Aldrich + Elliott
WATER RESOURCE ENGINEERS

VILLAGE OF ESSEX JUNCTION, VERMONT

Water Resource Recovery Facility

New Headworks Screen - Equipment Only

April 2017

6 Market Place, Suite 2 | Essex Junction, Vermont 05452 | TEL (802) 879.7733 | AEENGINEERS.COM

VILLAGE OF ESSEX JUNCTION

WATER RESOURCE RECOVERY FACILITY

NEW HEADWORKS SCREEN - EQUIPMENT

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INFORMATION TO BIDDERS

1. Separate sealed BIDS for the **Water Resource Recovery Facility New Headworks Screen – Equipment Only** will be received by the Village of Essex Junction (Owner), at the following address: Village Office, 2 Lincoln Street, Essex Junction, VT 05452 until **1:00 p.m.** (prevailing local time), **June 1, 2017** and then at said office publicly opened and read aloud.

2. All Bids must be made on the blank form of the BID proposal attached hereto. No lines on the BID may be left blank. **Failure to fully complete the BID will render the Bidder non-responsive, and the Bid will not be read**. The Owner may waive any informalities or minor defects or reject any or all bids. In the event there is any discrepancy in the PROPOSAL between any price in words, figures, or the extended totals, the price in words shall govern and the extended totals in each case shall be corrected accordingly. A conditional or qualified bid will not be accepted.

3. A Bidder may withdraw any proposal submitted prior to the hour set for the closing of the Bids provided the request is signed in a manner identical with the proposal being withdrawn. No Bidder may withdraw a Bid within 45 days after the actual date of the opening.

4. The Owner will be responsible for payment in accordance with the terms of the Contract.

5. A pre-bid meeting and site inspection is not scheduled to be held. The prospective Bidders are responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents, and can coordinate a site visit directly with the Village. They can contact the Village to schedule at (802) 878-6943. The failure or omission of a Bidder to do any of the foregoing shall, in no way, relieve any Bidder from any obligation in respect to his Bid.

Village of Essex Junction
Owner


Signature

Pat Scheidel, Municipal Manager
Title

May 5, 2017
Date

BID

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the

laws of the State of _____ doing business as: _____
(a corporation, a partnership or an individual)

To the: Village of Essex Junction
(Loanee or Grantee) (hereinafter called "OWNER".)

In compliance with your Advertisement for BIDS, BIDDER hereby proposes to perform all WORK for the construction of:

Water Resource Recovery Facility New Headworks Screen – Equipment Only

in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID, each party thereto certifies as to his own organization, that his BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK for supply of the equipment under this contract on the date of issuance of the NOTICE TO PROCEED and to fully complete the PROJECT within 180 consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of $ 500 for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

_____

_____

_____

_____

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VILLAGE OF ESSEX JUNCTION

WATER RESOURCE RECOVERY FACILITY

NEW HEADWORKS SCREEN – EQUIPMENT ONLY

SCHEDULE OF PRICES

Item No.	Estimated Quantity	Unit	Brief Description of Item With Unit Price Written in Words	Unit Price in Figures	Total Amount in Figures
1	1	L.S.	Screen and Washer Compactor (Equipment only)		
			_____	$_____	$_____
			_____ Per Lump Sum		

VILLAGE OF ESSEX JUNCTION

WATER RESOURCE RECOVERY FACILITY

NEW HEADWORKS SCREEN – EQUIPMENT ONLY

SCHEDULE OF PRICES

*TOTAL CONTRACT PRICE ……$ _____

(IN FIGURES)

_____

_____

TOTAL CONTRACT PRICE IN WORDS

***Note:**

The "Total Contract Price in Words" is the basis for bid comparison.

Respectfully Submitted:

_____ _____

Signature Address

_____ _____

Title Date

License Number (if applicable)

(SEAL - if BID is by a corporation)

Attest: _____

NOTICE OF AWARD

TO: _____

_____

_____

PROJECT Description: Water Resource Recovery Facility New Headworks Screen - Equipment

Owner's Project Number _____

The OWNER has considered the BID submitted by you for the above described WORK in response to its ADVERTISEMENT FOR BIDS dated _____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $ _____

You are required by the Information for Bidders to execute the Agreement and furnish the required certificates of insurance within ten (10) calendar days from the date of this NOTICE to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this NOTICE, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE TO AWARD to the OWNER.

Dated this _____ day of _____ , 2017.

Village of Essex Junction _____ By _____
Owner

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

By _____

this _____ day of_____**,** 2017.

By _____

Title _____

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 2017, by and

between the Village of Essex Junction, hereinafter called "OWNER" and _____ doing business as (an individual, a partnership or a corporation) hereinafter called "CONTRACTOR (Equipment Supplier)".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR (Equipment Supplier) will commence and complete the WRRF New Headworks Screen – Equipment Only.

2. The CONTRACTOR will furnish all the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR will commence the WORK required by the CONTRACT DOCUMENTS on the date of issuance of the NOTICE TO PROCEED and will complete the same within 180 calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS. The CONTRACTOR acknowledges that the date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the CONTRACTOR further agrees to pay as liquidated damages, the sum of $500 for each consecutive calendar day that the CONTRACTOR shall be in default after the time specified in the Agreement and as provided in Section 15 of the General Conditions.

4. The CONTRACTOR agrees to perform all the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of $_____ or as shown in the BID schedule.

5. The term "CONTRACT DOCUMENTS" means and includes the following:
   Information for BIDDERS
   BID
   Notice of Award
   Agreement
   Notice to Proceed
   Change Order
   Certificate of Substantial Completion
   General Conditions
   DRAWINGS prepared by Aldrich + Elliott, PC dated April 2017
   SPECIFICATIONS prepared or issued by Aldrich + Elliott, PC and dated April 2017.
   ADDENDA: No. ___ through ___, dated _____

6. OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in 3 copies, each of which shall be deemed an original on the date first above written.

OWNER: _____

BY: _____
(Signature)

Name: _____

Title: _____

ATTEST: _____
(Signature)

Name: _____
(Please print)

(Seal)

Title: _____

CONTRACTOR: _____

BY: _____
(Signature)

Name: _____

(Contractor Seal)

Address: _____

_____

_____
Phone #

ATTEST: _____
(Signature)

Name: _____
(Please print)

Title: _____

NOTICE TO PROCEED

To: _____ Date of Issuance: _____

_____

_____

Project: Water Resource Recovery Facility New Headworks Screen - Equipment

You are hereby notified to commence all WORK on this date in accordance with the Agreement dated

_____. The date of completion of all WORK is _____.

_____
(Owner)

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED

is hereby acknowledged by_____, (Name of Contractor)

this the _____ day of _____

By: _____

By:_____
(Signature)

Title: _____

CHANGE ORDER #____

Contract Title: _____
Owner:_____
Contractor:_____
Engineer: _____

Date: _____
Agreement Date: _____
ORIGINAL PRICE: $_____
Notice to Proceed Date: _____
Calendar Days: _____
Original Completion Date: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

DESCRIPTION / JUSTIFICATION:

PRICE: This C.O.[1] will (not change/increase/decrease) the Contract Price By: $_____
Current Contract Price per most recent C.O.: $_____
The new Contract Price including this C.O. is: $_____

TIME: Current Contract Calendar Days as per most recent C.O.: Calendar Days _____
This C.O. will (not change/increase/decrease) the Contract Calendar Days by: Calendar Days _____
The new Contract Calendar Days including this C.O. is: Calendar Days _____
The new Contract Completion Date is, therefore: _____

SIGNATURES/APPROVALS:
Stipulated price and time adjustment includes all costs and time associated with the above described change. CONTRACTOR waives all rights for additional compensation or time extension for said change. CONTRACTOR and OWNER agree that the price(s) and time adjustment(s) stated above are equitable and acceptable to both parties.

Recommended By (ENGINEER): _____
Print or Type Name Signature

Accepted By (CONTRACTOR):_____
Print or Type Name Signature

Ordered By (OWNER): _____
Print or Type Name Signature

[1] C.O. means Change Order

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner _____ Owner's Project Number _____

Project Name_____

==========

Contractor _____ Contract Date _____

Contract for _____

==========

Project or Specified Part Shall Include _____

_____

_____

==========

DEFINITION OF SUBSTANTIAL COMPLETION

The date of Substantial Completion of a Project or specified part of a Project is the date when the construction is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part of the Project can be utilized for the purpose for which it was intended.

==========

To: _____
(Owner)

And To: _____
(Contractor)

The WORK performed under this CONTRACT has been inspected by authorized representatives of the OWNER, CONTRACTOR, and ENGINEER, and the Project or Specified Part of the Project is hereby declared to be Substantially Completed as of the following date:

Date of Substantial Completion: _____

If a tentative list of items to be completed or corrected is appended hereto, the failure to include an item on it does not alter the responsibility of the CONTRACTOR to complete all the WORK in accordance with the CONTRACT DOCUMENTS and CONTRACT TIME.

Recommended By:

_____	_____	_____
ENGINEER	AUTHORIZED REPRESENTATIVE	DATE

Approved By:

_____	_____	_____
OWNER	AUTHORIZED REPRESENTATIVE	DATE

==========

The Contractor accepts the above Certificate of Substantial Completion.

_____	_____	_____
CONTRACTOR	AUTHORIZED REPRESENTATIVE	DATE

==========

EXCEPTIONS AS TO GUARANTEES AND WARRANTIES:

==========

ATTACHMENTS:

1) Punch List Dated: _____

2) List the Contractor's Warranty Start and End Dates along with any Extended Warranty information here. Some items (such as roofing) may have a manufacturer's warranty longer than one year. Any documentation to support warranty requests (bill of sale, etc) need to be supplied as part of the OWNER's O&M Manual under the warranty section.

GENERAL CONDITIONS

1. The Contractor (Equipment Supplier) shall furnish and pay the cost, including taxes (except tax exempt entities) and all applicable fees, of all the necessary materials and shall furnish and pay for all the superintendence, labor, tools, equipment and transportation and perform all the Work required for the items listed and itemized under the Bid Schedule of the Bidder's Proposal attached hereto in strict accordance with the Plans, Specifications and requirements, general conditions and special conditions which are attached hereto and made a part hereof, and any amendments thereto and such supplemental plans and specifications which may hereafter be approved.

2. In the event the Owner is dissatisfied with the slow progress or incompetence in the performance of the Work in accordance with the schedule for completion of the various aspects of construction, the Owner shall give the Contractor written notice in which the Owner shall specify in detail the cause of dissatisfaction. Should the Contractor fail or refuse to remedy the matters complained of within five days after the written notice is received by the Contractor the Owner shall have the right to take control of the Work and either make good the deficiencies of the Contractor itself or direct the activities of the Contractor in doing so, employing such additional help as the Owner deems advisable. In such events the Owner shall be entitled to collect from the Contractor any expenses in completing the Work.

