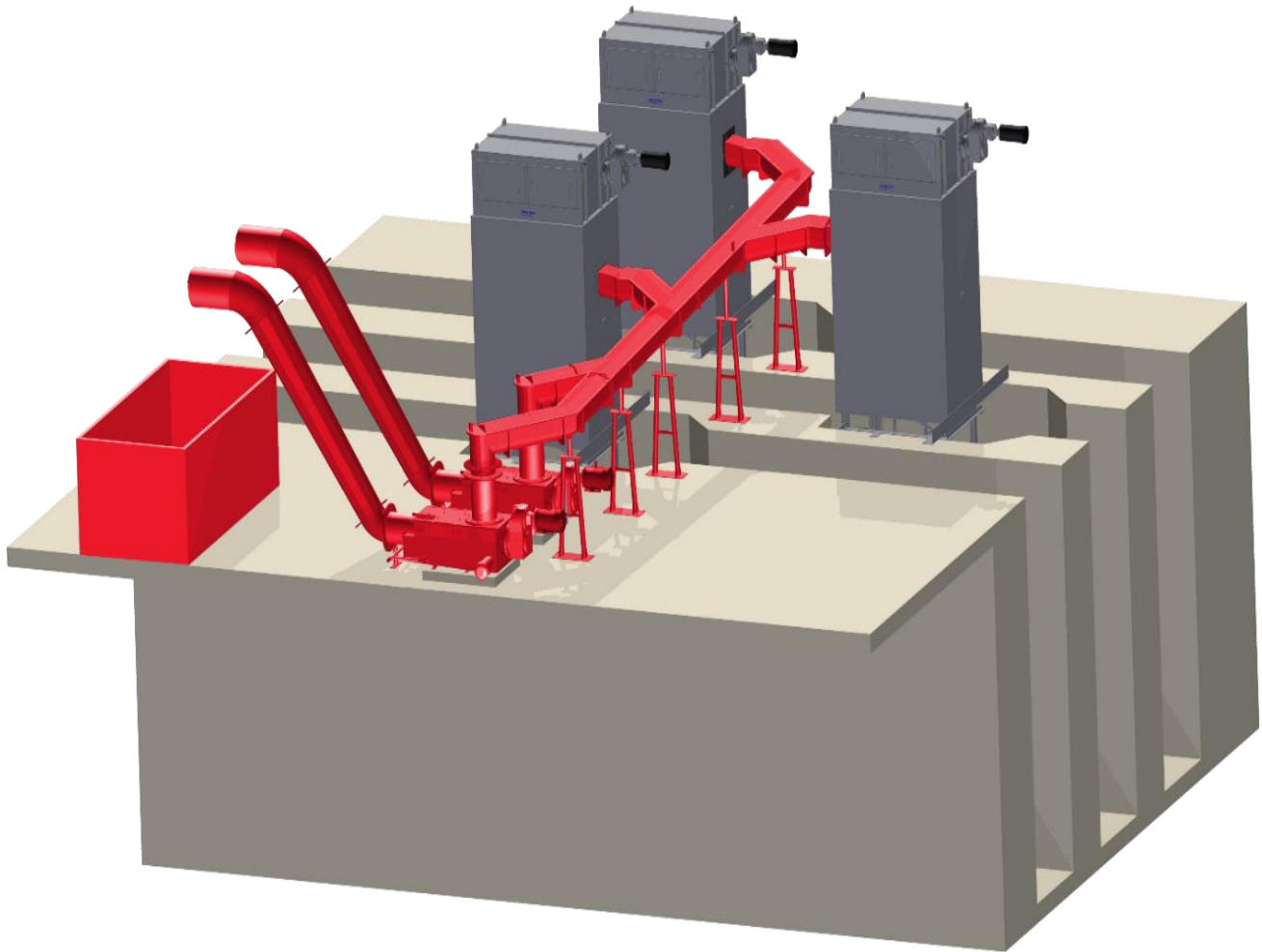


**GREAT WHITE CENTER FLOW SCREENS, WHITETIP
SHARK WASHING COMPACTORS AND GRIT PACKAGE
PROPOSAL FOR SAN LUIS WEST WWTP
SAN LUIS, AZ
DECEMBER 13, 2024**



ORIGINAL EQUIPMENT MANUFACTURER



**4750 118th Avenue North • Clearwater, Florida 33762
Phone: 813-818-0777 • Fax: 813-818-0770**

Mr. Randall Dow, Sales and Marketing Director
Hydro-Dyne Engineering
4750 118th Avenue North
Clearwater, FL 33762

December 13, 2024

To: PACE
Attention: Nathaniel Tesch,
Ref: REQUEST FOR PROPOSALS ("RFP")
San Luis – West WWTP
San Luis, AZ

Dear Mr. Tesch:

Thank you for opportunity for Hydro-Dyne Engineering ("Hydro-Dyne") to offer equipment and services for the San Luis, AZ – West WWTP Project. We are an ISO 9001:2015 certified and BABA compliant, in-house US manufacturer of custom screening and grit removal equipment, uniquely qualified to design and manufacture the multi-stage Center Flow screening equipment and grit removal equipment for San Luis, AZ.

Hydro-Dyne prides itself on making high-quality equipment. Our patented designs are simple and robust and therefore reliable. Some of our older screens have been in service for 30 years or more. There are no submerged sprockets, bearings, or chains that need to be maintained or fixed, much less allow rags to wrap around them. Our products are always made of stainless steel that we pickle and passivate in-house.

I wish to highlight specific RFP evaluation criteria:

1. BABA Compliance – Hydro-Dyne can provide a system that is fully compliant with BABA requirements at no additional cost or extension of delivery schedule. Included is an Appendix "BABA Compliance Certificate and Factory Overview" with our BABA Certification.
2. Capital Cost – Hydro-Dyne price reflects the value we provide in our equipment design, the quality of our US based manufacturing and the industry's lowest cost to maintain equipment. Hydro-Dyne has taken exception to several RFP requirements (see Exhibit D), in order to provide the most competitive capital equipment offer.

Hydro-Dyne is quoting an upgraded enhanced washing compactor which exceeds the RFP requirement to produce dewatered screenings capable of passing the EPA Paint Filter Test as described in method 9095 of EPA Publication SW-486. Smaller opening (6mm and smaller) perforated plate screens may remove a high amount of organic solids which need to be thoroughly washed and returned to the channel by the washing compactor. The quoted washing compactor will meet the following specifications:

- Weight reduction up to 80%
- Screening volume reduction up to 85%
- Organic removal up to 95%
- Dewatered screenings dry solids content up to 40% (depending on material to be dewatered)



3. Maintenance Cost – Hydro-Dyne has the industry’s lowest equipment lifecycle costs due to a myriad of factors, including multiple proprietary designs, component selection, pickling process and proven record of operational longevity. A majority of the replacement parts included as part of our bid, will not require use as replacements over the next 10 years. We maintain an inventory of spare parts and can quickly manufacture and deliver other parts within days. Included is an Appendix “10 Year Life Cycle Cost: Screening and Grit Removal Systems” which provides a detailed spreadsheet of labor, power and replacement parts costs over 10 years.
4. References – Hydro-Dyne is including as Exhibit A, our list of eleven MBR System United States reference installations, including two (Mountain House, CA and Goodyear (Sarival), AZ) of design similar to San Luis, AZ. Our oldest dual stage membrane screening system (Canton, OH – 88MGD design flow) has been in operation for over 9 years.

Hydro-Dyne is the only Center Flow Band Screen to receive pre-approval from three major MBR System Suppliers (Dupont (Memcor, Veolia (Suez) and Kubota) for use in protect of their MBR Systems.

5. Technical Support – Hydro-Dyne has an experienced and dedicated team of in-house factory trained service technicians. They can provide prompt phone support and can be quickly deployed to Sarival, AZ for any needed service support. We also have a local representative (Joe Wolfer, JBI) who can deploy to the site quickly.
6. Schedule Support – All of the resources required to design, procure, manufacture, assemble, and test our equipment, is located under one roof at our Clearwater, FL factory. This gives us total control over our submittal and manufacturing delivery lead times.

Key Members of Hydro-Dyne Engineering’s Team, all located at our Clearwater, FL factory, Include:

Jay Conroy – President/Owner
Christy Howard – Vice President
Brett Malson – VP Operations
Joe Clark – Sales Director
Randy Dow – Sales & Marketing Director
Brandon Leeth – Regional Sales Manager
Chris Brierley – Engineering Director
David Scatton – Quality Assurance Manager
Tim Nemes – Production Manager
Tony Farmer – Service Manager

Once again, Hydro-Dyne Engineering appreciates this opportunity to submit a bid and looks forward to discussing our proposal with you.

Kindest regards,

Randall Dow
Sales and Marketing Director
Hydro-Dyne Engineering, Inc.

GREAT WHITE CENTER FLOW SCREENS, WHITETIP SHARK WASHING COMPACTORS AND GRIT
PACKAGE BID PROPOSAL PACKAGE INDEX

File Name: San Luis, AZ

- 1) Recommended Technical Specifications for Fine Screens
 - a. Peak Flow: 7.5 MGD
 - b. Grid Type: UHMWPE Perforated Panels Opening Size: 6 mm (1/4")
 - c. Channel Depth: 66"
 - d. Channel Width: 18"
 - e. Channel Recess Width around Screen: 36"
 - f. Material of Construction: 304 Stainless Steel

- 2) Hydraulic Capacity & Headloss Calculations for Fine Screens

- 3) Recommended Technical Specifications for Ultra Fine Screens
 - a. Peak Flow: 7.5 MGD
 - b. Grid Type: Stainless Steel Perforated Panels Opening Size: 2 mm (5/64")
 - c. Channel Depth: 102"
 - d. Channel Width: 18"
 - e. Channel Recess Width around Screen: 36"
 - f. Material of Construction: 304 Stainless Steel

- 4) Hydraulic Capacity & Headloss Calculations for Ultra Fine Screens

- 5) Recommended Technical Specifications for Grit Package:
 - a. Peak Flow: 7.5 MGD
 - b. Vortex Grit Trap components for Concrete Chamber with 5hp Gorman Rupp Grit Pump
 - c. Grit Classifier with Krebs DB10 Cyclone
 - d. Material of Construction: 304 Stainless Steel

- 6) Proposed Drawings:
 - a. Headworks Proposed Layout - Plan View
 - b. Headworks Proposed Layout – View A-A
 - c. Headworks Proposed Layout - View B-B
 - d. Headworks Proposed Layout - View C-C
 - e. Headworks Proposed Layout - View D-D
 - f. Screen Breakout Assembly
 - g. Washing Compactor Breakout Assembly
 - h. Grit Trap Breakout Assembly
 - i. Grit Classifier Breakout Assembly

- 7) Exhibits
 - a. Exhibit A – Reference List & Membrane Supplier Approvals For Use Of Hydro-Dyne Engineering Screens To Protect MBR Systems
 - b. Exhibit B – Performance Bond – Surety Letter of Bondability
 - c. Exhibit C – Equipment Summary List
 - d. Exhibit D – Exclusions/Exceptions
 - e. Exhibit E – Addendum Acknowledgement Form

8) Appendices

- a. 5-Year Service Proposal
- b. Typical Sequence Of Operation For Two Channel Integrated Headworks System
- c. UKWIR Certificates for Hydro-Dynes 2mm and 6mm Center Flow Screens
- d. Bipartisan Infrastructure Law, Build America, Buy America and Domestic Content Assurance of Compliance and Factory Overview
- e. 10 Year Life Cycle Cost: Screening and Grit Removal Systems
- f. Standard Spare Parts Pricing and Availability
- g. Sample Operation and Maintenance Manual (See Separate File)
- h. Certificate of Conformance
- i. Literature



Tel: 813-818-0777 Fax: 813-818-0770

Represented Locally By:

HRM
 Attn: Jay Martin
 Number-(817)-835-0195

December 9, 2024

Ref: San Luis, AZ - West WWTP
 Bid Date: 12/13/24
 Specification: RFP
 Appendices: 1,2

Hydro-Dyne Engineering Scope of Work 5753-7, 8, 9

Hydro-Dyne Engineering is pleased to offer this Scope of Work for the equipment detailed below in accordance to the specification(s) and addendum(s) stated above, and the attached Hydro-Dyne Engineering Terms and Conditions. Where clarifications to the specifications are necessary, they will be listed below.

Hydro-Dyne Specification Section	Description Center Flow Coarse/Fine Screen	Quantity
2.2	Center Flow Coarse Center Flow Fine	2 each 2 each
2.3	Weir (coarse and fine)	4
2.4	Sluice	2
2.5	Washing Compactor Coarse Washing Compactor Fine	2 2
2.6	Spare Parts	1 lot
2.7	Accessories	1 lot
2.8	Controls	1 lot

Hydro-Dyne Specification Section	Description Grit System	Quantity
2.2	Vortex Grit Trap	2
2.3	Grit Pump	2
2.4	Grit Classifier	2
2.5	Controls – (included with Screen Controls)	
2.7	Spare Parts	1 lot
2.8	Accessories	1 lot

	Total Base Price	USD\$
Adder	1 Year Extended Warranty (Total 3 years)	
Adder	12 month validity extension – beyond initial 6 months (for notification to proceed with manufacturing)	
Adder	5 – YEAR ON-SITE INSPECTION AND SERVICE PLAN	
Adder	Performance Bond	

FREIGHT

F.O.B shipment point with freight costs included.

NOT INCLUDED

This scope of work is limited to the specification section(s) and addendum(s) referenced above. Any other documents are not included. Concrete work, installation, plumbing, wiring connections, valves, strainers, level sensor mounts, engineering certifications or seals, seismic/wind calculations and related PE stamps, and anything else not specifically detailed as included by the manufacturer in the specification above will be construed as NOT INCLUDED, whether or not inclusion is specifically acknowledged.

This scope of work does not include supply of any type of bond unless specifically itemized in the table above.

COMPLIANCE WITH BIPARTISAN INFRASTRUCTURE LAW (BIL Public Law 117-58)
and BUILD AMERICA, BUY AMERICA ACT (BABA)

Equipment supplied in this Scope of Work will comply with the Bipartisan Infrastructure Law's (BIL) Build America, Buy America (BABA) requirements for manufactured products. As defined in the Law, this means:

- (i) the manufactured product was manufactured in the United States, and
- (ii) the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product.

VALIDITY

Price quoted is firm provided:

1. Written acceptance is received at the factory **and notification to proceed with manufacture** within 180 calendar days of the date of this offering.
2. Purchaser agrees to timely review and approval of submittals. The Purchaser is permitted a maximum of thirty (30) calendar days for the review and return of initial submittals, and fourteen (14) calendar days for the review and return of any resubmittal. Purchaser is allowed no more than one (1) resubmittal. Any delays in the review and approval process or any resubmittals exceeding this limit may result in a price escalation, not to exceed 1.5% per calendar month of the total purchase price. Hydro-Dyne Engineering reserves the right to impose not only additional costs, but such delays may also affect the overall project timeline.
3. Purchaser agrees to accept shipment 26 to 30 weeks from date of receipt of approved drawings and authorization to proceed with manufacture. Shipments delayed by the purchaser or his agents will be escalated at a rate of 1-1/2% per calendar month, compounded, of the value of the unshipped portion.

PROJECT DELIVERY SCHEDULE

- Time required to generate an acceptable submittal for the Engineer's review – 6 weeks
- Time required to manufacture the equipment once the submittal has been approved by the Engineer and receipt of Notification to Proceed – 26 Weeks
- Time of delivery for O&M Manuals – Prelim - 8 weeks after approved submittals, Final – 16 weeks after submittal approval.
- Time of delivery of complete equipment systems – 1 week after manufacture of equipment
- Schedule delay (for both shop drawing submittals preparation and equipment fabrication and delivery with O&M Manual) will result in liquidated damage of \$500 per calendar day with cap at 50% of the equipment cost starting two weeks after milestone due date.

TAXES

Applicable sales or use taxes, fees, permits, and licenses are not included.

COMMISSIONING SERVICE & CUSTOMER TRAINING

- This service will not exceed three (3) trips and five (5) eight-hour working days.
- Each additional trip will be figured at \$2,000 and each additional day onsite will be figured at \$1,200. It is agreed and understood that all necessary utilities such as water, electric, air, etc. be connected and functional prior to the arrival of our servicemen.
- A complete job of checking, adjusting, etc. of the equipment and installation cannot be accomplished unless the plant is ready to operate at the time this service is to be performed.
- Our servicemen are non-union technicians and any extra cost for other assisting personnel as required by local union regulations is not included in this proposal.
- Advance notification of at least fifteen (15) working days prior to the date start-up service is required.

WARRANTY

The equipment and all appurtenances including, but not limited to: frame, supports, covers, and mechanisms manufactured by Hydro-Dyne Engineering are warranted for a period of 24 months against defects in materials and workmanship, starting upon beneficial use or 90 days after delivery, whichever occurs first. The Warranty covers repair or replacement of the defective components, but does not include labor to remove and install equipment or parts, or shipping and freight charges to and from the purchaser's job site. The Warranty shall also not apply to any parts, equipment, accessories or components that were either manufactured or were designed by any person or entity other than Hydro-Dyne Engineering itself. Hydro-Dyne will provide any pass-through warranty that is permitted to pass-through to Purchaser in connection with the portions of the Products that are not Warranted Parts.

Optional Adder - 5 – YEAR ON-SITE INSPECTION AND SERVICE PLAN

One of our factory trained field service technicians will be on-site at your facility once per year to perform all the adjustments and tests that your specific Hydro-Dyne equipment requires to stay functioning at peak performance. Please see Attachment for details of service plan.

PAYMENT TERMS AS QUOTED

10% on Approved Submittal(s) - paid after assignment of contract to contractor and issuing of notice to proceed to manufacture equipment

70% on Delivery

15% on Start Up & Training

5% on Delivery of Final O&M Manual(s). Operation & Maintenance Manuals must be submitted and approved prior to shipping equipment to the jobsite.

- Past due balances will be subject to a service charge of 1-1/2% per month on the unpaid balance and services, including shipping and startup, will not be scheduled until account is current.

CLARIFICATIONS TO THE RFP

1. Hydro-Dyne's pricing is valid based on notification to proceed with manufacture by 6/9/25.
2. RFP 1.a.v - Hydro-Dyne is taking exception to the requirement to supply Volume in cubic yards of structural concrete required – Hydro-Dyne's design fits within a footprint of 27.0 ft x 63.2 ft, well within the 42 ft x 72 ft area identified in the RFP.
3. RFP 1.b. - There is no cost adder or schedule impact for providing a BABA compliant system.
4. RFP 1.e – Hydro-Dyne is willing to provide a Performance Bond in the amount of 100% through the end of warranty period. Hydro-Dyne is supplying a Letter of Bondability from our Surety in lieu of a letter in Hydro-Dyne letterhead.
5. RFP 1.e – Hydro-Dyne is taking exception to the requirement to provide a letter stating our willingness to provide a 100% performance guarantee for the duration of the warranty. Hydro-Dyne is excluding the Performance Guarantee from our offer.
6. RFP 1.g. – Hydro-Dyne is taking exception to the escalation clause and is including an adder for cost escalation to extend bid validity an additional 12 months. Note bid validity is based on date Notice To Proceed is received.
7. 4 - Maintenance and Repair Contract – Hydro-Dyne is taking exception to the Full Maintenance and Repairs Contract provisions. Hydro-Dyne is including, as an adder, a 5-year service plan as part of our offer.
8. 5 – Guarantee - Hydro-Dyne is taking exception to the following *“Further, it shall state that required subsystems or appurtenances omitted will be provided by the vendor at no additional cost to the owner.”*
9. 6 – Warranty – Hydro-Dyne is taking exception to the following *“The warranty shall include meeting the performance guarantee specified. Vendor shall bear 100% of any replacement costs or costs incurred due to upgrades required to meet the performance requirements during the lifetime of the warranty period and/or the duration of the Full Maintenance and Repair Contract.”* Hydro-Dyne is providing our standard 2 year warranty.
10. 8 - Equipment Performance, Layouts, and Specifications – Hydro-Dyne is taking exception to the following *“Performance data provided shall be guaranteed for the duration of the warranty period and/or Full Maintenance and Repair Contract.”*
11. 9 - Equipment/System Automation - Hydro-Dyne's system is designed for fully automatic operation with minimal operator attention. See Appendix “Typical Sequence Of Automatic Operation For Two Channel Integrated Headworks System”, for detailed description of system's automatic operation.

CLARIFICATIONS TO THE RFP

12. 12 – Schedule Liquidated Damages - Hydro-Dyne can agree to liquidated damage provisions for late delivery as revised below: “Should Seller delay the Project, or any portion thereof, in any way, then Supplier’s sole liability and Purchaser’s sole remedy is assessment of liquidated damages of \$500/day, starting 2 weeks after the contractual milestone date, up to 50% of the contract value, only if Purchaser is assessed liquidated damages by the Owner as a result of Supplier’s delay.”
13. RFP 1.2.D - Hydro-Dyne is quoting an upgraded enhanced washing compactor which exceeds the RFP requirement to produce dewatered screenings capable of passing the EPA Paint Filter Test as described in method 9095 of EPA Publication SW-486. Smaller opening (6mm and smaller) perforated plate screens may remove a high amount of organic solids which need to be thoroughly washed and returned to the channel by the washing compactor. The quoted washing compactor will meet the following specifications:
 - Weight reduction up to 80%
 - Screening volume reduction up to 85%
 - Organic removal up to 95%
 - Dewatered screenings dry solids content up to 40% (depending on material to be dewatered)
14. RFP 1.2.I - Details of electrical classification environments are not provided in the RFP. Hydro-Dyne is quoting both C1D2 components (motors, MCP) and C1D1 components (solenoids, LCS, level instruments) and can supply C1D1 components for a cost adder, if the final design requires these to be placed in a C1D1 environment.
15. Exhibit C – Capital Cost Summary – Hydro-Dyne costing details are for information only as we are providing an integrated package. Pricing provided cannot be used to purchase selective line items.
16. Materials of Construction - Hydro-Dyne is supplying our standard paint coatings and is taking exception to the paint spec for gears, motors and bearings. We can provide an adder to supply spec compliant paint if requested.
17. Payment Terms & Conditions A.1. – Hydro-Dyne takes exception to the statement “*Equipment submittal is required prior to the execution of this contract for the Engineer to review and approve.*” **Hydro-Dyne cannot start submittals until execution of the contract. We can complete submittals under a separate contract for 10% of the total order value. This contract will be billed and payments received within 30 days of submittal approval.**
18. Payment Terms & Conditions A.1. – The statement “*billing and payments will not commence until the assigning of this contract to the Construction Contractor where in the Construction Contractor will issue the Notice to Proceed to Order Equipment to the Vendor*”, does not define the time period between completion of submittals and the issuing of the notice to proceed. Hydro-Dyne pricing validity and validity extensions are based on receipt of the notification to proceed within 6 months of the proposal date.
19. Payment Terms & Conditions B. - Hydro-Dyne takes exception to Payment Terms paragraph B.
20. Hydro-Dyne proposal does not include engineering certifications or seals, seismic/wind calculations and related PE stamps. These can be provided for a cost adder upon request.

For additional information, please contact our local representative listed above or me personally.

Sincerely,

Randall Dow

Sales Director

Hydro-Dyne Engineering, Inc.

Hydro-Dyne Engineering Inc.
Terms & Conditions

1. ENTIRE AGREEMENT. This Agreement constitutes the complete agreement and understanding between Hydro-Dyne Engineering Inc. (“Seller”) and the purchase order issuer (“Purchaser”) with respect to the subject matter hereof and supersedes all prior solicitations, agreements, understandings and representations between the parties. This Agreement consists of these Terms and Conditions, Seller’s Scope of Work (the “SOW”), and Owner’s specifications (the “Owner Specs”). The SOW references the Owner Specs and provides clarifications and modifications to the Owner Specifications. If there is any conflict between the Owner Specifications and the SOW, the SOW shall control. Prior dealings, usage of the trade, and course of performance shall not be used to determine the meaning of this Agreement. Any terms and conditions included in Purchaser’s acceptance/purchase order that are in addition to or different from this Agreement shall have no force and effect and shall not be deemed to be part of this Agreement, except that the purchase price for the “Products” (as defined below) set forth in Purchaser’s acceptance/purchase order shall be deemed to be part of this Agreement unless Seller objects to the purchase price (and if Seller objects, a revised purchase price for the Products shall be mutually agreed between the parties and then listed in a revised acceptance/purchase order from Purchaser). Any agreement between the final equipment owner (“Owner”) and Purchaser (the “Prime Contract”) shall not be deemed to be part of this Agreement, Seller is not a party to the Prime Contract, and Seller is not required to comply with the Prime Contract.

2. DELIVERY. The SOW sets forth the delivery point(s) and delivery terms for delivery of the products expressly set forth in the SOW to be delivered to Purchaser under this Agreement (the “Products”). Seller shall not be liable to Purchaser or in breach of this Agreement if delivery does not occur by the dates set forth in the SOW as such dates are estimated delivery dates. If any delivery is or may be delayed by reason of Force Majeure (as defined in Section 10), Seller may at its option tender delivery to Purchaser at any point of manufacture and such shall constitute delivery for all purposes under this Agreement. If Purchaser fails to accept delivery when made by Seller, Purchaser shall promptly reimburse Seller for all costs associated with such failure, including costs of storage of the Products, regardless of whether some or all of the storage occurs at Seller’s facilities, and the storage location(s) shall be deemed to be the delivery point(s). If shipment is postponed at the request of Purchaser, as a result of delay in receipt of shipping instructions, or due to any other cause or reason other than the negligence or willful misconduct of Seller, payment of the purchase price for the Products by Purchaser shall be due on notice from Seller that the Products are ready for shipment, and the delivery point will then be the current location of the Products. Handling, moving, storage, insurance and other charges thereafter incurred by Seller with respect to the Products shall be for the account of Purchaser. Risk of loss shall pass to Purchaser at the delivery point.

3. TITLE. Seller shall retain all right, title, and interest in the Products to the extent permitted by applicable law, including a security interest in the Products, until the full purchase price has been paid to Seller. Without limiting the foregoing, until Purchaser pays Seller the full purchase price for the Products, Purchaser grants to Seller a purchase money security interest in the Products. Purchaser authorizes Seller to file, with or without Purchaser’s signature, and Purchaser will cooperate fully with Seller regarding, any documents needed to perfect a security interest with the appropriate jurisdiction(s). The giving and accepting of drafts, notes and/or trade acceptances to evidence the payments due shall not constitute or be construed as payment so as to pass Seller’s interests until said drafts, notes and/or trade acceptances are paid in full.

4. PAYMENTS. The payment terms for the Products are set forth in the SOW, the purchase price for the Products shall be set forth in the manner described in Section 1 above, and other amounts owed for or relating to the Products (e.g., Taxes/Surcharges, as defined below) are set forth in these Terms and Conditions. Seller may at its option ship the Products in stages and if it does so Purchaser shall pay

Seller on a pro rata basis, as shipped, for the amounts then owed. If Purchaser fails to make a payment under or relating to this Agreement by the due date, interest at a rate of the lesser of the maximum rate allowed by law, and one and one half percent (1.5%) per month, calculated daily, shall apply from the due date for payment. Purchaser shall promptly pay Seller's attorneys' fees and all other expenses of Seller incurred in seeking to collect past-due amounts owed under or relating to this Agreement. The purchase price does not include any federal, state, local, or provincial sales, use, value-added, excises, or other taxes or any surcharges, or import fees or duties (collectively, "Taxes/Surcharges"). Seller shall list Taxes/Surcharges separately on each invoice, and Purchaser is responsible for paying all Taxes/Surcharges to Seller. Purchaser shall pay to Seller any amounts owed under this Agreement when due and Purchaser shall not be entitled to setoff or apply against any money due or claimed to be due from Seller to Purchaser on account of any other agreement, transaction or claim unless Seller agrees in writing to be responsible and liable on each such occasion.

5. WARRANTY.

a. Solely for the benefit of Purchaser, Seller warrants that the portion of the Products that are both designed and manufactured by Seller (the "Warranted Parts") shall be free from defects in material and workmanship for the "Warranty Period", which (a) shall begin on the "Warranty Period Commencement Date". The Warranty Period Commencement Date shall be the earlier of (1) ninety (90) days from the date of delivery of the Warranted Parts, and (2) the date the Products are beneficially occupied by the Seller. The Warranty Period Length shall be documented by the SOW. Notwithstanding the foregoing, if the Warranted Parts are delivered in stages, then the Warranty Period described above shall apply on a per stage basis.

b. If any of the Warranted Parts fail to comply with the Warranty during the Warranty Period, Purchaser notifies Seller of such failure during the Warranty Period (and no later than five (5) days after Purchaser discovers the non-compliance), Purchaser is at the applicable time in full compliance with this Agreement, and none of the exclusions set forth in Section 5(c) apply, Seller shall repair or replace, at its option, free of charge to Purchaser (other than that of labor to remove and install equipment or parts, shipping and freight charges), at Seller's location or other location that Seller designates, any Warranted Part, or the relevant portion thereof, that examination by Seller establishes has failed under normal use and service operation (according to the guidelines of the applicable Operation and Maintenance Manual) by Purchaser within the Warranty Period; provided, that if it would be impracticable for the Warranted Part or relevant portion thereof to be returned to Seller as determined by Seller, Seller will visit Purchaser's job site to inspect the Warranted Part; however, if it is determined by Seller after inspection that Seller is not responsible under the Warranty, Purchaser shall pay seller published travel and other costs of Seller with respect to the site visit detailed in the SOW. Warranted Parts repaired or replaced under the terms of this warranty remain warranted under the original warranty period only. Proof of maintenance logs as dictated in the applicable Operation and Maintenance Manual will be required by the seller from the owner.

c. In addition to any other limitation or disclaimer with respect to the Warranty, the Warranty shall not apply if any defect in material or workmanship in the Warranted Part is caused in whole or in part by any acts or omissions of Purchaser or any other person or entity other than Seller (e.g. negligence acts, willful misconduct, or alterations to the Warranted Parts, by any person or entity other than Seller, failure to operate or maintain equipment under normal operating conditions in accordance with applicable Operation and Maintenance Manual(s), compromising equipment protection via controls changes), or any event (e.g., an accident during transit) or condition (e.g. decomposition of Warranted Parts by chemical action, erosion or corrosion or wear to Warranted Parts or due to conditions of temperature, moisture and dirt), beyond the reasonable control of Seller, including any Force Majeure event. The Warranty shall also not apply to any Products that are not Warranted Parts (e.g., parts, equipment, accessories or components that were either manufactured or were designed by any person

or entity other than Seller itself), but if there is any pass-through warranty that Seller is permitted to pass-through to Purchaser in connection with the portions of the Products that are not Warranted Parts, Seller shall do so.

d. THE PARTIES AGREE THAT OTHER THAN THE WARRANTY SET FORTH IN SECTION 5(a) WITH RESPECT TO THE WARRANTED PARTS ONLY, ALL OTHER WARRANTIES (WITH RESPECT TO THE PRODUCTS OR OTHERWISE RELATING TO THIS AGREEMENT), EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, WHETHER WRITTEN, ORAL OR STATUTORY, ARE EXCLUDED BY SELLER TO THE FULLEST EXTENT PERMISSIBLE BY LAW.

6. DRAWINGS AND TECHNICAL DOCUMENTATION. The seller requires approval of the Drawings before Seller begins manufacturing the Products, shipment may be delayed if the Drawings are not returned to Seller within forty-five (45) days of receipt by Purchaser of the Drawings for approval. Seller will furnish only general arrangement, general assembly, and if required, wiring diagrams, erection drawings, installation and operation-maintenance manuals for Seller's equipment (in English language). Seller will supply a maximum of three (3) complete sets of drawings and operating instructions. Additional sets will be paid for by Purchaser. Electronic files, if requested from Seller, will be provided in *pdf, jpg or tif* format only.

