vendors are to add, modify, or delete items from the list as appropriate for each Vendor's
- 24 equipment.
- 25 B. Provide one set of special tools to accommodate servicing of all screens.
- 26 C. Provide one complete replacement of the following items:
- 27 1. Bottom sprocket.
- 28 2. Top sprocket.
- 29 3. Top sprocket tension frame bearing.
- 30 4. Replacement drive chain with master link connection pieces.
- 31 5. Screen perforated plate panel.
- 32 6. Rotating brush.
- 33 7. Side seals and curved seals.
- 34 8. Bottom brush.
- 35 9. Each type of motor.
- 36 10. Each type of gear reducer.
- 37 D. All parts are to be suitably marked by part number referenced to the Vendor's O & M manual.

38 **PART 2 - PRODUCTS**

39 **2.1 EQUIPMENT LIST:**

<u>Equipment No.</u>	<u>Equipment Name:</u>
42 HWB-SCRN-4	43 Screen 4

44 Provide all required anchor bolts for all screens.

45 **2.2 ACCEPTABLE MANUFACTURERS**

- 46 A. FSM.

1 **2.3 MATERIALS**

- 2 A. Frame: 304L Stainless Steel.
 3 B. Screen Panels: 316L or 304 Stainless Steel.
 4 C. Screen Covers: 304L Stainless Steel.
 5 D. Drive Chain: 304L Stainless Steel.
 6 E. Discharge Outlet: 304L Stainless Steel.
 7 F. Access Panels in Screen Frames: 304L Stainless Steel.
 8 G. Access/View Panels in Screen Covers: ¼ IN clear Plexiglas.
 9 H. Rotating Deflector: 304 Stainless Steel.

10 **2.4 EQUIPMENT FEATURES**

- 11 A. Screen Panels:
 12 1. The perforated plate screens are to have the proven capability to operate at Maximum
 13 Differential Head conditions without permanent deflection of any the screen components
 14 (use a factor of safety of 2).
 15 2. Maximum deflection of any of screen panels: ¼-IN.
 16 3. Lifting fingers shall be placed on every tenth filter plate. The lifting fingers shall be located
 17 on the filter element to remove spherical solids from the bottom of the channel.
- 18 B. Capture Efficiency:
 19 1. Maximum gaps between the screen panels: 3 mm.
 20 2. Lateral edges of the panel are to be of sufficiently rigid construction and securely held in
 21 proper alignment to prevent any suspended or floating debris from passing between the
 22 panels up to specified Peak Flow.
- 23 C. Screen Travel Speed:
 24 1. Each screen shall have a travel speed that will quickly remove debris from the channel, and
 25 quickly return clean screen panels into the channel for further debris removal:
 26 a. High travel speeds are critical for efficient debris removal as well as to limit the head
 27 loss across the screen since the percent blinding increases in direct proportion to the
 28 time the panel is exposed to the wastewater flow in the channel.
 29 b. Screens shall have a two-speed drive capable of continuously operating at Peak Flow
 30 throughput up to a maximum screen travel speed of 30 feet per minute (FPM).
- 31 D. Screen Drive Mechanism:
 32 1. Motor: Max 2 HP, Two Speed, 460 V, 3 Phase, 60 Hz, TEFC.
 33 2. Gear Reducer:
 34 a. Hollow, shaft type.
 35 b. Anti-friction bearings.
 36 3. Low friction/wear resistant chain guides and other panel alignment features that allow high
 37 speed operation.
 38 4. The drive chain is to be continuously supported on the downstream side of the influent
 39 screen.
- 40 E. Maintenance Features:
 41 1. Screen Panel Removal:
 42 a. The screen shall be designed to allow removal of individual screen panels at the
 43 operating floor level without taking the screen out of the channel or limiting the ability
 44 to continuously or intermittently rotate the screen.
 45 b. The screen panels are to be removable by unbolting connections between the screen
 46 panel and the drive chain on both sides of the panel.
 47 c. The connections are to be accessible through the access panels in the screen frames
 48 specified below.
 49 2. Access Panels in Screen Frames:
 50 a. Provide access panels on the frames on each side of the screen to allow removal of the
 51 screen panels, or checking the chain tension.