4. The Owner may withhold liquidated damages at the rate specified in the Bid from the amount payable to the Contractor for each calendar day that the Contractor is in default after the time of completion stipulated in these Contract Documents. It is understood that the amount is approximately equal to the interest and other charges incurred by the Owner.

5. The Contractor guarantees all material and equipment furnished and all Work performed for a period of one (1) year from the date of substantial completion of the Contract. The Contractor guarantees that the facility is free from defects due to faulty materials or workmanship and the Contractor shall make the necessary corrections or repairs to correct these defects.

6. The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the Work as specified in the Contract Documents. If the Contractor observes that the Contract Documents are at variation with any laws, ordinances, rules or regulations, the Contractor shall promptly notify the Owner in writing and any necessary changes shall be adjusted through the use of Contract Change Orders.

7. The Contractor agrees to pay all claims for labor, materials, services and supplies and agrees to allow no such charge to be fixed on the property of the Owner.

8. The Contractor agrees to comply with all laws, rules and regulations that apply to related Work.

9. It is fully understood and agreed that none of the requirements of this Contract shall be considered as waived unless changes are made in writing and then only by the persons executing this Contract.

11. The Contractor agrees not to sublet or assign this Work without the written consent of the Owner.

12. The Contractor shall have full responsibility under these General Conditions, General Provisions, or Plans and Specifications for any subcontracts which the Contractor may let.

13. All questions or controversies which may arise between the Contractor and the Owner, under or in reference to this Contract, should be resolved, to the fullest extent possible at a meeting between the Contractor, the Owner, and a representative of the Lending Authority. The agreements reached at such meetings shall be carefully documented and become final and binding on all parties concerned.

14. The Contractor shall indemnify and save harmless the Owner and the Owner's agents and employees, from and against all losses and all claims, demands, payments, suits, actions, recoveries, and judgments of every nature, and description brought or recovered against them by reasons of any act or omission of the said Contractor, its agents, or employees, in the execution of the Work or in guarding the same.

15. PAYMENT

15.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the OWNER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate. If payment is requested on the basis of materials and equipment delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER's title to the material and equipment and protect his interest therein, including applicable insurance. The OWNER will, within ten (10) days of the presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all WORK covered by the CONTRACT DOCUMENTS. However, after fifty (50) percent of the WORK has been completed, if the OWNER finds that satisfactory quality and progress is being made, the OWNER shall reduce Retainage to five (5) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount shall be further reduced below five (5) percent to only that amount related to the punchlist and necessary to assure completion. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

15.2 The entire balance found to be due the Contractor (through the Partial Payment Estimate), but excepting such sums as may be lawfully retained by the Owner, shall be paid to the Contractor. Such payment shall be conditioned, however, upon the submission by the Contractor of evidence satisfactory to the Owner that all claims for labor, material, and any other outstanding indebtedness in connection with this Contract have been paid (Release of Lien Form).

15.3 Upon final completion and acceptance of the WORK, the OWNER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

15.4 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND or Payment BOND.

16. SUSPENSION OF WORK: The Owner may suspend the work or any portion thereof for a period of not more than ninety days or such further time as agreed by the Contractor. The Contractor will be allowed an increase in the contract price or an extension of contract time, or both, directly attributable to any suspension.

17. TERMINATION

17.1 After ten (10) days from delivery of a written notice to the Contractor and the Engineer, the Owner may, without cause and without prejudice to any other right or remedy, elect to abandon the project and terminate the contract. In such case, the Contractor shall be paid for all work executed and any expense sustained.

17.2 Upon completion or termination of the Work, the Contractor shall remove from the vicinity of the Work all equipment and all temporary structures, waste materials and rubbish resulting from its operations, leaving the premises in a neat and presentable condition. In the event of failure to do so, the same may be done by the Owner at the expense of the Contractor.

18. CONTRACT APPROVAL

18.1 Concurrence by the Owner in the award of the Contract is required before it is effective. A letter of approval shall be attached and made a part of the Agreement.

18.2 Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Vermont.

19. CONTRACT CHANGE ORDERS

19.1 All changes affecting the Project's construction cost or length of time, or modifications of the terms or conditions of the Contract, must be authorized by means of a written Contract Change Order which is mutually agreed to by the Owner and Contractor. The Contract Change Order will include extra Work, Work for which quantities have been altered from those shown in the Bid Schedule, as well as decreases or increases in the quantities of installed units which are different from those shown in the Bid Schedule because of final measurements. All changes must be recorded on a Contract Change Order and fully executed before they can be included in a partial payment estimate. Changes for Work, quantities, and/or conditions will include any respective time adjustment, if justified.

19.2 When the Contract sum is, in whole or in part, based on unit prices, the Owner reserves the right to increase or decrease a unit price quantity as may be deemed reasonable or necessary in order to complete the Work contemplated by this Contractor.

19.3 The markup in a Change Order for Overhead and Profit (OHP) by the General Contractor may not exceed 15% if the General Contractor does the work. If a Sub-Contractor executes the work, the Sub-Contractor's OHP may not exceed 15% and the General Contractor may not ask for more than a 5% markup for OHP on the actual work (not including the Sub-Contractor's OHP).

20. PARTIAL PAYMENT ESTIMATES

20.1 The Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the Owner from loss on account of:

20.1.1 Defective work not remedied,

20.1.2 Claims filed,

20.1.3 Failure of Contractor to make payments properly to Subcontractors or suppliers,

20.1.4 A reasonable doubt that the Work can be completed for the balance then unpaid,

20.1.5 Damage to another Contractor,

20.1.6 Performance of Work in violation of the terms of the Contractor Documents.

20.2 Where Work on unit price items is substantially complete but lacks testing, clean-up and/or corrections, amounts shall be deducted from unit prices in partial payment estimates to amply cover such testing, clean-up and/or corrections.

20.3 When the items in 20.1 and 20.2 are cured, payment shall be made for amounts withheld because of them.

20.4 Payments will not be made that would deplete the retainage nor place in escrow any funds that are required for retainage nor invest the retainage for the benefit of the Contractor.

21. PROTECTION OF LIVES AND PROPERTY

21.1 In order to protect the lives and health of its employees under the Contractor, the Contractor shall comply with all pertinent provisions of the Occupational Safety and Health Administration (OSHA) and any VOSHA Safety and Health requirements.

21.2 The Contractor alone shall be responsible for the safety, efficiency, and adequacy of its plant, appliances, and methods, and for any damages, which may result from their failure or their improper construction, maintenance or operation.

22. INSURANCE

22.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

22.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

22.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death or his employees;

22.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

22.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

22.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from.

22.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverage afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER

22.3 INSURANCE REQUIREMENTS. Insurance obtained by the Contractor to cover the below-listed requirements shall be procured from an insurance company registered and licensed to do business in the State of Vermont. All insurance coverage for property damage shall provide coverage for “Replacement” cost. Before the Contract is signed and becomes effective, the Contractor shall file with the OWNER a certificate of insurance, in duplicate, executed by an insurance company or its licensed agent(s), on a form satisfactory to the OWNER, stating that with respect to the Contract awarded, the Contractor carries insurance in accordance with the following requirements. Renewal certificates for keeping the required insurance in force for the duration of the Contract shall also be filed as specified above. No warranty is made that the coverage and limits listed herein are adequate to cover and protect the interests of the Contractor and any SUBCONTRACTOR for the Contractor’s and any SUBCONTRACTOR’S operations. These are solely minimums that have been established to protect the interests of the OWNER. The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, insurances as hereinafter specified:

22.3.1 Workers Compensation Insurance. With respect to all operations performed the Contractor shall carry Workers Compensation Insurance in accordance with the laws of the State of Vermont, 21 V.S.A. Chapter 9. The Contractor shall also ensure that all SUBCONTRACTORS carry Workers Compensation Insurance in accordance with 21 V.S.A. Chapter 9 for all work performed by them.

22.3.2 Commercial General Liability Insurance. With respect to all operations performed by the Contractor and SUBCONTRACTORS, the Contractor shall carry Commercial General Liability Insurance on an occurrence form providing all major divisions of coverage, including but not limited to:

Premises - Operations
Independent Contractor’s Protective
Products and Completed Operations
Personal Injury Liability

22.3.3 Contractor's General Liability and Property Damage Insurance will be obtained by the CONTRACTOR protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Contractual

Liability applying to the Contractor's obligations, unless this requirement is waived in writing by the OWNER, shall have Limits of Coverage not less than:

$1,500,000 Each Occurrence
$2,000,000 General Aggregate applying, in total, to this project only
$2,000,000 Products/Completed Operations Aggregate
$ 250,000 Fire Damage Legal Liability

22.3.4 Automobile Liability Insurance. The CONTRACTOR shall carry Automobile Liability Insurance covering all motor vehicles, including owned, hired, borrowed, and non-owned vehicles, used in connection with the project. Limits of Coverage shall be not less than:

Bodily Injury: $1,000,000 Each Person, $1,000,000 Each Occurrence
Property Damage: $ 500,000 Each Occurrence, OR
Combined Single Limit: $1,500,000 Each Occurrence

22.3.7 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

22.4 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provision of the laws of the state in which the WORK is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous WORK under this CONTRACT at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause, each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

23. REMEDIES: Unless otherwise provided in this Contractor, all claims, counterclaims, disputes, and other matters in question between the Owner and the Contractor arising out of or relating to this Contractor or the breach thereof will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State of Vermont.

24. AUDIT AND ACCESS TO RECORDS: For all negotiated Contracts, the Owner, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the Contractor, which are pertinent to the Contract, for the purpose of making audits, examinations, excerpts and transcriptions. The Contractor shall maintain all required records for three years after final payment is made and all other pending matters are closed.

26. The Contractor shall provide written notification to the Owner within 10 working days of the Contractor's intent to use Subcontractors. The notification shall list the name, address and telephone number of the Subcontractor; estimated dollar amounts of Subcontract; estimated starting and completion dates of the Subcontract.

SECTION 01010

SUMMARY OF WORK

1. GENERAL

1.1 CONTRACT DOCUMENT

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in all sections.

B. Specification Arrangement
   1. Titles to and arrangements of sections and paragraphs in these Specifications are used merely for convenience and shall not be taken as a correct or complete segregation of the several categories of materials, equipment, and labor, nor as the attempt to outline or define jurisdictional procedures.

1.2 INTENT

A. The entire work provided for in this Specification and on the Contract Drawings shall be constructed and finished in every respect in a good workmanlike and substantial manner. All parts necessary for the proper and complete execution of the work whether the same may have been specifically mentioned or not, or indicated in a manner corresponding with the rest of the work as if the same were particularly described and specifically provided herein. It is not intended that the Contract Drawings shall show every detailed piece of material or equipment, but such parts and pieces as may be in accordance with the best practices and regulatory requirements, even though not shown, shall be furnished and installed. All materials and equipment shall be new unless specifically stated otherwise in these Contract Documents.

1.3 SCOPE

A. The work required by these Specifications shall include furnishing all labor, skill, supervision, tools, construction plant, equipment and materials, and performing all operations necessary for the properly completed Contract work as shown on the Specification Drawings, as mentioned in these Specifications, and as evidently required, to the complete satisfaction of the awarding authority and their authorized representatives.