7. INDEMNITY. Purchaser shall defend, hold harmless, and indemnify Seller and its affiliates, and each of their employees, officers, directors, representatives, contractors and agents (individually and collectively, "Indemnitees"), against all damages, costs, liability, losses, and expenses, including reasonable attorneys' fees, incurred by any Indemnitees in connection with any claim, action, demand, suit, or proceeding (individually and collectively "Claims"), arising out of, or relating to, the negligent acts or omissions of Purchaser, willful misconduct of Purchaser, or any breach of this Agreement or violation of law by Purchaser.

8. DEFAULT, TERMINATION. In the event that a party materially breaches this Agreement and does not cure within thirty (30) days of notice of such material breach from the other party, or such longer time as reasonably necessary to cure such breach, the non-breaching party may terminate this Agreement. Notwithstanding the foregoing, Seller shall also have the right to terminate this Agreement if Purchaser fails to pay any amount owed within ten (10) days after the due date for such payment. If Purchaser becomes insolvent, commits an act of bankruptcy or defaults in the performance of any term or condition of this Agreement, the entire unpaid portion of the purchase price shall, without notice or demand, become immediately due and payable. Seller at its option, without notice or demand, shall be entitled to sue for said balance and for reasonable legal fees, plus out-of-pocket expenses and interest; and/or to enter any place where the Products are located and to take immediate possession of and remove the Products, with or without legal process; and/or retain all payments made as compensation for the use of the Products; and/or resell the Products, without notice or demand, for and on behalf of the Purchaser, and to apply the net proceeds from such sale (after deduction from the sale price of all expenses of such sale and all expenses of retaking possession, repairs necessary to put the Products in saleable condition, storage charges, taxes, liens, collection and legal fees and all other expenses in connection therewith) to the balance then due to Seller for the Products and to receive from the Purchaser the deficiency between such net proceeds of sale and such balance. Purchaser hereby waives all trespass, damage and claims resulting from any such entry, repossession, removal, retention, repair, alteration and sale. The remedies provided in this paragraph are in addition to and not limitations of any other rights of Seller.

9. TERMINATION FOR CONVENIENCE. Purchaser may terminate this Agreement for convenience upon notifying Seller at least thirty (30) days prior to the "termination date" set forth in the notice and paying Seller for all costs and expenses (including overhead) incurred by it in

performing its work and closing out the same plus a reasonable profit thereon in an amount determined by Seller. Purchaser shall pay all such costs and expenses and the reasonable profit to Seller within ten (10) days of the termination of the Agreement.

10. FORCE MAJEURE. If Seller is unable, wholly or in material part, by any reason of Force Majeure to carry out any of its obligations hereunder, then on Seller's notice to Purchaser within a reasonable time after the occurrence of the cause relied upon, such obligations shall be suspended. "Force Majeure" shall include, but not be limited to, acts of God, laws and regulations, strikes, civil disobedience or unrest, pandemics, lightning, fire, flood, washout, storm, communication lines failure, delays of the Purchaser or any third party, breakage or accident to equipment or machinery, wars, police actions, terrorism, embargos and any other causes that are not reasonably within the control of the Seller. Notwithstanding anything in this Agreement to the contrary, if the delay is the result of Purchaser's action or inaction, then in addition to an adjustment in time, Purchaser shall promptly reimburse Seller for Seller's costs incurred to maintain its schedule or to seek to limit any slippage from the schedule as much as reasonably practicable under the circumstances.

11. CHOICE OF LAW, CHOICE OF VENUE. This Agreement shall be governed and construed in accordance with the laws of the State of Florida, without regard to its rules regarding conflicts or choice of law. The parties submit to the exclusive jurisdiction and venue of the state and federal courts located in Pinellas County or Clearwater, FL. The parties irrevocably waive the right to request trial by jury.

12. ASSIGNMENT. Purchaser shall not assign or transfer this Agreement without the prior written consent of the Seller. Any attempt to make such an assignment or transfer shall be null and void. Seller shall have the authority to assign, or otherwise transfer, its rights and obligations in connection with this Agreement, in whole or in part, upon prior written notice to Purchaser.

13. LIMITATION OF LIABILITY/NO LIQUIDATED DAMAGES, THIRD PARTY BENEFICIARIES, OR BACKCHARGES. Notwithstanding anything in this Agreement to the contrary, (i) except as set forth in Sections 7 and 9, under no circumstances shall either party be liable to the other party for any special, incidental, indirect, punitive or consequential damages, whether foreseeable or not, under, relating to, or arising out of this Agreement, including, without limiting the foregoing, for any losses relating to plant shutdowns, non-operation or increased expense of operation, service interruptions, or cost of purchased or replacement power; and (ii) the maximum aggregate liability of Seller under, relating to, or arising out of this Agreement, shall be the amount paid by Purchaser to Seller under this Agreement for the Products. This is an aggregate cap, not a per claim cap. This Section 15 shall apply to any and all claims, regardless of whether such claims are in contract, tort, strict liability or otherwise. The parties agree that there are no liquidated damages associated with this Agreement nor are there any third-party beneficiaries to this Agreement. In addition, under no circumstances shall Seller be responsible and liable for any work, repairs, replacements or changes to the Products, or any backcharges, unless Seller agrees in writing to be responsible and liable on each such occasion.

14. MISCELLANEOUS. The Parties are entering into this Agreement as independent contracting parties. This Agreement will not be construed to create an association, joint venture or partnership between the Parties or to impose any partnership liability upon any Party. This Agreement may be signed in counterparts, each of which shall be deemed an original, and all of which taken together shall constitute one single agreement between the Parties. A signature delivered by pdf format or facsimile will be considered an original. The Parties agree to act in good faith with respect to each provision of this Agreement and any dispute that may arise related hereto. The provisions of this Agreement that by their nature are continuing shall continue in full force and effect and shall bind the

Parties beyond any termination of this Agreement. Each Party shall have the right to use any agents, contractors, subcontractors, or other non-employees (individually and collectively, "Contractors/Agents" of such Party) to perform any of its obligations or to act on behalf of the Party. All actions of a Party's Contractors/Agents in connection with this Agreement are attributable to that Party for all purposes under this Agreement. The rights and remedies of the Purchaser in connection with the Products provided by Seller and limited to the rights and remedies expressly stated in this Agreement. Any failure by Seller to enforce Purchaser's strict performance of any provision of this Agreement will not constitute a waiver of Seller's right to subsequently enforce such provision or any other provision of this Agreement. If any portion of this Agreement is held to be invalid or unenforceable under applicable law, then the validity of the remaining portions thereof shall not be affected by such invalidity or unenforceability and shall remain in full force and effect. Furthermore, any invalid or unenforceable provision shall be modified accordingly within the confines of applicable law, giving maximum permissible effect to the parties' intentions expressed herein. Seller shall retain sole ownership of its intellectual property used or produced in connection with this Agreement, and Purchaser shall not gain any rights in such intellectual property under this Agreement or otherwise arising out of this Agreement. Each party has had an opportunity to independently review this Agreement, and the language in all parts of this Agreement shall in all cases be construed simply, as a whole and in accordance with its fair meaning and not strictly for or against any party. Each party has been given the opportunity to independently review this Agreement with legal counsel, and each party has the requisite experience and sophistication to understand, interpret and agree to the particular language of the provisions hereof. Accordingly, it is the parties' intent that in the event of an ambiguity in or dispute regarding the interpretation of this Agreement, this Agreement shall not be interpreted or construed against the party preparing it.

GREAT WHITE CENTER FLOW SCREEN & WHITETIP SHARK WASHING COMPACTOR TECHNICAL SPECIFICATIONS

Part 1 GENERAL

1.1 SCOPE – Supply all labor, materials, equipment and incidentals required to install and place into operation the fine and coarse screening system as shown on the Drawings and as specified herein.

1.2 REFERENCE STANDARDS – The properties of all materials, design, fabrication and performance of the equipment to be furnished under this section shall be in accordance with the latest issue of applicable standard specifications. The governing authorities of these standards are listed below.

- A. AISC, American Institute of Steel Construction
- B. AISI American Iron and Steel Institute
- C. ANSI, American National Standards Institute
- D. ASCE, American Society of Civil Engineers
- E. ASME, American Society of Mechanical Engineers
- F. ASTM, American Society of Testing and Materials
- G. AWS, American Welding Society
- H. IBC, International Building Code
- I. IEC, International Electric Code
- J. IEEE, Institute of Electrical and Electronics Engineers
- K. NEC, National Electrical Code
- L. NEMA, National Electrical Manufacturers Association
- M. Underwriters Laboratory (UL and cUL)

1.3 SUBMITTALS - Submittals shall be provided to the engineer that includes all the following information:

- A. Certified shop drawings showing all important details of construction, dimensions and anchor bolt locations.
- B. Descriptive product literature.
- C. Schematic electrical wiring diagram and electrical controls information.
- D. Complete motor and drive data.
- E. The total weight of the equipment.
- F. A complete bill of materials of all equipment.
- G. A valid certificate of registration naming manufacturer, and supplier if equipment is relabeled, as ISO 9001:2015 certified.
- H. A certificate from an industry recognized, independent testing facility verifying compliance with Screening Capture Ratio requirement.

1.4 QUALIFICATIONS

- A. All the equipment specified under this Section shall be supplied by a single manufacturer whose Quality Management System is ISO 9001:2015 certified and applicable to the manufacture of water and wastewater treatment equipment.

- B. If equipment is not manufactured by supplier, including welding and machining, the name and contact information of manufacturing facility must be supplied. If more than one manufacturer is used all companies and facilities must be provided.
- C. If patents protecting equipment are not owned by supplier, then an affidavit must be supplied stating owner of design and expiration of licensing agreement.
- D. All equipment specified under this Section shall comply with Bipartisan Infrastructure Law's (BIL Public Law 117-58) Build America, Buy America (BABA) requirements for manufactured products. As defined in the Law, this requires:
 - (i) the manufactured product was manufactured in the United States, and
 - (ii) the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product.Certifications attesting to compliance will be required prior to approval and shall be included with submittals and upon completion of manufacture.

1.5 DESIGN REQUIREMENTS

A. System Description

1. The fine screen will have a continuous stainless steel belt that automatically rotates within the internal guide system of the static frame.
2. The fine screen herein specified will be of the center flow type. The flow enters the inside of the continuous belt and exits through both sides and the bottom of the belt.
3. The screen shall have undergone performance testing by an industry recognized, independent testing facility. The results of this testing shall verify a Screening Capture Ratio of at least 84% (coarse screen)/ 93% (fine screen) for solids equal to or larger than the screen grid opening listed in System Performance below.
4. The screen will be installed into a widened chamber section of the channel as shown on the contract drawings to accommodate the flow pattern through the screen belt.
5. The solids will collect as a mat on the inside of the continuous belt. The belt will intermittently rotate and elevate the solids to the discharge point. Larger objects will be picked up by a series of hooks and/or trays placed at regular intervals.
6. The solids will be removed at the top of the screen by two spray bar headers positioned on the outside of the belt. The screenings will drop into an internal hopper and be fed to the screening handling system.
7. The continuous belt will be directly driven by drive sprockets that shall support and rotate the grid assembly.
8. The screen will be totally enclosed and have access covers that will be lightweight and easily removable for maintenance. Maintenance, inspection, access and lubrication points shall be no higher than 60 inches above grade level.

9. The Washing Compactor will be positioned next to the screening channels and will be fed by a sluice system.
 10. The Washing Compactor will be adequately sized to handle all the screenings and wash water that will be generated by the screen at peak flow. The system will be required to wash the screenings to reduce the organic content and compact the remaining solids into a dry plug.
 11. The Washing Compactor will generally comprise of a screw auger rotating within the washing and drainage trough, a wash water system, a compaction zone and an outlet chute arrangement.
 12. All stainless steel (including frame, grid and drive components) mentioned below as stainless steel shall be T304 stainless steel. All hardware shall be T316 stainless steel.
- B. System Performance – The fine screening system will be designed to meet the following design parameters:

COARSE SCREENS;

1. Number of screens	2
2. Peak flow per screen	7.5 MGD
3. Average flow to screen	3 MGD
4. Velocity through the grid	max 3.0 ft/s
5. Screen grid opening	6 mm
6. Head loss at peak flow	4.7 inches @ 50% blinding and 37 inches downstream water level
7. Structural design differential of frame/grid	48 inches minimum @ 100% blinding
8. Drive design differential (operating)	48 inches minimum
9. Screen grid supporting drive sprockets	2 minimum – all stainless steel
10. Channel width	18 inches
11. Channel Recess	36 inches
12. Channel height	66 inches
13. Number of Washing Compactors	2
14. Diameter of screw	8 inches
15. Minimum diameter of shaft	2.75 inches
16. Compactor discharge height above grade	48 inches
17. Screen wash water requirements	29 GPM @ 60 PSI each
18. Compactor wash water requirements	25 GPM @ 60 PSI each
19. Sluice wash water requirements	10-20 GPM @ 60 PSI intermittent

FINE SCREENS;

1. Number of screens	2
2. Peak flow per screen	7.5 MGD
3. Average flow to screen	3 MGD
4. Velocity through the grid	max 3.0 ft/s
5. Screen grid opening	2 mm
6. Head loss at peak flow	11.4 inches @ 65% blinding and 34 inches downstream water level
7. Structural design differential of frame/grid	48 inches minimum @ 100% blinding
8. Drive design differential (operating)	48 inches minimum
9. Screen grid supporting drive sprockets	3 minimum – all stainless steel
10. Channel width	18 inches
11. Channel Recess	36 inches
12. Channel height	102 inches
13. Number of Washing Compactors	2
14. Diameter of screw	6 inches
15. Minimum diameter of shaft	2.25 inches
16. Compactor discharge height above grade	48 inches
17. Screen wash water requirements	58 GPM @ 60 PSI each
18. Compactor wash water requirements	25 GPM @ 60 PSI each
19. Sluice wash water requirements	10-20 GPM @ 60 PSI intermittent

Part 2 PRODUCTS**2.1 MANUFACTURER**

- A. The equipment shall be the Center Flow Screen and Washing Compactor as provided by Hydro-Dyne Engineering, Inc., Clearwater, FL. Other than the named supplier, all manufacturers proposing equipment described herein, will provide a detailed submittal package, which will consist, at a minimum, of all information and details prescribed in section 1.3, 1.4 and Part 2 of this specification. All pre-qualification submittals will be submitted to the Engineer at least 15 days prior to the bid date.
- B. If submitted equipment requires arrangement differing from that specified, prepare and submit for review complete structural, mechanical, and electrical drawings and equipment lists showing all necessary changes and embodying all special features of equipment proposed. Any changes are at no additional compensation and the Manufacturer will be responsible for all engineering costs of redesign by the Engineer, if necessary.

2.2 THE CENTER FLOW SCREEN**A. Perforated Plate - The Continuous Screening Belt**

1. The Fine screenings belt will consist of panels manufactured from stainless steel plate that shall be punched with perforations of the specified opening. The stainless steel plate shall be reinforced with a stainless steel frame.

2. The Coarse screenings belt will consist of panels manufactured from 3/8” thick UHMWPE with perforations of the specified opening.
3. The perforated panels will be supported by 12 gauge stainless steel vertical mounted lifting hooks horizontally spaced a maximum of 3 inches apart preventing deflection. The lifting hooks shall support the screening grid and bear tension loads across the entire length and width of the screen belt. Grids that do not have stainless steel vertical mounted lifting hooks horizontally spaced a maximum of 3 inches apart across the grid will not be acceptable.
4. The hooks on elements shall form horizontal lifting trays or shelves for removing large solids and rags every 8 inches around the entire screen grid.
5. The perforated panels will be connected by heavy duty stainless steel axles every 8 inches to form a continuous belt that will rotate within the frame’s guide system. The axle design will allow the plates to pivot and create a seal between the perforated panels to prevent the passage of solids.
6. The axles will include Delrin spacers that will maintain the 3 inch space between the vertical support elements. Delrin spacers will also form a seal between each perforated panel with clearance not to exceed 0.5mm.
7. The axles will be extended to fix a UHMWPE guide link to the side of each perforated plate. These guides will interlock to create a continuous guide link system that will slide within the frame.
8. Guide links shall be precision machined from solid virgin UHMWPE. Injection molded links are not acceptable.
9. The heavy duty guide links will be minimum 2 inches thick to protect against undue wear from grit and will be specially machined to form a closure seal between the rotating belt and the static frame.
10. The seal shall be continuous from grade level through the water flow forming an uninterrupted closure between the traveling screen grid and the stationary frame. The seal shall be heavy gauge stainless steel, fixed to the screen frame and be adjustable so it will remain in contact with the rotating screen belt at all times.
11. Screen designs that have gaps and/ or tolerances greater than 0.5mm between the screens grid plates and between the sides of the grid and screen frame, including the chain, are not acceptable.
12. Screen’s sealing materials are to consist of solid, non-flexible materials that will maintain the 0.5mm tolerance for the lifecycle of the screen.
13. Screen designs whose sealing materials will not last the lifecycle of the screen and require replacement by the owner/ operators, are not acceptable.
14. Guide systems that use rollers, stainless or hardened steel chains will not be acceptable.

15. Grid panel sealing systems that require the use of replaceable neoprene seals or stainless steel hinges will not be acceptable.
16. Grid to frame sealing systems that require the use of replaceable adjustable UHMWPE strips attached to the frame will not be acceptable.

B. The Frame

1. The continuous belt will rotate within a heavy duty stainless steel static support frame that shall be a rectangular box construction.
2. The guide link system will travel around a stainless steel guide wear track that is integral to the support frame. Top and bottom wear tracks shall be bolt in and field replaceable.
3. There shall be a removable inspection panel located directly beneath the drive allowing easy access to the grid drive sprockets, drive shaft and screenings collection hopper.
4. The design will ensure that the support frame meshes with the closure seal on each guide link to prevent passage of screening material and grit particles.
5. All components of the lower wear tracks shall be bolt in, field replaceable and manufactured from stainless steel.
6. The frame shall accommodate stainless steel protective covers designed to prevent leakage and contain spray wash. All maintenance and inspection access points shall have hinged and gasketed access covers. Screens with covers requiring neoprene, rubber or plastic seals are not acceptable.
7. To minimize odors and nuisance, the screen frame shall have flanged connections for odor control.
8. The screen manufacturer will supply stainless steel angled filler plates to connect from the upstream corners of the support frame to the channel walls.

C. The Offloading of Screenings

1. Two stainless steel spray wash headers will be located in the head space of the screen to offload the screenings from the continuous belt.
2. The spray bar will incorporate brass nozzles at 2 inch spaces that can easily be replaced or removed for cleaning.
3. The spray bars will be positioned behind the rotating belt and will backwash the solids into an internal hopper manufactured from stainless steel. The wash water will be used to continuously flush the screenings from the internal hopper into the extended sluice.
4. The addition of a rotating or static brush system to aid offloading will not be acceptable.

D. Screen Drive Mechanism

1. Each screen will have a maximum 0.75 hp (0.56KW, FLA 1.1), inverter duty electric motor suitable for a 460/3/60 supply and rated for a Class 1 Div. 2 environment. As a minimum, the motor will have an IP55 enclosure rating and will conform to NEMA MG-1 requirements. The motor will be located outside of the screen covers and above the top of the channel.
2. The gear reducer shall be directly coupled to a heavy duty shaft machined from solid stainless steel round bar.
3. The drive shaft shall be supported on both ends by grease filled roller bearings. Separate grease-filled self-contained cartridge seals shall be mounted on drive shaft between bearings and frame to eliminate spray wash from entering bearings or gear reducer.
4. The continuous belt will be supported and rotated around heavy duty stainless steel sprockets located on the drive shaft in the head space of the screen.
5. These sprockets will have removable bolted-on lugs that transmit torque directly from the gear reducer to notches on the underside of the UHMWPE guide links. The drive shall be sized so that a minimum of four lugs are engaging guidelinks at all times. Driving forces shall be transmitted to areas located behind the screen's grid to prevent solids from contacting drive surfaces.
6. Chain driven systems or screens with wheels submerged in the wastewater are not acceptable.
7. Drive systems that use an external track and pinion to drive or push the band against grid weight supporting wear tracks will not be acceptable. Drive shall lift, and be capable of bearing, the full weight of the grid.

2.3 WEIR

- A. The manufacturer shall design and supply a stainless steel weir that will be installed by the contractor downstream of the screen.
- B. The weir will be designed to maintain a downstream water depth that will increase screen performance during periods of high flow.
- C. The weir will be anchored to the sides of the channel with no horizontal supports across the channel to prevent the accumulation of solids.

2.4 THE SCREENINGS TRANSFER SLUICE

- A. The manufacturer will design and supply a screenings launder sluice system that will collect screenings and wash water from the discharge hopper of the screen and transfer them into the washing compactors.

1. Collected screenings will transfer through the sluice by means of gravity. Mechanically driven conveyors will not be acceptable.
2. The manufacturer shall supply a solenoid valve that will be plumbed in field into the back plate of the sluice. The contractor will connect to a local plant water supply, and the water supply will provide supplementary transport water.
3. The sluice will be manufactured from stainless steel. It shall comprise of U-shaped lengths of trough that will be flange connected to the desired overall length.
4. A change in direction will be achieved using long swept bends that will prevent blockages from occurring.
5. The sluice system will be designed with a splitter that diverts flow into 1 of 2 compactors. The splitter will be fitted with a manual removable gates to divert into any branch of the sluice
6. The sluice system will include the support leg structure manufactured from stainless steel as needed. The legs will be suitable for anchoring to a concrete floor.
7. Covers will be lightweight, no more than 6 feet long and bolted for easy removal by a single operator.

2.5 THE WASHING COMPACTOR WITH ENHANCED WASHING AND DEWATERING

- A. The main body will be the washing trough that will receive screenings and wash water directly from the end of the screenings transfer sluice.
- B. The washing trough will house the screw auger and provide a dedicated section to reduce organic content.
- C. The stainless steel drainage section will be perforations with 2mm or 5mm openings and be adjustable to maintain auger alignment. This drainage section shall be removable and easily replaceable in the field with no special tools. The flights of the screw may be fitted with a stiff nylon brush that will maintain contact with the drainage section, preventing blockages. The replaceable brushes will be supplied in pre-coiled lengths with stainless steel removable clamps.
- D. The underside of the washing trough will be a catch pan chute that will divert the water that passes through the drainage section, back to the influent flow with dual outlet plain end pipe connections. The unconnected pipe side will be capped with a rubber compression cap so that it can be removed and the drain piping can be cleaned if necessary. The catch pan will include a flushing connection point for washing and cleaning.
- E. The catch pan will include a separate wash water supply to purge the area of accumulated solids. A single spray nozzle will direct water across the length of the pan toward the outlet. The frequency of cleansing cycles will be controlled through the main control panel.

- F. The AR400 hardened steel screw auger will sit in the washing trough. Washing compactors with shaftless screws are not acceptable as a shaft is required to support the flight and provide necessary torque and compaction. Screw auger will be primer coated to inhibit corrosion. Screw augers not made out of AR-400 hardened steel will not be acceptable.
- G. The auger will be a varied pitch screw aligned at the compaction end by AR400 hardened steel wear and anti-rotation bars designed to prevent the compacted screening from spinning within the compaction zone.
- H. The screw will rotate allowing wash water and free organic/fecal material finer than trough openings to escape and return to the plant flow. The wash water will flush the separated organic material through the drainage section in solution or as small particles.
- I. Washing of screenings shall be achieved through an enhanced washing module consisting of the following minimum requirements manufactured out of stainless steel:
1. Variable pitch flight for separate screening transport through the wash, dewatering and compaction zones.
 2. Washing Module Zone
 - a. Flanged connections and a stainless steel orifice plate or nozzle
 - b. Hardened steel wear and anti-rotation bars
 - c. Separately controlled high pressure washing to shear and break-up organic and fecal material for return to the channel.
 - d. Cleansing cycles moving the auger in forward and reverse direction are controlled through the main control panel and operator adjustable up to 9 cycles
 3. Dewatering and Compaction Zone
 - a. Stainless steel header feeding an external rinse shower
 - b. Hardened steel wear and anti-rotation bars
 - c. Full circumference perforations for dewatering and extrusion of organics and fecal material.
 - d. Attached drainage catch pan with a separate wash water supply to purge the area of accumulated solids
 - e. Removable covers for inspection access
- J. Washing compactors that do not have a separate washing and rinse/dewatering zones will not be accepted.
- K. The compacted screenings will be pushed through the compaction zone and pass through an elbow into an outlet chute. The outlet chute will provide for screening expansion and will elevate the dewatered screenings to discharge into a bagging system.
- L. The outlet chute will terminate in a flange that will connect directly to a stainless steel discharge long radius elbow that will direct the compacted screenings downward into the screenings collection bag. The elbow will be designed to prevent bridging of solids and will be flanged for accessibility.
- M. The outlet of the discharge elbow will be a stainless steel mounting assembly that will allow a 24” diameter circular screenings collection bag to slide into position.

- N. The screenings collection bag will house one 230 feet long continuous bag that will be released under the weight of compacted screenings dropping from the outlet chute.
- O. The plastic bag shall be capable of cutting and tying off into operator determined sizes to effectively capture odor and all remaining water in screenings.
- P. Each Washing Compactor will have a maximum 3 hp(2.2KW, FLA 3.8), inverter duty electric motor suitable for a 460/3/60 supply and rated for a Class 1 Div. 2 environment. As a minimum, the motor will have an IP55 enclosure rating and will conform to NEMA MG-1 requirements.

2.6 SPARE PARTS - The manufacturer will supply the following spare parts, per screen supplied, with the equipment:

- A. Ten (10) hook links and elements spacers
- B. Two (2) grid axles
- C. Two (2) guide links
- D. Two (2) screen panels
- E. One (1) center support link (fine screens only)
- F. One (1) brush for each screw
- G. Five (5) total screenings collection continuous bags

2.7 ACCESSORIES - The manufacturer will supply the following accessories, with the equipment:

- A. Eight (8) 0.75" NEMA 7 brass body solenoid valve
- B. Six (6) 1" NEMA 7 brass body solenoid valve
- C. Two (2) 2" NEMA 7 brass body solenoid valve
- D. Four (4) 2" wash water strainer
- E. Eight (8) wash water pressure gauge
- F. One (1) lot of anchor bolts.
- G. One (1) lot of ball valves

2.8 ELECTRICAL CONTROLS AND ANCILLARY COMPONENTS

- A. General Information - The manufacturer will supply two UL listed main control panels and fourteen local control stations that shall automatically control the equipment offered in this section.

- B. The Main Control Panel – NEMA 4X stainless steel enclosure for outdoor installation –
Each control panel shall consist of the following components for each screening system:

- 1 Enclosure, NEMA 4X, 304SS, 2-door, floor standing, 3-point latch with lighting fixture with door switch
- 1 Purge kit, exterior mount, leak compensation type
- 1 Main disconnect breaker with operating handle
- 1 480V surge suppressor
- 1 120V surge suppressor
- 1 Line filter
- 1 Control power transformer
- 1 ABB, ACS580 series VFD, 0.75HP, 480VAC/3Ph with fused protection (Coarse Screen)
- 1 Schneider, IEC starter, reversing type, 3HP, 480VAC/3Ph with circuit protection (Coarse Screen – WC)
- 1 ABB, ACS580 series VFD, 1.5HP, 480VAC/3Ph with fused protection (Fine Screen)
- 1 Schneider, IEC starter, reversing type, 1.5HP, 480VAC/3Ph with circuit protection (Fine Screen – WC)
- 1 Schneider, IEC starter, non-reversing type, 0.75HP, 480VAC/3Ph with circuit protection (Grit Trap)
- 1 Schneider, IEC starter, non-reversing type, 0.5HP, 480VAC/3Ph with circuit protection (Grit Classifier)
- 1 Schneider, IEC starter, non-reversing type, 5HP, 480VAC/3Ph with circuit protection (Grit Pump)
- 1 Allen Bradley, CompactLogix 1769-L33ER controller with standard I/O modules as required
- 1 Allen Bradley, PanelView Plus 7 series, 10” HMI, standard model with window it
- 1 24VDC power supply
- 1 Unmanaged ethernet switch, 8-ports (10/100Mbps)
- 7 Hour meter
- 2 IS Barrier – Analog Signal
- 1 IS relay – 4 channels
- 1 Ethernet surge suppressor
- 1 APC, SMT1500C UPS, 120VAC with UPS maintenance bypass switch
- 1 Heater with thermostat
- 1 Vortex A/C enclosure cooler, hazardous location, 2500BTU
- 1 Ground bar
- LOT of signal surge suppressors
- LOT of timer relays
- LOT of pilot lights as required
- LOT of control relays, terminal blocks, fuse blocks, wire duct, supplementary circuit protection, UL label as required

C. Ancillary Control Components -

1. Float switch
2. Ultrasonic differential level system consisting of the following per screen:
 - a. NEMA 4X enclosure with viewing window
 - b. Milltronics Hydro-Ranger LT500 controller with real-time 4-20 mA output
 - c. Two (2) NEMA 4X/7 transducers
3. Local Control Station – NEMA 7 - Each local station panel shall consist of the following components:
 - a. NEMA 7 enclosure
 - b. Hand/Off/Auto switch for each motor
 - c. Forward/Off/Reverse switch for compactor motor
 - d. Emergency stop
4. Sluice level limit switches

Part 3 SURFACE PREPARATION AND PAINTING

- A. The majority of stainless steel materials, flanges and piping shall be pickled by means of a four tank system that is in accordance with ASTMs A380. This process is for quality control, removal of heat affected discoloration, surface treatment for corrosive environments and to provide a uniform finish to stainless steel surfaces. Stainless steel components must be fully submerged in the tanks for complete coverage. Electro-chemical pickling is acceptable on weld finishes that cannot be submerged due to size. Sandblasting, pickling pastes and abrasive cleaners will not be accepted as forms of metal finishing. The drive and grid components do not require pickling.

Tank 1 – Detergent bath for the removal of soils, greases, oils and dirt

Tank 2 – Rinsing process to remove detergent and residual soils

Tank 3 – Two part acid solution for the removal of tightly adhere oxide films

Tank 4 – Final rinse process to remove all residual acid

The four-tank pickling process must be conducted in-house at the manufacturer's own ISO 9001 certified manufacturing facility. Any screening equipment providers who are unable to perform this process in-house are not acceptable.

- B. All ferrous surfaces (except stainless steel) shall be coated with a pre-primer, primer, and an exterior top coating, or fusion bonded polyester coating suitable for humid/wet environments for superior corrosion protection.
- C. Motor(s) and gearbox(s) shall be surface prepared to withstand humid/wet environments for superior corrosion protection.

Part 4 EXECUTION

4.1 WARRANTY - The Manufacturer of the equipment supplied under this specification shall provide a warranty for a period of 2 years commencing on startup and /or acceptance by the Owner but no later than 90 days from the date of shipment by the Manufacturer. The Manufacturer shall guarantee that the equipment furnished is suitable for the purpose intended and free from defects in design, materials and workmanship. In the event that the equipment fails to perform as specified the Manufacturer shall, at his option, promptly repair, modify or replace the defective equipment.

4.2 FACTORY TESTING

- A. The screening system and all components shall be factory assembled. Equipment is tested for a minimum of 4 hours prior to shipment. The equipment shall be shipped fully assembled and shall be capable of being set in place and field erected by the Contractor with minimal field assembly.
- B. During the factory test period the screening system shall be adjusted as required assuring proper operation on completion of the field installation. The Manufacturer shall supply a certification of the completion of the factory testing of the assembled screening system and appurtenances and shall certify as to the equipment being in satisfactory operating condition at time of shipment. The Engineer and/or Owner may, at their own option and expense, witness the factory test.