- 1 b. Approximately 10 IN x 12 IN with quick release fittings.
- 2 c. Approximately 48 IN above the operating floor level.
- 3 3. Access/View Panels in Screen Covers:
- 4 a. The front and back covers on each screen are to be provided with a clear Plexiglas
- 5 access panel to allow viewing the screen in operation and for cleaning the screen panels.
- 6 b. Minimum size:
- 7 1) 36 IN wide x 24 IN high.
- 8 c. Equip with durable seals that are retained and protected by framework welded to the
- 9 cover plates.
- 10 d. Front panels shall have quick-release fittings and back panels shall be hinged.
- 11 4. Discharge Chute/Hood:
- 12 a. A discharge chute/hood shall be provided that fully encloses the discharge section of the
- 13 screen. The upper section of the discharge chute/hood shall be hinged to allow complete
- 14 access to the screen cleaner brush and when opened will rotate downwards towards the
- 15 floor. The removable or hinged hood shall be secured with quick closing clamps and
- 16 supplied with two (2) gas cylinders to aid in opening and closing. Gas cylinders shall
- 17 hold the discharge hood in the open position without need for clamps or support rods.
- 18 Discharge hoods that rotate upwards allowing debris to fall on top of operators and
- 19 require securing clamps or rods to hold in the open position shall not be allowed.
- 20 b. The discharge chute/hood shall be from type 304 stainless steel.
- 21 c. Screen discharge chute/hood shall direct screenings directly to the compactor or other
- 22 device. Outlet shall extend down to the inlet of the compactor and shall be designed to
- 23 match the screenings compactor inlet hopper with no water leaking or screenings
- 24 dropping to the floor.
- 25 d. Provide hinged access panels on the discharge hood on each side of the screen to allow
- 26 for visual inspection.
- 27 5. Drive Chain Tensioning:
- 28 a. Provide to minimize chain, drive sprocket, and bearing wear.
- 29 b. Accurately maintain the tension of the screen drive chain and screen panel alignment.
- 30 c. Accomplished without removing the screen from the channel, or pivoting the screen out
- 31 of the channel.
- 32 d. Tensioning shall not require the removal of any screen cover plates, or guards.
- 33 e. Chain tensioning devices shall be readily accessible heavy-duty jacking screws located
- 34 on each side of the motor drive shaft.
- 35 F. Cleaning Mechanism:
- 36 1. The screen shall have an efficient cleaning system to completely remove collected debris
- 37 from the screen panels, and prevent the "carry-over" and accumulation of debris to the
- 38 downstream side of the screen, or the entrapment of material and gradual plugging of the
- 39 screen perforations over time:
- 40 a. Provide heavy-duty rotating brush or other method to clean the screen.
- 41 b. The motorized cleaner brush will automatically adjust as the brush wears during use.
- 42 The automatic adjustment will maintain consistent cleaning efficiency. The distance
- 43 between the cleaner brush and filter panels will be automatically controlled to ensure
- 44 the distribution and magnitude of pressure is equal across the entire filter panel surface.
- 45 Screens with rotating cleaner brushes requiring manual adjustment or adjustment with a
- 46 motor shall not be permitted.
- 47 c. If brushes are employed, the shape of the screen panels shall promote complete contact
- 48 with the rotating brush, with no sharp angles that would make the panels difficult to
- 49 clean.
- 50 d. If brushes are employed, brush-tensioning devices shall be provided on the outside of
- 51 the screen frame to allow the adjustment of the brush to maintain the desired contact
- 52 pressure with the screen panels.
- 53 2. Spray Water:
- 54 a. Provide spray water quick connection for optional use by the Plant staff for manual
- 55 intermittent cleaning the internal surfaces of the screen panels.