1.4 GENERAL DESCRIPTION OF WORK

A. The replacement of the Headworks screen consists of the following:
   1. This Contract includes supplying of equipment for the mechanical fine screen, washer/compactor, and appurtenances. Removal of the existing screen and other demolition work will be performed by others. In addition, installation of this new equipment will be performed by a separate Contractor(s).

1.5 WORK BY OTHERS

A. There may be other contractors working on related or nonrelated projects. If, through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration if such other contractor or subcontractor will settle. If such other contractor or subcontractor shall assert any claim against the Owner because of any damage alleged to have been sustained, the Owner shall notify the Contractor who shall indemnify and save harmless the Owner against any such claim.

1.6 WORK SEQUENCE

A. Sequence construction to accommodate continued usage of public property.

B. Contractor to sequence operations to conform with any requirements stipulated by permits, ordinances, or the Contract Documents.

C. Prior to performing any work, the Contractor shall submit a detailed flow plan and work schedule for review and approval by the Owner and engineer.

1.7 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by:
1. Law
2. Ordinances
3. Permits
4. Contract Documents

B. Do not unreasonably encumber site with materials or equipment.

C. Do not load structures with weight that will endanger structures.

D. Assume full responsibility for protection and safekeeping of products stored on premises.

E. Move any stored products which interfere with operations of Owner or other contractor(s).

F. Obtain and pay for use of additional storage or work areas needed for operations.

G. Limit use of site for work and storage.
1. Use of site not to interfere with pedestrian and vehicle access to abutting properties.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 None used.

END OF SECTION

SECTION 01015

CONTRACT DRAWINGS

1. GENERAL

1.1 CONTRACT DOCUMENT DRAWINGS

A. The drawings may be modified by addenda and will be issued for construction purposes. These drawings may be supplemented or superseded by such additional general and detail drawings as may be necessary or desirable as the work progresses. The drawings issued for construction at that time or after the signing of the Contract Documents will become the contract drawings.

1.2 EXISTING AND ADJACENT CONDITIONS

A. Wherever existing conditions or construction not required as part of the work of the contract are shown, they are so shown as a source of information only. The Owner, while believing such information is substantially correct, assumes no responsibility therefore. Before starting any work that might be affected by such existing construction or conditions, the Contractor shall have made himself familiar with all conditions affecting the nature and manner of performing the work and shall not be entitled to any extra compensation for any work or expense arising from or caused by his neglect to have verified all existing conditions and requirements.

1.3 DIMENSIONS

A. The drawings are made to scale by and large, but all working dimensions shall be taken from the figured dimensions or by actual measurements at the work, and in no case by scaling the prints. The Contractor shall study and compare all drawings and verify all figures before laying out or constructing the work and shall be responsible for any and all errors in the contract work which might have been avoided thereby. Whether or not an error is believed to exist, deviations from the drawings and the dimensions given thereon shall be made only after acknowledgment of receipt of revision is obtained in writing from the Engineer. The Contractor shall take all measurements of existing established conditions notwithstanding the figured dimensions on the drawings. When figured dimensions are not in agreement with the Contractor's measurements, the Contractor will adjust measurements as necessary and provide Engineer with justification for said revisions.

1.4 DIAGRAMMATIC DRAWINGS

A. Plans or drawings where work is shown diagrammatically, indicate approved working systems. Every piece of material, fittings, fixtures, or small equipment is not shown nor every difficulty or interference that may be encountered. To carry out the true intent and purpose of the Contract Documents, all necessary parts to make complete, correct working systems or installation shall be included as if detailed on these drawings.

B. The location of equipment shown on the drawings, unless exactly dimensioned, shall be considered as approximate only. The Contractor shall adjust the position of the equipment in accordance with good working practices to meet interferences, provide proper clearance and provide proper access space for operation and maintenance.

1.5 TYPICAL DETAILS

A. Where shown, the typical details shall apply to each and every item of the Contract work where such items are incorporated and the detail is applicable. Unless noted otherwise, such typical details shall be applicable in full.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 None used.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT (WWTF)

1. GENERAL

1.1 GENERAL

A. Each unit price or lump sum stated in the Schedule of Prices shall constitute full compensation for all materials, labor, tools, equipment and incidentals thereto, to perform the work in accordance with the Contract Documents.

B. Payment for any Item of work required by the Contract Drawings and Specifications and not listed as a separate item in the Schedule of Prices in the Proposal shall be considered as included in the lump sum prices stated in the Schedule of Prices and will not be paid for as a separate Item.

C. Contractor shall request progress payments no more than monthly based on percent complete. Retainage as described in the general conditions will be withheld until final payment.

D. A Project Schedule update in accordance with Specification Section 01310 shall be submitted with each monthly payments request and is a requirement for approval of the pay estimate.

1.2 SCREEN AND WASHER/COMPACTOR - EQUIPMENT ONLY (ITEM 1)

A. Measurement
   1. The screen and washer compactor equipment shall be bid on a lump sum basis. The lump sum price bid for this Item in the Proposal shall include the screen and washer/compactor equipment and all appurtenances.

B. Payment
   1. The lump sum price for this Item in the Proposal shall be full compensation for furnishing materials, tools, and equipment and for all work and expense incidental thereto for the screen and washer/compactor equipment as shown on the Contract Drawings.

END OF SECTION

SECTION 01300

SUBMITTALS AND SUBSTITUTIONS

1. GENERAL

1.1 DESCRIPTION

A. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards. To ensure that the specified quality of product is furnished and installed in accordance with design intent, procedures have been established for advance submittal of design data and for its review for compliance to Specification by the Engineer.

1.2 PRODUCT HANDLING

A. Make all submittals of schedules, shop drawings, samples, requests for substitutions, and other items in strict accordance with the provisions of this Section of these Specifications.

1.3 SHOP DRAWINGS

A. The Contractor shall furnish one (1) electronic copy in searchable PDF format, per the Engineer's direction, of manufacturer's shop drawings, specific design data as required in the detailed Specifications, and technical literature covering all equipment and fabricated materials which he proposes to furnish under this Contract in sufficient detail to indicate full compliance with the Specifications. Shop drawings shall indicate the method of installation, the exact layout dimensions and weights of the equipment or materials, including the locations, size, and details of valves, pipe connections, handling directions, and pick points, etc.

1. All Contractor submittals must be accompanied by a transmittal cover sheet that provides all information required by the Engineer for a prompt and timely review. The transmittal cover sheet shall be as shown at the end of this section. The Engineer will provide an electronic version of the transmittal cover sheet to the Contractor at the pre-construction meeting for their use. Shop drawing submittals that are missing the transmittal cover sheet or with cover sheets missing required information will be returned to the Contractor without review. The Contractor shall make no modifications to the form, except to complete fillable sections on the form.
2. The Contractor is responsible for the prompt submission of all shop and working drawings so that there shall be no delay in the work.
3. All substitutions must be marked as substitutions.
4. Submittals in excess of 30 pages shall be provided with a table of contents (index) to facilitate review.
5. Submittals in excess of 100 pages shall be submitted as a searchable and indexed pdf. They shall also be accompanied by one (1) paper copy upon request by the Engineer.

6. Operation & Maintenance Manuals shall be submitted both as a searchable and indexed pdf as described above, as well as three (3) hard copy manuals.

B. The Contractor shall complete a detailed review of all shop drawings before they are transmitted to the Engineer. The Contractor shall confirm that each of the conditions listed in Item 1.3.A above have been met and that the shop drawing specifically depicts the products and/or materials that they plan to provide/install. The Contractor shall further assure that all extraneous and irrelevant information is purged from the submission. When a specific submittal sheet indicates multiple options or choices, the proposed option or choice shall be clearly marked. If the Owner/Engineer is the select between options, those options that are not available shall be clearly indicated as such. Failure to meet any of these requirements will result in a rejection of the submission by the Engineer without a review. The Engineer will only consider a review of the submission after the Contractor makes the submission conforming to these requirements.

C. The Contractor is solely responsible for determining that the submission is properly coordinated with other work and other shop drawings. Contractor shall verify all field dimensions. Contractor shall determine suitability of materials and equipment to meet the design concept. Contractor shall confirm that the submission conforms to their means and methods.

D. The Contractor shall clearly list <u>any and all deviations</u> from the Contract Documents on the shop drawing transmittal cover sheet and clearly indicate deviations within the shop drawing material as well. The Engineer will review and accept or reject deviations noted above. Failure of the Contractor to properly identify a deviation and the Engineer's subsequent approval of the shop drawing does not alleviate the Contractor's responsibility to address said deviation which may include a subsequent rejection of the shop drawing submission if the deviation is found to be unacceptable.

E. The Engineer shall promptly review all shop drawings. The Engineer's acknowledgment of general conformance of any shop drawing shall not release the Contractor from responsibility for deviations from the Contract Documents and coordination with other work. Regardless of corrections made in or acknowledgment of general conformances given to such drawings by the Engineer, the Contractor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Contract Drawings and Specifications. The Engineer may require the submission of associated work, even work of other specification sections, if necessary to perform a coordinated review. In such an event, the Engineer shall promptly notify the Contractor.

F. The Engineer will review the submission for conformance with the information in the contract documents and to determine whether the proposed installation is compatible with the design concept. The Engineer will not make a determination regarding whether the submission is properly coordinated with other submissions, nor will the Engineer review Contractor means and methods, which are the sole responsibility of the Contractor.

G. Any substantive design changes or Contract Time or Price changes that the Contractor believes are resulting from the Engineers review comments, will be brought to the Engineer immediately. Engineer review comments on a shop drawing are <u>not</u>

authorization for the Contractor to perform a change in the Work that results in a Contract Time or Price change. Such changes can only be made by change order.

H. Approval by the Owner of any deviation in materials, workmanship, or equipment proposed subsequent to acceptance of the Shop Drawings or design data shall be requested in writing by the Contractor.

I. Portions of the work requiring a Shop Drawing or sample submission shall not begin until the Shop Drawing or submission has been acknowledged as conforming to Contract Documents by the Engineer. A copy of each Shop Drawing and each sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

1.4 MANUFACTURER'S CERTIFICATIONS

A. For pipe, cement, steel reinforcement, paint, and similar materials which are normally tested in the shop by the manufacturer, the Contractor shall furnish the Engineer certified records of physical, chemical, and other pertinent tests and/or certified statements from the manufacturer that the materials have been manufactured and tested in conformity with the Specifications. Where such a small quantity of materials is required to make physical tests or chemical analyses impractical, a certificate from the manufacturer stating the results of such tests or analyses of similar materials which were concurrently produced may be considered by the Engineer.

B. Each manufacturer's certificate shall be endorsed or accompanied by the Contractor's certificate that the materials certified by the manufacturer will be the material incorporated in the work.

1.5 SAMPLES

A. The Contractor shall furnish for review samples of materials to be used for construction, as requested by the OWNER or ENGINEER.