4.3 DELIVERY AND STORAGE

- A. The screening system shall be appropriately crated and delivered to protect against damage during shipment.
- B. An authorized representative of the Contractor shall inspect the screens on delivery to the jobsite and shall report any damage or missing components to the Manufacturer and the Engineer within 72 hours of receipt of the shipment.

4.4 INSTALLATION - The installation of the equipment shall be as indicated on the drawings and in strict accordance with the Manufacturer's instructions and recommendations.

4.5 FIELD TESTS, ADJUSTMENTS AND COMMISSIONING

- A. The equipment shall be shipped completely factory assembled. Contractor shall verify all access dimensions, channel dimensions, and any interior building dimensions to ensure equipment may be installed as factory assembled units.
- B. After completion of the installation, the equipment shall be inspected and certified by an authorized representative of the Manufacturer as being in compliance with the Manufacturer's recommendations and requirements. At such time as the Manufacturer has deemed the installation to be acceptable, the Manufacturer's authorized service representative shall make any required adjustments and shall start the equipment to ensure proper operation.

- C. The Manufacturer's authorized representative shall provide instruction to the plant personnel as to the operation and maintenance of the equipment including commissioning, shut down, on-line operations, lubrication and preventative maintenance.
- D. Manufacturer shall state field service rates for a Service Engineer to Owner and Contractor. In the event that the field service time required by this section should not be sufficient to properly place the equipment into operation, and the requirement for additional time is beyond the manufacturer's responsibility, additional time shall be purchased by Contractor to correct deficiencies in installation, equipment, or material without additional cost to Owner.
- E. The Contractor shall include in his bid, the cost of the above referenced authorized service representative for a minimum of three (3) trips totaling five (5) eight hour days onsite to complete the certifications and training described in this specification section.

End of Section

Great White Center Flow Screen Equipment Sizing



Tel: 813-818-0777 Fax: 813-818-0770

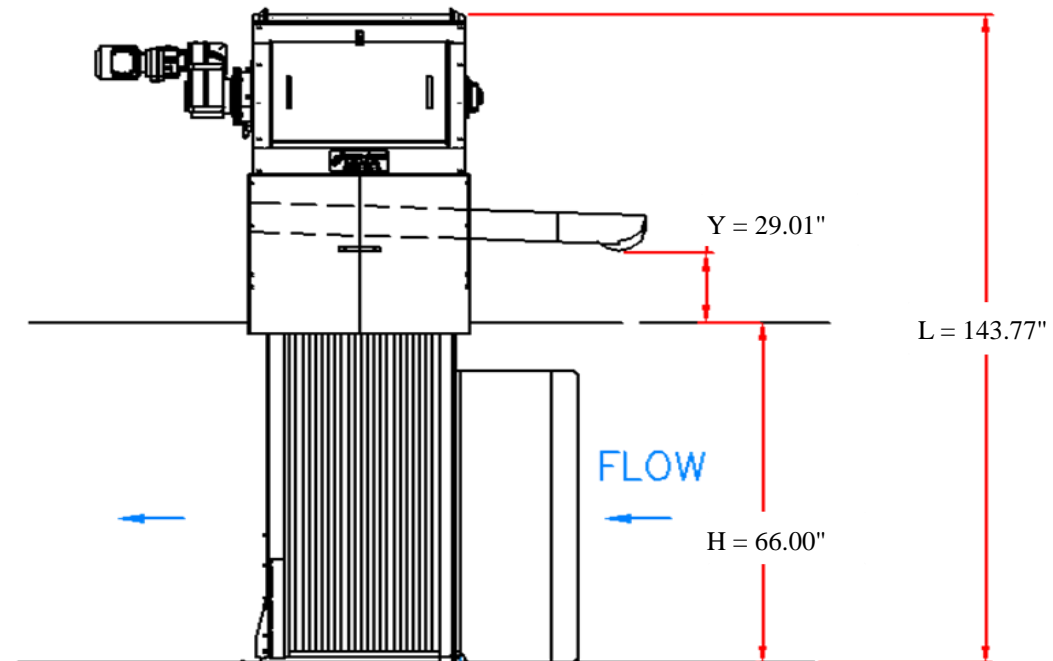
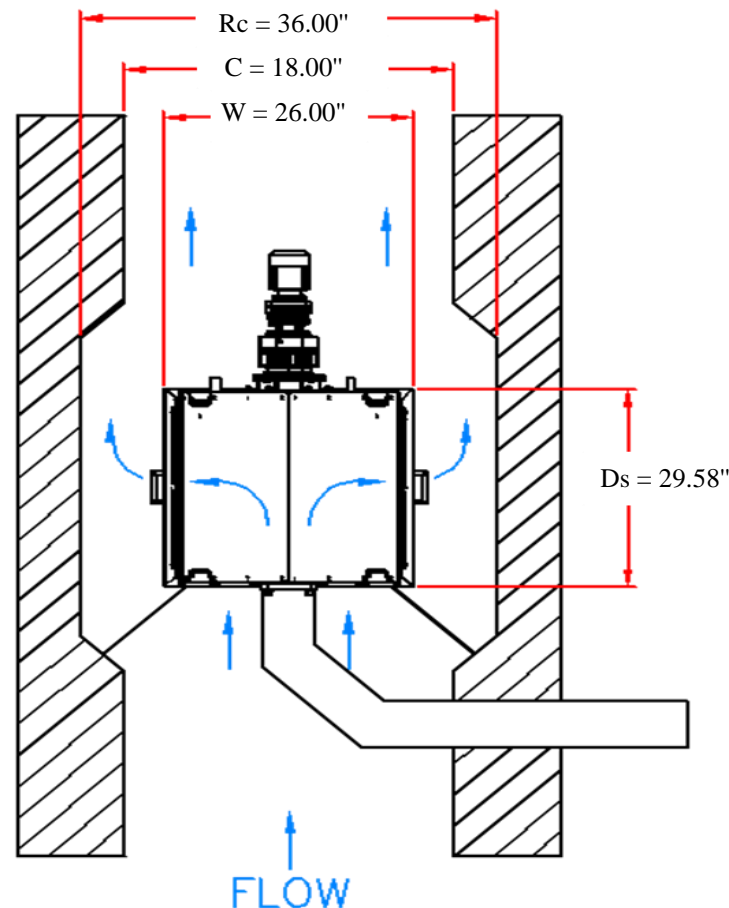
Project: San Luis, AZ - West WWTP
 Date: 11/19/2024
 Rep: JB Water
 By: STM Checked: JMB

Model # **CF 26 - 30 - 144 - 6 - P**

Channel Dimensions:		English Units	SI Units
C	Channel Width	18.00 in	457 mm
H	Channel Height	66.00 in	1676 mm
Rc	Recess Width,	36.00 in	914 mm
Rd	Channel Recess Depth	49.58 in	1259 mm
TC	Height from Grade to Top of Channel	0.00 in	0 mm

Equipment Dimensions:		English Units	SI Units
L	Length of Screen	143.77 in	3652 mm
W	Width of Screen	26.00 in	660 mm
Ds	Depth of Screen	29.58 in	751 mm
Y	Discharge Height from the Sluice	29.01 in	737 mm

Screen Grid Parameters:			
S	Grid Opening Spacing	6mm Perf UHMWPE	
Obs	Percent of Screen Obstructed	50 %	Hook Link 12 ga
OA _{eff} *	Effective Percent of Grid Opening	31.64 %	Straight Link 12 ga



NOTE: Image is not to Scale. Orientation of Equipment Subject to Change Depending on Layout Requirements.

NOTE: * Effective Percent of Grid Opening = Percent of Grid Opening at 6mm Opening \times (1 - Proposed 50% of Screen Obstructed).

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Great White Center Flow Screen Hydraulic Performance



Project: San Luis, AZ - West WWTP

Date: 11/19/2024

Rep: JBI Water

Tel: 813-818-0777 Fax: 813-818-0770

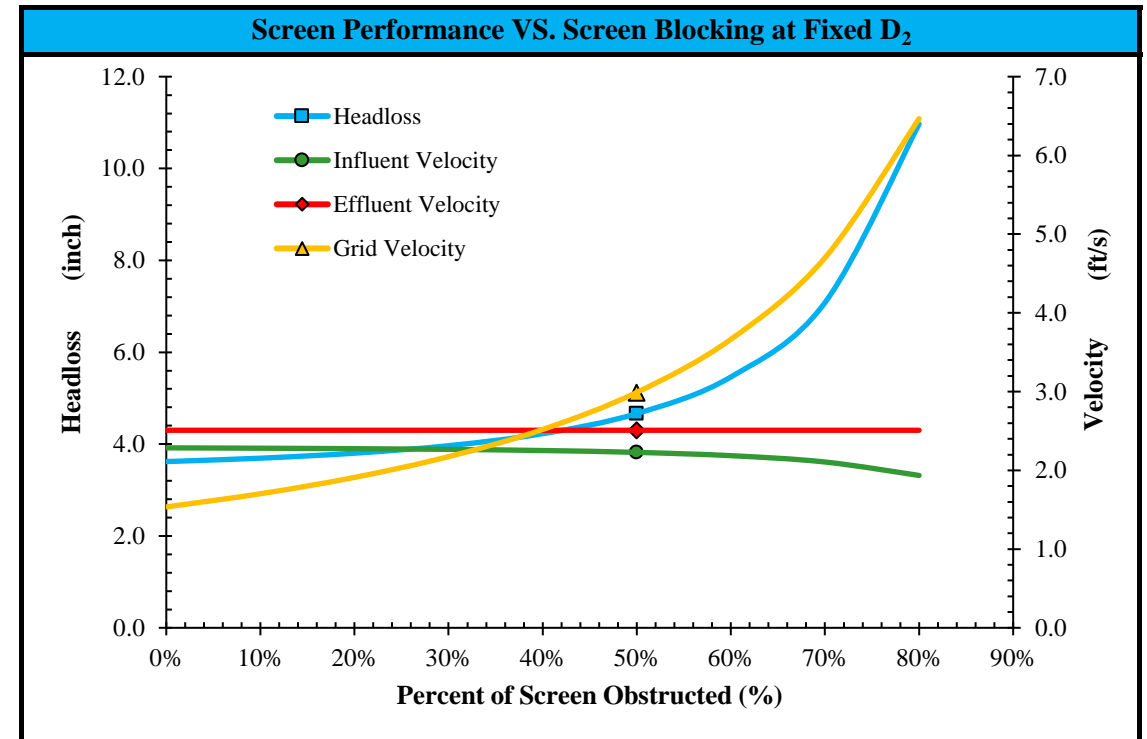
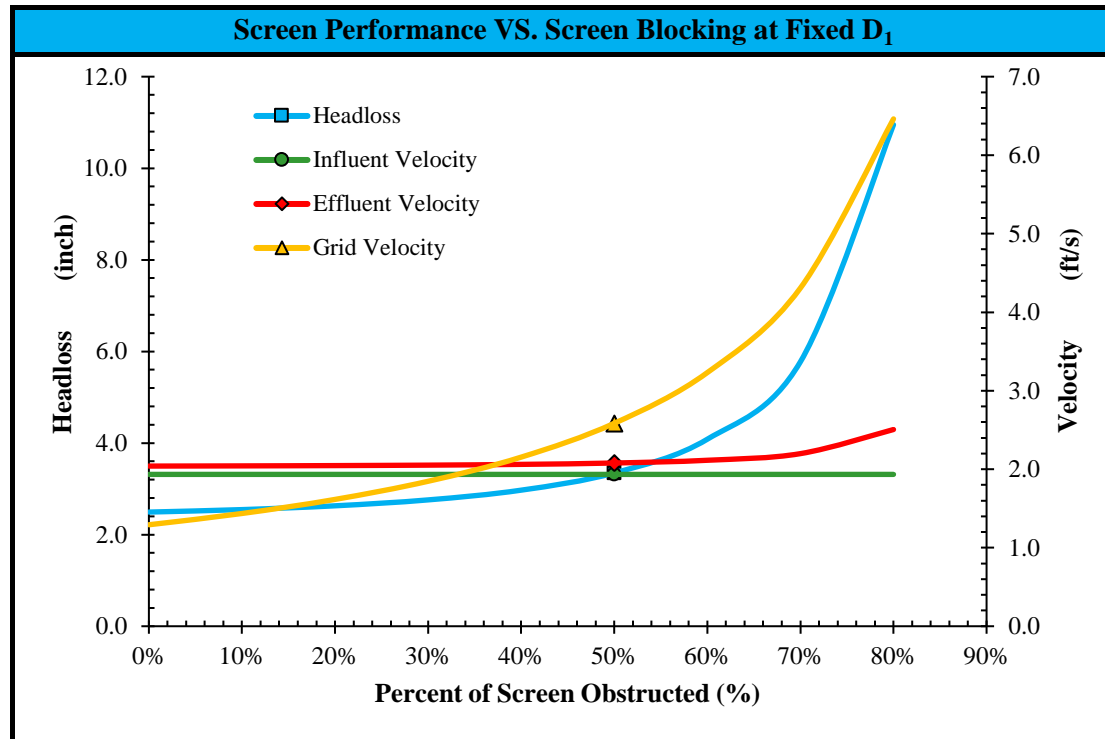
By: STM

Checked: JMB

Model # CF 26 - 30 - 144 - 6 - P

Fixed D ₁ Condition @ 50% Obs		English Units		SI Units	
Q	Flow Rate	7.50 MGD	5208 gpm	329 L/s	28391 m ³ /d
D ₁	Upstream Water Depth	48.00 in		1219 mm	
D ₂	Downstream Water Depth	44.65 in		1134 mm	
ΔH	Total Headloss	3.35 in		85 mm	
F	Freeboard	18.00 in		457 mm	
V ₁	Influent Channel Velocity	1.93 ft/s		0.59 m/s	
V _T	Throat Velocity of Screen	2.82 ft/s		0.86 m/s	
V _G	Velocity Through Grid	2.58 ft/s		0.79 m/s	
V _{Re}	Recess Zone Velocity	2.63 ft/s		0.80 m/s	
V ₂	Effluent Channel Velocity	2.08 ft/s		0.63 m/s	

Fixed D ₂ Condition @ 50% Obs		English Units		SI Units	
Q	Flow Rate	7.50 MGD	5208 gpm	329 L/s	28391 m ³ /d
D ₁	Upstream Water Depth	41.66 in		1058 mm	
D ₂	Downstream Water Depth	37.00 in		940 mm	
ΔH	Total Headloss	4.66 in		118 mm	
F	Freeboard	24.34 in		618 mm	
V ₁	Influent Channel Velocity	2.23 ft/s		0.68 m/s	
V _T	Throat Velocity of Screen	3.33 ft/s		1.01 m/s	
V _G	Velocity Through Grid	2.99 ft/s		0.91 m/s	
V _{Re}	Recess Zone Velocity	3.11 ft/s		0.95 m/s	
V ₂	Effluent Channel Velocity	2.51 ft/s		0.77 m/s	



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Great White Center Flow Screen Hydraulic Performance



Project: San Luis, AZ - West WWTP

Date: 11/19/2024

Rep: JBI Water

Tel: 813-818-0777 Fax: 813-818-0770

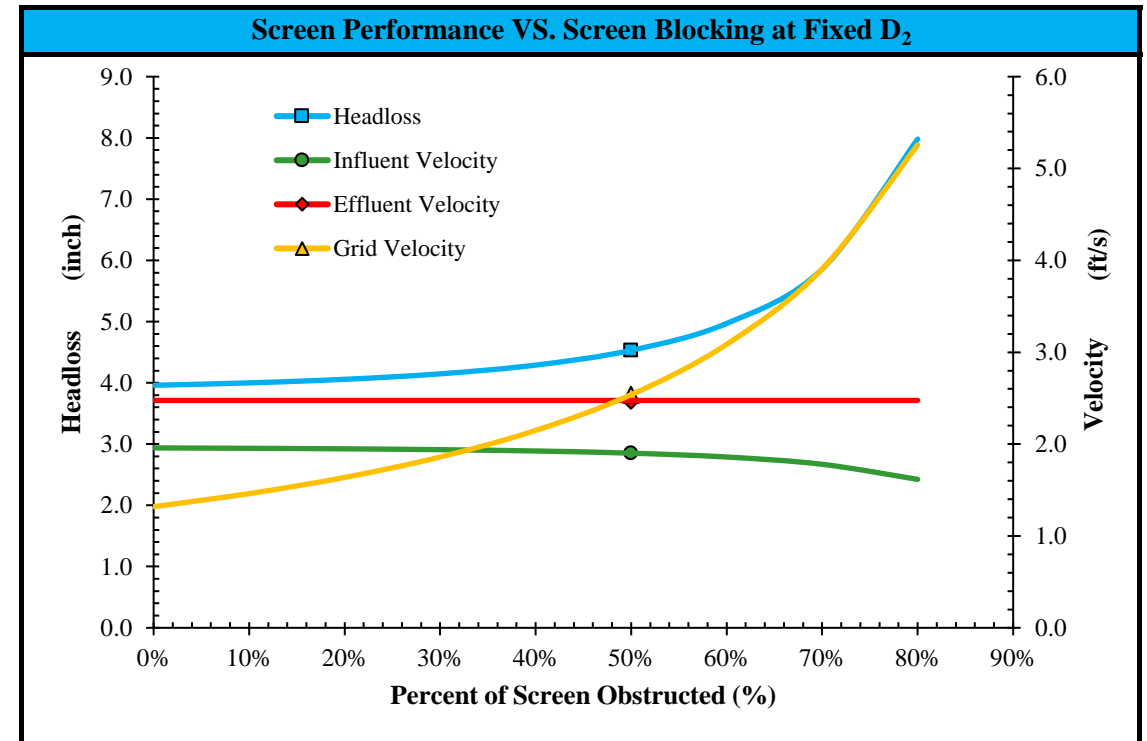
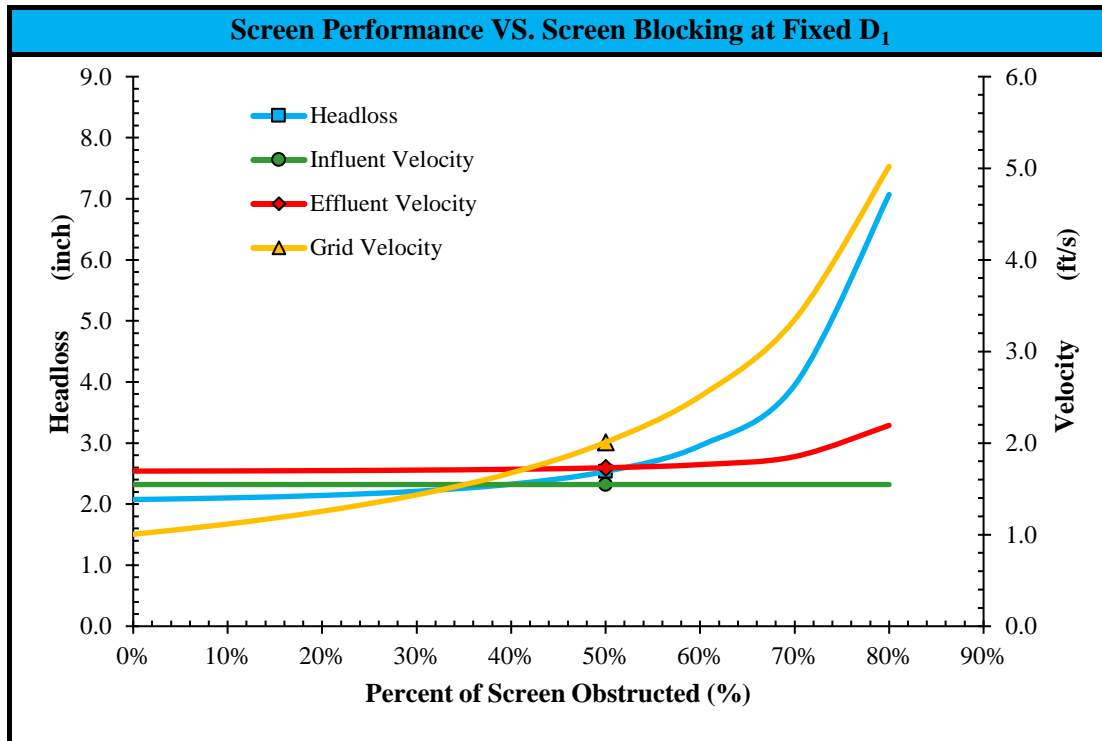
By: STM

Checked: JMB

Model # CF 26 - 30 - 144 - 6 - P

Fixed D ₁ Condition @ 50% Obs		English Units		SI Units	
Q	Flow Rate	3.00 MGD	2083 gpm	131 L/s	11356 m ³ /d
D ₁	Upstream Water Depth	24.00 in		610 mm	
D ₂	Downstream Water Depth	21.46 in		545 mm	
ΔH	Total Headloss	2.54 in		65 mm	
F	Freeboard	42.00 in		1067 mm	
V ₁	Influent Channel Velocity	1.55 ft/s		0.47 m/s	
V _T	Throat Velocity of Screen	2.67 ft/s		0.81 m/s	
V _G	Velocity Through Grid	2.01 ft/s		0.61 m/s	
V _{Re}	Recess Zone Velocity	2.16 ft/s		0.66 m/s	
V ₂	Effluent Channel Velocity	1.73 ft/s		0.53 m/s	

Fixed D ₂ Condition @ 50% Obs		English Units		SI Units	
Q	Flow Rate	3.00 MGD	2083 gpm	131 L/s	11356 m ³ /d
D ₁	Upstream Water Depth	19.53 in		496 mm	
D ₂	Downstream Water Depth	15.00 in		381 mm	
ΔH	Total Headloss	4.53 in		115 mm	
F	Freeboard	46.47 in		1180 mm	
V ₁	Influent Channel Velocity	1.90 ft/s		0.58 m/s	
V _T	Throat Velocity of Screen	3.58 ft/s		1.09 m/s	
V _G	Velocity Through Grid	2.54 ft/s		0.77 m/s	
V _{Re}	Recess Zone Velocity	2.92 ft/s		0.89 m/s	
V ₂	Effluent Channel Velocity	2.48 ft/s		0.76 m/s	



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Great White Center Flow Screen Equipment Sizing



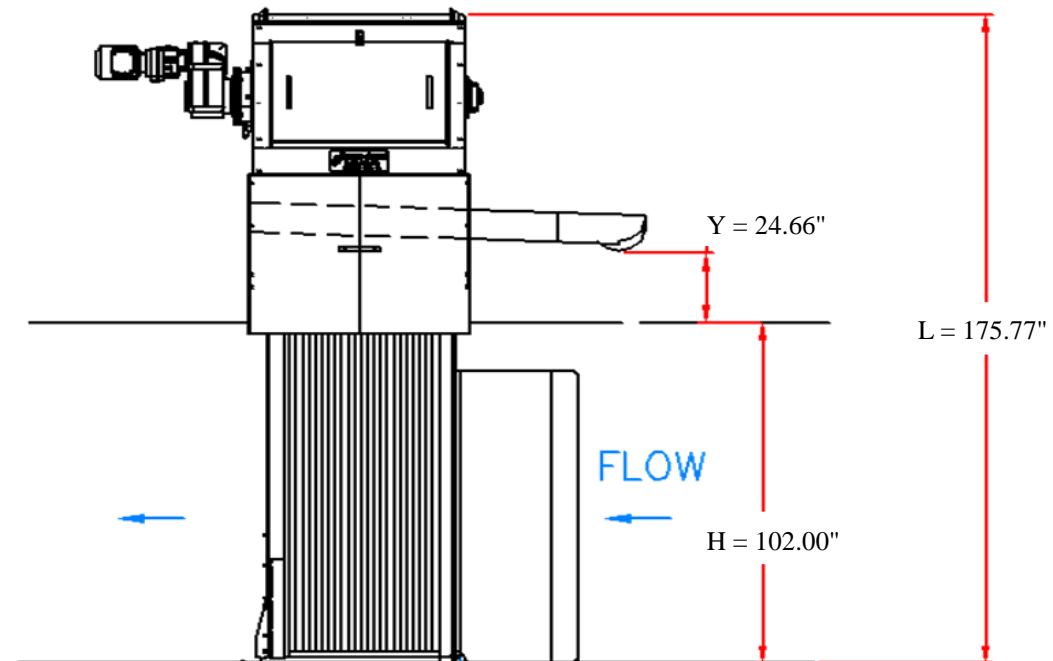
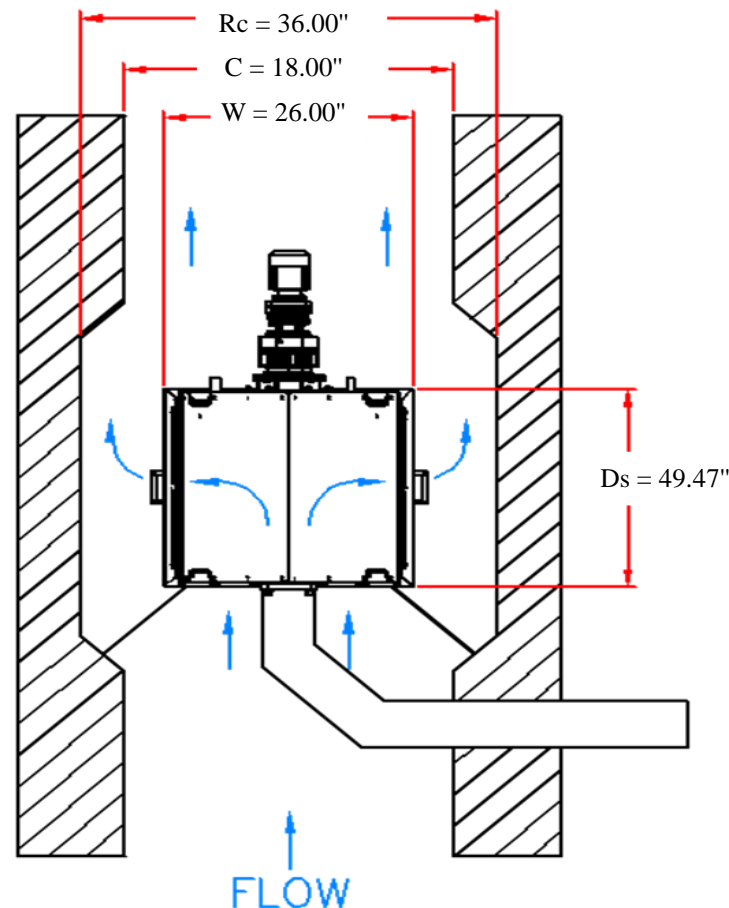
Tel: 813-818-0777 Fax: 813-818-0770

Project: San Luis, AZ - West WWTP
 Date: 11/19/2024
 Rep: JB Water
 By: STM Checked: JMB

Model # **CF 26 - 49 - 176 - 2 - P**

Channel Dimensions:		English Units	SI Units
C	Channel Width	18.00 in	457 mm
H	Channel Height	102.00 in	2591 mm
Rc	Recess Width,	36.00 in	914 mm
Rd	Channel Recess Depth	69.47 in	1765 mm
TC	Height from Grade to Top of Channel	0.00 in	0 mm

Equipment Dimensions:		English Units	SI Units
L	Length of Screen	175.77 in	4465 mm
W	Width of Screen	26.00 in	660 mm
Ds	Depth of Screen	49.47 in	1257 mm
Y	Discharge Height from the Sluice	24.66 in	626 mm
Screen Grid Parameters:			
S	Grid Opening Spacing	Perf 2mm metal	
Obs	Percent of Screen Obstructed	65 %	Hook Link 12 ga
OA _{eff} *	Effective Percent of Grid Opening	17.50 %	Straight Link 12 ga



NOTE: Image is not to Scale. Orientation of Equipment Subject to Change Depending on Layout Requirements.

NOTE: * Effective Percent of Grid Opening = Percent of Grid Opening at 2mm Opening \times (1 - Proposed 65% of Screen Obstructed).

