



## **ADVERTISEMENT**

### **Proposal Solicitation – Ocean Pines Biosolids Dewatering Equipment and Building Design**

Worcester County is seeking proposals from qualified Vendors to contract for design, bidding, and construction phase services in the Ocean Pines Service Area for the Ocean Pines Wastewater Treatment Plant biosolids dewatering equipment and building design in conformity with the requirements contained herein Proposal Documents.

Proposal Documents for the above referenced project may be obtained from the Worcester County Commissioner's Office by either e-mailing the Procurement Officer, Nicholas Rice, at [nrice@co.worcester.md.us](mailto:nrice@co.worcester.md.us) or by calling 410-632-1194 during normal business hours, or via the County's Bids page on the County's [website](#). Vendors are responsible for checking this website for addenda prior to submitting their bids. Worcester County is not responsible for the content of any Proposal Document received through any third party bid service. It is the sole responsibility of the vendor to ensure the completeness and accuracy of their Completed Proposal Documents.

A pre-proposal meeting will be held on Monday, June 26, 2023 at 1:30pm at the Worcester County DPW - Water Wastewater facility, located at 1000 Shore Lane, Berlin, MD 21811. The last day for questions will be noon on Monday, July 3, 2023. Sealed Proposal Documents are due no later than Wednesday, July 12, 2023 at 2:30pm and will be opened and read aloud in the Office of the County Commissioners, Worcester County Government Center – Room 1103, One West Market Street, Snow Hill, Maryland 21863.

Late Proposal Documents will not be accepted.

Minority vendors are encouraged to compete for award of the solicitation.

Nicholas W. Rice, CPPO, CPPB, NIGP-CPP  
Procurement Officer  
Worcester County, Maryland

**Worcester County Administration  
1 West Market Street, Room 1103  
Snow Hill, Maryland 21863**



## **REQUEST FOR PROPOSAL**

**PROJECT:** Ocean Pines Biosolids Dewatering  
Equipment and Building Design

**DEPARTMENT:** Public Works – Water & Wastewater

### **VENDOR:**

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

\_\_\_\_\_

### **PROPOSAL OPENING:**

**DATE:** Wednesday, July 12, 2023

**TIME:** 2:30 PM

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## SECTION I: INTRODUCTION

### A. PURPOSE

1. The purpose of this Request for Proposal Document is for Worcester County (“County”) to contract for design, bidding, and construction phase services in the Ocean Pines Service Area for the Ocean Pines Wastewater Treatment Plant biosolids dewatering equipment and building design in conformity with the requirements contained herein (“Proposal Document(s”).

### B. CLARIFICATION OF TERMS

1. Firms or individuals that submit a proposal for award of a contract (“Contract”) are referred to as vendors (“Vendors”) in this document. The Vendor that is awarded the Contract is herein referred to as the (“Successful Vendor”).

### C. QUESTIONS AND INQUIRES

1. Questions must be addressed in writing to the Worcester County Procurement Officer at [nrice@co.worcester.md.us](mailto:nrice@co.worcester.md.us).
2. The last date to submit questions for clarification will be **noon on Monday, July 3, 2023**.
3. Addenda are posted on the County website at <https://www.co.worcester.md.us/> under County Info: Bid Board: at <https://www.co.worcester.md.us/commissioners/bids> at least five calendar days before proposal opening.
4. It is the Vendors responsibly to make sure all addenda are acknowledged in their proposal. Failure to do so could result in the proposal being disqualified.

### D. FILLING OUT PROPOSAL DOCUMENTS

1. Use only forms supplied by the County.
2. One unbound original and five bound copies of the proposal form and any required attachments must be submitted in the solicitation and can be submitted in the same envelope unless otherwise instructed.
3. Proposal Documents should be complied as follows: (1) Cover letter, (2) Form of Proposal, (3) References, (4) Exceptions Document and Signed addenda, if necessary (5) Individual Principal Document, (6) Vendor’s Affidavit of Qualification to Bid, and (7) Non-Collusive Affidavit
4. Where so indicated by the make-up of the Proposal Documents, sums will be expressed in both words and figures, and in the case of a discrepancy between the two, the amount written in words will govern. In the event there is a discrepancy between the unit price and the extended totals, the unit prices will govern.
5. Any interlineation, alteration, or erasure will be initialed by the signer of the Proposal Documents.
6. Each copy of the Proposal Documents will be signed by the person(s) legally authorized to bind the Vendor to a contract, using the legal name of the signer. Proposal Documents submitted by an agent will have a current Power of Attorney attached certifying the agent’s authority to bind the Vendor.
7. Vendor will supply all information and submittals required by the Proposal Documents to constitute a proper and responsible completed Proposal Document package.
8. Any ambiguity in the Proposal Documents as a result of omission, error, lack of clarity or non-compliance by the Vendor with specifications, instructions, and/or all conditions of bidding will be construed in the light most favorable to the County.

**E. SUBMISSION OF PROPOSAL DOCUMENTS**

1. All copies of the Proposal Documents and any other documents required to be submitted with the Proposal Documents will be enclosed in a sealed envelope. The envelope will be addressed to the Worcester County Commissioners and will be identified with the project name: **OCEAN PINES BIOSOLIDS DEWATERING EQUIPMENT AND BUILDING DESIGN** and the Vendor's name and address. If the Proposal Documents are sent by mail, the sealed envelope will be enclosed in a separate mailing envelope with the notation "SEALED PROPOSAL DOCUMENTS ENCLOSED" on the face thereof.
2. Proposals must be mailed or hand carried to the **Worcester County Administration Office, 1 West Market Street, Room 1103, Snow Hill, MD 21863**, in order to be received **prior** to the announced proposal deadline. *Proposals received after said time or delivered to the wrong location will be returned to the Vendor unopened.*
3. **Proposals are due and will be opened at the time listed on the front of this Proposal Document.**
4. If you are delivering a proposal in person please keep in mind to allow time to get through security and into the Administration Office. It is fully the responsibility of the Vendor to ensure that the proposal is received on time.
5. The County will not speculate as to reasonableness of the postmark, nor comment on the apparent failure of a public carrier to have made prompt delivery of the proposal.
6. Vendors, or their authorized agents, are expected to fully inform themselves as to the conditions, requirements, and specifications before submitting Proposal Documents; failure to do so will be at the Vendor's own risk.
7. A fully executed Affidavit of Qualification to Bid will be attached to each Proposal Document.
8. Minority vendors are encouraged to participate.
9. All Vendor submitted Proposal Documents will be valid for a minimum of sixty days from the date of Proposal Document opening.
10. Electronically mailed proposals are **not** considered sealed proposals and will **not** be accepted.

**F. OPENING OF PROPOSALS**

1. Proposal Documents received on time will be opened publicly and Vendor's names and total costs will be read aloud for the record.
2. The Contract will be awarded or all Proposal Documents will be rejected within sixty days from the date of the Proposal Document opening.

**G. ACCEPTANCE OR REJECTION OF PROPOSALS**

1. Unless otherwise specified, the Contract will be awarded to the most responsible and responsive Vendor complying with the provisions of the Proposal Documents, provided the proposal does not exceed the funds available, and it is in the best interest of the County to accept it. The County reserves the right to reject the Proposal Documents of any Vendor who has previously failed to perform properly in any way or complete on time contracts of a similar nature; or a Proposal Document from a Vendor who, investigation shows, is not in a position to perform the Contract; or Proposal Documents from any person, firm, or corporation which is in arrears or in default to the County for any debt or contract.
2. Completed Proposal Documents from Vendors debarred from doing business with the State of Maryland or the Federal Government will not be accepted.

3. In determining a Vendor's responsibility, the County may consider the following qualifications, in addition to price:
  - a. Ability, capacity, and skill to provide the commodities or services required within the specified time, including future maintenance and service, and including current financial statement or other evidence of pecuniary resources and necessary facilities.
  - b. Character, integrity, reputation, experience and efficiency.
  - c. Quality of past performance on previous or existing contracts, including a list of current and past contracts and other evidence of performance ability.
  - d. Previous and existing compliance with laws and ordinances relating to contracts with the County and to the Vendor's employment practices.
  - e. Evidence of adequate insurance to comply with Contract terms and conditions.
  - f. Statement of current work load and capacity to perform/provide the Goods and/or Services.
  - g. Explanation of methods to be used in fulfilling the Contract.
  - h. The Vendor, if requested, will be prepared to supply evidence of its qualifications, listed above, and its capacity to provide/perform the Goods and/or Services; such evidence to be supplied within a specified time and to the satisfaction of the County.
4. In determining a Vendor's responsiveness, the County will consider whether the Proposal Document conforms in all material respects to the Proposal Documents. The County reserves the right to waive any irregularities that may be in its best interest to do so.
5. The County will have the right to reject any and all Proposal Documents, where applicable to accept in whole or in part, to add or delete quantities, to waive any informalities or irregularities in the Proposal Document received, to reject a Proposal Document not accompanied by required Bid security or other data required by the Proposal Documents, and to accept or reject any Proposal Document which deviates from specifications when in the best interest of the County. Irrespective of any of the foregoing, the County will have the right to award the Contract in its own best interests.