B. Contractor shall pay all costs for samples. Samples will only be returned to the Contractor upon Contractor's request. Such requests must be made in writing at the time of delivery to the ENGINEER for review.

1.6 SUBSTITUTIONS

A. Whenever a material, article, or piece of equipment is identified on the Contract Drawings or Specifications by reference to brand name or catalog number, it shall be understood that this is referenced for the purpose of defining the performance or other important requirements and that other products of equal capacities, quality, and function shall be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalog number, and if such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may allow its substitution and use by the Contractor. If the substitution where called for in the Contract Documents is of inferior substance or function, but nonetheless

acceptable to the Owner, the substitution will be accepted with cost differential deducted from the Contract Price by Change Order.

B. An item shall be considered equal to the item named or described if (1) it is at least equal in quality, durability, appearance, strength, and design, (2) it will perform at least equally the specific function imposed by the general design for the work being contracted for on the materials being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the Specifications. The name and identifications of all materials other than the one specifically named shall be submitted to the Engineer in writing for review prior to purchase, use, or fabrication of such items. Subject to the provisions of any applicable laws, approval shall be at the sole discretion of the Owner, shall be in writing to be effective, and the decision of the Owner shall be final. The Engineer may require tests of all materials so submitted to establish quality standards at the Contractor's expense.

C. Substitutions that are deemed by the Engineer as requiring significant changes in the function or general design of the project or that will require an unreasonable level of effort to review as a substitution will be rejected. The Contractor may petition the Owner for further consideration of the substitution request, which may incur additional services of the Engineer. In such an event, the Owner, at their sole discretion can determine whether to authorize the Engineer to perform these services, with the cost of these services to be borne by the Contractor through a change order to their contract. Should such an authorization be granted and the substitution ultimately rejected, the Contractor shall still bear the cost of the Engineer’s additional services.

D. All directions, specifications, and recommendations by manufacturers for installation, handling, storing, adjustment, and operation of their equipment shall be complied with; responsibility for proper performance shall rest with the Contractor.

E. For the use of material other than specified, the Contractor shall assume the cost of, and responsibility for, satisfactorily accomplishing all changes (including redesign costs by the Engineer if necessary), in the work as shown. If no manufacturer is named, the Contractor shall submit the product he intends to use for review of the Engineer.

F. Except as otherwise provided for the provisions of any applicable laws, the Contractor shall not have any rights of appeal from the decision of the Owner concerning any materials submitted if the Contractor fails to obtain the approval for substitution under this Specification. Any additional cost incurred by a substitution shall be at the Contractor's expense.

G. Availability of Specified Items
   1. Contractor shall:
      a. Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the work.
      b. In the event specified item or items will not be available, so notify the Engineer prior to receipt of bids in writing.

H. General
   1. Where manuals are required to be submitted covering items included in this work,

prepare all such manuals in durable plastic or other binders approximately 8 1/2 x 11" in size and in searchable PDF format and with at least the following:

a. Commercial quality 8 1/2 x 11", 3-ring binders with hardback, cleanable, plastic covers; 2" maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
b. Identify each binder on front and on spine with typed or printed title, "Operation and Maintenance Instructions"; list title of Project and identify equipment covered by manual.
c. Identify portable storage device with typed or printed title, "Operation and Maintenance Instructions"; list title of Project and identify equipment covered by manual.
d. Arrange content by section numbers and provide a table of contents.
e. For electronic submittal, arrange content in the device such that each section is a separately titled file, titled per the Table of Contents.
f. Provide with reinforced, punched binder tabs. Bind with text; fold larger drawings width to size of text pages.
g. For electronic submittal, provide drawings each as a separately titled file specific to the drawings or group of drawings.
h. Manufacturer's printed data or type written data on 20 lb. paper.

I. Extraneous Data
1. Where contents of manuals include manufacturers' catalogue pages, clearly indicate the precise items included in this installation and delete or otherwise clearly indicate all manufacturers' data with which this installation is not concerned.

1.7 GROUPING OF SUBMITTALS

A. Unless otherwise specifically permitted by the Engineer, make all submittals as appropriate in groups containing all associated items, including items of other specification sections, to allow the Engineer to review and confirm that there is coordination between components as specified. The Engineer may not allow partial submittals as not complying with the provisions of the Contract Documents.

B. All shop drawing submissions shall be separated by specification section. The Engineer will review shop drawings by specification section. Failure to comply with this requirement without the prior approval of the Engineer will result in return of the submission without review.

C. To the extent practical, the Contractor shall submit all information required by a given specification section at one time.

D. Where components described by different specification sections are submitted concurrently, for convenience or to satisfy (condition A above), they must still be submitted divided by specification section.

1.8 TIMING OF SUBMITTALS

A. General
1. Make all submittals far enough in advance of scheduled dates of installation to provide all required time for reviews, for securing necessary approvals, for possible

revision and re-submittal, and for placing orders and securing delivery.

B. Delays
1. Costs of delays occasioned by tardiness of submittals shall be borne entirely by the Contractor.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 None used.

END OF SECTION

ENGINEER'S SUBMITTAL REVIEW

Submittal Description:_____ Submittal No.:_____

Project: _____ Date Received: _____

_____ Date Reviewed: _____

Engineer: **Aldrich + Elliott, PC** Engineer's No.: _____

Contractor:_____ Contractor's No.: _____

ENGINEER'S REVIEW

Engineer's review is solely for general conformance with the design concept of the project and general compliance with the information included in the Contract Documents. Contractor shall be solely responsible for compliance with the Contract Documents, including, but not limited to drawings and specifications, manufacturer's instructions, Owner's directions, codes and building official directions. Contractor is solely responsible for correlating and confirming dimensions at the jobsite, choice of fabrication processes and techniques of construction, coordination of construction, coordination of his work with that of other trades, and performing the work in a safe and satisfactory manner. Engineer relies on the Contractor's Review Certification in the performance of his review.

☐ **Reviewed – No Comments** ☐ **Reviewed – See Comments Below**

☐ **Submit Additional Information** ☐ **Revise & Resubmit**

_____

[Reviewer's Name] – Aldrich + Elliott, PC

Review Comments:

SECTION 01600

MATERIALS AND EQUIPMENT

1. GENERAL

1.1 QUALITY

A. Incorporate only new materials and equipment in the work unless otherwise specified. All materials and equipment furnished by the Contractor shall be subject to the inspection of the Engineer. Do not deliver materials to the work site prior to completion of the shop drawing process.

B. Furnish all facilities and labor for the handling and inspection of all materials and equipment. If required by the Engineer, either prior to beginning or during the progress of the work, submit samples of materials for such special tests as may be necessary to demonstrate that they are of the quality specified. Furnish, store, pack, and ship such samples as required by manufacturer.

1.2 HANDLING AND STORAGE OF MATERIALS

A. Handle and store all materials and equipment to be incorporated in the work, before, during, and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind whatsoever to the material or equipment.

B. Store cement and lime under a roof and off the ground. Keep completely dry at all times. Keep spilling to a minimum. Store all miscellaneous steel and reinforcing steel off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Handle and store brick, block, and similar masonry products in a manner to reduce breakage, chipping and cracking.

C. Store all mechanical equipment subject to corrosive damage by the atmosphere, in a building.

D. Remove promptly from the site of the work all materials which have become so damaged as to be unfit for the use intended or specified. The Contractor shall not receive compensation for the damaged material or its removal.

E. Unload and place and secure pipe and all other materials delivered to the job in a manner which will not hamper the normal operations, or interfere with the flow of necessary pedestrian or vehicular traffic.

F. The Contractor shall provide suitable equipment and labor, and shall handle materials at all times so as to avoid damage. Under no circumstances shall pipe be dropped.

G. The Contractor shall be fully responsible for all materials until final acceptance of the completed work.

H. The Contractor shall take all precautions to prevent stored materials and equipment from becoming dislodged, shifting, or falling.

1.3 PRODUCTS LIST

A. Within thirty (30) days after date of Contract, submit to Engineer seven (7) copies of complete list of all products which are proposed for installation.

B. Tabulate list by each Specification section.

C. For products specified under reference standards, include with listing of each product:
1. Name and address of manufacturer
2. Trade name
3. Model or catalogue designation
4. Manufacturer's data
5. Performance and test data
6. Reference standards

1.4 CONTRACTOR'S OPTIONS

A. For products specified only by reference standards, select any product meeting standards, by any manufacturer.

B. For products specified by naming several products or manufacturers, select any product or manufacturer named.

C. For products specified by naming one or more products, but indicating the option of selecting equivalent products by either a specific or general "or equal" clause, Contractor must submit request, as required for substitution, for any product not specifically named.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 None used.

END OF SECTION

SECTION 01730

OPERATION AND MAINTENANCE MANUALS

1. GENERAL

1.1 REQUIREMENTS INCLUDED

A. Compiling of product data and related information required for maintenance of products.

B. Preparing of operation and maintenance data and instructions for systems and equipment.

C. Schedule of required submittals.

1.2 QUALITY ASSURANCE

A. Prepare instructions and data using personnel experienced in maintenance and operation of described products.

1.3 FORMAT

A. Prepare data in the form of an instructional manual.

B. Binders
1. Commercial quality 8 1/2” x 11", 3-ring binders with hardback, cleanable, plastic covers; 2" maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

C. Cover
1. Identify each binder with typed or printed title, "Operation and Maintenance Instructions;" list title of Project and identify equipment covered by manual.

D. Arrange content by section numbers and provide a table of contents.

E. Provide tabbed fly leaf for each separate product and system with typed description of product and major component parts of equipment.

F. Text
1. Manufacturer's printed data or type written data on 20 lb. paper.

G. Drawings
1. Provide with reinforced, punched binder tabs. Bind with text; fold larger drawings width to size of text pages.

1.4 CONTENTS, EACH VOLUME

A. Table of Contents
1. Provide title of project, schedule of products and systems, indexed to content of the volume.

B. For Each Product or System
1. List names, addresses and telephone numbers of subcontractors, manufacturers and suppliers, including local source of supplies and replacement parts.

C. Product Data
1. Mark each sheet to clearly identify specific products and components' parts and data applicable to installation; delete inapplicable information.

D. Drawings
1. Supplement product data to illustrate relations of component parts of equipment and systems to show control and flow diagrams. Do not use project record documents as maintenance drawings.

E. Typed Text
1. Prepare as required to supplement product data. Provide logical sequence of instructions for each procedure. Incorporate manufacturer's instructions for each procedure. Incorporate manufacturer's instructions for delivery, storage, assemble, installation, startup, adjusting, finishing, operation and maintenance.

1.5 MANUAL FOR MATERIALS AND FINISHES

A. Building Products, Applied Materials and Finishes
1. Include product data with catalog number, size, composition, color and texture designations. Provide information for reordering custom manufactured products.

B. Instructions for Care and Maintenance
1. Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture-Protection and Weather-Exposed Products
1. Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional Requirements
1. As specified in individual Specification sections.