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Great White Center Flow Screen Hydraulic Performance



Project: San Luis, AZ - West WWTP

Date: 11/19/2024

Rep: JBI Water

Tel: 813-818-0777 Fax: 813-818-0770

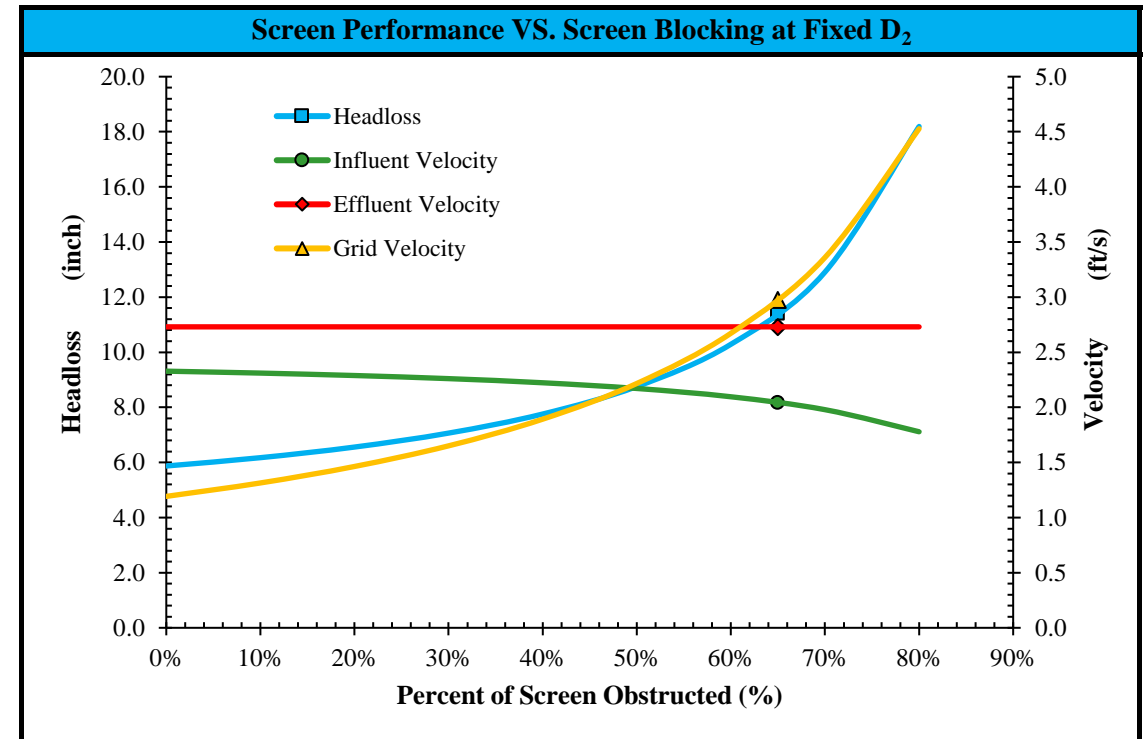
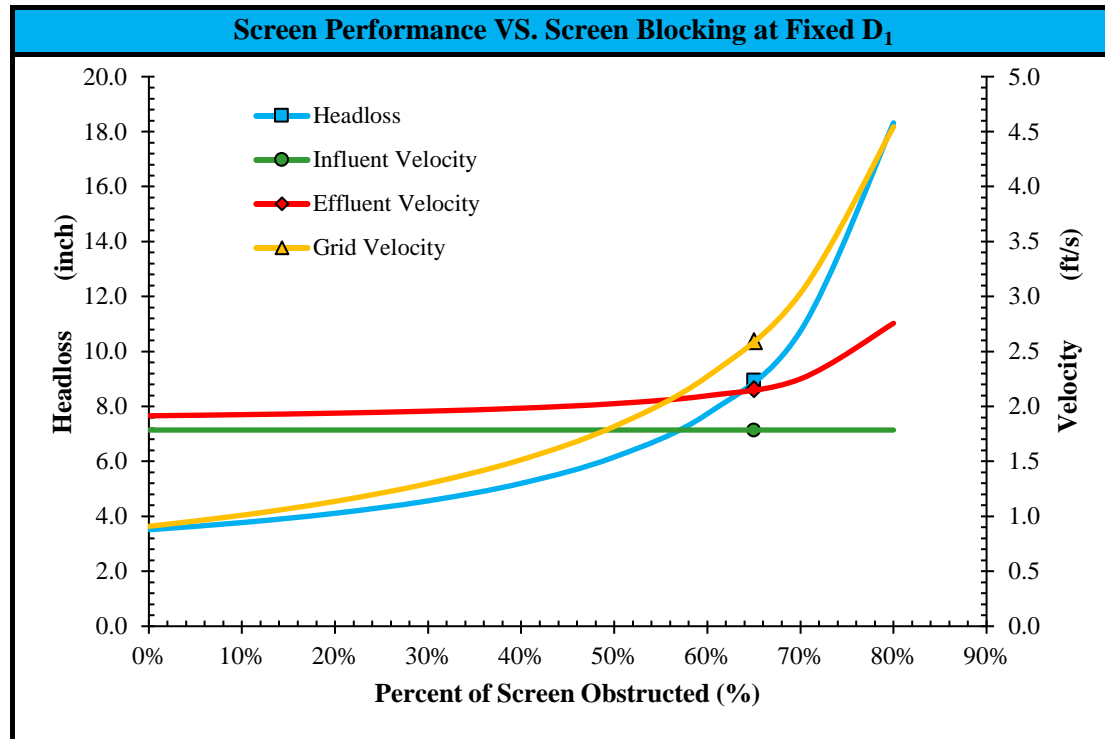
By: STM

Checked: JMB

Model # CF 26 - 49 - 176 - 2 - P

Fixed D ₁ Condition @ 65% Obs		English Units		SI Units	
Q	Flow Rate	7.50 MGD	5208 gpm	329 L/s	28391 m ³ /d
D ₁	Upstream Water Depth	52.00 in		1321 mm	
D ₂	Downstream Water Depth	43.04 in		1093 mm	
ΔH	Total Headloss	8.96 in		228 mm	
F	Freeboard	50.00 in		1270 mm	
V ₁	Influent Channel Velocity	1.79 ft/s		0.55 m/s	
V _T	Throat Velocity of Screen	2.57 ft/s		0.78 m/s	
V _G	Velocity Through Grid	2.60 ft/s		0.79 m/s	
V _{Re}	Recess Zone Velocity	2.71 ft/s		0.83 m/s	
V ₂	Effluent Channel Velocity	2.16 ft/s		0.66 m/s	

Fixed D ₂ Condition @ 65% Obs		English Units		SI Units	
Q	Flow Rate	7.50 MGD	5208 gpm	329 L/s	28391 m ³ /d
D ₁	Upstream Water Depth	45.41 in		1153 mm	
D ₂	Downstream Water Depth	34.00 in		864 mm	
ΔH	Total Headloss	11.41 in		290 mm	
F	Freeboard	56.59 in		1437 mm	
V ₁	Influent Channel Velocity	2.04 ft/s		0.62 m/s	
V _T	Throat Velocity of Screen	3.01 ft/s		0.92 m/s	
V _G	Velocity Through Grid	2.98 ft/s		0.91 m/s	
V _{Re}	Recess Zone Velocity	3.34 ft/s		1.02 m/s	
V ₂	Effluent Channel Velocity	2.73 ft/s		0.83 m/s	



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Great White Center Flow Screen Hydraulic Performance



Project: San Luis, AZ - West WWTP

Date: 11/19/2024

Rep: JBI Water

Tel: 813-818-0777 Fax: 813-818-0770

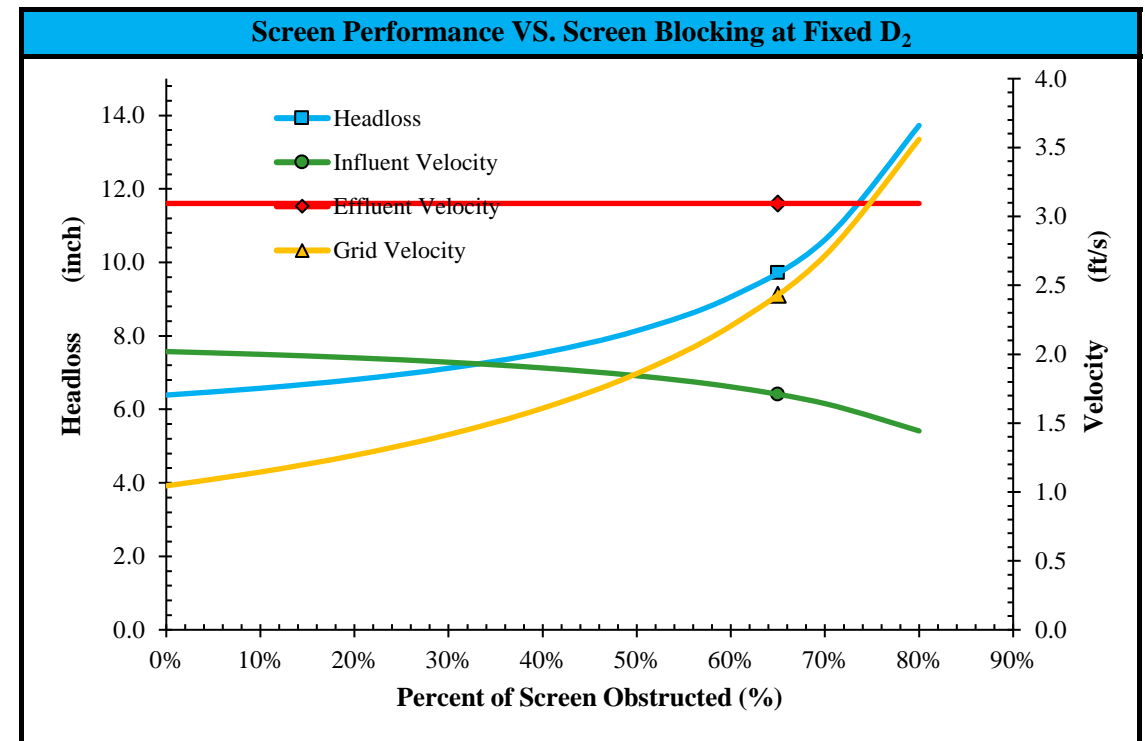
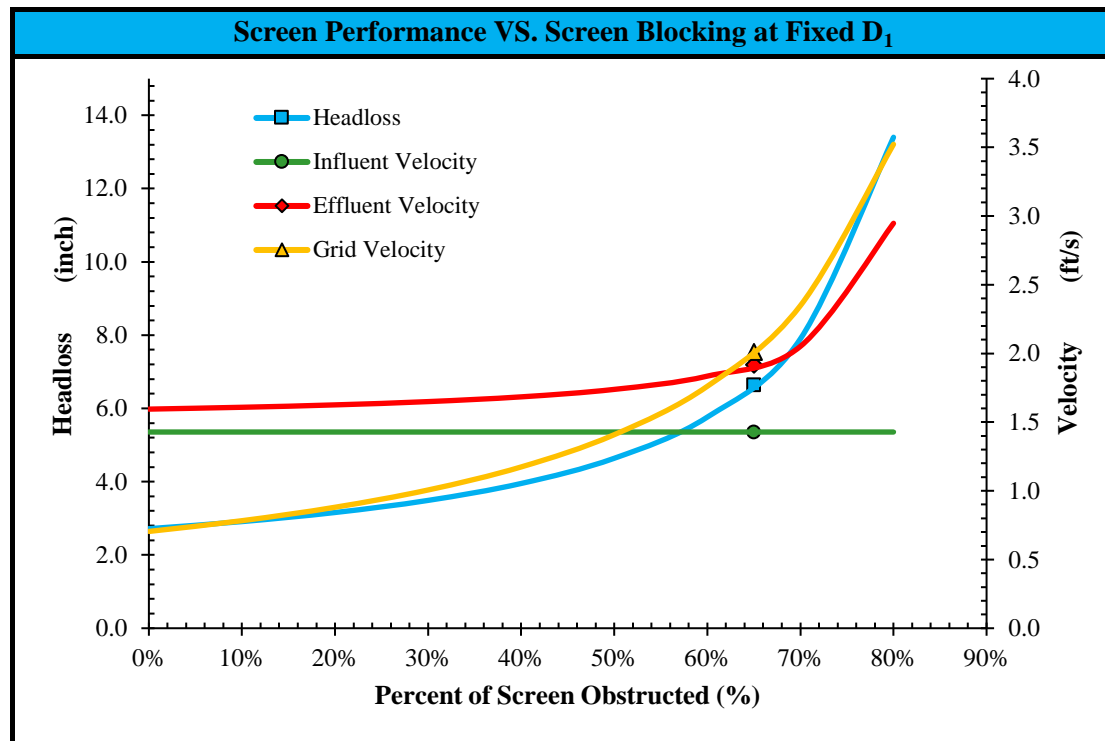
By: STM

Checked: JMB

Model # CF 26 - 49 - 176 - 2 - P

Fixed D ₁ Condition @ 65% Obs		English Units		SI Units	
Q	Flow Rate	3.00 MGD	2083 gpm	131 L/s	11356 m ³ /d
D ₁	Upstream Water Depth	26.00 in		660 mm	
D ₂	Downstream Water Depth	19.36 in		492 mm	
ΔH	Total Headloss	6.64 in		169 mm	
F	Freeboard	76.00 in		1930 mm	
V ₁	Influent Channel Velocity	1.43 ft/s		0.44 m/s	
V _T	Throat Velocity of Screen	2.40 ft/s		0.73 m/s	
V _G	Velocity Through Grid	2.01 ft/s		0.61 m/s	
V _{Re}	Recess Zone Velocity	2.36 ft/s		0.72 m/s	
V ₂	Effluent Channel Velocity	1.92 ft/s		0.59 m/s	

Fixed D ₂ Condition @ 65% Obs		English Units		SI Units	
Q	Flow Rate	3.00 MGD	2083 gpm	131 L/s	11356 m ³ /d
D ₁	Upstream Water Depth	21.73 in		552 mm	
D ₂	Downstream Water Depth	12.00 in		305 mm	
ΔH	Total Headloss	9.73 in		247 mm	
F	Freeboard	80.27 in		2039 mm	
V ₁	Influent Channel Velocity	1.71 ft/s		0.52 m/s	
V _T	Throat Velocity of Screen	3.07 ft/s		0.94 m/s	
V _G	Velocity Through Grid	2.43 ft/s		0.74 m/s	
V _{Re}	Recess Zone Velocity	3.41 ft/s		1.04 m/s	
V ₂	Effluent Channel Velocity	3.09 ft/s		0.94 m/s	



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VORTEX GRIT REMOVAL AND HANDLING SYSTEM (PUMP) TECHNICAL SPECIFICATIONS

Part 1 GENERAL

1.1 SCOPE – Supply all labor, materials, equipment and incidentals required to install and place into operation the grit system as shown on the Drawings and as specified herein.

1.2 REFERENCE STANDARDS – The properties of all materials, design, fabrication and performance of the equipment to be furnished under this section shall be in accordance with the latest issue of applicable standard specifications. The governing authorities of these standards are listed below.

- A. AISC, American Institute of Steel Construction
- B. AISI American Iron and Steel Institute
- C. ANSI, American National Standards Institute
- D. ASCE, American Society of Civil Engineers
- E. ASME, American Society of Mechanical Engineers
- F. ASTM, American Society of Testing and Materials
- G. AWS, American Welding Society
- H. IBC, International Building Code
- I. IEC, International Electric Code
- J. IEEE, Institute of Electrical and Electronics Engineers
- K. NEC, National Electrical Code
- L. NEMA, National Electrical Manufacturers Association
- M. Underwriters Laboratory (UL and cUL)

1.3 SUBMITTALS – Submittals shall be provided to the engineer that includes all the following information:

- A. Certified shop drawings showing all important details of construction, dimensions and anchor bolt locations.
- B. Descriptive product literature.
- C. Schematic electrical wiring diagram and electrical controls information.
- D. Complete motor and drive data.
- E. The total weight of the equipment.
- F. A complete bill of materials of all equipment.
- G. A valid certificate of registration naming manufacturer, and supplier if equipment is relabeled, as ISO 9001:2015 certified.

1.4 QUALIFICATIONS

- A. All the equipment specified under this Section shall be supplied by a single manufacturer whose Quality Management System is ISO 9001:2015 certified and applicable to the manufacture of water and wastewater treatment equipment.
- B. If equipment is not manufactured by supplier, including welding and machining, the name and contact information of manufacturing facility must be supplied. If more than one manufacturer is used all companies and facilities must be provided.

- C. If patents protecting equipment are not owned by supplier then an affidavit must be supplied stating owner of design and expiration of licensing agreement.
- D. All equipment specified under this Section shall comply Bipartisan Infrastructure Law's (BIL Public Law 117-58) Build America, Buy America (BABA) requirements for manufactured products. As defined in the Law, this requires:
 - (i) the manufactured product was manufactured in the United States, and
 - (ii) the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product.Certifications attesting to compliance will be required prior to approval and shall be included with submittals and upon completion of manufacture.

1.5 DESIGN REQUIREMENTS – VORTEX COLLECTOR

A. System Description

1. The Grit Trap will be a “vortex” style system designed to operate continuously.
2. The internal rotating mechanism will be installed into the circular concrete chamber as shown on the contract drawings. The chamber will consist of an upper separation chamber and a lower collection hopper.
3. The wastewater flow will enter the chamber tangentially, flow around the upper separation chamber and exit via an outlet channel running parallel to the inlet.
4. The grit solids will fall through the upper separation chamber to settle in the lower collection hopper. The transfer grit pump will regularly cycle and transport the grit particles to the de-watering Grit Classifier.
5. Consistent performance of the grit chamber throughout the flow ranges will be maintained by the motor driven impeller that continuously rotates within the upper separation chamber. The device will provide the ideal conditions to enhance grit settlement and maximize the ejection of light organic solids from the chamber.
6. The floor of the upper separation chamber must be sloped as shown on the contract drawings to prevent grit accumulation and allow the grit to fall by gravity into the collection hopper.
7. All stainless steel (including drive tube and impeller) mentioned below as stainless steel shall be T304 stainless steel. All hardware shall be T316 stainless steel.

B. System Performance

1. The Grit Trap will be designed to meet the following grit removal performance guarantee at all flows up to and including the peak flow. Grit is defined as silica sand; specific gravity = 2.65 g/cc:
 - a. Grit greater than 50 mesh/297 micron 95%
 - b. Grit greater than 60 mesh 90%
 - c. Grit greater than 70 mesh/210 micron but not less than 50 mesh 85%
 - d. Grit greater than 100 mesh/149 micron but not less than 70 mesh 65%

2. The Grit Trap model will be selected to meet the following design parameters:
 - a. Number of chambers required 1
 - b. Peak flow per chamber 7.5 MGD
 - c. Maximum allowable head loss at peak flow 1 inches
 - d. Average flow 3 MGD
 - e. Grit fluidizing water requirements 20gpm @ 40PSI

1.6 DESIGN REQUIREMENTS – GRIT PUMP

A. System Description

1. The manufacturer shall supply a grit pump to transfer the grit and liquid from the collection hopper to the grit screw classifier system.
2. The grit pump shall be mounted as shown on the contract drawings.
3. The contractor shall supply the 4 inch pipe from the top of the suction pipe to the grit pump inlet and the grit pump outlet to the grit screw classifier.
4. System Performance – The grit pump will fully comply with the following criteria:
 - a. Number of grit pumps 1
 - b. Maximum pump capacity 250 GPM
 - c. Minimum Motor HP rating 5 hp
 - d. Inlet connection 4 inches
 - e. Outlet connection 4 inches

1.7 DESIGN REQUIREMENTS – GRIT CLASSIFIER SYSTEM

A. System Description

1. The Grit Classifier system will be adequately sized to receive and process a mixture of grit and liquid regularly pumped at the maximum specified rate from the vortex grit chamber.
2. A cyclone mounted on top of the Grit Classifier will provide initial dewatering. The excess liquid will be immediately returned to the main flow.

3. The partially dewatered grit will be deposited into the main body of the Grit Classifier. The heavy grit will settle in the collection hopper while the excess liquid will overflow an internal weir and be returned to the main flow.
 4. The grit will be elevated by a rotating screw to a discharge point above the internal water level. By this time the grit material will be free of any free-standing liquid.
 5. All stainless steel (including Grit Classifier and grit cyclone) mentioned below as stainless steel shall be T304 stainless steel. All hardware shall be T316 stainless steel.
- B. System Performance – The Grit Classifier system will fully comply with the following criteria:

1. Number of cyclones	1
2. Maximum capacity of cyclone:	250 GPM
3. Inlet flanged spool piece connection	4 inches
4. Overflow flanged spool piece connection	6 inches
5. Apex	2 inches
6. Maximum underflow to screw classifier	30 GPM Maximum
7. Number of screw classifiers	1
8. Maximum capacity of screw classifier	30 GPM
9. Diameter of screw	12 inches
10. Diameter of screw shaft	3 inches
11. Minimum length of screw	8 feet
12. Speed of screw	12 RPM
13. Motor Size	1/2 HP

Part 2 PRODUCTS

2.1 MANUFACTURER

- A. The equipment shall be the Grit Trap and the Grit Classifier as provided by Hydro-Dyne Engineering, Inc., Clearwater, FL. The grit pump shall be the Gorman Rupp T4A. Other than the named supplier, all manufacturers proposing equipment described herein, will provide a detailed submittal package, which will consist, at a minimum, of all information and details prescribed in section 2.2, including BABA compliance, of this specification. All pre-qualification submittals will be submitted to the Engineer at least 15 days prior to the bid date.
- B. If submitted equipment requires arrangement differing from that specified, prepare and submit for review complete structural, mechanical, and electrical drawings and equipment lists showing all necessary changes and embodying all special features of equipment proposed. Any changes are at no additional compensation and the Manufacturer will be responsible for all engineering costs of redesign by the Engineer, if necessary.

2.2 THE VORTEX GRIT TRAP

A. General

1. The internal mechanism of the Grit Trap will consist of a gear motor, a drive head, a drive tube and a rotating impeller.
2. The grit chamber shall be a concrete structure provided by the contractor that must have inlet and outlet channels as shown on the drawings.

B. The Drive Head Assembly

1. The drive head will be a composite unit consisting of a heavy duty steel base and cover. The base section will support a nominal 20 inch turntable bearing that has a minimum B-10 life of 20 years. The Contractor will be responsible for correctly mounting the drive head on the bridge.
2. The drive tube will be rotated at a nominal 15 RPM by a heavy duty spur tooth bull gear wheel securely bolted to the turntable bearing. This bull gear wheel will be driven by a steel drive pinion mounted on the output shaft of the helical gear motor. The pinion and the bull gear will have a service factor of 5.0 or greater at standard operating speeds.
3. The helical gear motor will be directly shaft mounted to the bull gear wheel. Each drive head will have a single 3/4 hp(0.56KW, FLA 1.1), continuous duty electric motor suitable for a 460/3/60 supply and rated for a Class 1 Div.2 environment. As a minimum, the motor will have an IP55 enclosure rating and will conform to NEMA MG-1 requirements.
4. The whole drive head assembly will be suitable for continuous operation.

C. The Rotating Mechanism

1. The drive tube will be 10 inch diameter pipe that will run down the center of the grit chamber. The drive tube will pass through an opening in bull gear wheel and terminate inside the drive head as an open pipe. This will allow passage for the suction pipe assembly detailed in 2.3 B1.
2. The impeller will be attached to the drive tube by means of a two piece collar. The impeller shall have four equally spaced blades fixed to a base plate. As the impeller rotates each blade will pass within 6 inches from the top of the collection hopper. The impeller blades will be set at 5 to 20 degrees to the vertical. The profile of the impeller blades will be designed to maximize grit capture and eject floating solids out of the chamber. The impeller will rotate at a nominal 15 RPM in the direction to the wastewater flow.
3. The rotating mechanism will be manufactured from stainless steel.

2.3 THE GRIT PUMP – TOP MOUNTED

A. General

1. The grit pump shall be supplied on a factory built fabricated steel base suitable for mounting as shown on the contract drawings.

B. The Internal Suction Pipe for Top Mounted Grit Pump

1. The grit pump suction arrangement will consist of a 4-inch diameter suction pipe and a parallel 1.5-inch fluidizing pipe that will run down the inside of the drive tube to within 4 inches off the bottom of the grit collection hopper floor. Both pipes will terminate immediately above the drive head. The manufacturer will supply a 1.0 inch solenoid valve and two manual PVC isolation valves that the Contractor will install at a convenient place in the fluidizing pipe above the drive head. The Contractor will bring and connect an air or water supply to the 1.5 inch pipe that will provide agitation of the grit before each pumping cycle.
2. The grit pump suction assembly will be manufactured from stainless steel.
3. The contractor will connect the fluidizing pipe to a water supply that will deliver a minimum pressure of 40 psig at the suction point. This will provide a blast of water that will agitate the grit prior to each pumping cycle.
4. The manufacturer will control the solenoid valve and hence the fluidizing cycle through the control panel
5. The Contractor will supply the pipe to the flanged connection of the center mounted 4 inch suction pipe that terminates above the drive head to the inlet of the grit pump.
6. The Contractor shall provide the 4 inch pipe from the outlet of the grit pump to the dewatering screw classifier.
7. The grit pump shall be designed to handle the passage of a 3-inch spherical solid.

C. Grit Pump Design

1. The foot supported pump casing will be designed to retain sufficient liquid for automatic re-priming between pumping cycles. It will allow a horizontal centerline suction and vertical discharge arrangement and incorporate a fill port with safety lock bar and Teflon gasket. A drain hole will be provided for connection to the drain kit. The kit shall contain 10' length of reinforced plastic hose with a female quick connect fitting at one end, and factory installed drain fittings in each pump. Fittings include a stainless steel pipe nipple, stainless steel bushing, stainless steel ball valve and aluminum male quick connect fitting.
2. A separate capped threaded port will be provided if a casing heater is required. If required thermostat control will be provided the main control panel.

3. The cover plate will be supplied with a removable wear liner. It will be sealed to the pump casing by two Buna-N O-rings. The cover plate also has a pressure relief valve to open at 75 PSI fitted with a handle pusher bolt capability.
4. The two vane impeller will be a semi open, non clog design that has integral pump-out vanes on the back shroud. The impeller will be threaded on to the pump shaft and secured with a lock screw.
5. The shaft bearings will be anti-friction ball or tapered roller type that will withstand loads associated with normal operation. A mechanical cartridge seal will seal the pump shaft against leakage. This seal will be double floating to prevent misalignment that might arise from vibration, deflection or general movement.
6. Separate oil filled cavities, vented to the atmosphere will be provided for the shaft seal and bearings. The cavities will be cooled by the pumped liquid. The bearing and seal cavities will have an oil level sight gauge and fill plug with vent. The oil will be prevented from leaking by a three lip seal arrangement.

D. Grit Pump Drive Motor

1. The motor will 5 hp(3.7KW, FLA 6.5), minimum continuous duty electric motor suitable for a 460/3/60 supply and rated for a Class 1 Div.2 environment. As a minimum, the motor will have an IP55 enclosure rating and will conform to NEMA MG-1 requirements.
2. The V-belt transmission will transfer the power from the motor to the pump. The V-belt will have two belts and safety factor of 1.5. The drive transmission will be supplied with removable guards with openings less than ½ an inch.

E. Grit Pump Construction

1. The materials of construction will be as follows:
 - a. Casing – Gray Iron No. 30
 - b. Suction flap – molded neoprene with steel reinforcement.
 - c. Cover plate – Iron 30 with replaceable wear plate
 - d. Impeller – Cast ADI (Austempered Ductile Iron) with minimum Brinell hardness of 400.
 - e. Pump shaft – Alloy steel No. 4150
 - f. Shaft sleeve – Alloy steel No. 4130
 - g. Mechanical seal mating faces – Silicon Carbide
 - h. Replaceable seal plate.

2.4 THE GRIT CLASSIFIER SYSTEM

A. The Grit Cyclone

1. The grit pump will pump the grit mixture directly to a flanged inlet connection situated on the side of the cyclone through a 4 inch delivery pipe, supplied by the contractor. The cyclone will be mounted on a support placed over the inlet hopper of the Grit Classifier.

2. The cyclone will be capable of receiving and processing pumped flow up to the maximum capacity per section 1.7.B.2. The excess water will be separated and returned to the main flow via a vortex finder and through a 6 inch flanged outlet connection situated on the top of the cyclone inlet head. The contractor will supply and install the return pipe with siphon break. The remaining concentrated grit mixture will be removed and directed via the cone and apex into Grit Classifiers inlet hopper. The apex will have a fixed neoprene rubber liner and include quick release toggle clamps.
3. The cyclone will be designed to remove at least 98% of grit entering the feed inlet that is larger than 100 micron and having a specific gravity of 2.65 or greater.
4. The cyclone will work on the constant centrifugal principle and have no moving parts. Pressure must be maintained above 5 psi.
5. The cyclone casing will be fabricated from carbon steel plate sections. All sections shall be constructed with replaceable neoprene rubber liners.
6. The inlet adapter will include a 1.25" pressure gauge connection and the manufacturer shall supply a pressure gauge assembly complete with protective diaphragm, 0-30 PSI dial.
7. Cyclones must be painted with one coat gray Primer – 2-3 mils nominal dry film thickness. Finish Coat will be one part enamel, color blue, 2-3 mils nominal dry film thickness.

B. The Grit Classifier

1. The partially de-watered grit mixture will fall by gravity from the underside of the cyclone into the main body of the Grit Classifier. The main body is comprised of an inlet hopper and a screw trough that will be manufactured from stainless steel plate.
2. The inlet hopper will have sloping side walls and a minimum pool area of 6ft². The design will guarantee retention of 95% of 100-micron grit particles (silica sand with specific gravity of 2.65) at the maximum inflow without added internal baffle plates.
3. The grit particles will settle on the bottom of the inlet hopper. The excess liquid will spill over an internal weir within the inlet hopper and be returned to the sewage flow. The manufacturer will terminate with a flanged 4 inch pipe connection within 12 inches of the main body of the Grit Classifier.
4. The retained grit particles will be elevated from the inlet hopper by a rotating screw that runs the full length of the Grit Classifier. The full pitch screw will be installed at a nominal 16 degree angle to the horizontal.
5. The screw assembly will move the grit particles from the submerged inlet hopper to the "drying zone" section of the screw trough. The length of the "drying zone" must be no less than 2 feet to ensure adequate de-watering. The dry grit will discharge from an outlet at the end of the screw trough and be directed into the dumpster (supplied by others).

6. The screw assembly will be supported within the main body by a top and bottom bearing arrangement specially designed to avoid premature wear by abrasive grit particles. The bearing arrangement must support the entire length of the screw and maintain a 1/2 inch nominal clearance between the screw flights and the full length of the Grit Classifier main body. This will allow a permanent grit layer to accumulate and act as a natural wear liner protection.
7. The bottom bearing shall be mounted externally to the main body of the classifier. A 2" full port drain and flush valve will be mounted below the bottom drive shaft bearing on the main body of the classifier.
8. The bottom drive shaft bearing shall be mounted to the main body of the classifier and will consist of a (4) bolt flanged housing that is accessed externally to the hopper.
9. The entire Screw Classifier will be provided complete with the support legs suitable for mounting directly to the concrete floor.
10. The manufacturer shall provide lightweight minimum 16 gauge stainless steel covers that are easily removed for maintenance and totally enclose the Grit Classifier.
11. The motor shall be 1/2 hp(0.37KW, FLA 0.81), continuous duty electric motor suitable for a 460/3/60 supply and rated for a Class 1 Div.2 environment. As a minimum, the motor will have an IP55 enclosure rating and will conform to NEMA MG-1 requirements.

2.5 THE CONTROL PANEL

- A. The manufacturer will supply two (2) UL listed main control panels and fourteen local control stations that shall automatically control the coarse and fine screen equipment and the grit system in this section. Details are included in the screening specification.
- B. Sequence of operation and control:
 1. The Grit Trap will run continuously.
 2. The grit pump can be controlled manually but will normally operate automatically in timed on/off adjustable cycles as selected.
 3. In automatic mode the grit pump cycle will be initiated by a 24 hour time clock.
 4. The grit agitation cycle will start (0-5 minutes) and then stops.
 5. The grit pump and screw classifier will then start immediately (0-10 minutes).
 6. The signal is received to stop and the grit pump stops immediately.
 7. The Screw Classifier initiates a run on cycle (0-5 minutes) and then stops.
 8. End of cycle.

2.6 SURFACE PREPARATION AND PAINTING

- A. The majority of stainless steel materials, flanges and piping shall be pickled by means of a four tank system that is in accordance with ASTMs A380. This process is for quality control, removal of heat affected discoloration, surface treatment for corrosive environments and to provide a uniform finish to the stainless steel surfaces. Stainless steel components must be fully submerged in the tanks for complete coverage. Electro-chemical wanding is acceptable on weld finishes that cannot be submerged due to size. Sandblasting, pickling pastes and abrasive cleaners will not be accepted as forms of metal finishing.

Tank 1 – Detergent bath for the removal of soils, greases, oils and dirt

Tank 2 – Rinsing process to remove detergent and residual soils

Tank 3 – Two part acid solution for the removal of tightly adhere oxide films

Tank 4 – Final rinse process to remove all residual acid

- B. All ferrous surfaces (except stainless steel) shall be coated with a pre-primer, primer, and an exterior top coating, or fusion bonded polyester coating suitable for humid/wet environments for superior corrosion protection.
- C. Motor(s) and gearbox(s) shall be surface prepared to withstand humid/wet environments for superior corrosion protection.

2.7 SPARE PARTS - The manufacturer will supply the following spare parts:

- A. One (1) rotating assembly O-Ring(s)
B. One (1) set of impeller clearance adjustment spacers
C. One (1) set of spare V-belts

2.8 ACCESSORIES – The manufacturer will supply the following accessories with the equipment:

- A. One (1) 1” explosion proof brass body solenoid valve (GT Fluidizing)
B. Two (2) 1” manual isolation valve (GT Fluidizing)
C. Bagger system on Grit Classifier
D. One (1) lot of anchor bolts.

Part 3 EXECUTIONS

3.1 WARRANTY – The Manufacturer of the equipment supplied under this specification shall provide a warranty for a period of twenty-four months commencing on acceptance and/or beneficial occupancy by the Owner but no later than 90 days from the date of shipment by the Manufacturer. The Manufacturer shall guarantee that the equipment furnished is suitable for the purpose intended and free from defects in design, materials and workmanship. In the event that the equipment fails to perform as specified the Manufacturer shall, at his option, promptly repair, modify or replace the defective equipment.

3.2 FACTORY TESTING

- A. The grit removal system and all components shall be factory assembled and operationally tested prior to shipment. The equipment shall be shipped fully assembled and shall be capable of being set in place and field erected by the Contractor with minimal field assembly.
- B. During the factory test period the grit removal system shall be adjusted as required assuring proper operation on completion of the field installation. The Manufacturer shall supply a certification of the completion of the factory testing of the assembled system and appurtenances and shall certify as to the equipment being in satisfactory operating condition at time of shipment. The Engineer and/or Owner may, at their own option and expense, witness the factory test.