#### **H. QUALIFICATIONS**

1. The Vendor must be in compliance with the laws regarding conducting business in the State of Maryland.  
All Vendors shall provide a copy Certificate of Status from the Maryland Department of Assessments and Taxation, evidencing the Vendor is in good standing with the State of Maryland. See [https://sdatcert1.resiusa.org/certificate\\_net/](https://sdatcert1.resiusa.org/certificate_net/) for information on obtaining the Certificate of Status. *Certificates of status are not available for trade names, name reservations, government agencies, sole proprietorships, and some other accounts as these are not legal entities and thus are not required for these categories of Vendors.* For more information on the Certificate of Status please see <http://www.dat.state.md.us/sdatweb/COSinfo.html> .
2. Worcester County reserves the right, at its sole discretion, to extend the date this documentation must be provided. The Vendor's inability to provide this documentation could result in the proposal being rejected.

#### **I. DESCRIPTIVE LITERATURE**

1. The proposed descriptive literature fully describing the product bid is what is intended to be included as the price. Failure to do so may be cause for rejection of the proposal.

2. Any items, systems or devices supplied in this proposal that are proprietary in nature relative to maintenance, repair, servicing or updating must be disclosed on the proposal form.

**J. NOTICE TO VENDORS**

1. Before a Vendor submits the Proposal Documents it will need to become fully informed as to the extent and character of the Goods and/or Services required and are expected to completely familiarize themselves with the requirements of this Proposal Document's specifications. Failure to do so will not relieve the Vendor of the responsibility to fully perform in accordance therewith. No consideration will be granted for any alleged misunderstanding of the material to be furnished or the Services to be performed, it being understood that the submission of a Proposal Document is an agreement with all of the items and conditions referred to herein.

**K. PIGGYBACKING**

1. Worcester County may authorize, upon request, any governmental entity (hereafter Authorized User) within the County to purchase items under the contract awarded pursuant to this proposal solicitation.
2. All purchase orders issued against the contract by an authorized User shall be honored by the Successful Vendor in accordance with all terms and conditions of this contract.
3. The issuance of a purchase order by an Authorized User pursuant to this provision shall constitute an express assumption of all contractual obligations, covenants, conditions and terms of the contract. A breach of the contract by any particular Authorized User shall neither constitute nor be deemed a breach of the contract as a whole which shall remain in full force and effect, and shall not affect the validity of the contract nor the obligations of the Successful Vendor thereunder respecting the County.
4. The County specifically and expressly disclaims any and all liability for any breach by an Authorized User other than the County and each such Authorized User and Successful Vendor guarantee to save the County, its officers, agents and employees harmless from any liability that may be or is imposed by the Authorized User's failure to perform in accordance with its obligations under the contract.

**END OF SECTION**

## **SECTION II: GENERAL INFORMATION**

### **A. ECONOMY OF PROPOSAL**

1. Proposal Documents will be prepared simply and economically, providing straightforward and concise description of the Vendor's capabilities to satisfy the requirements of the Proposal Documents. Emphasis should be on completeness and clarity of content. Elaborate brochures and other representations beyond that sufficient to present a complete and effective Proposal Document are neither required nor desired.

### **B. PUBLIC INFORMATION ACT (PIA)**

1. Worcester County is subject to the Maryland Public Information Act and may be required to release proposal submissions in accordance with the Act.
2. Any materials the Vendor deems to be proprietary or copyrighted must be marked as such; however, the material may still be subject to analysis under the Maryland Public Information Act.
  - a. The Vendor may invoke proprietary information or trade secret protection for submission of any data/material by (1) identifying the data/material in a written description, (2) clearly marking the data/material as proprietary, and (3) providing a written statement detailing the reasons why protection is necessary. The County reserves the right to ask for additional clarification prior to establishing protection.

### **C. CONTRACT AWARD**

1. A written award by the County to the Successful Vendor in the form of a Purchase Order or other contract document will result in a binding Contract without further action by either party. If the Successful Vendor fails or refuses to sign and deliver the Contract and the required insurance documentation, the County will have the right to award to the next responsible and responsive Vendor. Contract will be executed by the Successful Vendor within fourteen calendar days of receipt of the Contract.
2. Proposal Documents and Contracts issued by the County will bind the Vendor to applicable conditions and requirements herein set forth, unless otherwise specified in the Proposal Documents, and are subject to all federal, state, and municipal laws, rules, regulations, and limitations.
3. County personal property taxes ("Taxes") must be on a current basis; if any such Taxes are delinquent, they must be paid before award of Contract. Failure to pay will result in the award of Contract to another Vendor.
4. The County reserves the right to engage in individual discussions and interviews with those Vendors deemed fully qualified, responsible, suitable and professionally competent to provide the required Goods and/or Services should the project size warrant it. Vendors will be encouraged to elaborate on their qualifications, performance data, and staff expertise.

### **D. AUDIT**

1. The Successful Vendor agrees to retain all books, records, and other documents relative to the awarded Contract for five years after final payment, or until audited. The County, its authorized agents, and/or State auditors will have full access to and the right to examine any of said materials during said period.

### **E. NONPERFORMANCE**

1. The County reserves the right to inspect all operations and to withhold payment for any goods not performed or not performed in accordance with the specifications in this Proposal Document.



Errors, omissions or mistakes in performance will be corrected at no cost to the County. Failure to do so will be cause for withholding of payment for that Goods and/or Services. In addition, if deficiencies are not corrected in a timely manner, the County may characterize the Successful Vendor as uncooperative, which may jeopardize future project order solicitations.

**F. MODIFICATION OR WITHDRAWAL OF PROPOSAL**

1. A Proposal Document may not be modified, withdrawn, or cancelled by the Vendor during the stipulated time period following the time and date designated for the receipt of Proposal Documents, and each Vendor so agrees in submitting Proposal Documents.

**G. DEFAULT**

1. The Contract may be cancelled or annulled by the County in whole or in part by written notice of default to the Successful Vendor upon non-performance, violation of Contract terms, delivery failure, bankruptcy or insolvency, any violation of state or local laws, or the making of an assignment for the benefit of creditors. An award may then be made to the next most highly rated Vendor, or when time is of the essence, similar commodities and/or service may be purchased on the open market. In either event, the defaulting Vendor (or his surety) will be liable to the County for cost to the County in excess of the defaulted Contract price.
2. If a representative or warranty of either Party to the Contract is false or misleading in any material respect, or if either Party breaches a material provision of the Contract (“Cause”), the non-breaching Party will give the other Party written notice of such cause. If such Cause is not remedied within fifteen calendar days (“Cure Period”) after receipt of such notice, (unless, with respect to those Causes which cannot be reasonably corrected or remedied within the Cure Period, the breaching Party will have commenced to correct or remedy the same within such Cure Period and thereafter will proceed with all due diligence to correct or remedy the same), the Party giving notice will have the right to terminate this Contract upon the expiration of the Cure Period.

**H. COLLUSION/FINANCIAL BENEFIT**

1. The Vendor certifies that his/her Proposal is made without any previous understanding, agreement, or connection with any person, firm, or corporation making a Proposal Document for the same project; without prior knowledge of competitive prices; and is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action.
2. Upon signing the Proposal Document, Vendor certifies that no member of the governing body of the County, or members of his/her immediate family, including spouse, parents or children, or any other officer or employee of the County, or any member or employee of a Commission, Board, or Corporation controlled or appointed by the County Commissioners has received or has been promised, directly or indirectly, any financial benefit, related to this Proposal Document and subsequent Contract.

**I. TAX EXEMPTION**

1. In buying products directly from a Vendor, Worcester County is exempt from being *directly* charged Federal excise and Maryland sales tax. A copy of an exemption certificate shall be furnished upon request.
2. According to the Office of the Comptroller of Maryland, a *Contractor is responsible for paying sales tax* on his/her purchases relating to any projects or services and should incorporate it into their proposal.
3. Successful Vendors **cannot** use the County tax exemption to buy materials or products used on County projects.