- 1 B. Lifting Lugs: The equipment shall be provided with lifting lugs.
- 2 1. Provide one set of lifting lugs four feet from the end of the screen frame for tipping the
- 3 screen out of the channel.

4 **2.6 FINISHES**

- 5 A. Stainless steel components shall be provided with an ASTM 480, No.1 finish.
- 6 B. All non-machined surfaces other than galvanized or stainless steel shall be shop painted with
- 7 Vendor's standard coating.

8 **PART 3 - EXECUTION**

9 **3.1 GUARANTEES**

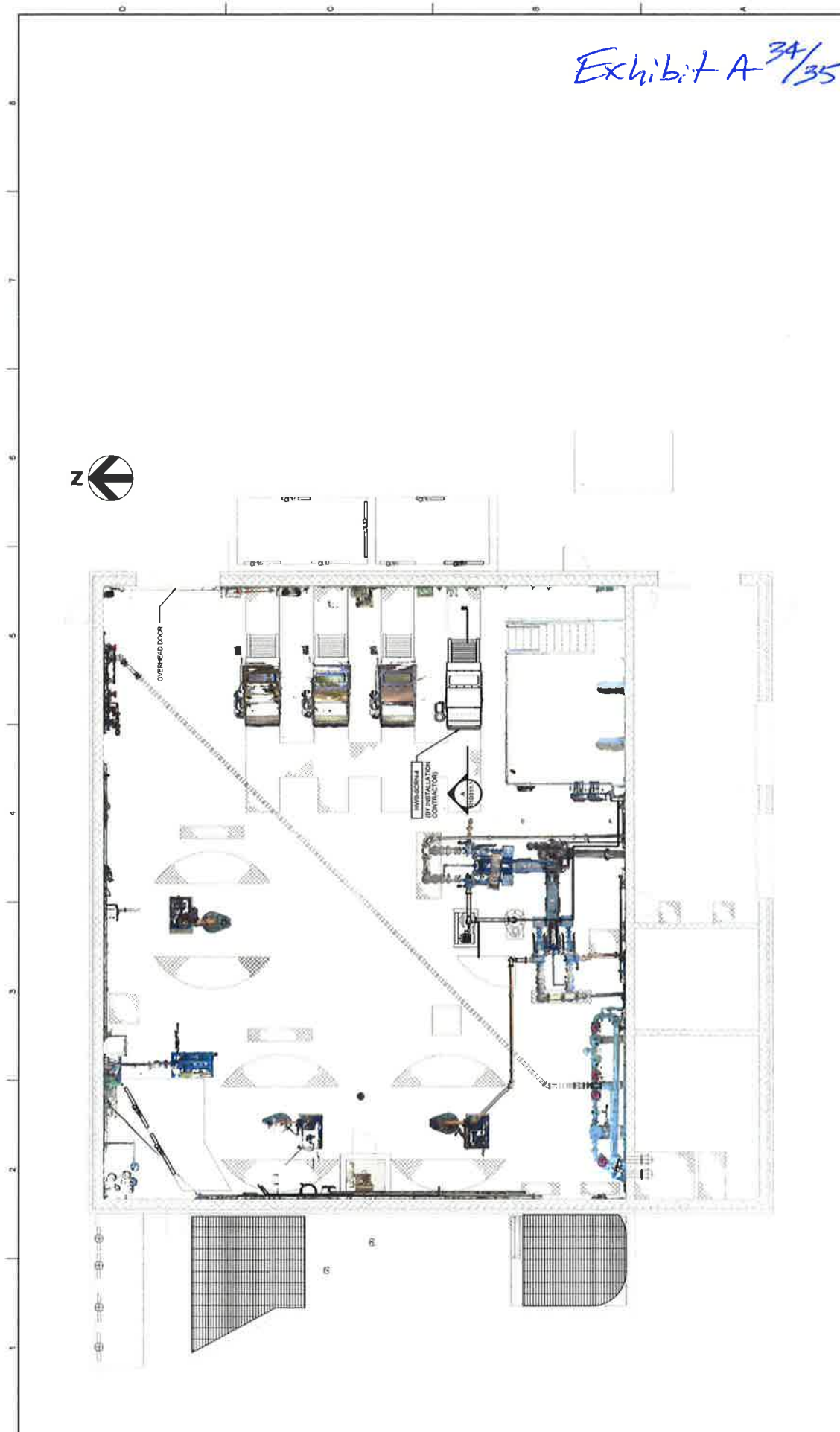
- 10 A. The screens shall be unconditionally guaranteed to meet or exceed design criteria detailed in Part
- 11 2 of this specification.
- 12 B. The screen Vendor shall provide a two-year unconditional guarantee from startup or 30 months
- 13 from delivery, whichever is sooner.