3.3 DELIVERY AND STORAGE

- A. The grit removal system shall be appropriately crated and delivered to protect against damage during shipment.
- B. An authorized representative of the Contractor shall inspect the equipment on delivery to the jobsite and shall report any damage or missing components to the Manufacturer and the Engineer within 72 hours of receipt of the shipment.

3.4 INSTALLATION – The installation of the grit removal system shall be as indicated on the drawings and in strict accordance with the Manufacturer's instructions and recommendations.

3.5 FIELD TESTS, ADJUSTMENTS AND COMMISSIONING

- A. The equipment shall be shipped completely factory assembled. Contractor shall verify all access dimensions, channel dimensions, and any interior building dimensions to ensure equipment may be installed as a factory assembled units.
- B. After completion of the installation, the equipment shall be inspected and certified by an authorized representative of the Manufacturer as being in compliance with the Manufacturer's recommendations and requirements. At such time as the Manufacturer has deemed the installation to be acceptable, the Manufacturer's authorized service representative shall make any required adjustments and shall start the equipment to assure proper operation.

- C. The Manufacturer's authorized representative shall provide instruction to the plant personnel as to the operation and maintenance of the equipment including commissioning, shut down, on-line operations, lubrication and preventative maintenance.
- D. Manufacturer shall state field service rates for a Service Engineer to Owner and Contractor. In the event that the field service time required by this section should not be sufficient to properly place the equipment into operation, and the requirement for additional time is beyond the manufacturer's responsibility, additional time shall be purchased by Contractor to correct deficiencies in installation, equipment, or material without additional cost to Owner.
- E. The Contractor shall include in his bid, the cost of the above referenced authorized service representative. See screen specification for trip and days supplied.

End of Section

Sand Shark Grit Trap Equipment Sizing



Tel: 813-818-0777 Fax: 813-818-0770

Project: San Luis, AZ - West WWTP
 Date: 11/19/2024
 Rep: JBI Water
 By: STM Checked: _____

Model#	GTT60I102CC4C
	GTK-144CN

Equipment Dimensions							
A	B	C	D	E	F	G	H
144 inches	60	30	60	16	67	24	0
3658 mm	1524	762	1524	406	1702	610	0

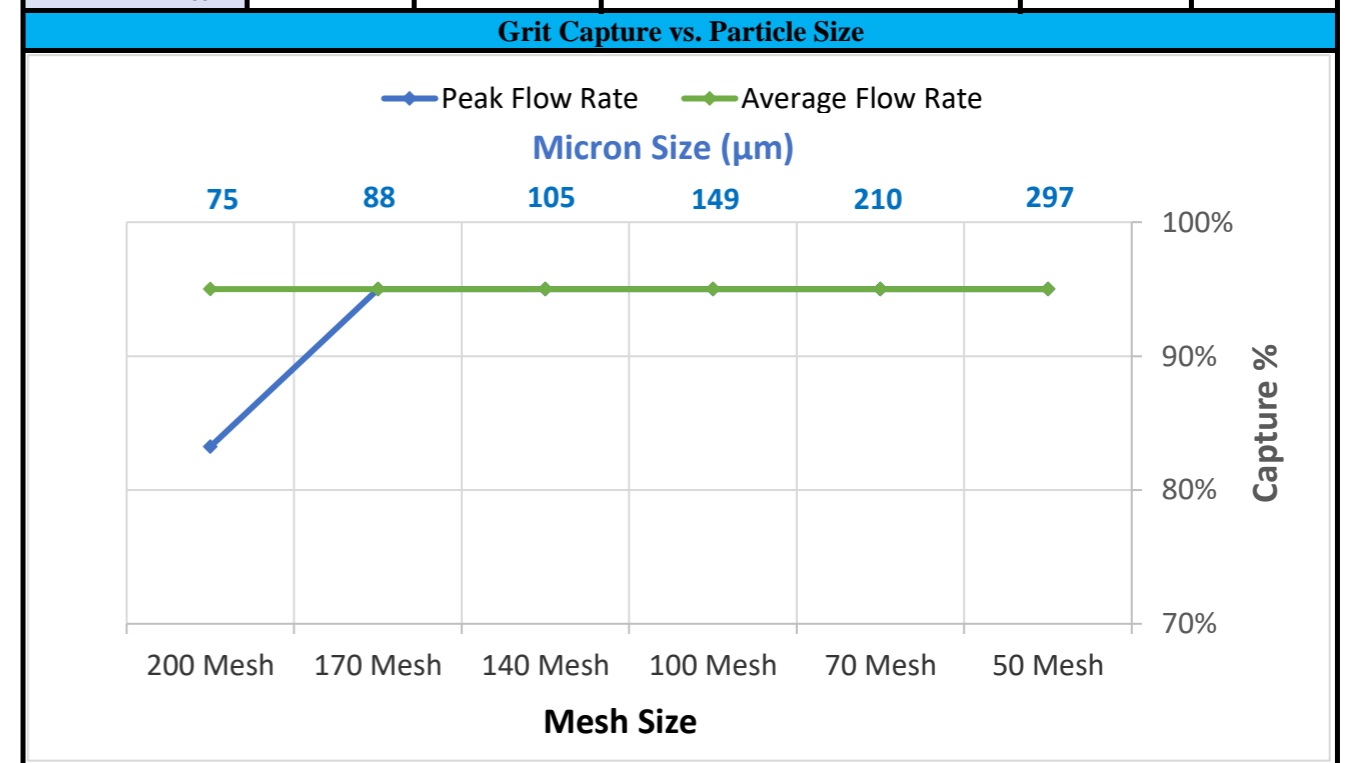
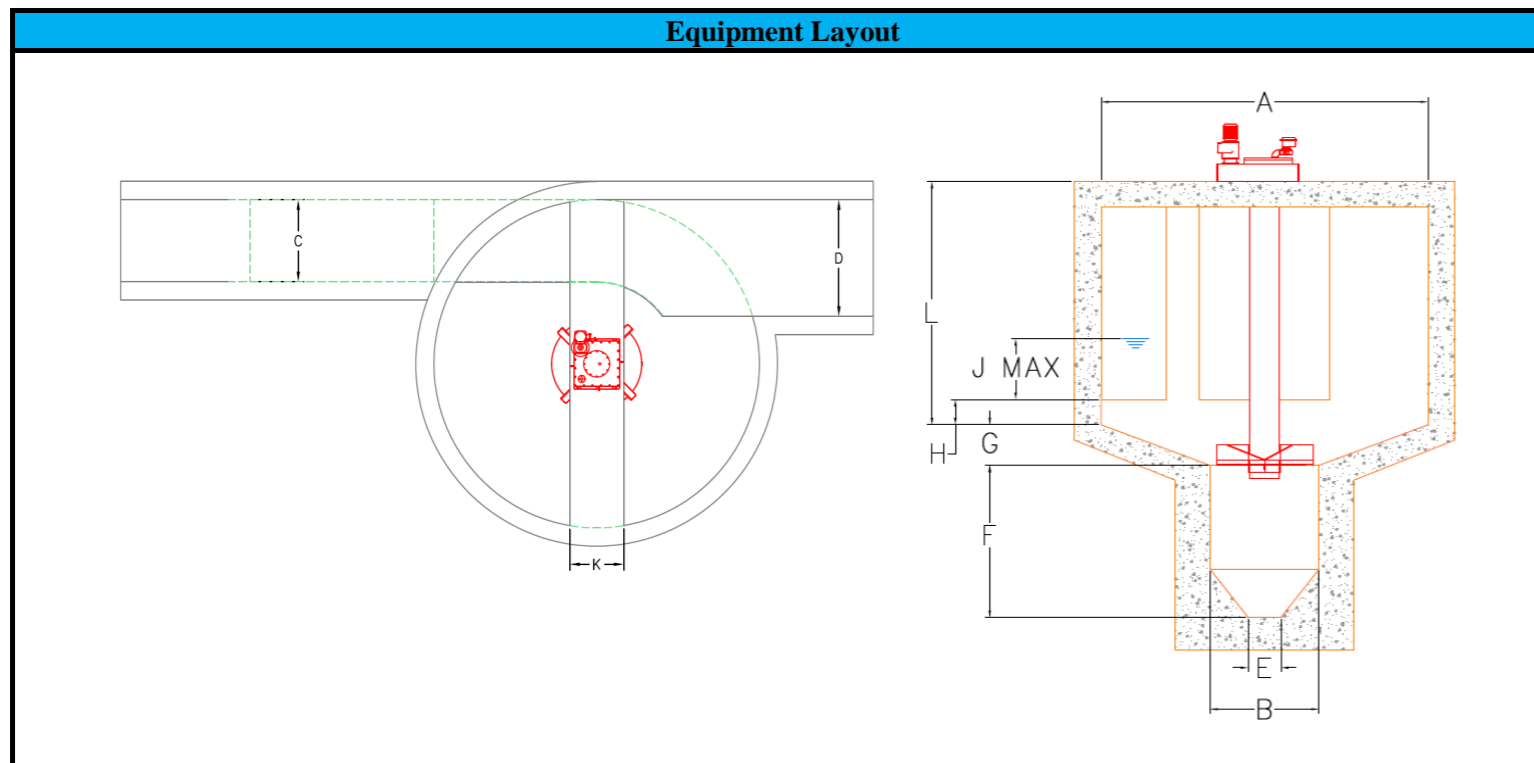
Channel Dimensions		
J	K	L
23	32	78
579	813	1981

Operating Conditions					
Weir Height	0.5 feet	6.4 inches	Flow Rate	Peak	Average
	0.16 m	164 mm		7.5 MGD	3 MGD
Specific Gravity	2.65		Upstream Channel Velocity	329 L/s	131 L/s
				3.48 ft/s	1.92 ft/s
			Required Capture	1.14 m/s	0.63 m/s
			HDE Projected Capture		
Cut Size (X ₅₀)	50 mesh	297 microns	95%	95%	95%
Cut Size (X ₇₀)	70 mesh	210 microns	85%	95%	95%
Cut Size (X ₁₀₀)	100 mesh	149 microns	65%	95%	95%
Cut Size (X ₁₄₀)	140 mesh	105 microns			
Cut Size (X ₂₀₀)	200 mesh	75 microns			

NOTE: Water levels into grit trap as follows:

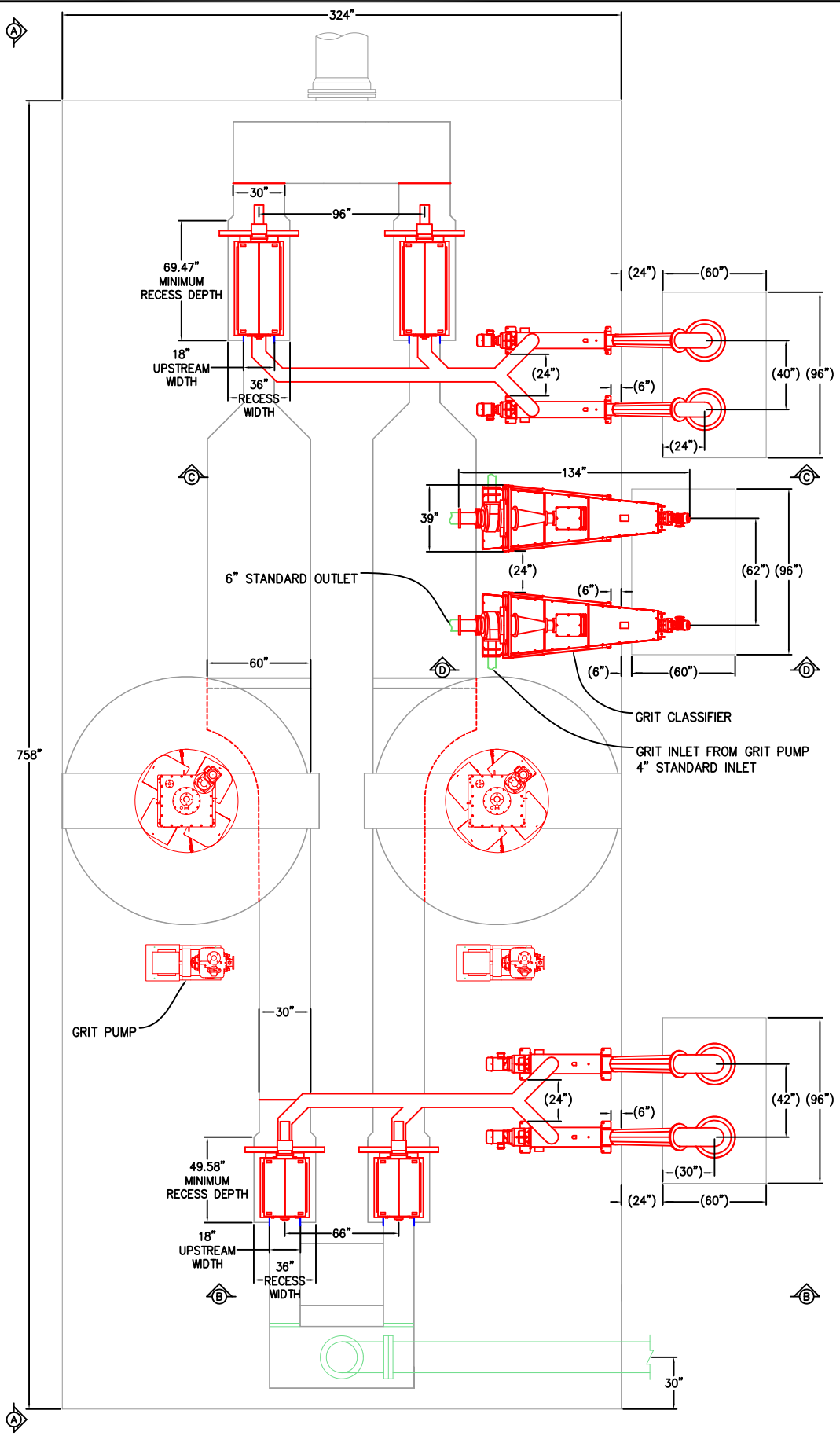
Peak water level	1.33 ft	16.00 in
Average water level	0.97 ft	11.63 in

Channel height	66.00 in
Freeboard at peak	50.00 in
Freeboard at avg	54.37 in



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Proposal Drawings



PLAN VIEW

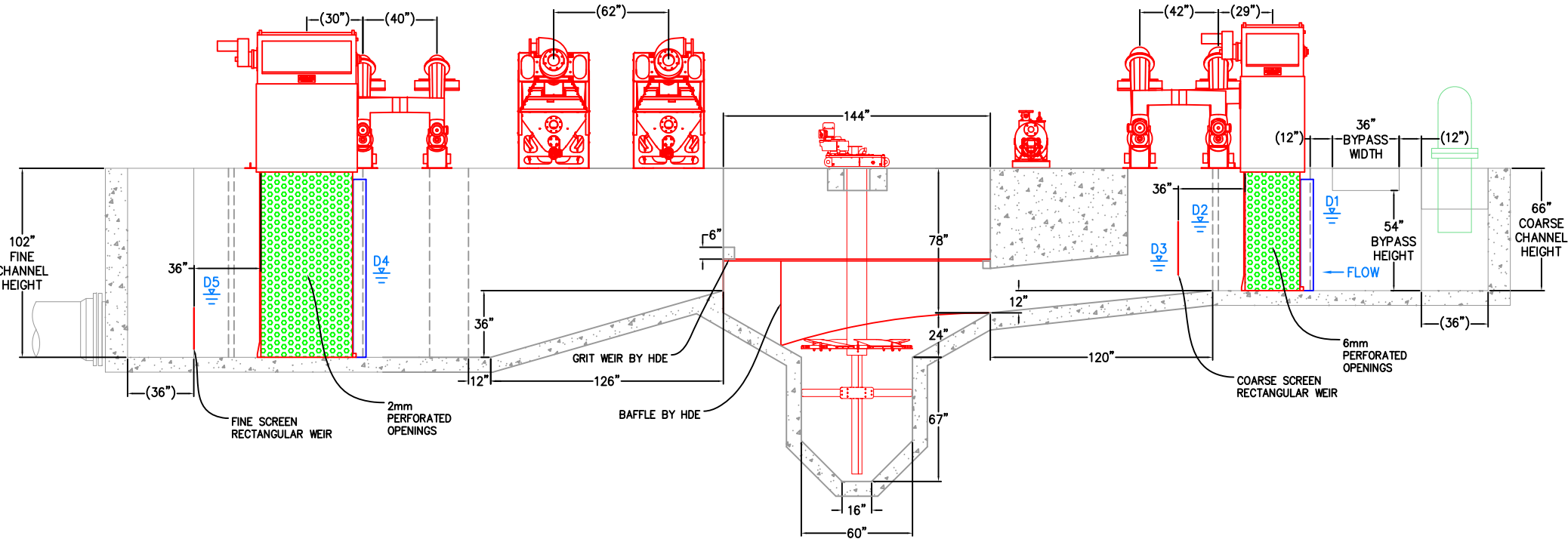
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P3 - S. T-M. - UPDATED LAYOUT WITH SMALLER EQUIPMENT RATED FOR 7.5MGD PEAK FLOW. BOTH COARSE AND FINE SCREENS HAVE SINGLE STAGE WYE SLUICE CONVEYANCE. 12/06/2024

UNLESS NOTED	
TOLERANCE	
.X	± 0.125"
.XX	± 0.060"
.XXX	± 0.030"
FRACTIONAL:	± 1/4"
∠	± 1°



SAN LUIS, AZ - TYPICAL PROPOSAL LAYOUT			
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DRAWN BY/DATE:	S. T-M 12/6/2024	CHECKED BY/DATE:	J. BOGGESS 12/6/2024
SIZE:	A		



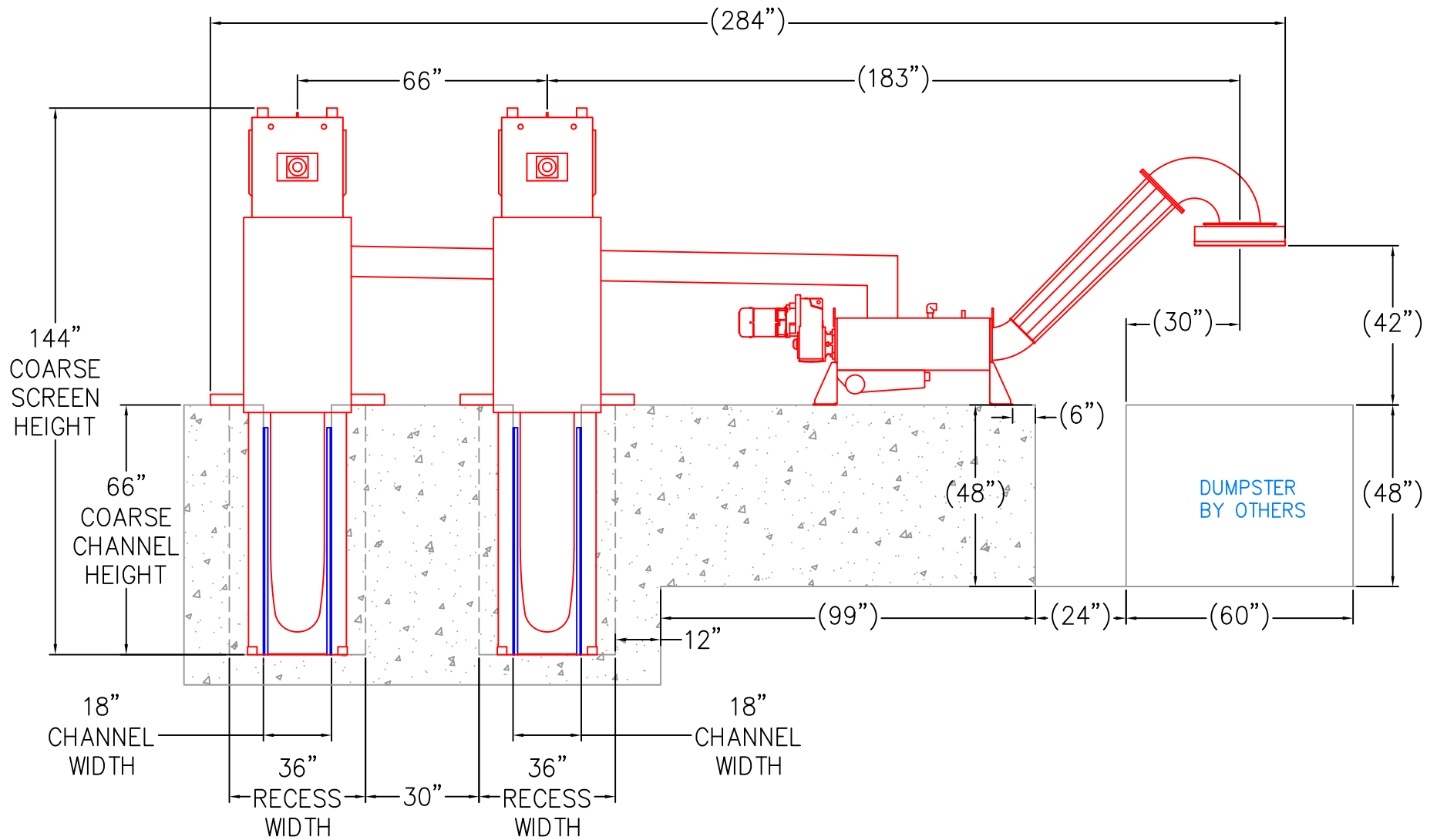
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TOLERANCE	
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FRACTIONAL: ± 1/4"	



SAN LUIS, AZ – TYPICAL PROPOSAL LAYOUT			
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CHECKED BY/DATE:	J. BOGGESS	12/6/2024	SIZE: A



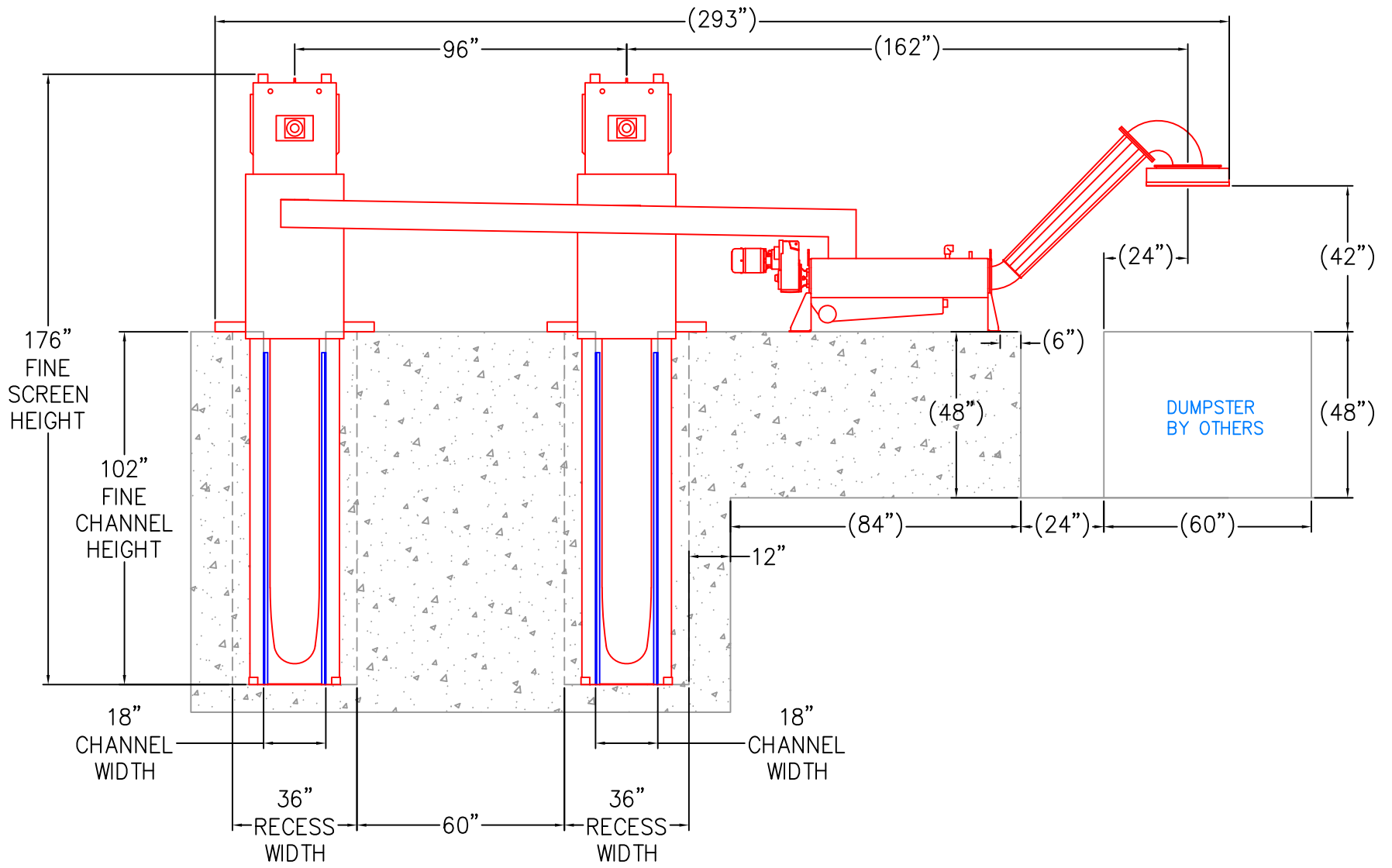
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UNLESS NOTED	
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FRACTIONAL: ± 1/4"	



SAN LUIS, AZ – TYPICAL PROPOSAL LAYOUT			
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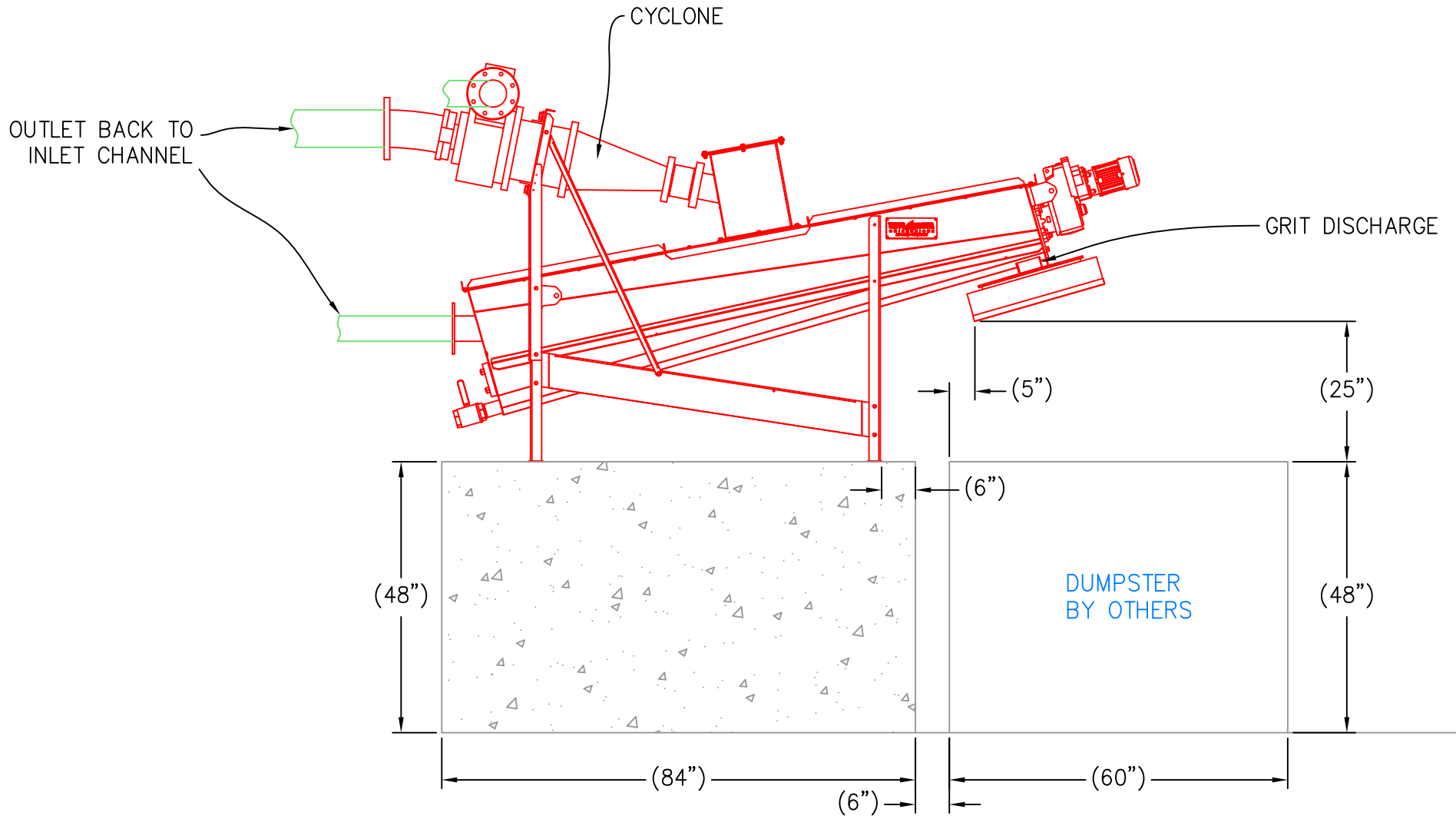
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UNLESS NOTED	
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FRACTIONAL: ± 1/4"	



SAN LUIS, AZ – TYPICAL PROPOSAL LAYOUT			
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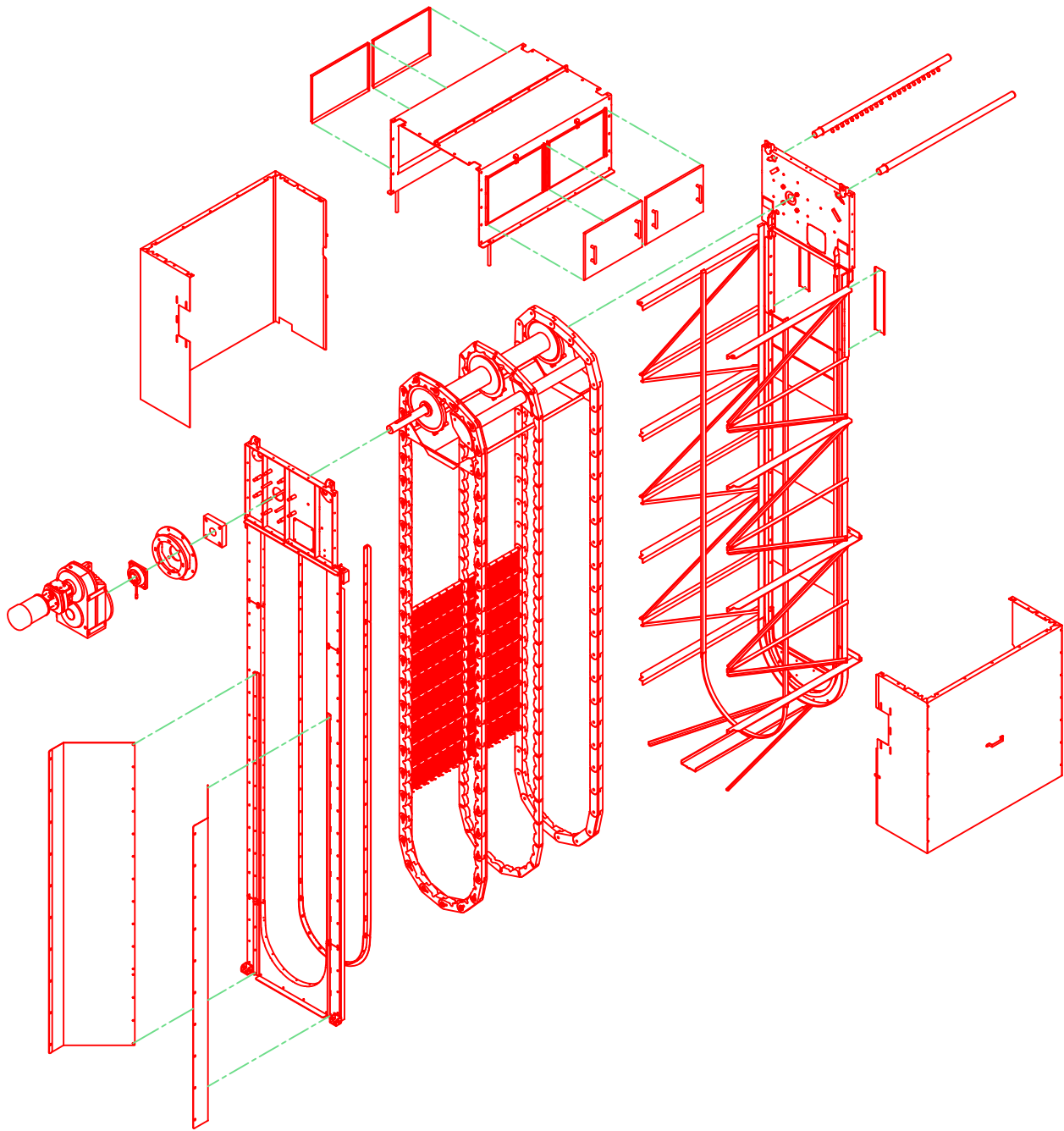
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.XXX	± 0.030"
FRACTIONAL: ± 1/4"	