**J. CONTRACT CHANGES**

1. No claims may be made by anyone that the scope of the project or that the Vendor's Goods and/or Services have been changed (requiring changes to the amount of compensation to the Vendor or other adjustments to the Contract) unless such changes or adjustments have been made by an approved written amendment (Change Order) to the Contract signed by the Chief Administrative Officer (and the County Commissioners, if required), prior to additional Goods and/or Services being initiated. Extra Goods and/or Services performed without prior, approved, written authority will be considered as unauthorized and at the expense of the Vendor. Payment will not be made by the County.
2. No oral conversations, agreements, discussions, or suggestions, which involve changes to the scope of the Contract, made by anyone including any County employee, will be honored or valid. No written agreements or changes to the scope of the Contract made by anyone other than the Procurement Officer (with the Chief Administrative Officer and/or County Commissioners approval, if required) will be honored or valid.
3. If any Change Order in the Goods and/or Services results in a reduction in the Goods and/or Services, the Vendor will neither have, nor assert any claim for, nor be entitled to any additional compensation for damages or for loss of anticipated profits on Goods and/or Services that are eliminated.

**K. ADDENDUM**

1. No oral statements of any person will modify or otherwise affect or interpret the meaning of the Contract specifications, or the terms, conditions, or other portions of the Contract. All modifications and every request for any interpretation must be addressed to Worcester County's Procurement Officer and to be given consideration, must be received no later than the last day for questions listed in Section I, Subsection C.2.
2. Any and all interpretations, corrections, revisions, and amendments will be issued by the Procurement Officer to all holders of Proposal Documents in the form of written addenda. Vendors are cautioned that any oral statements made by any County employee that materially change any portion of the Proposal Documents cannot be relied upon unless subsequently ratified by a formal written amendment to the Proposal Document.
3. All addenda will be issued so as to be received at least five days prior to the time set for receipt of Proposal Documents, and will become part of the Contract and will be acknowledged in the Proposal Document form. Failure of any Vendor to receive any such addenda will not relieve said Vendor from any obligation under the Proposal Document as submitted.
4. Vendors are cautioned to refrain from including in their Proposal Document any substitutions which are not confirmed by written addenda. To find out whether the County intends to issue an amendment reflecting an oral statement made by any employee, contact Worcester County's Procurement Officer during normal business hours.
5. The Worcester County Procurement Officer reserves the right to postpone the Proposal Document opening for any major changes occurring in the five-day interim which would otherwise necessitate an Addendum.

**L. EXCEPTIONS/ SUBSTITUTIONS**

1. Any exceptions or substitutions to the specifications requested should be marked on the proposal form and listed on a separate sheet of paper attached to the proposal.

2. An exception to the specifications may disqualify the proposal. The County will determine if the exception is an essential deviation or a minor item.
3. In the case of a minor deviation, the County maintains the option to award to that Vendor if it determines the performance is not adversely affected by the exception.

**M. APPROVED EQUALS**

1. In all specifications where a material or article is defined by describing a proprietary product or by using the name of a Vendor or manufacturer, it can be assumed that an approved equal can be substituted.
2. The use of a named product is an attempt to set a particular standard of quality and type that is familiar to the County. Such references are not intended to be restrictive.
3. However, the County shall decide if a product does in fact meet or exceed the quality of the specifications listed in the solicitation. It shall be the responsibility of the Vendor that claims his product is an equal to provide documentation to support such a claim.

**N. DELIVERY**

1. All items shall be delivered F.O.B. destination and delivery costs and charges included in the proposal unless otherwise stated in the specifications or proposal form.

**O. INSURANCE**

1. If required by the General Conditions or Terms and Conditions, the Successful Vendor shall provide the County with Certificates of Insurance within ten calendar days of proposal award notification evidencing the required coverage.
2. Successful Vendor must provide Certificates of Insurance before commencing work in connection with the Contract.

**P. PROPOSAL EVALUATION**

1. Proposal tabulations will be posted on the County website at <https://www.co.worcester.md.us/commissioners/bids>. Click on the Expired Bids & Results tab and find the proposal tabulation for the proposal you are interested in. Proposal tabulations will be posted as soon as reasonably possible after the Proposal opening.

**END OF SECTION**

## **SECTION III: GENERAL CONDITIONS**

### **A. DRAWINGS AND SPECIFICATIONS**

1. Should any detail be omitted from the drawings or specifications, or should any errors appear in either, it shall be the duty of the Successful Vendor to notify the County's designated construction inspector.
2. In no case shall the Successful Vendor proceed with the work without notifying and receiving definite instructions from the County. Work wrongly constructed without such notification shall be corrected by the Successful Vendor at his own cost.

### **B. MATERIALS, SERVICES AND FACILITIES**

1. It is understood that, except as otherwise specifically stated in the Proposal Documents, the Successful Vendor will provide and pay for all materials, labor, tools, equipment, water, light, power and transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time.
2. Materials and equipment will be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work will be located so as to facilitate prompt inspection.
3. Manufactured articles, materials, and equipment will be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.
4. Materials, supplies and equipment will be in accordance with samples submitted by the Successful Vendor and approved by the County.

### **C. INSPECTION AND TESTING**

1. All materials and equipment used in the construction of the Work will be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Proposal Documents.
2. The County or its representatives may, at any time, enter upon the work and the premises used by the Successful Vendor, and the Successful Vendor shall provide proper and safe facilities to secure convenient access to all parts of the work, and all other facilities necessary for inspection, as may be required.
3. The County will appoint such persons as deemed necessary to properly inspect the materials furnished or to be furnished, and the work done under the contract and to see that the same strictly corresponds with the drawings and specifications. All such materials and workmanship shall be subject to approval of the County. Approval or acceptance of payment shall not be misconstrued as approval of items or work not in conformance with specifications and drawings nor shall it prevent the rejection of said work or materials at any time thereafter during the existence of the contract, should said work or materials be found to be defective, or not in accordance with the requirements of the contract.
4. Work and material will be inspected promptly, but if for any reason should a delay occur, the Successful Vendor shall have no claim for damages or extra compensation.
5. The Successful Vendor shall pay for all inspection costs necessary to complete the work which may be incurred to comply with the requirements of any agency other than the County, such as a railroad, public service utility company, or any other governmental agency or any other agency whose jurisdiction affects the work in any manner unless otherwise specified herein.

**D. APPROVAL OF SUBSTITUTION OF MATERIALS**

1. Samples of materials shall be submitted by the Successful Vendor for approval before such materials are ordered from the manufacturers or distributors and shall be approved by the County before actual work is begun.
2. It is the intention of these specifications to permit all vendors bidding on this work to secure the fullest amount of competition on the various materials and specialties names herein. Wherever a material or article is defined by describing a proprietary product or by using the name of a vendor or manufacturer, the term or approved equal shall be presumed to be implied unless otherwise stated.

**E. PROTECTION OF WORK, PROPERTY AND PERSONS**

1. Successful Vendor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Successful Vendor will take all necessary precautions and programs in connection with the Work. Successful Vendor will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to, all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
2. Successful Vendor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. Successful Vendor will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. Successful Vendor will notify owners of adjacent utilities when progress of the Work may affect them. The Successful Vendor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by Successful Vendor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable.
3. In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Successful Vendor, without special instruction or authorization from the County, will act to prevent threatened damage, injury or loss. Successful Vendor will give the County prompt Written Notice of any significant changes in the Work or deviations from the Proposal Documents caused thereby, and a Change Order will thereupon be issued covering the changes and deviations involved.

**F. BARRICADES, DANGER, WARNING AND DETOUR SIGNS**

1. The Successful Vendor shall provide, erect and maintain all necessary barricades, sufficient red lights, flares, danger signals and signs, provide a sufficient number of watchmen and take all necessary precautions for the protection of the work and safety of the public.

**G. LICENSES AND PERMITS**

1. The Successful Vendor shall have all necessary licenses required to do the work and give all notices and obtain and pay all necessary permits required by local laws and regulations for building.
2. State and Federal permits (if applicable) to undertake work have been obtained by the County and accompany these specifications.

**H. SUPERVISION**

1. The Successful Vendor shall maintain, at all times during the progress of work, a competent and experienced supervisor who shall represent the Successful Vendor, and all directions given to him shall be binding. Important decisions regarding directions, if requested by the supervisor, shall be confirmed in writing.
2. Supervision by the County or its representative does not relieve the Successful Vendor of responsibility for defective work executed under the direct control of the Successful Vendor. Responsibility for defective work rests upon the Successful Vendor, whether discovered by the County prior to final payment or subsequent thereto.