1.6 MANUFACTURER'S MANUALS FOR EQUIPMENT AND SYSTEMS

A. Each Item of Equipment and Each System
1. Include a description of unit or system, and component parts. Give function, normal operating characteristics, and limiting tests and certifications where appropriate and

complete nomenclature and commercial number of replaceable parts, where applicable.

B. Panelboard Circuit Directories
   1. Provide electrical service characteristics and name of load on each branch circuit breaker.

C. Operating Procedures
   1. Include startup, break-in, and routine normal operating instructions and sequences; including regulation, control, stopping, shutdown, emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements
   1. Include routine procedures and guide for troubleshooting, disassembly, repair, and reassemble instructions, alignment, adjusting, balancing, and checking instructions. Provide servicing and lubrication schedule, and list of lubricants repaired.

E. Controls
   1. Provide the following:
      a. Sequence of operation.
      b. Original parts list, illustrations, assembly drawings and diagrams required for maintenance.
      c. As-installed control diagrams.
      d. Contractor's coordination drawings, with as-installed color coded piping diagrams.
      e. Charts of valve tag numbers with location and function of each valve, keyed to flow and control diagrams.
      f. As-installed color coded wiring.

F. Additional Requirements
   1. As specified in individual Specification sections.

1.7 SUBMITTALS

A. Submit two (2) paper and one (1) electronic and searchable copy draft Operation and Maintenance Manual for equipment and component parts within 30 days after shop drawing acceptance. Manuals shall include all materials complying with the presentation and format requirements of this section. One (1) copy will be returned with the Engineer's comments.

B. Submit two (2) paper and one (1) electronic copy of revised manual (if required) in final form complying with Engineer's comments within 30 days from the return of the reviewed manual. One (1) copy of the final manual will be returned. Revise content of documents as required until final submittal.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 None used.

END OF SECTION

SECTION 01731

SERVICE OF MANUFACTURER'S REPRESENTATIVES

1. GENERAL

1.1 WORK INCLUDED

A. Observing installation of equipment.

B. Checking, inspecting and adjusting equipment and certification of equipment, alarms, instrumentation and controls.

C. Performance testing and startup of equipment, alarms, instrumentation and controls.

D. Operator training.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 INSTALLATION

A. Furnish the services of a manufacturer's qualified representative to observe the actual installation of equipment.

B. Furnish the services of a manufacturer's qualified trained service representative or designee acceptable to the Owner to check, inspect, and adjust all equipment and accessories in accordance with individual Specification sections. The services shall begin when the equipment is requested to be placed into operation by the Owner.

C. The minimum period of time that the service representatives shall perform the services described herein shall be in accordance with individual Specification sections. Any additional time to correct and make equipment ready to startup will be as required and at no additional cost to the Owner. The individual Specification sections noted on the schedule are not all inclusive of sections requiring service representation.

D. The service representative shall: inspect the equipment for proper installation, lubrication and adjustment, damage and missing parts; inspect and check control systems and accessory equipment whether or not supplied by other manufacturer's; and make all necessary corrections to make equipment ready to startup and properly operate after startup.

E. Prior to equipment startup, the service representative shall furnish a letter to the Owner confirming that equipment installation is in conformance with the manufacturer's recommendations; that all alignments, adjustments and corrections have been made and that the equipment is ready for operation.

3.2 PERFORMANCE TESTING AND STARTUP

A. Performance testing shall not be performed on-site until after the service representative's letter of installation certification has been furnished to Owner.

B. Performance testing of all electrical, mechanical and hydraulic equipment and associated controls and instrumentation shall be performed to demonstrate that the equipment and associated systems meet the specified performance conditions.

C. Provide the services of a manufacturer's qualified service representative or designee acceptable to the Owner, as required for equipment provided on the Project. These services shall be provided in addition to the installation, observation, and/or installation certification requirements and operator training requirements as described in this Section.

D. All mechanical, electrical and hydraulic equipment and associated control systems and associated control systems and instrumentation are to be tested. Performance criteria and/or procedures are contained in various sections of the individual equipment Specifications. Where a specific procedure is not described in the individual Specifications, testing procedures common to the industry shall be employed to verify performance.

E. All scheduling of performance testing shall be approved by the Owner and a minimum of 7 days' notice shall be provided to the Owner prior to scheduling of testing.

F. Performance testing of all equipment shall be performed prior to plant startup and/or acceptance of the work.

G. Prior to initiating the performance test, the general procedure to be used shall be submitted to the Owner for his review.

H. All equipment, instrumentation, materials and labor shall be provided by the Contractor and/or the service representative.

I. During the performance tests, the designated service representative shall record data necessary to verify that the equipment being tested meets specified performance criteria.

J. Following completion of the performance tests, the Contractor shall submit a performance test report which summarizes the results of the performance tests and certifies that the equipment meets the specified performance requirements.

K. If the equipment fails to meet the specified performance requirements, the equipment shall be modified or replaced and retested with the end result being that the equipment meets the specified performance criteria. Modification, replacement and retesting shall be provided at no extra cost to the Owner.

L. Requests for acceptance of a piece of equipment or system will be considered only after completion of successful performance testing and submittal of the performance test report by the Contractor.

3.3 OPERATOR TRAINING

A. Operator training shall be performed during the performance testing and start-up.

B. After certifying to the installation of the equipment and at the direction of the Owner, the manufacturer's representative shall train the Owner's operational staff in the startup, operation and routine maintenance of the equipment in the presence of the Engineer.

C. Following the training, the manufacturer shall provide written certification to the Owner that the required training was provided.

END OF SECTION

SECTION 01740

GUARANTEES

1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall take notice of special guarantees required in the technical sections of these Specifications. If any item requires excessive maintenance during guarantee periods, the item shall be considered defective and the Contractor shall correct the defects. All defects so corrected shall be at the expense of the Contractor.

B. In the event that any equipment furnished as part of this Contract fails to meet the Performance Specifications herein during the applicable guarantee period and the equipment has been maintained by the Owner in accordance with the manufacturer's recommendations, the equipment shall be repaired, modified, or replaced with equipment acceptable to the Owner at no cost to the Owner so that the Performance Specifications are met. The Contractor shall bear all cost associated with such guarantee work.

2. PRODUCTS

2.1 None used.

3. EXECUTION

3.1 None used.

END OF SECTION

SECTION 11330

MECHANICALLY CLEANED FINE BAR SCREEN AND WASHER COMPACTOR (EQUIPMENT ONLY)

1. GENERAL

1.1 DESCRIPTION

A. Work Included
   1. Furnish all materials, equipment, and incidentals required for a mechanically cleaned fine bar screen and washer compactor in the existing Headworks, as shown on the Contract Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. Acceptable Manufacturers
   1. The mechanically cleaned fine bar screen and washer compactor equipment and appurtenances shall be provided by Duperon Corporation, or approved equal.

B. The equipment shall be fully assembled and shop tested at the manufacturing facility prior to shipment. Shop testing shall include a minimum of 4 hours of run time. The engineer, the owner, or the owner's designated representative reserves the right to witness the shop test.

C. All equipment furnished under this Section and related sections shall be of a single manufacturer who has been regularly engaged in the design and manufacture of the equipment and demonstrates, to the satisfaction of the Engineer, that the quality is equal to equipment made by those manufacturers specifically named herein.

D. The screen manufacturer shall have at least 25 installations of the specified model of mechanically cleaned bar screen equipment that has been in successful operation, at similar size and type installations, for at least five (5) years. Upon request, the manufacturer shall provide a reference of such installation sites along with the relevant contact information. If the screen manufacturer cannot demonstrate that they have the minimum 25 similar installations, a minimum five (5) year warranty shall be provided for the mechanical screen and washer compactor in lieu of the experience requirements.

E. The equipment furnished shall be fabricated, assembled, installed and placed in proper operation condition in full conformity with approved drawings, specifications, engineering data, and/or recommendations furnished by the equipment manufacturer.

1.3 REFERENCE STANDARDS

A. American National Standards Institute (ANSI)

B. American Society for Testing and Materials (ASTM)

C. American Welding Society (AWS)

D. American Institute of Steel Construction (AISC)

E. American Bearing Manufacturers Association (ABMA)

F. American Gear Manufacturers Association (AGMA)

G. National Electrical Manufacturers Association (NEMA)

H. Underwriters Laboratory (UL)

1.4 BASIS OF DESIGN

A. Mechanically Cleaned Bar Screen
1. The mechanically cleaned bar screen shall have a head sprocket only, with no sprockets, bearings, idlers, or similar drive components under water to trap the chain.
2. The mechanically cleaned bar screen shall meet the total screen debris removal capacity of:

Scraper Ratio below Water Level:

$$\frac{\text{Upstream Water Level (ft)}}{1.745\ \text{ft}} = \text{Number of Scrapers below Water level}$$

Debris Volume per Linear Foot = 0.152 ft^3 /hr (0.046 m^3/m)

Total Screen Debris Removal Capacity on Low (ft^3/hr) =
(0.152 ft^3/ft) x (Screen Width) x 60 x (Number of Scrapers below Water Level)

Total Screen Debris Removal Capacity on High (ft^3/hr) =
(0.152 ft^3/ft) x (Screen Width) x 260 x (Number of Scrapers below Water Level)

3. The flow ability of the screen area, specifically, shall be defined as follows: A composite number representing the specific flow- ability of a screen area composed of the bars' Hydraulic Headloss Coefficient Shape Factor, the bar width and the clear opening of the screen field per formula below.

$$(\text{Coefficient Shape Factor}) \times \left(\frac{\text{Bar Width}}{\text{(Clear Opening)}}\right) = \left(\frac{0.190}{\text{(Clear Opening)}}\right)$$

4. The mechanically cleaned bar screen shall be designed to run automatically (24/7), without operator.
5. The equipment shall have multiple scrapers on the bar screen at one time cleaning continuously from bottom to top, the entire width of the bar screen. The drive output shaft rotation shall be constant and in one direction in order to reduce maintenance and increase product life. Units which have single raking arms or that require cycle times shall not be allowed. Cleaning mechanisms that utilize shock absorbers, springs or other dampening or hydraulic actuations are unacceptable.
6. The link system shall have jam evasion capability by flexing around and collecting large objects such as a 2 X 4, bowling ball, grease balls and surges of solids at peak loading times without overloading and shutting down the unit. The link system shall be such that it bends in one direction only which allows it to become its own lower sprocket and frame and shall have a 1,000 pound lifting capacity.
7. Designs employing the use of endless moving media or cables and hydraulic cylinders to remove debris from the channel and units utilizing proximity or limit switches for reverse cycles are not acceptable.
8. Equipment utilizing a greater than ½ HP motor or two or more motors to complete a screen cleaning cycle is not acceptable.
9. The design shall be such to ensure that all maintenance can be accomplished at the operating floor level or above. No part of the drive system including sprockets shall be located below the water surface at maximum design flow.
10. Design Conditions:

Site Installation Information:	
Channel Width:	2.50 Ft
Channel Height:	5.25 Ft
Bar Opening Size:	1/4"
Angle of Installation:	20 degrees
Average Flow:	3.3 MGD
Average Water Level:	* 2 Ft Upstream
Maximum Flow:	10 MGD
Maximum Water Level:	* 4.25 Ft Upstream
Maximum Head Differential:	1 Ft
Equipment Location:	Indoors
Indoor Installation:	
Ceiling Clearance Height:	9’
Site Access Constraints:	None
Roof Opening Available:	Yes
Door Opening Size:	6’-0”
Installation Area Classification:	Class I Div I – Local to Bar Screen and Washer Compactor
Collection and Conveyance	Washer Compactor to Discharge Chute
Washer/Compactor:	Yes

B. Compactor Washer
   1. Design Features:
      a. Compacting Action: Dual augers provide positive displacement action, are orientated on top of each other and rotate in opposing directions. The augers are intermeshed and are of 1 left hand and 1 right hand lead and shall have ability to rotate, 2.2 RPM in opposing directions. Compactor augers shall be designed with a limited float on top of a perforated plate, allowing them to accommodate irregular debris.
      b. Washing Action: Wash port manifold is integrated prior to the compaction housing and delivers 3 to 5 GPM assuming supply pressure is 40 to 60 PSI at a ½ inch NPT connection for attaching water source utilizing filtered effluent or municipal water. Washing action is flood wash type from a single ½ inch NPT supply. Drain connection shall be 3" NPT male.
      c. Operation: Washer Compactor is designed to be continuous run not requiring operator. Washer Compactor is equipped with a self-regulating, active pressure zone designed to accept non-standard wastewater debris in its original form, such as rocks, broken concrete, and metal (bolts, short pipe, etc.) up to 4 inches long. Washer Compactor shall have the ability to process multiple pieces of clothing, variable volumes of debris, and unprocessed septage or grease. Compactor moves at normal operating speed of 2.2 RPM and can run intermittently to sync with upstream equipment.
      d. Design Conditions:

Design Summary:	
Peak Capacity:	60 cu. ft/hour (for approx. 5 minutes)
Average Capacity:	30 cu. ft/hour (continuous)
Water: Typical	Utilizes filtered effluent or municipal water
	Consumes 3-5 gallons per minute
	Requires 40 to 60 PSI
	½ inch NPT supply – male threads
	3 inch NPT drain – male threads
Materials of Construction:	304 SSTL
	17-4 spur grears
	Delrin (or equiv,) thrust and plane bearings
	UHMW auger supports
Dimensions:	
Hopper Height (Deck to Hopper):	38"
Hopper Length:	27"
Motor/Drive:	
Motor Size:	3/4 HP
Motor Paint:	Standard Tnemec Coating
Motor Service Factor:	1.0
Output Speed:	2.2 RPM
Speed Reducer Ratio/Output:	809:1
Speed Reducer Paint:	Standard Tnemec Coating

1.5 SUBMITTALS

A. Provide full and complete shop drawings, catalog cuts, and other technical data to fully define the materials, equipment, and performance capabilities for each characteristic specified herein.

B. Manufacturer recommended installation instructions.

C. Manufacturer's guarantee/warranty.

D. Operation and Maintenance Data
   1. For all equipment furnished under this section, the Contractor shall submit two (2) copies and one (1) searchable electronic copy of operation and maintenance manuals to include the following:
      a. General - equipment function, description and normal and limiting operating characteristics.
      b. Installation instructions - assembly procedures and alignment and adjustment procedures.
      c. Operation instructions - startup procedures, normal operating conditions, emergency and normal shutdown procedure.
      d. Lubrication and maintenance instructions which shall list all points to be greased or oiled, shall recommend type, grade and temperature range of lubricants, and shall recommend frequency of lubrication.
      e. Troubleshooting guide.
      f. Parts list and predicted life of parts subject to wear.
      g. Drawings - cross sectional view, assembly and wiring diagrams. Drawings shall include detailed parts lists with part numbers, instructions for ordering spare parts, and complete preventive maintenance instructions required to ensure satisfactory performance and longevity of the equipment.
      h. Performance curves.
      i. Instructions for adjustment, calibration and testing of selected electronic components or assemblies, normally considered replaceable by the manufacturer, whose performance is not ascertainable by visual inspection.
      j. Service instruction for major components not manufactured by the equipment manufacturer but which are supplied by him in accordance with these specifications. The incorporation of literature produced by the actual component manufacturer shall be acceptable.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store equipment in manufacturer's original undamaged shipping containers with tags and labels intact and legible.
B. Store all equipment up off the ground, under cover, protected from weather, and construction activities or other possible damage.

1.7 WARRANTY

A. For a period of one year from the Date of Substantial Completion or eighteen months after delivery, the manufacturer shall repair or replace any equipment which

has been found defective in materials or workmanship under normal conditions of use and maintenance. Guarantee need not cover alterations by Owner; damage from accidents, abuse and vandalism; nor acts of God. Repair made during this guarantee period shall not utilize spare parts furnished as part of this Contract but shall be provided by the manufacturer. In the event repairs of the equipment require installation of spare parts provided under this contract, the manufacturer shall replace those spare parts in a timely manner.

B. Manufacturer shall warrant for the period of 5 years all rotating parts of the Mechanically Cleaned Bar Screen including the gear motor, bearing, drive head, and the link system including the links, castings, pins and retaining rings. Manufacturer warrants that these components shall be replaced if damaged or defective in the normal use of the equipment.

C. The manufacturer's liability shall be limited to the cost of materials and installation.

2. PRODUCTS

2.1 MECHANICALLY CLEANED FINE BAR SCREEN

A. Components
1. Bar screen assembly: Bar screen assembly shall be of stainless steel and designed to withstand 1 foot head differential unless noted otherwise in Section 2.2 J Design Conditions. Unless noted otherwise materials of construction shall be 304 Stainless Steel. A stainless steel channel bottom plate shall be an integral part of the bar screen assembly to fully engage scrapers in the bar screen at the base of the unit and assure that the raking mechanism reaches the bottom of the screen to prevent debris accumulation. The Bar screen assembly shall be shipped in one piece.
   a. Screen Bars: Bars shall be 316L stainless steel and be tear-shaped with a Hydraulic Coefficient shape factor of 0.76 and the minimum dimensions of 0.25 inch x 0.75 inch x 0.13 inch. Bars shall be individually replaceable without welding.
   b. Side Fabrication: The screen framework shall be 304 stainless steel bent plate with minimum of 3/16 inch cross section. Horizontal members shall be of stainless steel bent plate or stainless steel pipe. Support members and frame shall adequately support the bar screen based on site specific requirements.
   c. Dead Plate: Dead plate shall be 0.25 inch thick 304 stainless steel. The dead plate shall be flat and true; span the entire width of the unit; and transition from bar screen to discharge point. The dead plate shall prevent reentry of rags downstream.
   d. Discharge Chute: The discharge chute shall be 11ga. (0.12 inch) 304 stainless steel. The discharge chute shall be bolted to the dead plate and shall be designed to allow debris to be transferred from discharge point into the debris containment.
   e. Link Slides: Link slide assembly shall be provided per manufacturer standard design and shall be constructed of UV Stable UHMW PE rollers

and 304 stainless steel supports and components.

2. Return Guide/Closeouts: Return guide/Closeouts shall be 304 stainless steel and shall assure proper alignment of scrapers as they enter the bar screen and assure that there is no space wider than the clear opening between bars to prevent passage of larger solids than allowed through the screen.
3. Debris Blade: A 304 stainless steel and UV Stable UHMW-PE debris blade assembly, which does not require a separate drive, shall be installed to assist in removing debris from the scraper on the mechanically cleaned bar screen unit as recommended by the manufacturer. Hydraulic, shock, or spring controlled debris blade mechanisms are not acceptable.
4. Screen Enclosure: A 14ga. #4 brushed satin finish 304 SSTL Enclosure shall be installed to cover the screen above the operating deck level. Front Enclosure shall have removable panels for access to equipment. Removable panels shall be 16ga. 304 SSTL and shall be provided with knurled knobs for "no tool required" access. Alignment notches shall be included to support repositioning of removable panels. The top of the Front enclosure shall include a knock out for a customer site option to install a 6-inch diameter pipe stub. Rear Enclosure shall have hinged removable doors and shall be secured with a lift-slide-latch handle. Rear removable door shall include an integral viewing door that shall be secured with a lift-slide-latch handle to provide access for a quick look inside. For multi-deck applications, 14ga. #4 brushed satin finish 304 SSTL side shields will also be provided.
    a. Front Enclosure Design Options:
        1) SSTL removable panels (standard)
5. Link System: The link system shall be passivated stainless steel castings and have a minimum ultimate strength of 60,000 lbs with a minimum cross section of 1.5 inches and weighing a minimum of 4.5 lbs each. Parts must meet ASTM A380 specification for surface finish.
    a. 304 stainless steel system includes 302 stainless steel retaining rings and 304 stainless steel pins.
6. Scrapers: Scrapers shall be spaced 21 inches apart. To provide long product life the scraper shall move at no greater than 28 inches per minute at standard operating speed of ½ rpm allowing for approximately 1 debris discharge per minute. Staging Scrapers and Thru Bar Scrapers shall be a maximum ratio of 2:1 per manufacturer recommendations. At least one scraper every 84 inches shall fully penetrate the bar screen, cleaning all three sides of the bars as well as through to the cross members in openings of 0.25, 0.375 and 0.50 inches.
    a. Staging Scrapers; Staging Scrapers shall be 1 inch thick x 4 inches x screen width UV Stable UHMW-PE with a serrated edge.
    b. Thru Bar Scrapers: Thru Bar Scrapers shall be minimum .375 inch thick x 5 inches x screen width 304 stainless steel.
7. Drive Head: The Drive Head shall be located at the top of the mechanically cleaned bar screen.
    a. Drive Unit: Each mechanically cleaned bar screen unit shall operate independently and shall have its own drive unit and driven components.
        1) Drive Sprockets and end castings shall be cast 304 stainless steel.
        2) Drive Shaft shall be 304 stainless steel.
        3) Gearbox shall be shaft-mounted, right angle type and include spiral bevel gearing. The output shaft speed shall be controlled by a vector

type inverter or per rake manufacturer's recommendation. It shall have at least a 1.52 or greater service factor based on machine torque requirements. The gearbox shall not be vented to the outside atmosphere. The gearbox shall be grease filled. Oil filled gearboxes are not allowed.