SAN LUIS, AZ – TYPICAL PROPOSAL LAYOUT			
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CHECKED BY/DATE: J. BOGGESS		12/6/2024	SIZE: A

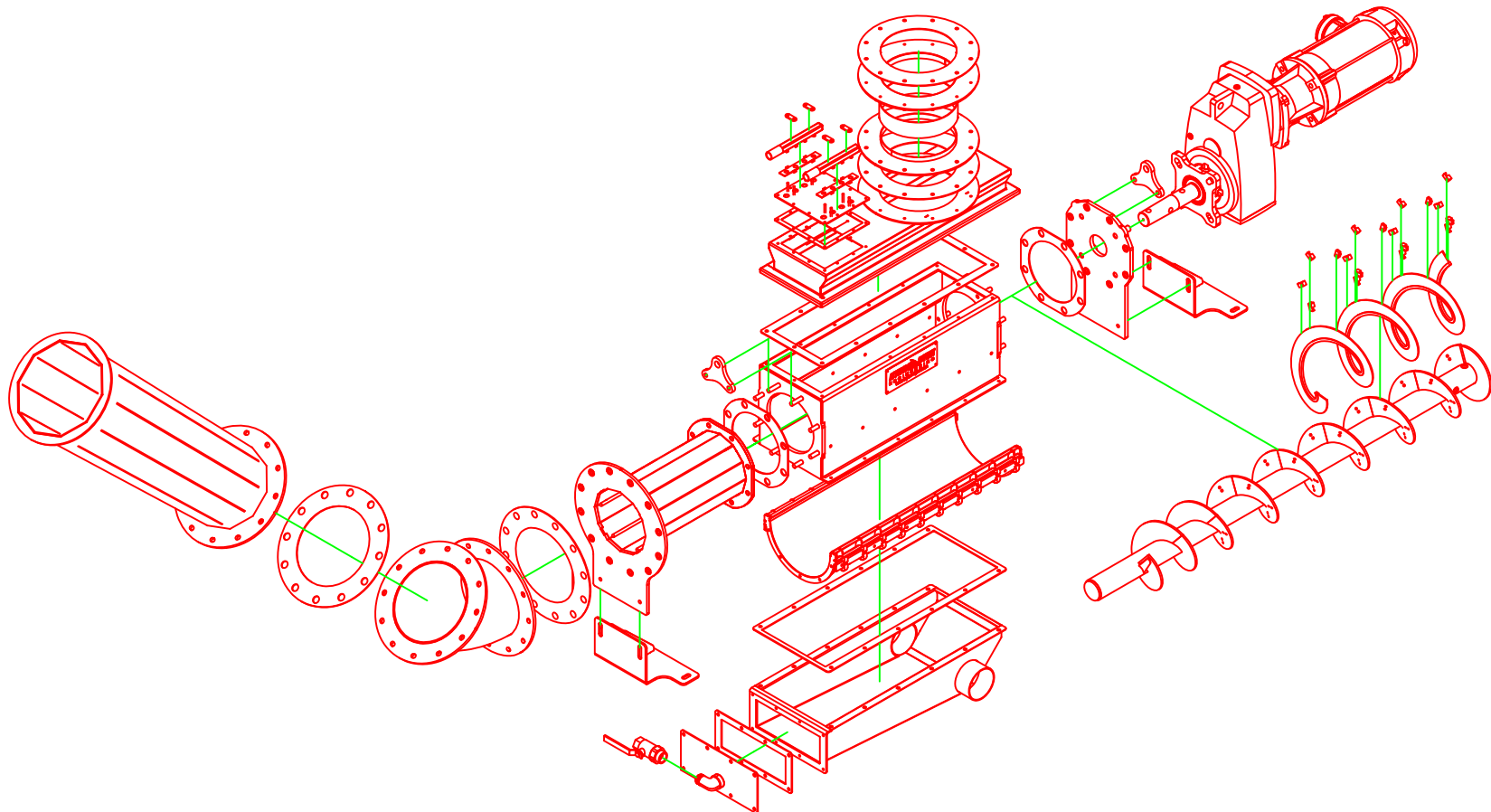


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UNLESS NOTED	
TOLERANCE	
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.XX	± .015
.XXX	± .005
.XXXX	± .0005



HYDRO-FLO – TYPICAL BREAKOUT – COMPLETE ASSEMBLY			
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REV.:	D	SCALE:	NTS
DRAWN BY/DATE:	J. COONEY – 04/23/14	CHECKED BY/DATE:	T. HUNT – 04/23/14
SIZE:	A		



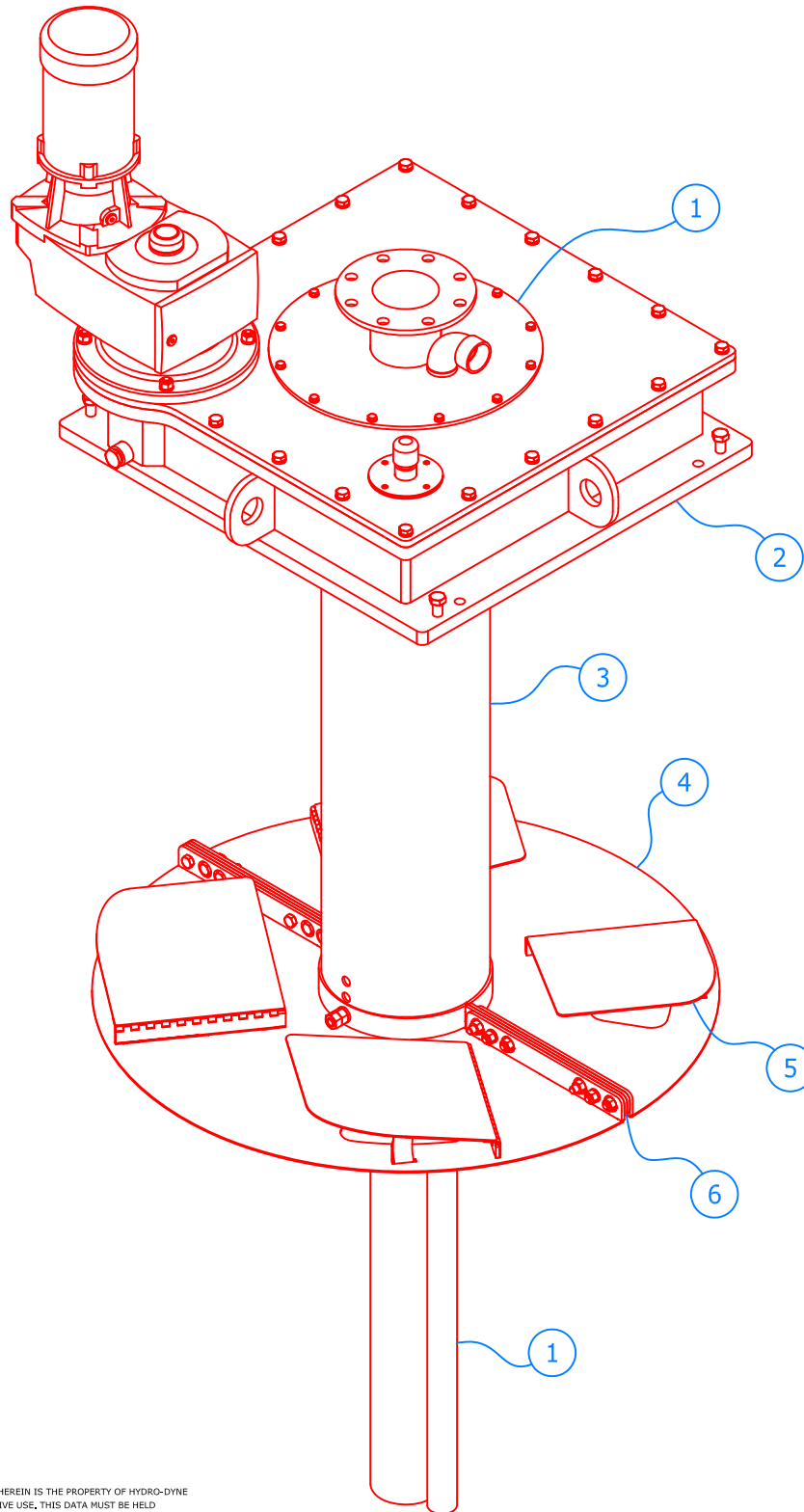
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AND HAS BEEN PROVIDED FOR RESTRICTIVE USE. THIS DATA
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DUPLICATION OR DISCLOSURE IS PROHIBITED UNLESS
AUTHORIZED IN WRITING BY HYDRO-DYNE ENGINEERING INC.

UNLESS NOTED	
TOLERANCE	
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.XX	± 0.060"
.XXX	± 0.030"
FRACTIONAL: ± 1/4"	



TYPICAL BREAKOUT - COMPACTOR		
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DRAWN BY/DATE: C. DISPENZA	6/28/2016	SCALE: NTS
CHECKED BY/DATE: -	6/28/2016	SIZE: A

ITEM	PART NUMBER	QTY	DESCRIPTION
1	GT-T-A1-008-XX	1	TOP MOUNT SUCTION ASSEMBLY
2	GT-D-A2-001	1	DRIVE ASSEMBLY
3	GT-P-A1-013-XX	1	DRIVE PIPE ASSEMBLY
4	GT-P-A1-001-XX	2	IMPELLER ASSEMBLY
5	GT-P-A1-021-XX	4	VANE ASSEMBLY
6	GT-P-A1-018-XX	2	IMPELLER CLAMP ASSEMBLY



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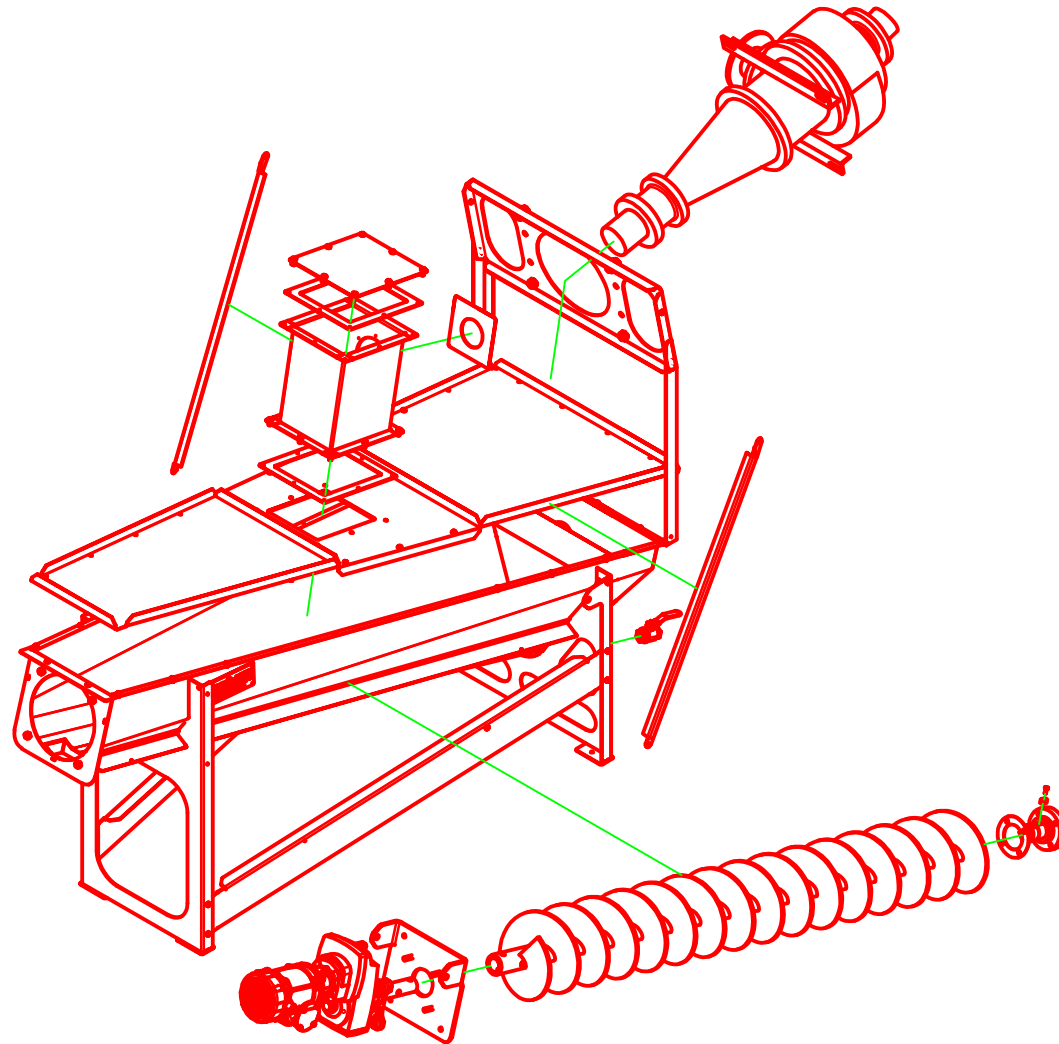
UNLESS NOTED

TOLERANCE
.X ± 0.125"
.XX ± 0.060"
.XXX ± 0.030"
FRACTIONAL: ± 1/4"
± 1°



GRIT TRAP - TYPICAL ASSEMBLY - TOP MOUNT - IMPELLER

DRAWING #: GT-TOP-IMPELLER	SHT.: 1/1	REV.: C
DRAWN BY/DATE: C. DISPENZA 02/17/19	SCALE: N.T.S.	
CHECKED BY/DATE: J. BOGGESS 02/17/19	SIZE: A	



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UNLESS NOTED	
TOLERANCE	
.X	± .030
.XX	± .015
.XXX	± .005
.XXXX	± .0005



GRIT CLASSIFIER TYPICAL BREAKOUT – ASSEMBLY			
DRAWING # GC-12-98C	SHT.: 1/1	REV.: –	
DRAWN BY/DATE: C. DISPENZA	12/23/20	SCALE: N.T.S.	
CHECKED BY/DATE: –	–	SIZE: A	

**Exhibit A Reference List &
Membrane Supplier Approvals
For Use Of Hydro-Dyne
Engineering Screens To Protect
MBR Systems**

Hydro-Dyne Engineering - MBR Reference List (June 2024)

#	Facility / Installation	Process	Install Date	Indoor/ Outdoor	Scope of Supply (All Fine Screening - 2mm PP)	Scope of Supply (Grit Removal)	Operati on Period	Flow Rate	Owner Contact Name	Owner Contact Number	email address
1	Cranberry, PA Brush Creek WPCF	Municipal WWTP	2017	Indoor/ Outdoor	Fine Screen Only: CF38-61-199-2P (x2) Compactor: WCP10-2P (x2)	None	24/7	30 MGD each	Mike Sedon	724-776-4806 x1300	mike.sedon@cranberrytownship.org
2	Shepardstown, WV Shepardstown WWTP	Municipal WWTP	2011	Indoor	Dual Stage Screening/ Integrated Headworks Coarse Screen: STR-20-127-3L (x1) Fine Screen: CF26-37-135-2P (x2)	Grit Tank - GT 40 Grit Classifier 9-144-C Sluice	24/7	2 MGD each	Frank Welch	304-876-3322	fwelch@shepherdstown.us
3	Franconia, PA Franconia Sewer Authority	Municipal WWTP	2010	Outdoor	Package Plant Fine: CF23-18-87-2P (x2) (2mm PP Screen in tank) Integral Compactor: WCP6 1WW(x2)	None	24/7	1 MGD each	Joanne Strom	215-272-4155	jstrom@franconia-township.org
4	Fallsburg / Loch Sheldrake, NY Loch Sheldrake WWTP	Municipal WWTP	2017	Indoor	Dual Stage Screening CF 23-36-129-2P STR 23-89-6L, WCP6-5S	None	24/7	3 MGD	John Barton	845-701-3974	lswwtplab@fallsburgny.com
5	Minotola, NJ Borough of Buena Municipal Authority	Municipal WWTP	2013	Outdoor	Fine: CF26-30-119-2P(x2) Compactor: WCP-6VP-2WW (x2)	None	24/7	2 MGD	Jon Erber	856-697-0450	j.erber@buenaboroughmua.com
6	Canton, OH Canton WWTP	Municipal WWTP	2015	Indoor	Dual Stage Screening Coarse: CF50-67-277-4P (x3) Fine: CF38-72-217-2P (x6) Compactor: WCP-12 – 2WW (x3) Sluice	None	24/7	44 MGD each (coarse) 22MGD each (fine)	Deborah Houdeshell	330-489-3080	deb.houdeshell@cantonohio.gov
7	Schofield Barracks Wahiawa HI	Municipal WWTP	2021	Outdoor	Single Stage Screening CF28-67-181-2P (x2) WCW-10HD-64-2P with Sluice	None	24/7	6.5 MGD each	Wayne White - Aqua Engineers	808-685-7873	wayne@aquaengineers.com
8	Mountain House, CA	Municipal WWTP	2023	Indoor	Dual Stage Screening/ Integrated Headworks CF32-43-163-6P (x2) CF32-67-187-2P (x2) WCW10(x2)	Grit Tank - GT192-60 (x2) Grit Classifier: GC-12 (x2)	24/7	17 MGD each	Richard White	916 997 7245	rwhite@auburnconstructors.com
9	Lloydminster, AB	Municipal WWTP	2023	Indoor	CF 28-36-229-2P (x2) WCP6 (x2)	None	24/7	16 MGD each	Landon Code	780-205-0954	lcode@lloydminster.ca
10	Sioux Falls, SD Smithfield Foods (Process – Industrial Hog Processing Waste post lagoon and coarse screen)	Industrial WWTP	2022	Indoor	Fine Screen: CF28-30-261-2P (x2) WCP6 (x2)	None	24/7	4 MGD each	Tony Naatjes	605-359-0115	tnaatjes@smithfield.com
11	Goodyear, AZ Sarival WRF (Process - Dual stage screening of raw influent)	Municipal WWTP	2023	Outdoor	Dual Stage Screening/ Integrated Headworks CF28-33-157-6P (x2) CF28-55-165-2P (x2) WCW10 (x2) Sluice	Grit Tank: GT-144-60 (x2) Grit Classifier: GC-12 (x2)	24/7	10 MGD each	Rick Rhodes	623-688-4371	rick.rhoads@libertyutilities.com

Hydro-Dyne Screen Approval – MBR System Suppliers

SUEZ/GE

From: Goldstein, Jake <jake.goldstein@suez.com>
Sent: Wednesday, October 16, 2019 5:00 PM
To: Randall Dow <randall.dow@hydro-dyne.com>
Cc: Bemmann, Cinzia (ext) <cinzia.bemmann.ext@suez.com>
Subject: RE: Suez/GE MBR System - Hydro-Dyne Screen Approval

Hi Randy,

Cinzia has received responses from the majority on your reference list; the last email has just arrived.

Based on these responses, your customers are happy with the product and with the service.

As a result, we have decided that your screens can be used for membrane protection when there is a primary clarification in place.

I just modified the list of acceptable screens, and yours is No 1 in the respective category:

Traveling-Band Screens (mostly in gravity channels) – used in tandem with clarifiers		
Hydro-Dyne	Great White Center Flow Screen	https://www.hydro-dyne.com/products/great-white-center-flow-screen/

Cinzia has already initiated the internal procedure in order to officially make your screens acceptable in the MBR applications.

Please let me know if you have any your comments.

Regards,
Jake

Kubota

From: Hiro Kuge <hiroo.kuge@kubota.com>
Sent: Wednesday, June 24, 2020 5:48 PM
To: Randall Dow <randall.dow@hydro-dyne.com>
Subject: Re: Hydro-Dyne Thank You For Visiting Us At WEFTEC (Kubota)

Randy

Sorry for not replying, but thanks for the reminder. I think I have explained to you before, but we never had any "Organized Approval process" for the fine screen, but I think we are a lot more confident with your screen then before.

I think I have told you this before, very honestly, but before, our organization has almost never recommended the band screen, but currently, we have changed our explanation whenever we get asked about the fine screen.

The only band screen we will recommend is going to be your screen. Please keep explaining to our sales regional managers, because I think they need to confirm in their own eyes like I did at WEFTEC. They need to believe in what they are recommending, and this is not a paper process.

Thank you & with my best respect,

Hiro Kuge M. S.
Technology Manager
KUBOTA Membrane USA Corporation



05 June, 2019

Dupont/
Memcor

Evoqua Water Technologies has evaluated the Hydro-Dyne Engineering Great White Shark Center Flow Band Screen and approves the use of their screen as a pre-screen for Evoqua MBR system designs. The final viability of using a Hydro-Dyne screen for a specific project needs to be based on the project specific design requirements

With kind regards,

A handwritten signature in blue ink, appearing to read "Gerin James".

Gerin James
Technology Leader, Memcor® MBR

**Exhibit B Performance Bond
Surety Letter of Bondability**



7217 Benjamin Road
Tampa, FL 33634

(813) 243-1110
(813) 243 -1109 fax
contractbonds@prosuregroup.com
www.prosuregroup.com

December 9, 2024

Pacific Advanced Civil Engineering, Inc. (PACE)
C/O Nathaniel Tesch
8723 E. Via de Commercio, Ste. A-204
Scottsdale, AZ 85258

Re: Letter of Bondability for Hydro-Dyne Engineering, Inc.

To Whom It May Concern:

Please be advised that we are the surety bond agents for Hydro-Dyne Engineering, Inc.. As such, we have enjoyed an excellent relationship with this firm as they have completed all contractual obligations in an acceptable fashion and have taken care of all pay obligations in a timely manner.

We have established a bond line for Hydro-Dyne Engineering, Inc. in the amount of \$3,000,000.00 per single project with an \$6,000,000.00 aggregate limit. This program is in place through Swiss Re Corporate Solutions America Insurance Corporation rated "A +" (Class XV) by A.M. Best and appears on the U.S. Treasury Circular 570 of approved sureties.

We don't hesitate to recommend this fine company to you. If you should have any further questions, please don't hesitate to contact me.

Sincerely,
ProSure Group, LLC

David B. Shick
President
Attorney-In-Fact for Surety

Exhibit C
Equipment Summary List

Exhibit C - Proposed Equipment Summary	
Headworks Screening and Grit Removal System	
Manufacturer/Equipment System General Information	
6 mm Fine Screens	
Name of Manufacturer	Hydro-Dyne Engineering
Type of Screening System	Great White Shark Center Flow Screen
Model Info. 6mm Fine Screen	CF26-49-176-2P4
Total # of Units for System (Including Redundancy)	Two (2)
6mm Fine Screen Drive Assembly - Horsepower per Unit (Hp)	0.5 hp
Other Motorized Devices - Horsepower per Unit (Hp)	NA
Total Unit Max Connected Electrical Load/Train (kW)	+0.44 kW per screen
Max Operational Weight per 6mm Fine Screen (lbs - if packaged unit)	2600 lbs
Overall Footprint (ft x ft)	2.5 ft x 12 ft; Screen only
Endless Bagger (Yes/No)	NA (Will be on Washing Compactors)
2mm Fine Screens	
Name of Manufacturer	Hydro-Dyne Engineering
Type of Screening System	Great White Shark Center Flow Screen
Model Info. 2mm Fine Screen	CF26-49-176-2P4
Total # of Units for System (Including Redundancy)	Two (2)
2mm Fine Screen Drive Assembly - Horsepower per Unit (Hp)	0.75 hp
Other Motorized Devices - Horsepower per Unit (Hp)	NA
Total Unit Max Connected Electrical Load/Train (kW)	+0.44 kW per screen
Max Operational Weight per 2mm Fine Screen (lbs - if packaged unit)	4000 lbs
Endless Bagger (Yes/No)	NA (Will be on Washing Compactors)
Overall Footprint (ft x ft)	4.1 ft x 14.6 ft
Washer Compactor (if not integrated with screens)	
Name of Manufacturer	Hydro-Dyne Engineering
Model Info.	WCW8S-23-5P4 (Coarse Screening) / WCW6S-39-2P4 (Fine Screening)
Total # of Units for System (Including Redundancy)	Two (2) / Two (2)
Conveyor Horsepower (Hp)	3.0 hp / 1.5 hp
Total Unit Max Connected Electrical Load (kW)	+1.9 kW per Coarse Screen WC / +0.97 kW per Fine Screen WC
Power Requirements, and Controlled By?	480V / 3 phase / 60hz and Controlled by Main Control Panel and Local Control Panel supplied by Manufacturer
Endless Bagger (Yes/No)	Yes
Grit Vortex Unit	
Name of Manufacturer	Hydro-Dyne Engineering
Vortex Model Info	Sand Shark Grit Trap / GTT60102CC4C
Total # of Units for System (Including Redundancy)	Two (2)
Total Unit Max Connected Electrical Load/ Grit Train (kW)	+0.62 kW per Vortex Grit Trap
Power Requirements, and Controlled By?	480V / 3 phase / 60hz and Controlled by Main Control Panel and Local Control Panel supplied by Manufacturer
Grit Pump	
Name of Manufacturer	Gorman-Rupp
Model Info	14A71S-B/F
Total # of Units for System (Including Redundancy)	Two (2)
Total Unit Max Connected Electrical Load/ Grit Train (kW)	3.1 kW per Grit Pump
Power Requirements, and Controlled By?	480V / 3 phase / 60hz and Controlled by Main Control Panel and Local Control Panel supplied by Manufacturer
Grit Vortex Classifier	
Name of Manufacturer	Hydro-Dyne Engineering
Model Info	Sand Shark Grit Classifier / GC12-98-4C
Total # of Units for System (Including Redundancy)	Two (2)
Total Unit Max Connected Electrical Load/ Grit Train (kW)	0.44 kW per Grit Classifier
Power Requirements, and Controlled By?	480V / 3 phase / 60hz and Controlled by Main Control Panel and Local Control Panel supplied by Manufacturer
Endless Bagger (Yes/No)	Yes
Performance Information	
6 mm Fine Screen and Washer Compactor	
Peak Flow Capacity per 6mm Screen (MGD)	7.5 MGD
Design Headloss (in)	3.35 in
Velocity Through 6mm Fine Screen (fps) @ Design Flow & Peak hr Flow	Include Graph or Separate Table with Values (FLOW VARYING)
6mm Fine Screen Head loss at Peak hr Flow (in) and Blinding (0%,30%,65%)	Include Graph or Separate Table with Values (FLOW VARYING)
Washer Compactor Screenings Handling (cu ft/Hr)	40 cu ft/Hr
Conveyor Lifting Capacity (lbs)	1150 lbs
Screen Washwater Consumption and Pressure (GPM and PSI)	28.8 GPM at 60 PSI
Screenings Volume Reduction (%)	Up To 85%
Screenings Volume Reduction (% Dryness)	Up To 40%
2mm Fine Screen and Washer Compactor	
Peak Flow Capacity per 2mm Screen (MGD)	7.5 MGD
Design Headloss (in)	8.96 in
Velocity Through 2mm Fine Screen (fps) @ Design flow and Peak-hr Flow	Include Graph or Separate Table with Values (FLOW VARYING)
2mm Fine Screen Head loss at Peak Flow (in) and Blinding (0%,30%,65%)	Include Graph or Separate Table with Values (FLOW VARYING)
Washer Compactor Screenings Handling (cu ft/Hr)	17.9 cu ft/Hr
Conveyor Lifting Capacity (lbs)	770 lbs
Screen Washwater Consumption and Pressure (GPM and PSI)	57.6 GPM at 60 PSI
Screenings Volume Reduction (%)	Up To 85%
Screenings Volume Reduction (% Dryness)	Up To 40%
Grit Vortex Unit and Classifier	
Solids Capture (%) at 0.25mm particle size & 2.65 SG	95%
Grit Pump Capacity (gpm)	250 GPM
Grit Pump Operating Pressure	12.5 PSI
Grit Classifier and Integral Hydro-Cyclone Capacity	250 GPM
Grit Classifier Grit Handling (cu ft/Hr)	180 cu ft/Hr
Capital Cost	
Single Train 6mm Fine Screen Equipment Cost (\$)	\$222,711
Total 6mm Fine Screens Equipment Cost (\$)	\$445,422
Single Train 2mm Fine Screen Equipment Cost (\$)	\$380,355
Total 2mm Fine Screens Equipment Cost (\$)	\$760,710 Price includes controls for all equipment
Single Train Washer/Compactor Equipment System Cost (\$)	Included in Screen Cost
Total Washer/Compactor Equipment System Cost (\$)	Included in Screen Cost
Single Train Grit System and Classifier Equipment Cost (\$)	\$133,290
Total Grit System and Classifier Equipment Cost (\$)	\$266,418
If Required: Total Misc. Equipment Costs (Booster Pumps, etc) (\$)	\$0
If Required: Structural Components (Lifts, Access Platforms, etc) (\$)	\$0
If Required: Total Volume of Structural Concrete (CY)	See Exceptions
Installation/Start-Up/Training Cost (\$)	\$16,000
Total Freight (FOB to Jobsite) (\$)	\$16,000
Standard Spare Parts and System Consumables (\$)	\$8,000 Include With Spare Parts List - See Service & Support Section
Total Equipment System Capital Cost (\$)	\$1,510,550
Total Cost Addition to Reach BABA Compliance (\$)	\$0 No additional cost required
Maintenance and Repair Contract	
Guaranteed Response Period (hrs)	Excluded
Cost of 5-year Service Contract (\$) - see exception/clarification	\$32,000
Cost of 5-yr Extension Option (\$)	Excluded
Electrical and Controls	
Equipment Design Input Power (kW)	To be provided at submittal
Total Power at Point of Connection (kW)	To be provided at submittal
Separate Control Panels per Train included (y/n)	Y
PLC Type/Model and Communication Protocol going to Other PLCs or SCADA	Allen Bradley CompactLogix 1769-L33ER / Ethernet IP
Warranty & Guarantee	
Guarantee Statement Provided (y/n)	N
Equipment System Warranty Period (months)	24
Extended Warranty (months)	12
Cost of Extended Warranty (\$)	\$44,840
Performance Bond	
Performance Bond Cost - 24 Months (\$)	\$52,969
Performance Bond Cost - 36 Months (\$)	\$59,700
Service & Support	
Start-up Period (days)	(3) Trips and (5) days
Is Spare Parts List Provided? (y/n)	Y
Are Maintenance Requirements and Schedule Provided? (y/n)	Y
Location of Parts Distribution Center (city, distance in miles to project)	Cleawater, FL / 1,926 miles
Location of Design Support Center (city, distance in miles to project)	Cleawater, FL / 1,926 miles
Design Support (y/n)	
Delivery Schedule	
Submittal Preparation Period (months)	6 weeks
Fabrication Period (months)	26 weeks
Delivery Period (months)	1 week

Exhibit D
Exclusions/Exceptions

EXHIBIT D – EXCLUSIONS/EXCEPTIONS FORM

Please identify exceptions to any of the specifications provided in the RFP Package. Please submit this form with your proposal. If no exceptions are taken, enter “None” for the first item. Make additional copies as necessary. Please note that these exceptions do not mitigate the responsibility of the vendor, in any way, whatsoever, on performance, equipment quality, maintainability, and operability.