**I. CLEAN UP**

1. Upon completion of the items within a given location as specified and before monthly estimates will be paid, the construction area and all other areas occupied by the Successful Vendor during the construction of said Contract shall be cleaned of all surplus and discarded materials, bracing, forms, rubbish and temporary structures that were placed there by the Successful Vendor.
2. Disposal of the aforementioned shall be the responsibility of the Successful Vendor.

**J. CHANGES IN WORK**

1. The County, without invalidating the contract, may order extra work or make changes by altering, adding or deducting from the work with the contract sum being adjusted accordingly.
2. All such work shall be executed under the conditions of the original contract, except that any claim for the extension of time caused thereby shall be adjusted at the time of ordering such change.
3. The value of any such extra work or change shall be determined in one or more of the following ways:
  - a. By estimate and acceptance of lump sum.
  - b. By unit prices named in the contract or subsequently agreed upon.

**K. TIME FOR COMPLETION**

1. The Work contemplated under this Contract shall be considered as continuous and be completed within the timeframe(s) stated in Section IV of this Proposal Document.
2. The Successful Vendor will be allowed to work eight hours per day, Monday through Friday, except for holidays, fifty-two weeks per year.
3. The Successful Vendor will not be permitted to work on holidays observed by Worcester County or the State of Maryland or on Sundays unless otherwise authorized in writing.
4. In case of an emergency which may require that work be done on Saturdays, Sundays, and Holidays, the Successful Vendor shall request permission of the County to do so. If, in the opinion of the County, the emergency is bonafide, permission may be granted to the Successful Vendor to work such hours as may be determined are necessary by the County. Also, if in the opinion of the County a bonafide emergency exists, the Successful Vendor may be directed to work such hours as may be necessary whether or not the Successful Vendor requests permission to do so.
5. The Successful Vendor shall pay the County for all costs incurred for inspection services required for work permitted during holidays, weekends or in excess of eight hours per day.

**L. CORRECTION OF WORK**

1. The Successful Vendor will promptly remove from the premises all Work rejected by the County for failure to comply with the Proposal Documents, whether incorporated in the construction or not, and the Successful Vendor will promptly replace and re-execute the Work in accordance with the Proposal Documents and without expense to the County and will bear the expense of making good all Work of other Vendors destroyed or damaged by such removal or replacement.
2. All removal and replacement Work will be done at the Successful Vendor's expense. If the Successful Vendor does not act to remove such rejected Work within ten days after receipt of Written Notice, the County may remove such Work and store the materials at the expense of the Successful Vendor.

**M. CONSTRUCTION SAFETY AND HEALTH STANDARDS**

1. It is a condition of this contract, and shall be made a condition of each sub-contract entered into pursuant to this contract, that the Successful Vendor and any sub-contractor shall not require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under construction safety and health standards (Title 29, Code of Federal Regulations, Part 1926, formerly Part 1518, as revised from time to time, promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standard Act.) (83 Stat. 96).
2. Failure of Worcester County to inform the Successful Vendor of safety violations will not release the Successful Vendor of his responsibilities.

**N. GUARANTEE**

1. The Successful Vendor shall furnish the County with a one-year guarantee of workmanship and materials, dating from time of acceptance of the project and shall make good any defects which may occur during that period.
2. If any special guarantees in excess of the one-year period are specified by the manufacturer, these guarantees shall take precedence over the one-year period guarantee.
3. Upon completion of work, and before final payment or release of retainage, the Successful Vendor shall submit, and obtain from each subcontractor, material supplier and equipment manufacture general warranties and a notarized asbestos free guarantee.

**END OF SECTION**

## **SECTION IV: PROPOSAL SPECIFICATIONS**

### **A. SCOPE**

1. The County is seeking proposals from qualified Consulting Engineering firms for design, bidding, and construction phase services in the Ocean Pines Service Area for the Ocean Pines Wastewater Treatment Plant biosolids dewatering equipment and building design in accordance with the terms and conditions and specifications set forth in this solicitation.

### **B. CONTRACT PRICING**

1. Pricing must include all labor, materials, tools, and equipment to perform Work.
2. Pricing will not change during the Contract Period.

### **C. BACKGROUND**

1. The Worcester County Commissioners are proposing to have the biosolids dewatering equipment and building replaced. The project is outlined in a Preliminary Engineering Report prepared by the Engineering firm George, Miles, and Buhr LLC in June 2021 (please see attachment).
2. This project will include the construction of the new sludge buffer tank, the provision of sludge storage/transport container, and the site piping requirements necessary to connect the proposed system to the existing facility.
3. This project will include necessary electrical improvements to connect the proposed equipment to the facility's electrical service and emergency power, and the facility's SCADA system for remote monitoring. Payment requests, plans, specifications, bidding standards, site signage, etc.

### **D. SUMMARY**

1. The Successful Vendor will develop construction plans and specifications, obtain all necessary permits, assist in construction contractor solicitation through the competitive sealed bid process, and provide construction phase services for the Biosolids Dewatering Equipment and Building Design to the Ocean Pines Wastewater Treatment Plant. The following specific tasks are required:
  - a. **DESIGN PHASE SERVICES**
    - i. Review the Preliminary Engineering Report and confirm details needed to design the system
    - ii. Schedule and attend a kick-off meeting with County staff to finalize the scope of the project and discuss project details and schedule.
    - iii. Coordinate with County staff on all equipment and appurtenances needed to connect to County SCADA system SCADA System.
    - iv. Obtain needed background information from on-site survey and aerial photography to design the wastewater collection system and pump station.
    - v. Identify and address any wetlands and floodplain issues. The proposed site in the PER is located in a marked wetland area but further site evaluation is required. Public Works is open to placement of the new equipment and building at alternative locations located on the wastewater treatment property should they be identified by the successful vendor. The selected consultant shall survey the proposed location provided, or any other proposed building site, and verify elevations prior to design to ensure all controls are a minimum of two (2) feet above the floodplain (Based on NAVD 1988) and that no additional mitigation is required.



- vi. Coordinate a geotechnical consultant to obtain soil borings for proposed location of the building site to confirm suitable subsurface conditions exist to support the equipment and building.
  - vii. Include design and permitting services for the Biosolids Dewatering Building.
  - viii. Prepare plats for any additional easements or right-of-way needed to accommodate proposed design.
  - ix. Design documents (Plans and Specifications) shall be submitted for review at the 30% (preliminary), 90% (pre-final) and final design phase
  - x. At the 90% design point, prepare and submit an application to MDE for the needed construction permit
  - xi. Concurrently, obtain the needed approvals for Erosion and Sediment Control, Storm Water Management as well as the required General Permit for Storm Water During Construction
  - xii. Prepare a cost estimate for the project at each submittal stage.
  - xiii. Complete the final design by addressing regulatory and staff comments and provide three copies of the final construction plans and specifications to the County for bidding. Additionally, provide the documents in Adobe Acrobat form for electronic distribution to Contractors
- b. **BIDDING PHASE SERVICES**
- i. Attend a pre-bid meeting with construction contractors, record and distribute meeting minutes.
  - ii. Respond to contractor requests for information.
  - iii. Assist in the creation of addendums
  - iv. Review contractor bid packages, tabulate bids, provide written recommendation for award of construction contract.
  - v. Check contractor suitability, ensure contractor is responsive and responsible bidder, including but not limited to checking for any suspension and debarment issues.
  - vi. Submit bid package and recommendation of award to funding agency for concurrence.
  - vii. Provide value engineering recommendations in cases where bids come in higher than construction funding available.
  - viii. Assist in value engineering negotiations with bidders as needed.
- c. **CONSTRUCTION PHASE SERVICES**
- i. Chair preconstruction meeting with successful contractor, record and distribute meeting minutes
  - ii. Review of project submittals from the contractor
  - iii. Respond to Requests for Information
  - iv. Review of the project schedule
  - v. Chair monthly progress meetings and providing meeting minutes
  - vi. Review contractor pay requests and make recommendations for payment
  - vii. Prepare and submit payment reimbursement request to funding agencies
  - viii. Conduct on-site conformational survey of critical elevations (i.e. pipe inverts, bottom elevation, sewer manhole inverts, etc.). Provide flood elevation certificate to comply with FIRM Flood maps. Identify any equipment installed at the incorrect elevation.