4) The motor shall be AC induction type, inverter duty, 3 phase 480 volt and mounted to the gear reducer. The motor shall be ½ hp, designed for 1800 RPMs base speed and rated for Class I, Groups C & D, Class II Groups F & G environments. The motor shall have an EPNV enclosure, NEMA design B with a 56C frame size. Service factor shall be 1.0 or greater, Class F insulation and be optimized for IGBT type inverters. The motor must be UL listed and designed for continuous operation.
5) Motor shall have built in, normally closed, thermostat to protect from overheating that is to be field wired to corresponding terminal in control panel for redundant (ambient) overload protection.
6) All drive head components shall be of components available in the United States.

b. Bearing: Bearing shall be greased ball bearing type, non self-aligning, sealed and lubricated and shall have a 24/7/365 L10 life of 20 years when in compliance with stated O&M recommendations. Non-sealed bearings are not acceptable.
c. Speed Reducer: Speed reducer shall be a double-reduction, cycloidal style and shall comply with all applicable AGMA standards. The speed reducer shall be capable of a 4/1 speed range with variable output speeds between 0.50 to 2.2 output RPMs (in high flow conditions). The speed reducer shall produce an output torque of 11,417 in.lb. and have a gear ratio of 809:1.

8. Standard Coating: All non-stainless bar screen components shall be coated in strict accordance with the paint manufacturer's specification. Surface Preparation shall be done in accordance with SSPC-SP-10 Near White. The three-part coating system shall be manufactured by Tnemec as follows: Prime Coat Series 90-97 Tnemec Zinc at 2.5-3.5 mils DFT, Intermediate Coat Series 27 F.C. Typoxy at 3.0-5.0 mils DFT, and Top Coat Series 1075U Endura-Shield II at 2.0-3.0 mils DFT. Standard color is 11SF Safety Blue. Material shall meet all state and federal VOC and other regulatory requirements.
9. Alternatives: Any alternate products must provide certified test reports when submitting products other than those specified herein the specification. Test reports shall indicate the test method, system and requirements for those products being submitted, and shall meet or exceed the test criteria and performance values of the specified coatings herein.

B. Electrical, Controls, Instrumentation
1. General: Controls for both the screen and washer compactor shall be in a single enclosure provided by the bar screen and washer compactor manufacturer. The manufacturer shall be responsible for proper sizing and function of the controls at 480V, unless specified otherwise. The main control panel shall not exceed 48" (high) X 36" (wide) X 12" (deep).
a. Main control panels shall be operated within a temperature range between 35°F and 104°F.

b. Controls shall be designed to accept incoming power supply per plans/specs and shall include a step-down transformer as needed to achieve 120V.
c. Control Panel(s) shall be constructed to meet the appropriate NEMA classification requirements and will include a main, lockable disconnect. The panel will be constructed by a UL certified control panel build facility and will be supported by the appropriate UL labeling.
d. Controls shall be tested prior to shipment to owner. The rake manufacturer shall verify all overload settings in the rake controller to insure proper overload and speed settings required for the application are properly programmed.
e. Control panel(s) shall be wired complete with a minimum of #16 MTW wire in the appropriate colors for the circuits being supplied. 120VAC control shall be red, grounded AC neutral shall be white, DC control shall be blue, DC neutral shall be blue with a white tracer, equipment ground shall be green and all incoming and outgoing external power source wires shall be a yellow configuration. All AC power wiring shall be a minimum of #12 Black. All wires shall be labeled at both ends with heat-shrink wire markers. Internal panel wiring shall be contained in non-flammable, covered wire way.
f. All panel(s) and panel mounted devices shall be labeled with engraved I.D. markers that reference back to the system schematics. Tags shall be white with black core, engraved as required.
g. All field wiring and power cables between the bar screen Main Control Panel and the Local Push Button Station shall be provided by others under the Electrical Section. VFD rated motor cable (Belden #29502 or equal) is recommended for all motors. Motor cables shall be less than 80 ft unless otherwise specified.

2. Components:
   a. Main Control Panel
      1) Enclosure(s) shall be NEMA 12, painted.
      2) Enclosure shall be located in an interior, unclassified space.
      3) Main Control Panel shall be designed with a SCCR rating of 18KA at 480VAC minimum and labeled as such, unless otherwise specified.
      4) All terminals utilized in the main panel shall be 600V rated terminals and 20% spare terminal space shall be provided for any potential future revisions.
      5) The Main Control Panel shall include at a minimum the following:
         i. Main fusible disconnect with lockable operator, unless otherwise specified.
         ii. Physical or virtual Hand/Off/Auto (HOA) Selector and Push/pull E-Stop button.
         iii. Elapsed run-time meter
         iv. Indication for "Power On", "Forward" and necessary faults.
      6) Relay Based Controls shall include the following:
         i. Variable Frequency Drive (VFD)
         ii. Electronic torque control
         iii. Hard contact SCADA Interlock(s)
         iv. Adjustable on/off cycle timers

b. Local Control Push Button Station
   1) Enclosure shall be NEMA 7/9 rated for Classified area. Local push button station must be local to the equipment to maintain requirements of local safety codes.
   2) Local station shall be mounted within 10 feet or as close to the equipment as safely possible and be field wired by the electrical subcontractor to the corresponding terminal inputs in the main control panel.
   3) The remote pushbutton station shall include HOA, Forward, Jog Reverse and E-Stop buttons.

c. Instrumentation: Each raking assembly shall have a separate level system that shall be installed and field wired by others per the manufacturer's instructions. *The level system shall be non contact as floats are not acceptable.*
   1) Two Level/Two Speed Control: When the lower level switch trips, the rake runs. When the upper level switch trips the rake runs at high speed. When the level switch returns to the normal position, an off-delay timer is initiated to prevent intermittent equipment starting/stopping. Cycle timing logic shall also be included that shall function in parallel with the level control for optimal rake run time.

3. Controls Design Conditions:

Incoming Power: (Voltage/Phase)	3 Phase 480 Volt
Enclosures:	1 Main Control Panel
Installation location:	Indoors
Approx. distance between main panel and equipment motor	20 feet
Climate controlled location:	No, heat is provided
Transducer/Float cable length (50 ft standard):	Provided

2.2 COMPACTOR WASHER

A. Components:
1. Compactor Housing: The compactor housing shall be constructed of 304 stainless steel and be a minimum of 11 Gauge and connect to 3/8-inch thick flanges.
2. Augers: Shall be of stainless steel with flights 3/8 inch and have a 4 inch flight pitch. Augers shall be coupled to a transmission at the drive end and supported at the compaction end with UHMW plane bearings. Such arrangement allows movement for accommodation of irregular debris.
3. Drive Assembly:
   a. Each Washer Compactor unit shall operate independently and will have its own drive unit and driven components. The gearbox shall not be vented to the outside atmosphere.
   b. The gearbox shall be grease lubricated and designed for 5 years (or 20,000 hours of operation) between recommended clean and re-grease services. The gearbox shall be right angle type and shall incorporate cycloidal and spiral bevel gearing with a total ratio of 809:1. The gear reducer output shaft speed shall be 0.5 RPM minimum – 2.2 RPM

maximum and controlled by an AC Tech, vector type inverter or greater service factor based on unit torque requirements. It shall be shaft mounted utilizing the keyless Taper-Grip® bushing.

c. The motor shall be mounted to the gear reducer by utilizing a quill, C-Face mounting style. The gearmotor shall be AC induction type, ¾ hp, 3/60/230/460 volt, explosion proof, inverter duty model.

d. The drive assembly shall incorporate the standard coating system.

4. Auger Transmission:
   a. The Drive Assembly shall be coupled to a dual gear transmission which drives the augers in counter rotation.
   b. The spur gears are contained in a stainless steel housing and supported by Delrin (or equivalent) plane bearings.
   c. Grease fittings shall be located outside of the transmission housing to provide lubrication to the gears.
5. Speed Reducer: Shall have a maximum output of 2.2 RPM, 809:1 reduction ratio with 18,940 in-lb of output torque.
6. Thrust Bearings: Shall be Delrin (or equivalent), self-lubricating and be capable of withstanding minimum 2000 Lb. of thrust load (each auger) at 2.2 RPM for life of machine.
7. Screw supports: Shall be UHMW plane type, self-lubricating and fastened into place using stainless steel fasteners.
8. Spur Gears: Shall be 17-4 PH stainless steel.

B. Materials:
1. Fabrications: All welded fabrications are to be made from stainless steel. All welded connections and welding procedures shall comply with AWS “Structural Welding Code – Sheet Steel” D1.3/D1.6.
2. Select Parts: Select power transmission parts to be made from cast iron; however, shall conform to coating as follows.
3. Standard Coating:
   a. Motor Gearbox shall be coated in strict accordance with the paint manufacturer’s specification. Surface Preparation shall be done in accordance with SSPC-SP-10 Near White. The three-part coating system shall be manufactured by Tnemec as follows: Prime Coat Series 90-97 Tnemec Zinc at 2.5-3.5 mils DFT, Intermediate Coat Series 27 F.C. Typoxy at 3.0-5.0 mils DFT, and Top Coat Series 1075U Endura-Shield II at 2.0-3.0 mils DFT. Standard color is 11SF Safety Blue. Material shall meet all state and federal VOC and other regulatory requirements.
4. Non-metal: Parts not covered above shall be made from UHMW polyethylene.

C. Controls:
1. General:
   a. Controls shall be provided by Washer Compactor manufacturer.
   b. Controls shall be designed to accept 3PH 480 volt incoming power supply per plans/specs. Control panel power shall be 1PH/120VAC and shall include a step-down transformer to achieve 120V.
   c. Controls shall be built by a UL-approved panel builder and bear the UL-approved logo. Controls shall be tested by panel builder and by the Washer Compactor manufacturer prior to shipment to owner. The Washer

Compactor manufacturer shall verify all overload settings in the Washer Compactor controller to insure proper overload and speed settings required for the application are properly programmed.

2. Main Panel:
   a. A single main panel shall be supplied that integrates both the bar screen and washer compactor controls.
   b. The control package shall include the following and utilize the panel builder's standard component manufacturers, unless otherwise approved by the Washer Compactor manufacturer:
      1) N4X 304 SSTL enclosure with continuous hinge, exterior, lockable door.
      2) High volt transformer.
      3) HOA Selector where Hand mode shall enable the local station and Auto receives a Run signal from a remote/discrete source. When input signal is cut, the Washer Compactor shall then utilize an off-delay timer to allow debris to finish depositing.
      4) Speed controller (based on vector drive technology), pre-programmed for speed/overload control by the panel builder and verified by the Washer Compactor manufacturer.
      5) Dry contact input for motor thermostat to shut down equipment if motor overtemp condition occurs.
      6) Dry contact output signals for "Run", "Start Solenoid", "Common Fault", and "In Auto" conditions.
      7) 120 VAC output power to wash water solenoid.
      8) Dry contact input terminals for "Remote Run", "Motor Thermostat", and remote station.
      9) Main control power breaker with lockable, thru-door operator.
      10) Elapsed run-time meter.
      11) "Push-to-Test" type indicator lights for "Power On", "Forward", "VFD Fault", and "Motor Overtemp".
      12) Phenolic label on outer door indicating equipment identification number (as required by owner).
      13) Push/Pull E-Stop on outside of enclosure.
3. Remote Panel:
   a. A NEMA 7/9 remote push button station is required to maintain equipment requirements and local safety codes.
   b. The remote station shall be rated NEMA 7/9 and include HOA, Forward, Jog Reverse, and E-Stop buttons. The remote station shall be mounted as close to the equipment as safely possible and be field-wired by the electrical subcontractor to the corresponding terminal inputs in the main control panel. Jog Reverse shall only function for a period of one second (or less) when button is depressed to stay within manufacturer's operational and design parameters.
4. Sequence of Operations:
   a. The controls shall enable the remote push button station installed near the Washer Compactor when in Hand mode and utilize an input signal from a remote source when in Auto mode. Upon receiving a stop signal in Auto mode, the Washer Compactor shall utilize an off-delay timer to allow debris to finish depositing.

b. The speed controller fault shall be cleared by turning off the Washer Compactor, then waiting approximately three minutes (or time designated per current UL standards) and then turning the HOA back to the desired setting. A motor overtemp fault shall clear automatically when the motor cools to be within normal operating range.