14 **3.2 FIELD QUALITY CONTROL**

- 15 A. Field Tests:
- 16 1. Upon completion of the installation, each screen unit shall be field tested to ensure
- 17 compliance with the performance requirements as specified. Seller shall be responsible for
- 18 the following:
- 19 a. Demonstration of the accuracy of the head loss performance claims submitted.
- 20 b. Demonstration of the ability of the screen to remove large debris by lifting a spherical
- 21 object of a minimum diameter of 4-IN off the bottom of the channel immediately
- 22 upstream of the screen.
- 23 2. Testing procedures shall duplicate as nearly as possible the conditions of operation and shall
- 24 be selected to demonstrate that the equipment is operational and free from damage.
- 25 3. The Installation Contractor shall demonstrate that the influent screens and associated field
- 26 panels operate according to the Specifications with assistance from the Seller.
- 27 4. The Seller shall observe the tests and sign the test forms.
- 28 B. Seller's Services:
- 29 1. Provide the following Seller's Services to be completed in a minimum of one 2 day trip:
- 30 a. Installation check for each screen including:
- 31 1) Confirm the equipment has been installed in accordance with Seller's
- 32 requirements and is ready for operation.
- 33 2) Initial lubrication.
- 34 3) Alignment.
- 35 b. Startup including:
- 36 1) Unattended trouble free operation.
- 37 2) Process stabilization.
- 38 3) Balancing and proper control system operation.
- 39 c. Training:
- 40 1) Provide 4 hours of the manufacturer's technical representative's time for on-site
- 41 training of Owner's personnel.
- 42
- 43

END OF SECTION

Exhibit A 34/35



**PRELIMINARY TREATMENT
HEADWORKS GROUND LEVEL PLAN**

Water Reclamation Facility
City of Billings, MT
W.O. 19-34

Headworks Screen
Procurement



PROJECT MANAGER	CHAO HANSEN
CIVIL	J. OSTROMER
STRUCTURAL	K. KOSCHER
ARCHITECTURAL	J. ROBERT
PROCESS	C. HANSEN
MECHANICAL	L. WORTH
ELECTRICAL	D. BERGER
INSTRUMENTATION	D. BEST
PROJECT NUMBER	203305