- ix. Prepare as-built drawings based on contractor prepared red line drawings.
- x. Overseeing equipment start-up and building walk through.
- xi. Scheduling and attending the final inspection of the construction, including preparation of the final punch list
- xii. Certifying project completion and providing final construction certification to the Maryland Department of the Environment
- xiii. Consultant shall provide full time inspection services and include the qualifications of the proposed construction inspector

**E. GENERAL REQUIREMENTS**

- 1. The Successful Vendor must be licensed to perform Work in the state of Maryland.

**F. PROPOSAL CONTENT**

- 1. Proposals shall include the following information at a minimum:
  - a. General Description of the Firm, including the office responsible for completion of the work
  - b. Approach to completion of this project
  - c. Management and Staffing Plan to identify the key personnel assigned to the project
  - d. Qualifications of the firm, including specific qualifications of the Project Manager, Inspector, and key personnel
  - e. Quality Control program description
  - f. References for similar projects
  - g. Cost proposal as described in the Proposal Form
  - h. Schedule of completion including major milestones of Percent Complete (30%, 60%, 90%, and 100%), Design Phase Surveying, Site location, Building Design and Layout, and Permitting in Microsoft Project gant chart format or equivalent. Highlight any critical path items

**G. PRE-PROPOSAL CONFERENCE**

- 1. A pre-proposal meeting will be held on Monday, June 26, 2023 at 1:30pm at the Worcester County DPW - Water Wastewater facility, located at 1000 Shore Lane, Berlin, MD 21811.

**H. ATTACHMENTS**

- 1. Biosolids Dewatering Preliminary Engineering Report – June 2021

**I. PAYMENT**

- 1. The County will make payment(s) to the Successful Vendor within thirty calendar days from the receipt of a proper invoice for approved and accepted work performed.
- 2. Unless otherwise noted, **all additional charges shall be included in the price quoted.**
  - a. This includes delivery, shipping, and any other materials (proofs, paper, etc.) needed to successfully complete the project according to the terms described.
  - b. The County will not be responsible for any costs incurred by any vendor in preparing and submitting a proposal.
- 3. Successful Vendor agrees to complete any necessary vendor paperwork as required by the County.

**J. QUESTIONS**

- 1. The last day for questions is listed under Section I, Subsection C.2.

**K. AWARD**

1. The County intends to award to the Vendor whose Completed Proposal Documents represents the best value to the County.

**END OF SECTION**

## SECTION V: EVALUATION AND SELECTION PROCESS

### A. EVALUATION

1. All Vendors are advised that in the event of a receipt of adequate number of Proposal Documents which, in the opinion of the County, require no clarification and/or supplementary information, such Proposal Documents may be evaluated without discussion. Hence, Proposal Documents should be initially submitted on the most complete and favorable terms which Vendors are capable of offering the County. Proposal Documents will be evaluated using the following criteria:

<b>Weighting Factor</b>	<b>Criterion</b>
25%	Qualifications of the organization
25%	Vendor's experience on similar 2-3 MGD Wastewater Treatment Facility projects
20%	Vendor's organizational capacity to meet the demands of the RFP specifications
10%	Vendor's professional references
20%	Vendor's overall fee schedule and related expenses

2. Each Vendor will be rated for each criterion on a scale of zero to four as described below.

Unacceptable	0
Poor	1
Fair	2
Good	3
Superior	4

- a. A Vendor's final grade will be the sum of each criterion's rating multiplied by the weighting factor listed above.
3. After identifying the short list of the most qualified Vendor(s) based on the evaluation criteria, representative(s) may be required to clarify their Proposals by making individual presentations to the evaluation committee.
4. The County may enter into negotiations with Vendors and invite best and final offers as deemed to be in the best interest of the County. Negotiations may be in the form of face-to-face, telephone, facsimile, e-mail or written communications, or any combination thereof, at the County's sole discretion.
5. Vendors are strongly advised not to prepare their Proposal submissions based on any assumption or understanding that negotiations will take place. Vendors are advised to respond to this Request for Proposals fully and with forth-rightness at the time of Proposal submission.
6. Vendors are strongly cautioned not to contact elected officials or members of the evaluation committee. All questions and comments should be directed through the Purchasing Department. Inappropriate efforts to lobby or influence individuals involved in this selection may result in dismissal from further consideration, at the County's sole discretion.

**END OF SECTION**

**THIS AND PREVIOUS SECTIONS, OTHER THAN THE COVER PAGE, DO NOT NEED TO BE RETURNED WITH SUBMITTAL**

## FORM OF PROPOSAL

To whom it may concern:

We hereby submit our Proposal Documents for “OCEAN PINES BIOSOLIDS DEWATERING EQUIPMENT AND BUILDING DESIGN” as indicated in the Proposal Documents. Having carefully examined the Proposal Documents and having received clarification on all items of conflict or upon which any doubt arose, the undersigned hereby requests consideration of our Vendor for award of the referenced Proposal.

ITEM	DESCRIPTION	EXTENDED PRICE
1	Design Phase Services	
2	Bidding Phase Services	
3	Construction Phase Services	
<b>TOTAL</b>		

HOURLY RATE FOR INSPECTION AND RPR SERVICES \$ \_\_\_\_\_/HOUR

The Vendor agrees that the proposal will be good for at least sixty (60) days unless otherwise indicated in the proposal specifications.

Is your company currently involved in any active litigation? (Yes)\_\_\_\_ (No) \_\_\_\_\_ CHECK One.

Have you included your certificate of good standing with the State of Maryland? (See Section I, Subsection H.1 for more information.) (Yes)\_\_\_\_ (No) \_\_\_\_\_ CHECK One.

Is your company currently involved in any mergers or acquisitions? (Yes)\_\_\_\_ (No) \_\_\_\_\_ CHECK One.

Has your organization compiled your Completed Proposal Document as per Section I, subsection D.3 and in accordance with the Proposal Specifications Section of this Proposal Document?  
(Yes)\_\_\_\_ (No) \_\_\_\_\_ CHECK One

**NOTE: THIS PROPOSAL FORM MUST BE SIGNED BY AN OFFICER OF YOUR COMPANY OR AN AUTHORIZED AGENT FOR THIS PROPOSAL TO BE CONSIDERED VALID BY THE COUNTY.**

\_\_\_\_\_  
Sign for Identification

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Email

## REFERENCES

List three references for which the Vendor has provided Goods/Services similar to those requested in the Proposal Document within the last 12-36 months. Include contact name, address, telephone number, email address and services provided.

Company Name:		Company Name:	
Type of Project:		Type of Project:	
Address:		Address:	
Town, State, Zip Code:		Town, State, Zip Code:	
Contact Person:		Contact Person:	
Telephone Number:		Telephone Number:	
Email:		Email:	
Date of Service:		Date of Service:	
Company Name:			
Type of Project:			
Address:			
Town, State, Zip Code:			
Contact Person:			
Telephone Number:			
Email:			
Date of Service:			

\_\_\_\_\_  
Sign for Identification

\_\_\_\_\_  
Printed Name

## EXCEPTIONS

The undersigned hereby certifies that, except as listed below, or on separate sheets attached hereto, the enclosed Completed Proposal Document covers all items as specified.

**EXCEPTIONS:**

(If none, write none) \_\_\_\_\_

How did you hear about this solicitation?

- Worcester County's Website
- eMaryland Marketplace Advantage (eMMA)
- Newspaper Advertisement
- Direct email
- Other \_\_\_\_\_

The vendor hereby acknowledges receipt of the following addenda.

<u>Number</u>	<u>Date</u>	<u>Initials</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

\_\_\_\_\_  
Sign for Identification

\_\_\_\_\_  
Printed Name

**INDIVIDUAL PRINCIPAL**

Vendor Name: \_\_\_\_\_

Signed By: \_\_\_\_\_ In the presence of: \_\_\_\_\_

Address of Vendor: \_\_\_\_\_ Town, State, Zip \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

\*\*\*\*\*

**CO-PARTNERSHIP PRINCIPAL**

Name of Co-Partnership: \_\_\_\_\_

Address: \_\_\_\_\_ Town, State, Zip

\_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax: \_\_\_\_\_

Signed By: \_\_\_\_\_ In the presence of: \_\_\_\_\_

Partner

Witness

Signed By: \_\_\_\_\_ In the presence of: \_\_\_\_\_

Partner

Witness

Signed By: \_\_\_\_\_ In the presence of: \_\_\_\_\_

Partner

Witness

\*\*\*\*\*

**CORPORATE PRINCIPAL**

Name of Corporation: \_\_\_\_\_

Address: \_\_\_\_\_ Town, State, Zip

\_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax:

\_\_\_\_\_

Signed By: \_\_\_\_\_ In the presence of: \_\_\_\_\_

President

Witness

Attest: \_\_\_\_\_

Corporate Secretary

Affix Corporate Seal



**VENDOR’S AFFIDAVIT OF QUALIFICATION TO BID**

I HEREBY AFFIRM THAT:

I, \_\_\_\_\_ am the \_\_\_\_\_  
(Printed Name) (title)  
and the duly authorized representative of the Vendor of  
\_\_\_\_\_ whose address is  
(name of corporation)

\_\_\_\_\_ and that I possess the legal authority to make this affidavit on behalf of myself and the Vendor for which I am acting.