Exception #	Proposal Page #	Section #	Exception Taken
1	NA	NA	Hydro-Dyne’s pricing is valid based on notification to proceed with manufacture by 6/9/25.
2	2	1.a.v	Hydro-Dyne is taking exception to the requirement to supply Volume in cubic yards of structural concrete required – Hydro-Dyne’s design fits within a footprint of 27.0 ft x 63.2 ft, well within the 42 ft x 72 ft area identified in the RFP.
3	2	1.b	There is no cost adder or schedule impact for providing a BABA compliant system.
4	3	1.e.	Hydro-Dyne is willing to provide a Performance Bond in the amount of 100% through the end of warranty period. Hydro-Dyne is supplying a Letter of Bondability from our Surety in lieu of a letter in Hydro-Dyne letterhead.
5	3	1.e.	Hydro-Dyne is taking exception to the requirement to provide a letter stating our willingness to provide a 100% performance guarantee for the duration of the warranty. Hydro-Dyne is excluding the Performance Guarantee from our offer.
6	3	1.g.	Hydro-Dyne is taking exception to the escalation clause and is including an adder for cost escalation to extend bid validity an additional 12 months. Note bid validity is based on date Notice To Proceed is received.
7	3	4. Maintenance and Repair Contract	Hydro-Dyne is taking exception to the Full Maintenance and Repairs Contract provisions. Hydro-Dyne is including, as an adder, a 5-year service plan as part of our offer.
8	4	5. Guarantee	Hydro-Dyne is taking exception to the following <i>“Further, it shall state that required subsystems or appurtenances omitted will be provided by the vendor at no additional cost to the owner.”</i>

EXHIBIT D – EXCLUSIONS/EXCEPTIONS FORM

9	4	6. Warranty	Hydro-Dyne is taking exception to the following <i>“The warranty shall include meeting the performance guarantee specified. Vendor shall bear 100% of any replacement costs or costs incurred due to upgrades required to meet the performance requirements during the lifetime of the warranty period and/or the duration of the Full Maintenance and Repair Contract.”</i> Hydro-Dyne is providing our standard 2 year warranty.
10	4	8. Equipment Performance, Layouts, and Specifications	Hydro-Dyne is taking exception to the following <i>“Performance data provided shall be guaranteed for the duration of the warranty period and/or Full Maintenance and Repair Contract.”</i>
11	5	9. Equipment/System Automation	Hydro-Dyne's system is designed for fully automatic operation with minimal operator attention. See Appendix “Typical Sequence Of Automatic Operation For Two Channel Integrated Headworks System”, for detailed description of system's automatic operation.
12	6	12. Schedule Liquidated Damages	Hydro-Dyne can agree to liquidated damage provisions for late delivery as revised below: “Should Seller delay the Project, or any portion thereof, in any way, then Supplier’s sole liability and Purchaser's sole remedy is assessment of liquidated damages of \$500/day, starting 2 weeks after the contractual milestone date, up to 50% of the contract value, only if Purchaser is assessed liquidated damages by the Owner as a result of Supplier's delay.”
13	13	1.2.D	Hydro-Dyne is quoting an upgraded enhanced washing compactor which exceeds the RFP requirement to produce dewatered screenings capable of passing the EPA Paint Filter Test as described in method 9095 of EPA Publication SW-486. Smaller opening (6mm and smaller) perforated plate screens may remove a high amount of organic solids which need to be thoroughly washed and returned to the channel by the washing compactor. The quoted washing compactor will meet the following specifications: <ul style="list-style-type: none"> • Weight reduction up to 80% • Screening volume reduction up to 85% • Organic removal up to 95% • Dewatered screenings dry solids content up to 40% (depending on material to be dewatered)

EXHIBIT D – EXCLUSIONS/EXCEPTIONS FORM

14	13	1.2.I	Details of electrical classification environments are not provided in the RFP. Hydro-Dyne is quoting both C1D2 components (motors, MCP) and C1D1 components (solenoids, LCS, level instruments) and can supply C1D1 components for a cost adder, if the final design requires these to be placed in a C1D1 environment.
15		Exhibit C Capital Cost Summary	Hydro-Dyne costing details are for information only as we are providing an integrated package. Pricing provided cannot be used to purchase selective line items.
16	16	Materials of Construction	Hydro-Dyne is supplying our standard paint coatings and is taking exception to the paint spec for gears, motors and bearings. We can provide an adder to supply spec compliant paint if requested.
17	17	Payment Terms & Conditions A.1	Payment Terms & Conditions A.1. – Hydro-Dyne takes exception to the statement “Equipment submittal is required prior to the execution of this contract for the Engineer to review and approve.” Hydro-Dyne cannot start submittals until execution of the contract. We can complete submittals under a separate contract for 10% of the total order value. This contract will be billed and payments received within 30 days of submittal approval.
18	17	Payment Terms & Conditions A.1	The statement “ <i>billing and payments will not commence until the assigning of this contract to the Construction Contractor where in the Construction Contractor will issue the Notice to Proceed to Order Equipment to the Vendor</i> ”, does not define the time period between completion of submittals and the issuing of the notice to proceed. Hydro-Dyne pricing validity and validity extensions are based on receipt of the Notification To Proceed within 6 months of the proposal date.
19	17	Payment Terms & Conditions B.	Hydro-Dyne takes exception to Payment Terms paragraph B.
20	NA		Hydro-Dyne proposal does not include engineering certifications or seals, seismic/wind calculations and related PE stamps. These can be provided for a cost adder upon request.

Exhibit E
Addendum Acknowledgement
Form

EXHIBIT E - ADDENDUM ACKNOWLEDGEMENT

ADDENDUM	DATE ISSUED	SIGNATURE
1	11/22/24	<i>Randall Dow</i>
2	11/26/24	<i>Randall Dow</i>

APPENDIX

5-Year Service Proposal

Date: 12/9/24

Plant Name: San Luis, AZ - West WWTP

Hydro-Dyne Engineering On-Site Inspection and Service

Hydro-Dyne Engineering is pleased to offer On-Site Inspection and Service for your HDE equipment. There is no better way to protect the investment you have in this equipment and your sensitive downstream processing equipment than to properly maintain your screening, compacting and collection equipment to factory specifications. Your decision to use Hydro-Dyne on-site factory service will ensure that the health of your equipment is our priority. Our service planner will add your facility to our service calendar and arrange any air travel, rental cars and accommodations needed for our field technician to provide you the best service in the industry.

Our field service technicians are all full-time factory trained and authorized technicians that also work on our factory floor. Their knowledge of your equipment is not limited only to maintenance and service. They have a great understanding of how it is built and the processes we use to make this the best equipment on the market. One of our factory trained field service technicians will be on-site at your facility to perform all the adjustments and tests that your specific Hydro-Dyne equipment requires to stay functioning at peak performance. We will provide to you with our 5-year service contract offering, so we can continue to work with you to keep your Hydro-Dyne equipment running optimally.

Here is an itemization of the Hydro-Dyne equipment to be installed at your facility:

- | | | |
|-------------------|-------|------------------------------|
| • Screens | QTY 2 | CF26-30-144-6P |
| • Compactors | QTY 2 | WCW8S 23 5P |
| • Screens | QTY 2 | CF26-49-176-2P |
| • Compactor | QTY 2 | WCW6s 38 2P |
| • Grit Trap | QTY 2 | GTT60I102CC4C/CC, GTK-144C-N |
| • Grit Pump | QTY 2 | Gorman Rupp T4A71S-B/F |
| • Grit Classifier | QTY 2 | GC12-98-4C |

On-Site inspection and service includes:

- Authorized service and repairs performed by our factory trained technician.
- All technician expenses including: air travel, rental car, meals and hotel expenses.
- A comprehensive after-service summary report of all work performed, a record of control settings upon arrival and departure, a list of any performance improvements offered, oil analysis reports, a description of any current repairs needed and a schedule of recommended daily, weekly and monthly maintenance.
- Each electric motor will be cleaned, greased when needed, and the bearings inspected for wear. The full load amp draw will be measured on each motor. This inspection allows us to verify the output horsepower of the motor and brings to light any unforeseen mechanical load problems. All wiring, switches, resets and connections will be inspected.
- All screen and compactor bearings will be inspected and greased as needed.
- All seals and gaskets will be inspected for integrity and leakage.
- The spray nozzles will be cleaned and inspected for wear or damage. The orifice size will be measured, and the spray pattern confirmed.
- The spray wash header will be inspected. All supply lines and connections will be inspected.
- The drive shaft, drive sprockets, pivot shafts, drive chains and guide links will all be inspected for integrity and wear.
- The frames, guide tracks and screen panels will all be inspected for integrity and wear.
- All current monitors, proximity switches, motion switches, speed sensors, solenoids, transducers will be inspected and adjusted as needed.
- The control panel, emergency stop button, circuit breakers, and timers will be inspected.
- The compactor auger, brushes, spray assembly, housings and bagging assembly (if supplied) will be inspected.
- Sediment filters, filter housings, strainers, wiper blades and discharge chutes will be inspected.
- All access panels will be removed to accommodate inspections and cleaning.
- Channel seals and lower screen frame and wear tracks will be inspected (channel will need to be drained by facility personnel during inspection and service call).
- Weather sealing, insulation, heat trace and climate protection equipment will be inspected and tested as needed.

APPENDIX

Typical Sequence Of Operation For Two Channel Integrated Headworks System

Typical SEQUENCE OF OPERATIONS

SCREEN MODE OF OPERATION (TYPICAL FOR 4):

HAND: WHEN THE SCREEN HAND-OFF-AUTO SELECTOR IS IN THE HAND POSITION, THE SCREEN WILL RUN CONTINUOUSLY. THE SCREEN WILL RUN AT HIGH SPEED (60 HZ) UNLESS PROGRAMMED OTHERWISE IN THE FIELD. HAND CONTROL IS AVAILABLE EXTERNAL TO THE PLC FOR CONTINUED OPERATION IN EMERGENCY CONDITIONS.

AUTO: WHEN THE SCREEN HAND-OFF-AUTO SELECTOR IS IN THE AUTO POSITION, THE SCREEN WILL RUN BASED ON THE REPEAT CYCLE TIMER OR LEVEL CONTROL MODE OUTLINED BELOW.

SCREEN REPEAT CYCLE TIMER:

IF THE SCREEN HAS NOT RUN FOR THE CYCLE OFF TIME, THE SCREEN WILL BE CALLED TO RUN FOR THE CYCLE ON TIME. ANY CALL TO RUN THE SCREEN WILL RESET THE CYCLE OFF TIMER.

LEVEL CONTROL MODE:

THE SCREEN WILL BE CALLED TO RUN WHEN THE DIFFERENTIAL LEVEL REACHES THE HIGH LEVEL ON SETPOINT FOR LONGER THAN THE SCREEN ON DELAY TIME. THE SCREEN SPEED WILL VARY PROPORTIONAL TO THE DIFFERENTIAL LEVEL. THE SCREEN WILL CONTINUE TO RUN UNTIL THE LEVEL FALLS BELOW THE HIGH LEVEL OFF SETPOINT. THE SCREEN WILL THEN CONTINUE TO RUN FOR THE SCREEN OFF DELAY TIME.

A HIGH-HIGH LEVEL CONDITION IS TRIGGERED IF THE UPSTREAM LEVEL OR DIFFERENTIAL LEVEL RISE ABOVE THE RESPECTIVE HIGH-HIGH LEVEL ON SETPOINTS, OR IF THE UPSTREAM FLOAT SWITCH IS TRIGGERED. DURING A HIGH-HIGH LEVEL CONDITION, THE SCREEN SPEED WILL RUN AT HIGH SPEED (60 HZ BY DEFAULT).

SCREEN FAULTS:

THE SCREEN WILL FAULT AND STOP IMMEDIATELY BASED ON THE FOLLOWING CONDITIONS:

1. MOTOR OVER TEMPERATURE
2. VFD FAULT
3. MOTOR CIRCUIT PROTECTOR OVERLOAD
4. HIGH CURRENT
5. EMERGENCY STOP

IF A FAULT OCCURS, ENSURE THE FAULT CONDITIONS ARE CLEAR AND PRESS THE RESET PUSHBUTTON ON THE CONTROL PANEL.

SCREEN WASH VALVE MODE OF OPERATION:

THE SCREEN WASH VALVE WILL BE CALLED TO OPEN ANY TIME THE ASSOCIATED SCREEN IS RUNNING.

GRIT TRAP MODE OF OPERATION (TYPICAL FOR 2):

THE GRIT TRAP WILL RUN CONTINUOUSLY WHENEVER THE SELECTOR SWITCH IS IN THE ON POSITION.

THE GRIT TRAP WILL FAULT AND STOP IMMEDIATELY BASED ON THE FOLLOWING CONDITIONS:

1. MOTOR OVER TEMPERATURE
2. MOTOR CIRCUIT PROTECTOR OVERLOAD
3. EMERGENCY STOP

IF A FAULT OCCURS, ENSURE THE FAULT CONDITIONS ARE CLEAR AND PRESS THE RESET PUSHBUTTON ON THE CONTROL PANEL.

GRIT PUMP MODE OF OPERATION (TYPICAL FOR 2):

HAND: WHEN THE GRIT PUMP HAND-OFF-AUTO SELECTOR IS IN THE HAND POSITION, THE GRIT PUMP WILL RUN CONTINUOUSLY. HAND CONTROL IS AVAILABLE EXTERNAL TO THE PLC FOR CONTINUED OPERATION IN EMERGENCY CONDITIONS.

AUTO: WHEN THE GRIT PUMP HAND-OFF-AUTO SELECTOR IS IN THE AUTO POSITION, THE GRIT PUMP WILL RUN BASED ON THE GRIT PUMP CYCLE ON AND OFF TIMERS THAT ARE ADJUSTABLE THROUGH THE OIT. ONLY ONE GRIT PUMP WILL RUN AT A TIME.

THE GRIT PUMP WILL FAULT AND STOP IMMEDIATELY BASED ON THE FOLLOWING CONDITIONS:

1. MOTOR OVER TEMPERATURE
2. MOTOR CIRCUIT PROTECTOR OVERLOAD
3. EMERGENCY STOP

IF A FAULT OCCURS, ENSURE THE FAULT CONDITIONS ARE CLEAR AND PRESS THE RESET PUSHBUTTON ON THE CONTROL PANEL.

GRIT FLUIDIZING VALVE MODE OF OPERATION (TYPICAL FOR 2):

HAND: WHEN THE GRIT VALVE OPEN-CLOSE-AUTO SELECTOR IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN CONTINUOUSLY. HAND CONTROL IS AVAILABLE EXTERNAL TO THE PLC FOR CONTINUED OPERATION IN EMERGENCY CONDITIONS.

AUTO: WHEN THE GRIT VALVE OPEN-CLOSE-AUTO SELECTOR IS IN THE AUTO POSITION, THE VALVE WILL OPEN FOR THE GRIT FLUIDIZING TIME PRIOR TO THE GRIT PUMP RUNNING ON CYCLE TIME. THE FLUIDIZING TIME IS ADJUSTABLE THROUGH THE OIT.

COMPACTOR MODE OF OPERATION (TYPICAL FOR 2):

HAND: WHEN THE COMPACTOR HAND-OFF-AUTO SELECTOR IS IN THE HAND POSITION, THE COMPACTOR WILL RUN FORWARD OR REVERSE BASED ON THE FWD-OFF-REV SWITCH AT THE LOCAL CONTROL STATION. THE REVERSE POSITION WILL SPRING RETURN TO OFF WHEN NOT HELD. HAND CONTROL IS AVAILABLE EXTERNAL TO THE PLC FOR CONTINUED OPERATION IN EMERGENCY CONDITIONS.

AUTO: WHEN THE COMPACTOR HAND-OFF-AUTO SELECTOR IS IN THE AUTO POSITION, THE COMPACTOR WILL RUN WHENEVER AN ASSOCIATED FINE OR ULTRA-FINE SCREEN IS RUNNING. THE COMPACTOR WILL RUN ACCORDING TO THE AUTO CYCLE DETAILED BELOW.

COMPACTOR AUTO CYCLE:

REVERSING WASH SEQUENCE:

WHEN CALLED TO RUN, THE COMPACTOR WILL FOLLOW A REVERSE-DWELL-FORWARD-DWELL CYCLE. INDIVIDUAL TIMER VALUES ARE ADJUSTABLE THROUGH THE OIT. THE COMPACTOR WILL CONTINUE TO CYCLE FOR AN OFF-DELAY TIME AFTER BOTH ASSOCIATED SCREENS HAVE STOPPED. THE COMPACTOR WILL THEN RUN FORWARD FOR THE EXTRUDE TIME AND STOP. THE REVERSING SEQUENCE CAN BE DISABLED THROUGH THE OIT.

FORWARD ONLY MODE:

IF THE HIGH-HIGH LEVEL CONDITIONS ARE DETECTED IN AN ASSOCIATED SCREEN, THE COMPACTOR WILL PAUSE THE REVERSING SEQUENCE AND RUN IN FORWARD ONLY MODE UNTIL THE LEVEL CONDITION IS CLEARED. ON-DELAY AND OFF-DELAY TIMERS FOR FORWARD ONLY MODE ARE ADJUSTABLE THROUGH THE OIT.

JAM REVERSAL SEQUENCE:

IF THE COMPACTOR DETECTS HIGH CURRENT WHEN RUNNING FORWARD IN AUTO MODE, IT WILL INITIATE A JAM REVERSAL SEQUENCE. IT WILL PAUSE, THEN RUN IN REVERSE FOR THE JAM REVERSE TIME. AFTER ANOTHER PAUSE IT WILL CONTINUE RUNNING FORWARD. THE NUMBER OF JAM ATTEMPTS IS COUNTED, AND IF THE NUMBER OF ATTEMPTS EXCEEDS THE SETPOINT WITHIN THE JAM CLEAR TIME, THE COMPACTOR WILL FAULT.

IF A JAM OCCURS WHEN RUNNING IN HAND OR WHEN RUNNING REVERSE, THE COMPACTOR WILL FAULT IMMEDIATELY AND WILL NOT ATTEMPT A JAM REVERSAL SEQUENCE. THE JAM REVERSAL SEQUENCE CAN BE DISABLED THROUGH THE OIT.

COMPACTOR FAULTS:

THE COMPACTOR WILL FAULT AND STOP IMMEDIATELY BASED ON THE FOLLOWING CONDITIONS:

1. MOTOR OVER TEMPERATURE
2. MOTOR CIRCUIT PROTECTOR OVERLOAD
3. HIGH CURRENT IN HAND MODE OR REVERSE
4. JAM ATTEMPTS EXCEEDED
5. EMERGENCY STOP

IF A FAULT OCCURS, ENSURE THE FAULT CONDITIONS ARE CLEAR AND PRESS THE RESET PUSHBUTTON ON THE CONTROL PANEL.

COMPACTOR WASH VALVE MODE OF OPERATION:

THE COMPACTOR WASH VALVE WILL BE CALLED TO OPEN ANY TIME THE COMPACTOR IS CALLED TO RUN.

COMPACTOR RINSE/CATCH PAN/SCREEN TOP END SLUICE PURGE VALVE MODE OF OPERATION:

THE COMPACTOR RINSE/CATCH PAN/SCREEN TOP END SLUICE PURGE VALVE WILL OPEN FOR AN ADJUSTABLE DURATION TIME AFTER THE COMPACTOR HAS RUN FOR AN ADJUSTABLE ACCUMULATION TIME. THE VALVE WILL ALSO OPEN IF A HIGH SLUICE LEVEL IS DETECTED.

HIGH LEVEL CAPACITANCE SENSOR MODE OF OPERATION:

IF A HIGH LEVEL IS DETECTED IN THE SCREEN SLUICE, THE COMPACTOR RINSE/CATCH PAN/SCREEN TOP END SLUICE PURGE VALVE WILL OPEN AND RUN AS OUTLINED ABOVE.

IF A HIGH LEVEL IS DETECTED IN THE COMPACTOR ENTERANCE, THE COMPACTOR WASH VALVE AND COMPACTOR RINSE/CATCH PAN/SCREEN TOP END SLUICE PURGE VALVE WILL DISABLE TO PREVENT ADDITIONAL WATER FROM FILLING THE SLUICE/COMPACTOR. ADDITIONALLY, THE COMPACTOR WILL ENTER A FORWARD ONLY MODE AS OUTLINED ABOVE.

SYSTEM OPERATION:

EMERGENCY STOP:

IF THE EMERGENCY STOP PUSHBUTTON IS PRESSED AT THE MAIN CONTROL PANEL, ALL ASSOCIATED EQUIPMENT WITH THE CONTROL PANEL WILL STOP IMMEDIATELY AND VALVES WILL RETURN TO THEIR POWERED OFF STATE. PRESSING THE EMERGENCY STOP ON A LOCAL CONTROL STATION WILL STOP ALL EQUIPMENT ASSOCIATED WITH THAT STATION. TO RESET, ENSURE THE E-STOP IS NOT ACTIVE AND PRESS THE RESET PUSHBUTTON ON THE PANEL.

LOSS OF POWER:

IF THE POWER TO THE PANEL IS INTERRUPTED, THE EQUIPMENT MAY CYCLE IMMEDIATELY ONCE THE POWER IS RESTORED. PRESSING THE RESET PUSHBUTTON AFTER A POWER OUTAGE WILL NOT BE REQUIRED. LOSS OF POWER WILL BE INDICATED ON THE OIT.

PROJECT #: 04907

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NO.	DATE	DESCRIPTION	BY
1	11/18/22	PER SUBMITTAL COMMENTS	W. BARNETT
0	10/12/22	FOR SUBMITTAL	W. BARNETT
		REVISION	

UNLESS NOTED

TOLERANCE
 .X ± .030
 .XX ± .015
 .XXX ± .005
 .XXXX ± .0005



SCREEN & GRIT SYSTEM CONTROL PANEL - GOODYEAR, AZ / SARIVAL			
DRAWING #: AC0724	SHT.: 24/24	REV.: 1	
DRAWN BY/DATE: W. BARNETT	10/12/22	SCALE: N.T.S.	
CHECKED BY/DATE: M. HOWZE	10/12/22	SIZE:	

APPENDIX

UKWIR

Screenings Capture Rate (SCR)

Certifications

ThompsonRPM

THIS IS TO CERTIFY THAT THE:

HYDRO-DYNE HYDRO-FLO (2 mm APERTURES)

WAS TESTED AT THE:

**NATIONAL SCREEN EVALUATION FACILITY
CHESTER LE STREET STW
NORTHUMBRIAN WATER**

AUGUST 2011

AVERAGE SCREENINGS CAPTURE RATIO = 93%

FOR FURTHER DETAILS REFER TO:

THOMPSON RPM REPORT REF- TRPM-REP251

Barry Thompson
Thompson RPM Ltd

ThompsonRPM

THIS IS TO CERTIFY THAT THE:

HYDRO-DYNE HYDRO-FLO (6 mm APERTURES)

WAS TESTED AT THE:

**NATIONAL SCREEN EVALUATION FACILITY
CHESTER LE STREET STW
NORTHUMBRIAN WATER**

AUGUST 2011

AVERAGE SCREENINGS CAPTURE RATIO = 84%

FOR FURTHER DETAILS REFER TO:

THOMPSON RPM REPORT REF- TRPM-REP251

Barry Thompson
Thompson RPM Ltd

APPENDIX

BABA Compliance Certificate and Factory Overview

BUILD AMERICA, BUY AMERICA COMPLIANCE CERTIFICATION

Date 12/5/24

RE: San Luis, AZ - West WWTP

Location: San Luis, AZ

Specification Section(s): Request For Proposal

Dear Valued Partner,

We hereby certify that the products supplied for the above referenced project are in full compliance with Build America, Buy America (BABA) requirements including the domestic content requirements under Section 70912 stating the following requirement of Manufactured Products:

- i) the manufactured product was manufactured in the United States; and
- ii) (ii) the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55% of the total cost of all components of the manufactured product

The products below have a final manufacturing point at our Clearwater, Florida, USA headquarters.

1. Great White Shark (Coarse Screen) (x2) Model #: CF-26-30-144-6P4
2. White Tip Shark (Coarse Screen) Washing Compactor (x2) Model #: WCW8S-23-5P4
3. Sand Shark Grit Tank (x2) Model #: (1) GTT60I102CC4C, (1) GTT60I102CC4C, (2) GTK-144C-N
4. Sand Shark Grit Classifier (x2) Model #: GC12-98-4C
5. Great White Shark (Fine Screen) (x2) Model #: CF26-49-176-2P4
6. White Tip Shark (Fine Screen) Washing Compactor (x2) Model #:WCW6S-38-2P4

Selection of domestic materials and components wherever possible has been standard practice for Hydro-Dyne therefore compliance with BABA domestic content requirements is met without need for waivers or exceptions.

Signed by:

David Scatton

Quality Assurance Manager

Introduction

Hydro-Dyne Engineering, Inc. is a leading manufacturer of exceptional quality preliminary treatment equipment for municipal and industrial water and wastewater facilities. This includes both water and wastewater screening, solids compaction, solids handling, grit collection and removal equipment. We design and manufacture some of the most advanced technologies to protect not only the processes within municipal and industrial applications, but also our natural environments to ensure a cleaner and sustainable future for generations to come.

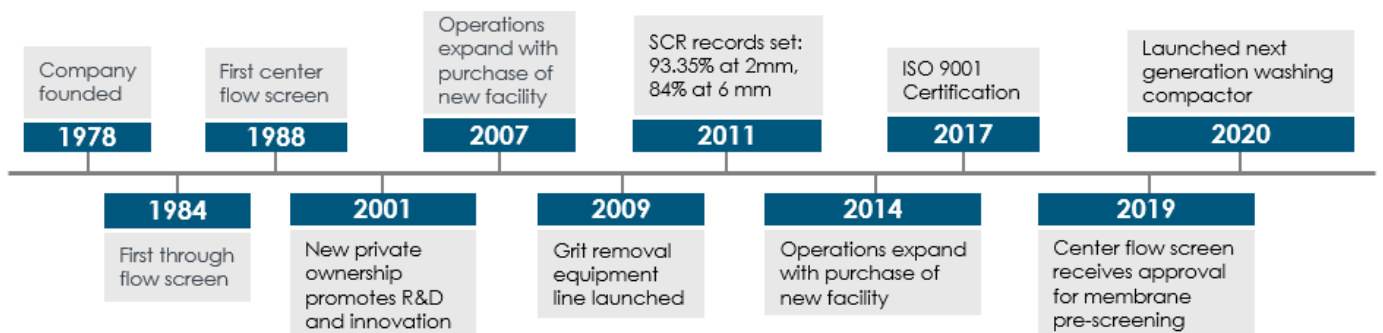
The figure below provides a picture of the 110,000 square foot manufacturing facility located in Clearwater.



Hydro-Dyne Engineering, Inc Headquarters located in Clearwater

Hydro-Dyne is unique in the water and wastewater industry as one of the only manufacturers that owns its own patents and performs all equipment design, fabrication, assembly, and testing in house. We have complete control of our products from start to finish and continuously improve and advance technologies through innovation and product testing. In fact, several of Hydro-Dyne’s recently patented designs establish the highest limits of screening in the industry.

It is important to note this company has been in the wastewater industry continuously under one owner for 20 years as an original equipment manufacturer. The figure below provides a timeline history of Hydro-Dyne Engineering.



Company History / Timeline

All equipment is manufactured from stock including steel preparation, welding, stainless steel passivation, assembly, and equipment testing. Equipment of various sizes is produced in the facility for <1 MGD to >100 MGD water and wastewater applications. The figures below provide pictures of various sizes of the equipment engineered, fabricated, assembled, and tested. Typically, septage receiving screening and compaction is on the smaller end of the spectrum to the left below.



Screen sizes from 1 MGD to 50 MGD

A 20,000 square foot area is dedicated to fabrication with stainless steel. The figure below shows the welding and material storage areas.



Welding / Fabrication Area

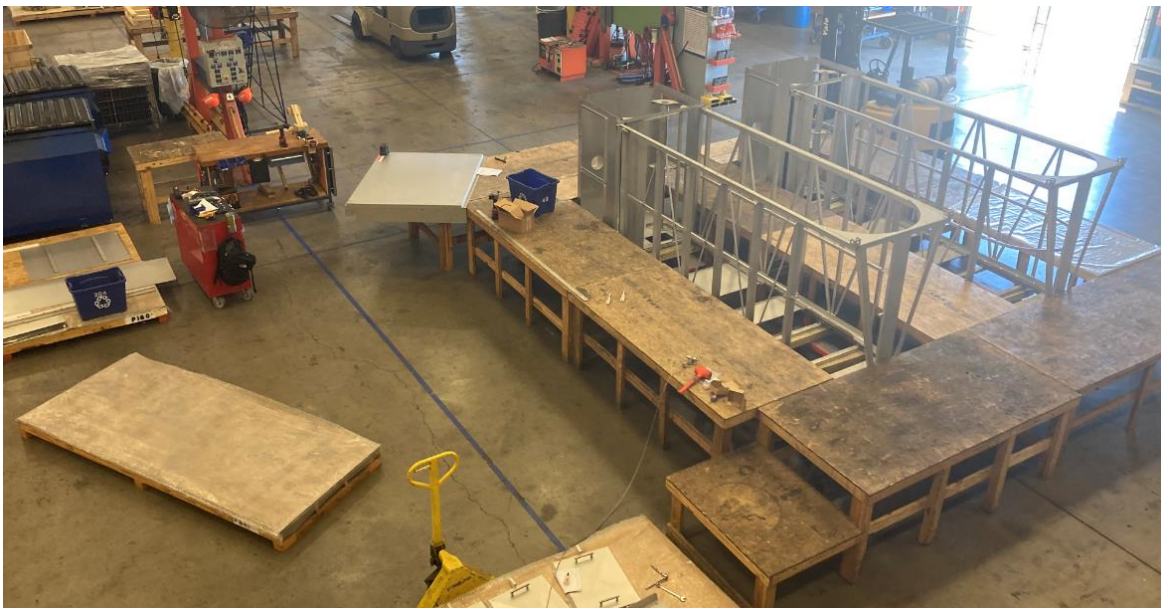
Pickling and passivation are completed in house with a 4-tank submerged cleaning, passivation and rinse process. All stainless steel weldments fabricated in the shop are passivated. Passivation provides a protective oxide layer over the steel surface. The result is steel that is resistant to the corrosive forces, particularly biogenic corrosion that is present in any wastewater application near the collection system or

headworks. The figure below shows stainless steel parts going into the pickling and passivation tank for contact with a mixture of hydrofluoric and nitric acid. This process is done to ASTM A380 for passivation of stainless steel.



Pickling and Passivation Process – Clearwater Facility

A 20,000 square foot area is dedicated to assembly of fabricated parts. The entire process completed under one roof. The figure below shows the assembly of wastewater screens in this area.