2.3 SPECIALTY TOOLS, SPARE PARTS AND LUBRICATION

A. Manufacturer shall provide any specialty tools and recommend spare parts required for maintaining the bar screen equipment as follows:
1. Drive Clevis Pin (1)
2. Snap/Retaining Rings (10)
3. Link Clevis Pins (4)
4. Hex Head Cap Screw (4)
5. Scraper Nuts (4)
6. Snap Ring Tool (1)
7. Never Seez, 1 oz. tube (1)

B. Manufacturer shall provide any specialty tools and recommend spare parts required for maintaining the washer compactor equipment as follows:
1. Upper/Lower Support (2)
2. Side Support (2)
3. FHCS: 0.25-20X1 (24)
4. 0.25 Flat Washer SAE (24)
5. 0.25 Nylock Nut (24)
6. AntiSeize Lubricant (1)
7. Never Seez, 1 oz. tube (1)

C. Manufacturer shall provide one tube of Multi-Purpose grease which is a 5-year supply of lubrication, required for maintaining all bar screen components.

D. Provide a full set of fuses for the main control panel.

2.4 ACCESSORIES

A. Washer Compactor Discharge Chute and Support
1. The washer compactor shall be supplied with the discharge chute and extension with bends as shown on the drawing. Total length is approximately 12’ and requires a minimum of two bends. Coordinate the chute layout with the existing field conditions.
2. The discharge chute extension shall include the required supports.

B. Washer Compactor Open Channel Support Frame
1. Provide the support frame constructed of 304L stainless steel custom built to span the existing channel.

3. EXECUTION

3.1 INSTALLATION

A. Equipment shall be installed in strict conformance with the manufacturer's installation instructions, as submitted with Shop Drawings, Operation and Maintenance Manuals and/or any pre-installation checklists. Installation shall utilize standard torque values and be installed secure in position and neat in appearance. Installation shall include any site preparation tasks as required by the engineer or manufacturer; such as unloading, touch-up painting, etc. and any other installation tasks and materials such as wiring, conduit, controls stands as determined by the customer and/or specified by the manufacturer.

3.2 TESTING

A. After completion of installation, CONTRACTOR shall provide for testing and shall be performed in strict conformance with the manufacturer's start up instructions. Testing of the bar screen shall demonstrate that the equipment is fully operational by picking up and depositing materials into specified containment.

B. Field certification shall include inspection of the following:
   1. Verify equipment is properly aligned and anchored per the installation instruction and drawings. Assure the bar screen unit is square, flat and unobstructed with required clearances maintained.
   2. Assure controls and instrumentation work in all modes.
   3. Check equipment for proper operation of debris blade, scrapers, etc as well as completion of the Start-Up requirements in the installation guide.

3.3 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The equipment to be furnished and installed under this section shall require the services of competent and experienced technical representatives of the manufacturer.

B. The equipment supplier shall review the plans and specifications, including structural and mechanical portions, to verify the spacer requirements as well as mechanical details. All modifications must be clearly indicated on the shop drawings and shall be at the Contractor's (or equipment supplier's) expense.

C. The General Contractor shall arrange for the equipment manufacturer to furnish the services of a qualified representative as necessary to check and supervise the installation, and to perform the initial operation and acceptance tests for not less than one (1) 8-hour day onsite. A written report covering the representative's findings and installation approval shall be mailed directly to the Engineer covering all inspections and outlining in detail and deficiencies noted.

D. Failure of Functional or Performance Test: In the event the equipment specified herein proved to be in noncompliance with the functional or performance requirements specified, the Contractor shall bear all costs for the satisfactory repair, replacement, and additional testing necessary to meet the specified requirements.

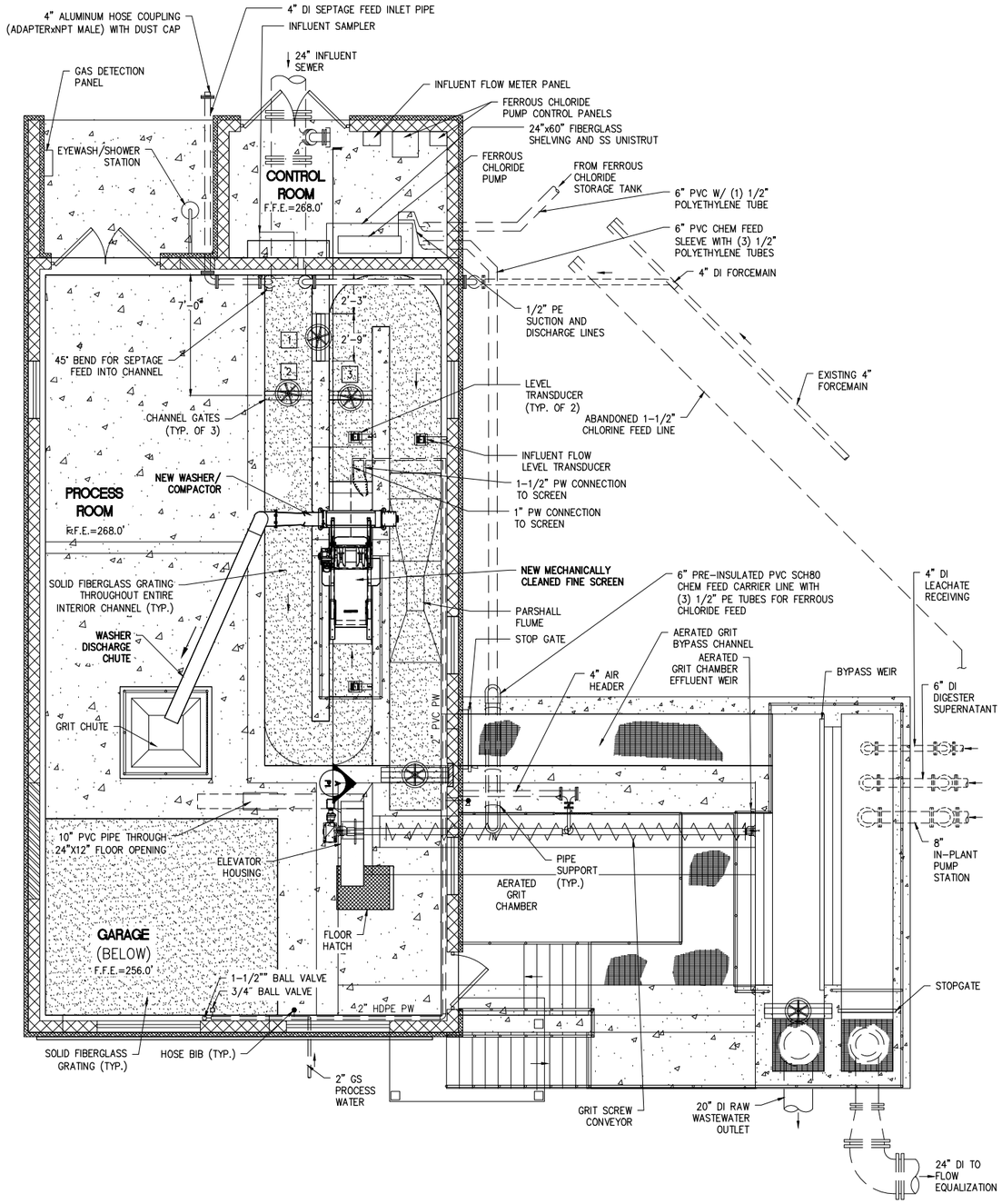
E. Services During Performance Testing and Plant Startup: Plant startup services are required for all equipment specified under this section. Also, when technical assistance is necessary due to any malfunction of the equipment furnished, the manufacturer's representative shall provide such services. The manufacturer's representative shall also conduct and/or assist the final performance and demonstration testing. These services shall continue until such times as the applicable equipment has been successfully performance tested and has been accepted by the Owner for full-time operations.

F. Training of Owner's Personnel: The manufacturer's representative shall provide detailed instruction to the Owner's personnel for operation of the specified equipment for a minimum of one (1) 8-hour day onsite. These training services shall include pre-startup and onsite equipment instruction and/or post-startup and onsite equipment instruction.

END OF SECTION

APPENDICES

APPENDIX A
DRAWINGS



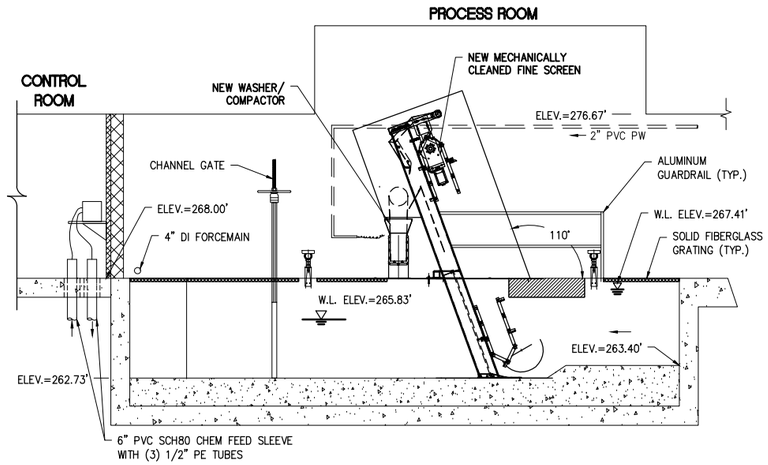
N

PLAN
SCALE: 1/4"=1'-0"

GRAPHIC SCALE

0 4' 6' 8'

(IN FEET)



A / P1 SECTION
SCALE: 1/4"=1'-0"

DRAWING HAS BEEN PLOTTED AT HALF SCALE

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS.

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AEengineers.com

No.	DATE	DESCRIPTION	CHECKED

VILLAGE OF ESSEX JUNCTION, VERMONT

WATER RESOURCE RECOVERY FACILITY

HEADWORKS PROPOSED PLANS AND ELEVATIONS

DESIGNED WAE	PROJECT NO. 17003
DRAWN JEB	DRAWING NO. P1
CHECKED WAE	
DATE APRIL, 2017	

Y:\17003-ESSEX JUNCTION\17003-P1.dwg, 4/5/2017 9:16:35 AM