Except as described in paragraph 3 below, neither I nor the above Vendor, nor to the best of my knowledge and of its officers, directors or partners, or any of its employees directly involved in obtaining contracts with the State or any county, bi-county or multi-county agency, or subdivision of the State have been convicted of, or have pleaded nolo-contendere to a charge of, or have during the course of an official investigation or other proceeding admitted in writing or under oath acts or omissions which constitute, bribery, attempted bribery, or conspiracy to bribe under the provisions of Article 27 of the Annotated Code of Maryland or under the laws of any state or federal government (conduct prior to July 1, 1977 is not required to be reported).

(State “none” or, as appropriate, list any conviction, plea or admission described in paragraph 2 above, with the date, court, official or administrative body, the individuals involved and their position with the Vendor, and the sentence or disposition, if any.)

\_\_\_\_\_ I acknowledge that this affidavit is to be furnished to the County, I acknowledge that, if the representations set forth in this affidavit are not true and correct, the County may terminate any Contract awarded and take any other appropriate action. I further acknowledge that I am executing this affidavit in compliance with section 16D of Article 78A of the Annotated Code of Maryland, which provides that certain persons who have been convicted of or have admitted to bribery, attempted bribery or conspiracy to bribe may be disqualified, either by operation of law or after a hearing, from entering into contracts with the State or any of its agencies or subdivisions.

I do solemnly declare and affirm under the penalties of perjury that the contents of this affidavit are true and correct.

\_\_\_\_\_  
Sign for Identification

\_\_\_\_\_  
Printed Name

**NON-COLLUSIVE AFFIDAVIT**

\_\_\_\_\_ being first duly sworn,  
deposes and says that:

1. He/she is the \_\_\_\_\_, (Owner, Partner, Officer, Representative or Agent) of \_\_\_\_\_, the Vendor that has submitted the attached Proposal Documents;
2. He/she is fully informed respecting the preparation and contents of the attached Proposal Document and of all pertinent circumstances respecting such Proposal Documents;
3. Such Proposal Document is genuine and is not a collusive or sham Proposal Document;
4. Neither the said Vendor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, have in any way colluded, conspired, connived or agreed, directly or indirectly, with any other Vendor, firm, or person to submit a collusive or sham Proposal Document in connection with the Work for which the attached Proposal Document has been submitted; or to refrain from bidding in connection with such Work; or have in any manner, directly or indirectly, sought by agreement or collusion, or communication, or conference with any Vendor, firm, or person to fix the price or prices in the attached Proposal Document or of any other Vendor, or to fix any overhead, profit, or cost elements on the Proposal Document price or the Proposal Document price of any other Vendor, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any disadvantage against (Recipient), or any person interested in the Work;
5. The price or prices quoted in the attached Proposal Document are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Vendor or any other of its agents, representatives, owners, employees or parties in interest, including this affiant.

Signed, sealed and delivered in the presence of:

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Witness

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

## EXHIBIT A

### WORCESTER COUNTY MARYLAND STANDARD TERMS AND CONDITIONS

The provisions below are applicable to all Worcester County (“County”) contracts. These provisions are not a complete agreement. These provisions must be attached to an executed document that identifies the work to be performed, compensation, term, incorporated attachments, and any special conditions (“Contract”). If the Standard Terms and any other part of the Contract conflict, then the Standard Terms will prevail.

1. **Amendment.** Amendments to the Contract must be in writing and signed by the parties.
2. **Bankruptcy.** If a bankruptcy proceeding by or against the Contractor is filed, then:
  - a. The Contractor must notify the County immediately; and
  - b. The County may cancel the Contract or affirm the Contract and hold the Contractor responsible for damages.
3. **Compliance with Law.** Contractor must comply with all applicable federal, state, and local law. Contractor is qualified to do business in the State of Maryland. Contractor must obtain, at its expense, all licenses, permits, insurance, and governmental approvals needed to perform its obligations under the Contract.
4. **Contingent Fee Prohibition.** The Contractor has not directed anyone, other than its employee or agent, to solicit the Contract and it has not promised to pay anyone a commission, percentage, brokerage fee, contingent fee, or other consideration contingent on the making of the Contract.
5. **Counterparts and Signature.** The Contract may be executed in several counterparts, each of which may be an original and all of which will be the same instrument. The Contract may be signed in writing or by electronic signature, including by email. An electronic signature, a facsimile copy, or computer image of the Contract will have the same effect as an original signed copy.
6. **Exclusive Jurisdiction.** All legal proceedings related to this Contract must be exclusively filed, tried, and maintained in either the District Court of Maryland for Worcester County, Maryland or the Circuit Court of Worcester County, Maryland. The parties expressly waive any right to remove the matter to any other state or federal venue and waive any right to a jury trial.
7. **Force Majeure.** The parties are not responsible for delay or default caused by fire, riot, acts of God, County-declaration-of-emergency, or war beyond their reasonable control. The parties must make all reasonable efforts to eliminate a cause of delay or default and must, upon cessation, diligently pursue their obligations under the Contract.
8. **Governing Law.** The Contract is governed by the laws of Maryland and the County.
9. **Indemnification.** The Contractor must indemnify the County and its agents from all liability, penalties, costs, damages, or claims (including attorney’s fees) resulting from personal injury, death, or damage to property that arises from or is connected to the performance of the work or failure to perform its obligations under the Contract. All indemnification provisions will survive the expiration or termination of the Contract.

**10. Independent Contractor.**

- a. Contractor is an “Independent Contractor”, not an employee. Although the County may determine the delivery schedule for the work and evaluate the quality of the work, the County will not control the means or manner of the Contractor’s performance.
- b. Contractor is responsible for all applicable taxes on any compensation paid under the Contract. Contractor is not eligible for any federal Social Security, unemployment insurance, or workers’ compensation benefits under the Contract.
- c. Contractor must immediately provide the County notice of any claim made against Contractor by any third party.

**11. Insurance Requirements.**

- a. Contractor must have Commercial General Liability Insurance in the amounts listed below. The insurance must include coverage for personal injury, discrimination, and civil rights violation claims. All insurance must name County, its employees, and agents as “ADDITIONAL INSURED”. A copy of the certificate of insurance must be filed with the County before the Contract is executed, providing coverage in the amount of \$1,000,000 per occurrence, \$2,000,000 general aggregate, and \$500,000 for property damage.
- b. Contractor must have automobile insurance on all vehicles used in the Contract to protect Contractor against claims for damages resulting from bodily injury, including wrongful death, and property damage that may arise from the operations in connection with the Contract. All insurance must name County, its employees, and agents as “ADDITIONAL INSURED”.
- c. Contractor must provide the County with a certification of Workers’ Compensation Insurance, with employer’s liability in the minimum amount required by Maryland law in effect for each year of the Contract.
- d. All insurance policies must have a minimum 30 days’ notice of cancellation. The County must be notified immediately upon cancellation.
- e. When insurance coverage is renewed, Contractor must provide new certificates of insurance prior to expiration of current policies.

**12. Nondiscrimination.** Contractor must not discriminate against any worker, employee, or applicant because of religion, race, sex, age, sexual orientation, physical or mental disability, or perceived disability. This provision must be incorporated in all subcontracts related to the Contract.

**13. Ownership of Documents; Intellectual Property.**

- a. All documents prepared under the Contract must be available to the County upon request and will become the exclusive property of the County upon termination or completion of the services. The County may use the documents without restriction or without additional compensation to the Contractor. The County will be the owner of the documents for the purposes of copyright, patent, or trademark registration.
- b. If the Contractor obtains, uses, or subcontracts for any intellectual property, then it must provide an assignment to the County of ownership or use of the property.
- c. The Contractor must indemnify the County from all claims of infringement related to

the use of any patented design, device, materials, or process, or any trademark or copyright, and must indemnify the County, its officers, agents, and employees with respect to any claim, action, costs, or infringement, for royalties or user fees, arising out of purchase or use of materials, construction, supplies, equipment, or services covered by the Contract.