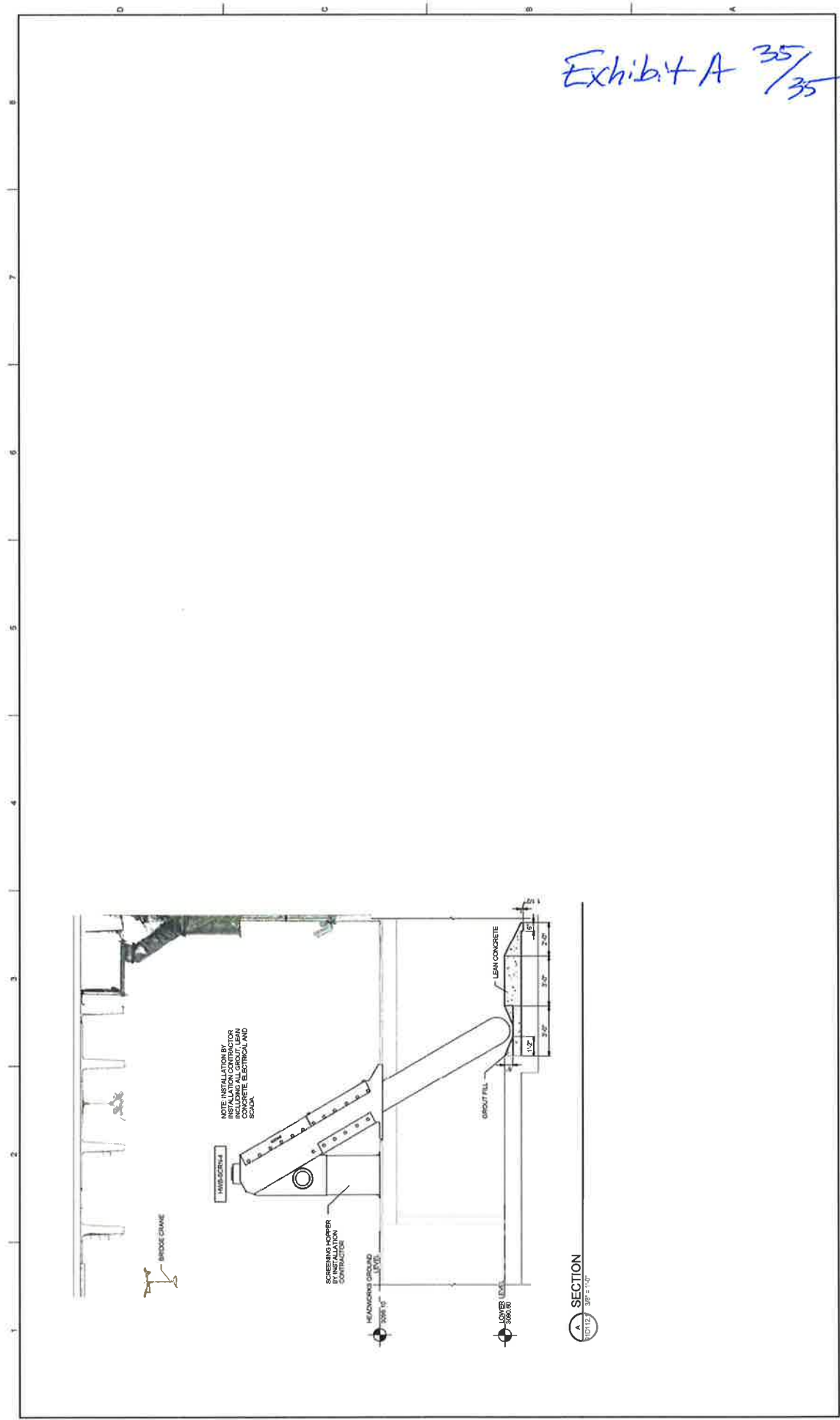
ISSUE	DATE	DESCRIPTION



FILENAME | 203305-1-PROCESS
SCALE | 3/8" = 1'-0"

SHEET
01D112.1

Exhibit A 35/35



PRELIMINARY TREATMENT
HEADWORKS SECTION

Water Reclamation Facility
City of Billings, MT
W.O. 19-34
Headworks Screen
Procurement

SHEET
01D311.1

FILENAME: 20230521-PROCESS08
SCALE: 3/8" = 1'-0"

STAR OF THE BIG SKY COUNTRY
BILLINGS

PROJECT MANAGER	CEMO HANSEN
CIVIL	J. OSTROMER
STRUCTURAL	K. KROEMER
ARCHITECTURAL	J. RICHENT
PROCESS	C. HARMEN
MECHANICAL	L. WORTH
ELECTRICAL	D. BEISNER
INSTALLATION	D. BEISNER
PROJECT NUMBER	202305

ISSUE	DATE	DESCRIPTION

HDR

SECTION
A
NOTED 3/8" = 1'-0"