Clearwater Assembly Area

APPENDIX
10 Year Life Cycle Cost:
Screening and Grit Removal Systems

Maintenance Summary Table - Screen and Compactor

CENTER FLOW SCREEN

PREVENTIVE MAINTENANCE SCHEDULE													
Item #	Part Name	Maintenance Requirement	W	M	Y	H	Mins to perform task	# Events Year	Total Hours Year	Part Replacement Cost \$	Man-Hours To Replace Hrs Per Event	Total Cost To Replace (10 yrs) \$	Comments
1	Screen grid area	Inspect for any build-up. Clean as needed.	X				5	52	4.3				
2	Drive shaft sprockets	Inspect for any build-up. Clean as needed.	X				5	52	4.3				
3	Pressure gauge	Inspect water pressure. Provide as required	X				5	52	4.3				
4	*Sediment filter	Inspect for blockages. Clean as needed.	X				15	52	13.0				Optional Item
5	Spray nozzles	Inspect for blockages. Clean as needed.	X				5	52	4.3	\$13.8	0.5	\$389	Figure 1 per year
6	Wash water accessories	Inspect for leaks, damage and function. Replace as needed.	X				5	52	4.3				
7	Flange bearing	Add appropriate grease		X			5	12	1.0	\$10	0.1	\$85	Once per year
8	Screen assembly	Clean machine exterior. Apply stainless steel preservative.			X		30	1	0.5				Once per year
9	Channel	Flush Tank of grit			X		0	1	0.0				Not required in most cases
11	Gear reducer breather	Inspect for wear or damage. Clean/replace as needed.		X		2,000	5	1	0.1				
12	Electric motor	Clean & measure full load amp draw.		X		2,000	30	1	0.5				Should not require replacement in 10 yrs
13	Gear reducer oil	Drain and replace oil.			5	10,000	30	1/5 years	0.10	\$50	1	\$200	Gears and bearings are not expected to require replacement
14	Guide links	Inspect for wear or damage. Replace as needed.			5		5	1/5 years	0.02				Should not require replacement unless damaged
15	Pivot shafts (axels)	Inspect for wear or damage. Replace as needed.			5		5	1/5 years	0.02				Should not require replacement unless damaged
16	Hook & straight links	Inspect for wear or damage. Replace as needed.			5		5	1/5 years	0.02				Should not require replacement unless damaged
17	Wear tracks	Inspect for wear or damage. Replace as needed.			5		2	1/5 years	0.01			\$0	Should not require replacement - grit loading dependent
W = WEEKLY, M = MONTHLY, Y = YEARS, H = HOURS													
Screen Subtotal									36.9	\$73.80	1.6	\$674	

WASHING COMPACTOR

PREVENTIVE MAINTENANCE SCHEDULE													
Item #	Part Name	Maintenance Requirement	W	M	Y	H	Mins to perform task	# Events Year	Total Hours Year	Part Replacement Cost \$	Man-Hours To Replace Per Event	Total Cost To Replace (10 yrs) \$	Comments
1	Trough drainage area	Inspect solids are cleared. Clean as needed.	X				5	52	4.3				
2	*Wash Module drainage area	Inspect solids are cleared. Clean as needed.	X				5	52	4.3				Optional Item
3	Flight coil brush	Inspect for any build-up. Clean as needed.	X				10	52	8.7				
4	Pressure Gauge	Inspect water pressure. Provide as required	X				5	52	4.3				
5	*Sediment Filter	Inspect for blockages. Clean as needed.	X				5	52	4.3				Optional Item
6	Trough drainage area	Inspect for damage or build-up. Clean or repair as needed.		X			5	12	1.0	\$2,395	4	\$2,695	Trough may require replacement once within 10 years.
7	Flight coil brush	Inspect for damage or build-up. Clean or replace as needed.		X			10	12	2.0	\$485	4	\$1,385	Replace approx every 3 years
8	Compactor Assembly	Clean machine exterior. Apply stainless steel preservative.		X	X		30	1	0.5				
9	Trough catch pan drainage area	Inspect for build-up. Clean as needed.			X		0	1	0.0				Not required in most cases
10	*Wash water accessories	Inspect for wear or damage. Replace as needed.		X			30	1	0.5				
12	Gear reducer breather	Inspect for wear or damage. Clean/replace as needed.			X	2,000	5	1	0.1				
13	Electric motor	Clean & measure full load amp draw.			X	2,000	30	1	0.5				Should not require replacement in 10 yrs
14	Gear Reducer oil	Drain and replace oil.			X	10,000	30	1/5 years	0.1	\$50	1	\$200	
W = WEEKLY, M = MONTHLY, Y = YEARS, H = HOURS													
Compactor Subtotal									30.7	\$2,930.00	9.0	\$4,280.00	
Grand Total									67.6	\$3,003.80	10.6	\$4,953.80	

10 year Cost - Labor	\$50,693
10 year Parts Replacement	\$4,954
10 Year Total	\$55,646
Power	\$13,718
10 year total	\$69,364

Maintenance Summary Table - Grit System

Grit Tank														
PREVENTIVE MAINTENANCE SCHEDULE														
Item #	Part Name	Maintenance Requirement	W	M	Y	Mins to perform task	Year	Year	Part Replacement Cost	Man-Hours To Replace	Total Cost To Replace (10 yrs)	Comments		
									\$	Hrs Per Event	\$			
1	Flush water pressure	Inspect water pressure.	X			5	52	4.3						
2	Flush water accessories	Inspect for leaks, damage and function. Replace as needed.	X			5	52	4.3						
3	Rotating System	Inspect for leaks, damage, vibration etc	X			5	52	4.3	\$13.8	0.5	\$389	Low speed operation		
4	Flange bearing	Add appropriate grease		X		5	12	1.0	\$10	0.1	\$85			
5	Gear reducer breather	Inspect for wear or damage. Clean/replace as needed.			X	5	1	0.1						
6	Electric motor	Clean & measure full load amp draw.			X	30	1	0.5				Not expected to be replaced in 10 yrs		
7	Gear reducer oil	Drain and replace oil.			5	30	1/5 years	0.10	\$50	1	\$200	Change oil once every 5 years		
W = WEEKLY, M = MONTHLY, Y = YEARS, H = HOURS														
GT Subtotal											14.7	\$73.80	1.6	\$674

Grit Pump														
PREVENTIVE MAINTENANCE SCHEDULE														
Item #	Part Name	Maintenance Requirement	W	M	Y	Mins to perform task	Year	Year	Part Replacement Cost	Man-Hours To Replace	Total Cost To Replace (10 yrs)	Comments		
									\$	Hrs Per Event	\$			
1	General Inspection	Inspect for temp, vibration, noise, leaks				10	356	59.3						
2	Bearing Lubrication	Inspect	X			5	52	4.3						
3	Seal Lubrication	Inspect	X			5	52	4.3						
4	V Belt Adjustment	Inspect and adjust if needed		X		5	12	1.0						
5	Air Release	Inspect for blockages. Clean as needed.		X		5	12	1.0						
6	Impeller Clearance Check	Inspect for wear, damage and function. Replace as needed.			X	60	1	1.0						
7	Check Valve	Inspect			X	5	1	0.1						
8	PRV	Inspect			X	30	1	0.5						
9	Alignment	Check within Tolerance			X	120	1	2.0						
10	Check Shaft Deflection	Check within Tolerance			X	120	1	2.0						
11	Electric Motor	Clean & measure full load amp draw.			X	60	1	1.0				Should not require replacement in 10 yrs		
12	Bearings	Inspect & Lubricate			X	30	1	0.5	\$50	1	\$200	Assumes pump is not running continuously		
13	Bearling Housing	Inspect			X	30	1	0.5						
14	Piping	Inspect for leaks			X	10	1	0.2						
15	Spare Part Replacement	Impellor, V Belt				60	1	1.0	\$2,500	4	\$3,100	Contingency		
W = WEEKLY, M = MONTHLY, Y = YEARS, H = HOURS														
Grit Pump Subtotal											78.8	\$2,550	5.0	\$3,300

Grit Classifier														
PREVENTIVE MAINTENANCE SCHEDULE														
Item #	Part Name	Maintenance Requirement	W	M	Y	Mins to perform task	Year	Year	Part Replacement Cost	Man-Hours To Replace	Total Cost To Replace (10 yrs)	Comments		
									\$	Hrs Per Event	\$			
1	Rotating System	Inspect for leaks, damage, vibration etc	X			15	52	13.0						
2	Cyclone	Inspect for leaks, damage, vibration etc	X			5	52	4.3						
3	Solids Quality	Inspect for proper dewatering / dryness	X			5	52	4.3						
4	Flange bearing - Top & Bottom	Add appropriate grease		X		5	12	1.0	\$20	0.1	\$95	Once per year		
5	GC assembly	Clean machine exterior. Apply stainless steel preservative.			X	30	1	0.5				Once per year		
6	Gear reducer breather	Inspect for wear or damage. Clean/replace as needed.			X	5	1	0.1						
7	Electric motor - Auger	Clean & measure full load amp draw.			X	30	1	0.5				Should not require replacement in 10 yrs		
8	Gear reducer oil	Drain and replace oil.			5	30	1/5 years	0.10	\$50	1	\$200	Replace on 5 yr intervals		
W = WEEKLY, M = MONTHLY, Y = YEARS, H = HOURS														
Grit Classifier Subtotal											23.9	\$70.00	1.1	\$295

10 year Cost - Labor	\$87,963
10 year Parts Replacement	\$4,269
10 Year Total	\$92,231
10 yr Power	\$13,065
10 year total	\$105,296

APPENDIX
Standard Spare Parts Pricing and
Availability

**HYDRO-DYNE CENTER-FLOW SCREEN AND WASHING COMPACTOR
RECOMMENDED STANDARD SPARE PARTS LIST**

Item #	Part Description	Lead Time	Shipping Location	*Current Price
1	Brass Nozzle Spray Tips	Stock	Clearwater, FL	\$ 30.00
2	Guide Link	Stock	Clearwater, FL	\$ 65.00
3	Grid Panel UHMW .250 x .295	1 - 2 weeks	Clearwater, FL	\$ 650.00
4	5/8" Axle - Cotter Pin	Stock	Clearwater, FL	\$ 80.00
5	Slotted Hook Link	Stock	Clearwater, FL	\$ 30.00
6	Compactor auger brush	Stock	Clearwater, FL	\$ 550.00
* 2024 PRICING				
ESTIMATED AVERAGE ANNUAL REPLACEMENT PARTS COST				

APPENDIX

**Sample Operation and
Maintenance Manual
(See Separate File)**

APPENDIX

Certificate of Conformance

**CERTIFICATE OF CONFORMANCE
City of San Luis
West Wastewater Treatment Plant 3
MGD MBR Phase 1 Upgrades
Request for Proposals
Headworks and Grit Removal System**

This will certify that the all headworks subsystems required for a fully operational system, as outlined in the specifications contained in the Request for Proposal, have been included in Hydro-Dyne Engineering firm equipment proposal #5753-7,8,9, dated 12/9/24 (subject to the Proposal Scope of Work Clarifications and Exceptions). Any required subsystems or appurtenances omitted, **and specifically called out in the specification**, will be provided by Hydro-Dyne Engineering at no additional cost to the owner.

BY: *Randall Dow*

Randall Dow
Sales & Marketing Director

DATE: 12/9/24

APPENDIX
Literature and Project Profiles



Great White Center/Dual Flow Screen

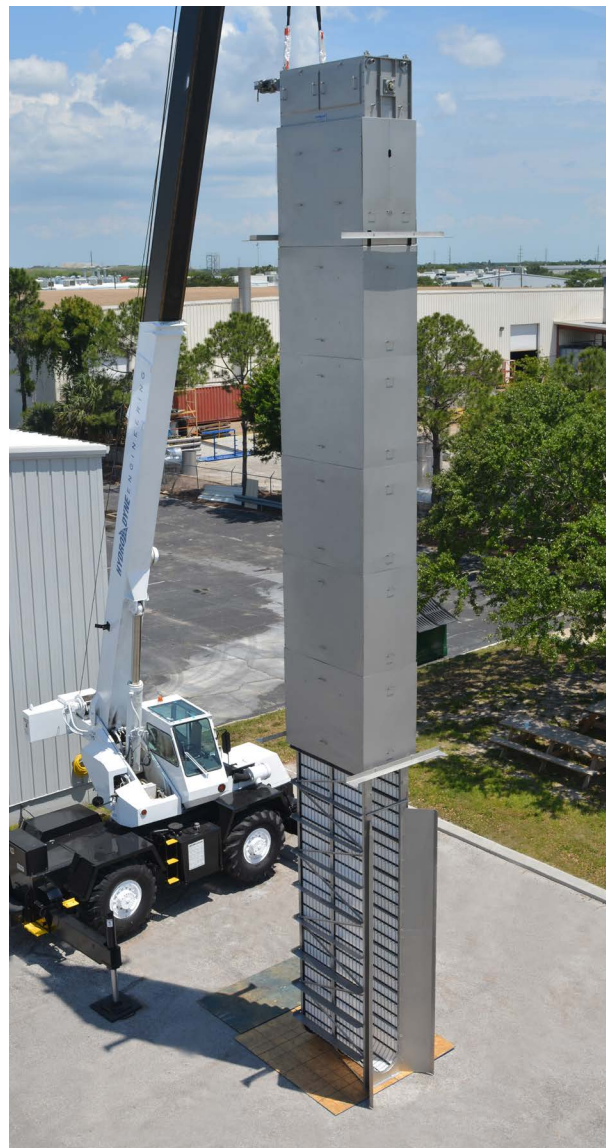
Highest Screenings Capture Ratio Available

- Independently certified¹ highest SCR water/wastewater screen
 - 93.25% with 2mm opening
 - 84% with 6mm opening
- Continuous band screen design eliminates bypass and carryover
- Excellent sensitive process and membrane protection
- Proprietary design features easily capture and offload screenings including rags and stringy material
- All T304 or T316 stainless steel fabrication

About the Great White Center/Dual Flow Screen

The Great White Shark is an apex predator that rules almost every body of water around the world. Like the Great White, our Center/Dual Flow Screen is designed and manufactured at the pinnacle of quality and dominates application environments.


The Great White Center/Dual Flow continuous band screen is designed to handle low-to-high flows and has been independently¹ certified to have the highest screenings capture ratio of all band screens on the market. Dual spray wash, patented grid design, proprietary sealing system and UHMWPE guide links make this an exceptional product for the filtering and offloading of water and wastewater screenings.



¹ UK Water Industry Research in National Screen Evaluation Facility Inlet Screen Evaluation Comparative Report (1999-2011)

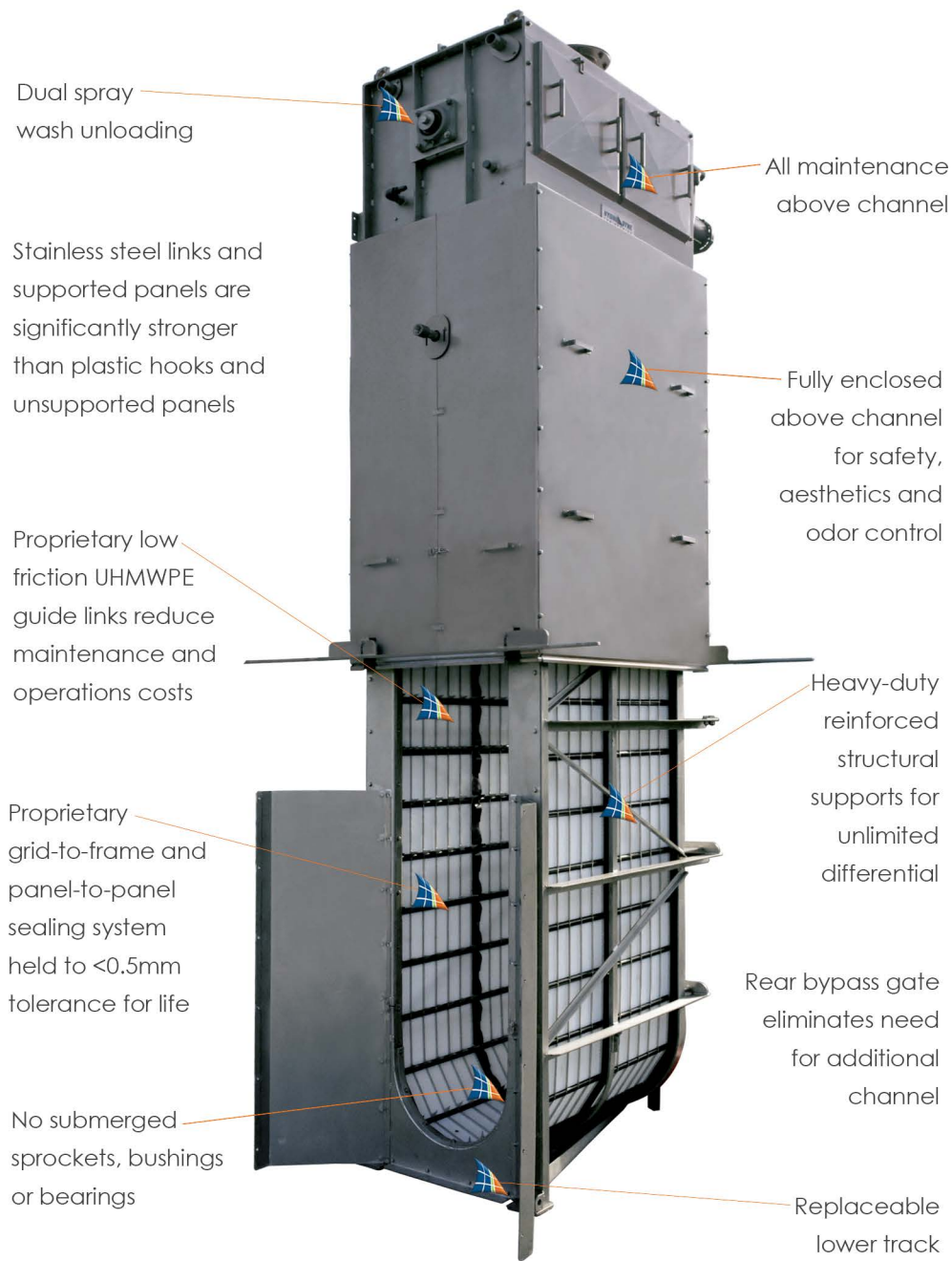
To learn more visit: www.hydro-dyne.com
sales@hydro-dyne.com | +1 (813) 818-0777

Coarse Screens | Fine Screens | Screenings Handling | Grit Removal Equipment

Designed & Manufactured in the USA 
4750 118th Avenue North Clearwater, FL 33762

ISO 9001:2015 Certified

HYDRO-DYNE[®]
ENGINEERING
Designed to Protect. Built to Perform.[™]



At-a-glance

models

Center Flow (center entrance/side exit)
Dual Flow (side entrance/rear exit)

grid opening range

0.5-25mm

flow capacity

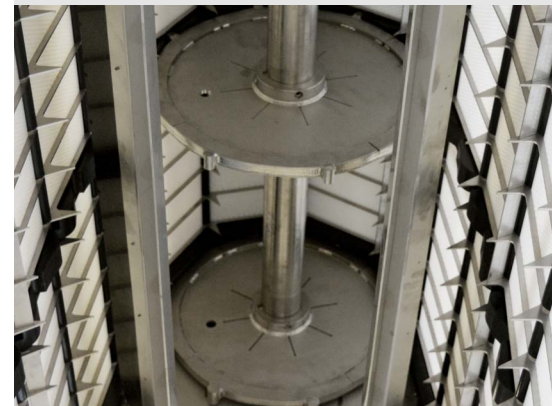
0.1mgd (5 L/s) to 125+mgd (5,500+ L/s)

grid types

Stainless steel laced link
Stainless steel wire mesh
Stainless steel perforated panel
UHMWPE perforated panel

Patented Drive Features

- Grid does not contact drive or unloading mechanism
- Direct drive uses no chains or sprockets
- Fully supports grid for negligible wear
- Fractional hp requirements



Optional Equipment

- Specialty stainless steel construction
- Cold weather/freeze protection
- Basic to sophisticated automation controls
- Sectional construction for restricted area assembly
- Integrated screenings handling equipment
- Electric, hydraulic or explosion-proof drives



To learn more visit: www.hydro-dyne.com
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4750 118th Avenue North Clearwater, FL 33762

ISO 9001:2015 Certified

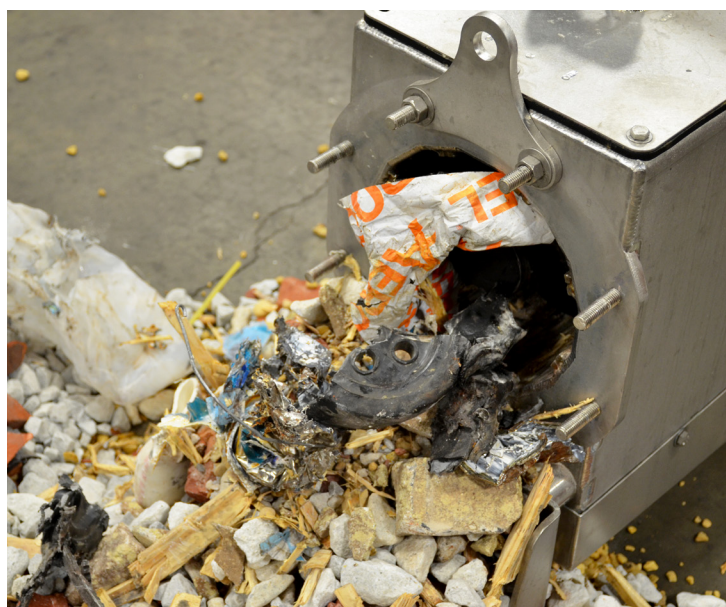
HYDRO-DYNE[®]
ENGINEERING
Designed to Protect. Built to Perform.[™]



Whitetip Shark Washing Compactors

Robust, High Performing Design to Meet Your Application Needs

- Multiple models and options to suit individual applications
- Designed to collect, dewater, condition, compact and transport screenings from any screen, launder/sludge or conveyor to any waste disposal drop point
- Weight reduction up to 80%
- Screening volume reduction up to 85%
- Organic removal up to 95%
- Dewatered screenings dry solids content up to 40% (depending on material to be dewatered)
- Screenings meet strict landfill requirements (EPA 9095 Paint Filter Test)
- All T304 or T316 stainless steel fabrication
- Heavy duty AR400 Auger for long wear life and ability to crush large objects
- Standard screw diameters: 6", 8", 10", 12", 16" and 20"



Whitetip Shark Family of Washing Compactors

The Whitetip Shark is a fierce but slow-moving shark, notable for its long, rounded fins which feature an iconic white tip. Hydro-Dyne's family of Whitetip Shark Washing Compactors thoroughly wash and compact screenings to produce the clean, compact white screening plugs they are known for by efficiently returning organics to the channel. Every compactor is custom-designed for individual applications, taking into account the type of flow and solids collected. Multiple models are available to ensure organic material is returned to the treatment plant's process and inorganic materials are separated, cleaned and dewatered in the most effective and efficient way possible. Stainless steel construction with a hardened alloy auger provides an enduring solution to exceed performance and disposal requirements.



To learn more visit: www.hydro-dyne.com
sales@hydro-dyne.com | +1 (813) 818-0777

Coarse Screens | Fine Screens | Screenings Handling | Grit Removal Equipment

Designed & Manufactured in the USA 
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Whitetip Shark Washing Compactor



Whitetip Shark with Enhanced Dewatering




Whitetip Shark with Enhanced Wash/Dewatering

The Whitetip Shark Washing Compactor features screenings drainage and compaction zones. Stainless steel flights and anti-rotation bars improve compaction and provide reliable equipment performance and life.

The Whitetip Shark Washing Compactor with Enhanced Dewatering features screenings drainage and rinse/compaction zones. Hardened Alloy screw and AR-400 flights greatly improve compaction and equipment reliability in harsh environments.

Up to 80% decrease in the total weight of solids output and up to 90% organic removal is achieved by this model with the addition of a washing zone and additional wash cycle. Operation includes a reversing function to the auger and timers so that the screened material is aggressively agitated during a longer wash cycle. Organic material is further broken down and washed back into the system through the drain. Rinse/Dewatering zone thoroughly rinses and compacts captured screenings.

-  Drainage/Washing
-  Compaction

-  Drainage/Washing
-  Rinse/Dewatering
-  Compaction

-  Drainage/Washing
-  Enhanced Washing
-  Rinse/Dewatering
-  Compaction

Optional Equipment

- Basic rinsing to thorough washing
- Integrated models located within screens
- External models fed via sluice or conveyor
- Trough types: perforated, slotted, wedgewire
- Shafted or shaftless flight
- Electric or hydraulic drive
- Cold weather/freeze protection

Discharge Options

- Dual Bearing: Dewatering
- Reduction Flange: Dewatering and some compaction
- Hinged Gate: Dewatering and compaction
- Press Elbow: Maximum dewater and compaction plus elevation

Screenings Collection Options

- Screenings collection bagging system
- Self-leveling bins
- Stainless steel discharge chute
- Lay flat hose or flexible pipe



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PROJECT HIGHLIGHTS

Dual Stage Screening/Membrane Pretreatment/ Sluice Configurations/On-site Testing

Great White Center Flow Screen



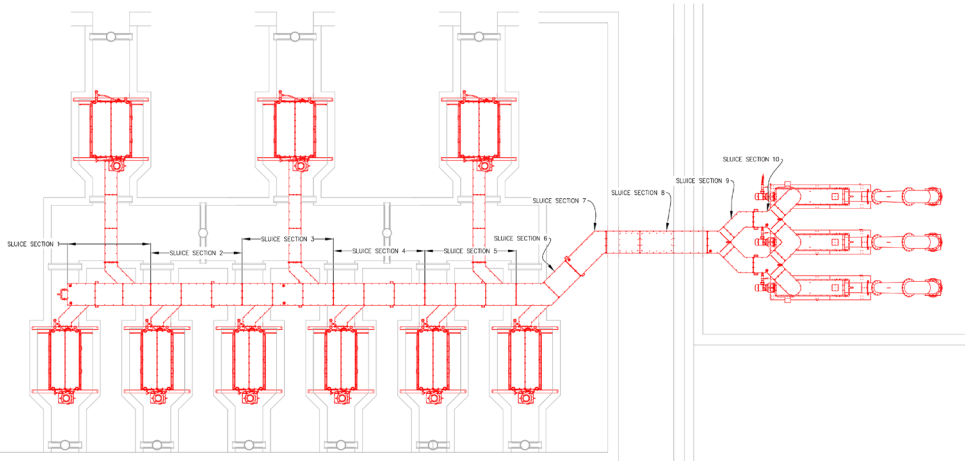
Dual stage screening with a common sluice shared by all screens and disposing into 3 washing compactors



Hammerhead on-site screen sizing test to determine the proper design and size



Right angle drive creates more open space around the screens



quick facts

location
Ohio, USA

consulting engineering firm
CT Consultants

contractor
Shook Construction

year installed
2015

scope of supply
Hammerhead On-Site Screen Sizing
CF50-67-277-4P (x3)
CF38-72-217-2P (x6)
WCP12-2WW (x3)
Sluice

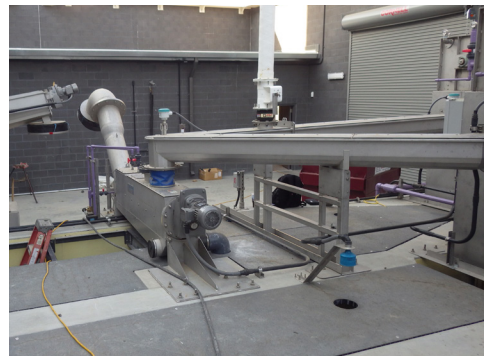
application
Municipal Wastewater Membrane
Bioreactor Plant (MBR)

flow rate
44 MGD (1,928 L/s) each

innovative aspects

- Design included three trains, each has one coarse and two fine screens
- Dual trough, fully enclosed sluice design connects all nine screens, with the ability to isolate to one compactor
- One of largest MBR (Ovivo/ Kubota) installations in North America
- On-site testing helped determine the optimal coarse and fine grid sizes

HYDRODYNE
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quick facts

location

California, USA

models

CF32-43-163-6P (x2)

CF32-67-187-2P (x2)

WCW10S-70-2P (x2)

GT-T-60-116 (x2)

GC-12-98C (x2)

application

Municipal Wastewater

Membrane Bioreactor Plant (MBR)

Coarse Screens (x2)

peak flow

17 MGD (745 L/s) each

grid openings

6 mm - UHMWPE

Perforated Panels

screen height

163" (4,140 mm)

screen width

32" (813 mm)

screen depth

43" (1,092 mm)



quick facts

Fine Screens (x2)

peak flow

17 MGD (745 L/s) each

grid openings

2 mm - Stainless Steel
Perforated Panels

screen height

187" (4,750 mm)

screen width

32" (813 mm)

screen depth

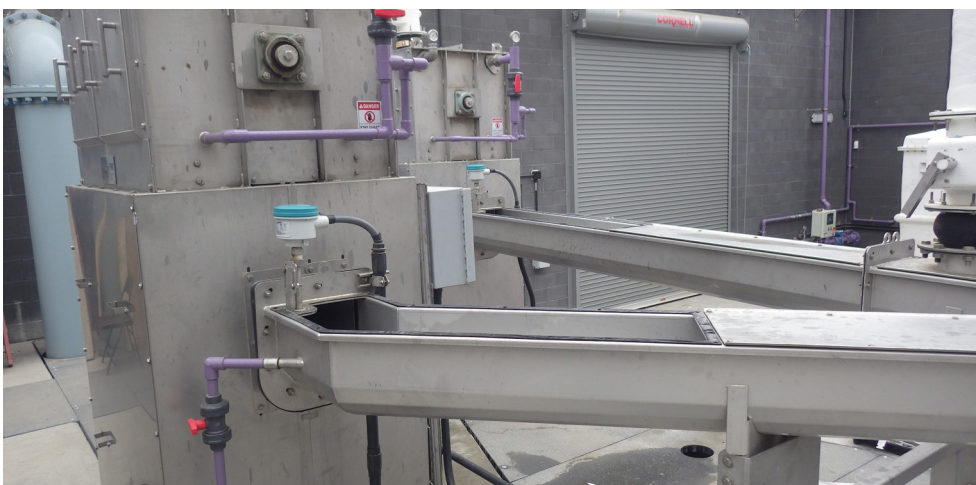
67" (1,702 mm)

Screenings Handling (x2)

Whitetip Shark

Washing Compactor

10" (254 mm) diameter





quick facts

location

Arizona, USA

models

CF28-33-157-6P (x2)

CF28-55-165-2P (x2)

WCW10S-38-2P (x2)

GT-T-60-112 (x2)

application

Municipal Wastewater

Membrane Bioreactor Plant (MBR)

Fine Screens (x2)

peak flow

10 MGD (438 L/s) each

grid openings

6 mm - UHMWPE

Perforated Panels

screen height

157" (3,988 mm)

screen width

28" (711 mm)

screen depth

33" (838 mm)





quick facts

Ultra-Fine Screens (x2)

peak flow

10 MGD (438 L/s) each

grid openings

2 mm - Stainless Steel
Perforated Panels

screen height

165" (4,191 mm)

screen width

28" (711 mm)

screen depth

55" (1,397 mm)

Screenings Handling

Whitetip Shark

Washing Compactor (x2)

10" (254 mm) diameter

Grit Removal

Sand Shark Grit Trap (x2)

peak flow

10 MGD (438 L/s) each

impeller diameter

60" (1,524 mm)



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Made in the USA 