14. **Payments.** Payments to the Contractor under the Contract will be within 30 days of the County's receipt of a proper invoice from the Contractor. If an invoice remains unpaid 45 days after the invoice was received, interest will accrue at 6% per year.
15. **Records.** Contractor must maintain fiscal records relating to the Contract in accordance with generally accepted accounting principles. All other relevant records must be retained by Contractor and kept accessible for at least three years after final payment, termination of the Contract, or until the conclusion of any audit, controversy, or litigation related to the Contract. All subcontracts must comply with these provisions. County may access all records of the Contractor related to the Contract.
16. **Remedies.**
  - a. **Corrections of errors and omissions.** Contractor must perform work necessary to correct errors and omissions in the services required under the Contract, without undue delays and cost to the County. The County's acceptance will not relieve the Contractor of the responsibility of subsequent corrections of errors.
  - b. **Set-off.** The County may deduct from any amounts payable to the Contractor any back-charges, penalties, or damages sustained by the County, its agents, or employees caused by Contractor's breach. Contractor will not be relieved of liability for any costs caused by a failure to satisfactorily perform the services.
  - c. **Cumulative.** These remedies are cumulative and without waiver of any others.
17. **Responsibility of Contractor.**
  - a. The Contractor must perform the services with the standard of care, skill, and diligence normally provided by a Contractor in the performance of services similar the services.
  - b. Notwithstanding any review, approval, acceptance, or payment for the services by the County, the Contractor will be responsible for the accuracy of any work, design, drawings, specifications, and materials furnished by the Contractor under the Contract.
  - c. If the Contractor fails to conform with subparagraph (a) above, then it must, if required by the County, perform at its own expense any service necessary for the correction of any deficiencies or damages resulting from the Contractor's failure. This obligation is in addition to any other remedy available to the County.
18. **Severability/Waiver.** If a court finds any term of the Contract to be invalid, the validity of the remaining terms will not be affected. The failure of either party to enforce any term of the Contract is not a waiver by that party.
19. **Subcontracting or Assignment.** The Contractor may not subcontract or assign any part of the Contract without the prior written consent of the County. The County may withhold consent for any reason the County deems appropriate.

20. **Termination.** If the Contractor violates any provision of the Contract, the County may terminate the Contract by written notice. All finished or unfinished work provided by the Contractor will, at the County's option, become the County's property. The County will pay the Contractor fair compensation for satisfactory performance that occurred before termination less the amount of damages caused by the Contractor's breach. If the damages are more than the compensation payable to the Contractor, the Contractor will remain liable after termination and the County can affirmatively collect damages.
21. **Termination of Contract for Convenience.** Upon written notice, the County may terminate the Contract when the County determines termination is in the County's best interest. Termination for convenience is effective on the date specified in the County's written notice. The County will pay for reasonable costs allocable to the Contract for costs incurred by the Contractor up to the date of termination. But the Contractor will not be reimbursed for any anticipatory profits that have not been earned before termination.
22. **Termination of Multi-year Contract.** If funds are not available for any fiscal period of the Contract after the first fiscal period, then the Contract will be terminated automatically as of the beginning of unfunded fiscal period. Termination will discharge the Contractor and the County from future performance of the Contract, but not from their rights and obligations existing at the time of termination.
23. **Third Party Beneficiaries.** The County and Contractor are the only parties to the Contract and are the only parties entitled to enforce its terms. Nothing in the Contract gives any benefit or right to third persons unless individually identified by name and expressly described as intended beneficiaries of the Contract.
24. **Use of County Facilities.** Contractor may only County facilities that are needed to perform the Contract. County has no responsibility for the loss or damage to Contractor's personal property which may be stored on County property.
25. **Whole Contract.** The Contract, the Standard Terms, and attachments are the complete agreement between the parties and supersede all earlier agreements, proposals, or other communications between the parties relating to the subject matter of the Contract.



OCEAN PINES WASTEWATER TREATMENT PLANT  
WORCESTER COUNTY, MARYLAND

BIOSOLIDS DEWATERING PRELIMINARY ENGINEERING  
REPORT



PREPARED FOR:  
WORCESTER COUNTY

JUNE 2021

GMB FILE NO. 200155

**GMB**

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**BIOSOLIDS DEWATERING PRELIMINARY ENGINEERING REPORT**  
**WORCESTER COUNTY**  
**OCEAN PINES WASTEWATER TREATMENT PLANT**

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**BIOSOLIDS DEWATERING PRELIMINARY ENGINEERING REPORT**

**WORCESTER COUNTY**

**OCEAN PINES WASTEWATER TREATMENT PLANT**

**JUNE 2021**

**EXECUTIVE SUMMARY**

The Worcester County Department of Public Works owns and operates the Ocean Pines WWTP in Ocean Pines, MD. In 2020, the County hired GMB to evaluate the existing Biosolids Dewatering Equipment at the facility and consider alternatives for upgrading or improving the system to further increase the capacity and throughput of sludge processing.

The Ocean Pines WWTP utilizes an activated sludge treatment process to achieve treatment of raw wastewater from the Ocean Pines Community and its surrounding areas. Biosolids generated by the treatment process are secondary in nature (without a primary solids component) and are collected from the treatment process, and stabilized in aerobic digesters. From the digesters, sludge can either be transferred directly to drying beds for dewatering, or pumped to a sludge buffer tank, where it is then processed by a belt filter press. From the belt filter press, sludge is then stored in the covered drying beds for further dewatering as the County does not currently have the ability to haul dewatered sludge cake with a solids concentration of less than 35%.

GMB evaluated alternatives to increase the solids handling and processing capacity at the Ocean Pines WWTP. These alternatives included constructing a new dewatering building together with either an inclined rotary screw press or belt filter press, along with all necessary appurtenances to facilitate dewatering sludge at the facility. These alternatives included equipment which was sized to handle the solids production at the facility, assuming an increase in influent flow of approximately 2.3 times the current average daily flow.

As a result of this evaluation, the alternative associated with providing screw press dewatering technology at the facility together with common improvements, is recommended for the Ocean

Pines WWTP. A preliminary layout of the recommended project can be found in the Appendix. For budgetary purposes only, the recommended project has a total project cost of approximately \$5,231,498.

## **PART 1 - INTRODUCTION**

### **1.1 Location**

The project area in consideration is designated as the Ocean Pines WWTP Site. This facility is located on Shore Lane, within Ocean Pines, MD. Ocean Pines is located in eastern Worcester County, MD and is served by the MD – 589 Exit on MD Route 90. Ocean City, MD is located approximately one (1) mile east of the site.

### **1.2 Environmental Considerations**

The Ocean Pines WWTP site is located in close proximity to the St. Martin River on its eastern and northern extremities. Location maps of the facility can be found in Appendix A. With its close proximity to a body of water, an understanding of the environmental impacts associated with the construction of improvements to the site must be considered. The majority of the existing improvements on the site are currently not within any documented flood plain, however, due to the proximity of the flood zones to the remainder of the WWTP parcel, any future improvements to the site to improve the biosolids handling of the facility will likely require construction utilizing the Coast Smart Design Criteria (where improvements/structures must be constructed three (3) feet above the 100-year flood elevation). Based on the floodplain information provided in the FIRM flood maps, and the documented 100-yr flood elevation of EL 4', which can be found in Appendix B, all improvements will require a minimum finished floor elevation of at least EL 7', if constructed in the floodplain.

Also taken into consideration was the proximity of wetlands to the site. As shown in the National Wetlands Inventory Map, Appendix C, there is a small amount of freshwater wetlands to the south of the facility, but there are no documented areas of wetlands that are of concern that would limit improvements to the site. It should be noted, however, that historical survey data lists the proposed project area as a potential wooded wetland that will require consideration during the design of the proposed improvements.

The location of this project should have minimal effects to the surrounding environmental resources. Based on the proposed improvements considered throughout this report, there are no anticipated major impacts to wetlands or farmland within the vicinity of the existing site. The existing parcel is owned by the County Commissioners of Worcester County and encompasses 35.6 acres of land. Roughly 10 acres of the land is utilized for the existing Ocean Pines WWTP, and the remainder of the property is wooded. This wooded area is almost entirely within the 100-year flood plain and could be utilized for the construction of the biosolids handling improvements, if necessary.

## **PART 2 – EXISTING FACILITIES**

This section is provided to describe and outline the existing facility and design criteria. As per the basis of this report, detailed descriptions of the existing biosolids handling improvements at the facility can be found within, as well as a breakdown of the operational performance of each unit process included within the solids handling systems.

### **2.1 Location Map**

As discussed previously, location maps of the area are provided and attached as appendices at the end of the report. The facility is located on Shore Lane, which is accessed by Ocean Parkway, within the Ocean Pines Community. The WWTP discharges all treated effluent to an NPDES Permitted outfall in the St. Martins River and hauls dewatered biosolids to the Worcester County Landfill for ultimate disposal. The current WWTP has a near term goal of rerating the WWTP capacity to 2.6 MGD. Based on the facility's existing discharge permit, the capacity of the WWTP is currently limited to 2.5 MGD. A site plan of the existing facility can be found in Appendix D.

### **2.2 History and Condition of Existing Facilities**

#### **2.2.1 Facility History**

The existing facility was initially constructed in 1988, and was later expanded in 1992 to a rated average daily flow of 1.5 MGD. In 2005, the facility was upgraded to expand the capacity 2.3

MGD, and was then rerated shortly thereafter to 2.5 MGD. More recently, the facility began accepting waste from the Ocean Downs Casino which, due to the projected demands of the existing service area, required the WWTP's capacity to again be reevaluated. It is expected that with minor modifications, the facility will be capable of treating 2.6 MGD of influent flow.

The expansion of the Ocean Pines WWTP in the 1990s brought forth the construction of the facility's existing biosolids dewatering improvements. The facility currently utilizes four (4) ~2,000 SF porous asphalt drying beds and a 1.5 – meter, Parkson Corporation belt filter press to dewater the solids produced by the WWTP's activated sludge process. As part of the 2004 facility upgrade, digesters and an additional sludge storage area were constructed to further stabilize the waste sludge from the treatment plant prior to dewatering, and store fully dewatered sludge prior to disposal.

**2.2.2 Existing Design Criteria and Solids Handling Process**

The Ocean Pines WWTP currently processes waste sludge by means of digestion through three (3) digesters that were constructed as part of the 2004 upgrade of the facility. Sludge is transferred to these digesters after it is wasted from the different activated sludge reactors at the facility. The digester's design criteria, as copied from the associated project plans for the 2004 upgrade project can be seen below for reference. It should be noted that the digester sizing is based on a total WAS rate of 50,000 gallons per day, or 3,450 dry pounds per day at 0.8% solids.

<u>AEROBIC DIGESTERS (NEW)</u>	
QUANTITY:	3
CAPACITY:	500,000 GALLONS
HYDRAULIC RETENTION TIME:	10 DAYS
VOLATILE MLSS (ASSUMED):	80%
SOLIDS DESTROYED (ASSUMED)	50%
SOLIDS RETENTION TIME:	60 DAYS
AIR REQUIREMENTS (PER 1,000 CF)	30 SCFM

Sludge is then transferred from these digesters to a 14' x 14' square sludge holding tank, with approximately 17,000 gallons of storage volume, via a digested sludge pumping system that

utilizes three (3) rotary lobe sludge pumps that draw suction from the bottom sumps of each of the digesters. These pumps have capacities as indicated below.

<u>NEW DIGESTED SLUDGE PUMPS</u>		DIGESTED SLUDGE PUMPING STATION
LOCATION		3
NO.		3
TYPE		ROTARY LOBE
DISCHARGE SIZE		4 - INCHES
DESIGN CAPACITY		40-80 GPM
DISCHARGE HEAD - TDH (MIN)		10 PSI
SHUT OFF HEAD (MAX)		100 PSI
PUMP MOTOR		3 H.P.

Sludge in the sludge holding tank is then transferred to the belt filter press for processing by sludge feed pumps. A 1.5m belt filter press typically operates at roughly 90 gpm, which at the estimated feed solids percentage of 1.5%, equates to just under 700 dry pounds per hour.

From the belt filter press, sludge could be hauled directly to the landfill; however, as the hauling requirement for the facility's sludge is 25%, sludge is instead transferred to the four (4) 2,000 SF drying beds on the site for further dewatering. Liquid sludge can also be sent directly to the drying beds, bypassing the belt filter press, for complete dewatering if necessary.

After being fully dewatered, sludge can also be transferred to a sludge storage structure instead of immediately being hauled to the local landfill. This storage area offers 2,200 SF of floor space under a canopy covering for sludge storage.

### **2.2.3 Existing Electrical Improvements**

The Ocean Pines Wastewater Treatment Plant is served by a Choptank Electric Cooperative 2000 kVA, pad mount, oil-filled, medium voltage transformer (utility transformer) located west of the Blower Building No. 1. The Choptank Electric Cooperative transforms the incoming 12,470 Volt, 3-phase system to a usable 480Y/277 Volt, 3-phase system.

The main electrical switchgear and Automatic Transfer Switch (ATS) serving the plant have an ampacity rating of 1600 amperes at 480/277 Volt. The on-site 750 kVA diesel-driven generator is able to provide 1,128 amperes at 480/277 Volt. The emergency switchgear serving the ATS is also rated for 1,600 amperes at 480/277 Volt. MCC-1 served by the ATS has the same ampacity rating as the upstream electrical equipment, i.e. 1,600 amperes.

To determine the existing capacity of the electrical service equipment, the Choptank Electric Cooperative utility bills for the last twenty-four (24) months were assembled in the following table. The demand (kW) is the unit of measure to approximate the highest load (kW) required by the WWTP. The results indicate the existing electrical service equipment had a maximum load of 677 amperes or 42% of 1600 ampere rated circuit breaker. Table 1 summarizes the data collected from the Choptank Electric Cooperative utility bills.

**TABLE 1: SUMMARY OF WWTP ELECTRICITY USAGE**

Ocean Pines WWTP Choptank Electric Cooperative				
	Month	Power Factor	Demand KW	Amps
2019	January	89.49%	466.08	626
2019	February	90.74%	401.28	532
2019	March	90.14%	424.80	567
2019	April	88.02%	417.12	570
2019	May	87.18%	423.36	584
2019	June	86.79%	413.76	573
2019	July	87.26%	415.68	573
2019	August	87.00%	406.56	562
2019	September	86.74%	428.16	594
2019	October	85.75%	400.80	562
2019	November	87.22%	420.00	579
2019	December	89.04%	456.48	617
2020	January	87.65%	420.00	576
2020	February	89.72%	417.60	560
2020	March	88.35%	475.68	648
2020	April	87.51%	482.88	664
2020	May	86.91%	465.12	644
2020	June	87.39%	467.04	643
2020	July	87.25%	491.04	677
2020	August	87.55%	467.52	642
2020	September	87.74%	489.60	671
2020	October	88.11%	402.72	550
2020	November	89.00%	415.68	562
2020	December	89.68%	412.80	554
	<b>Avg.</b>	<b>87.96%</b>	<b>436.17</b>	<b>597</b>
	<b>Max.</b>		<b>491.04</b>	<b>677</b>

## PART 3 – NEED FOR PROJECT

### 3.1 *Current Facility Operation*

The current facility and its associated biosolids production were analyzed over the course of a three (3) year period, from 2018 – 2020. The target of this analysis was focused on the relationship between the influent flows to the facility, and the quantity of biosolids produced by the facility in proportion to the influent flow. Due to the nature of the treatment processes, it was deemed reasonable to assume that, as the average influent flow of the facility increases, the biosolids produced by the facility would also increase proportionately on a linear basis. Table 2 below displays the average daily flow data recorded at the facility, per month, from January 2018 to August 2020.

**TABLE 2: AVERAGE INFLUENT FLOW DATA**

<b>Month</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
January	0.728	0.651	0.634
February	0.795	0.765	0.631
March	0.679	0.826	0.626
April	0.721	0.742	0.742
May	0.777	0.756	0.764
June	0.814	0.789	0.816
July	0.922	0.833	0.938
August	0.836	0.827	0.884
September	0.764	0.7	
October	0.721	0.667	
November	0.833	0.652	
December	0.8	0.732	
<b>Average (MGD)</b>	<b>0.783</b>	<b>0.745</b>	<b>0.754</b>

Based on the tabulated data above, the average influent flow, over the past three years, is approximately 0.761 MGD. As the facility’s current, proposed capacity is 2.5 MGD, the Ocean Pines WWTP is only operating at 30% of its current permitted capacity.

Also considered was the biosolids production of the facility, as calculated from sludge hauling load tickets. The County provided GMB with load ticket quantities for sludge hauled per month over the same period recorded above as influent flows. As the data was provided in “tons of sludge hauled,” and assuming a solids percentage (in this case, 25% solids as that is how the



County typically hauls sludge) a daily sludge production rate can be calculated in dry pounds per day. Table 3 below presents the sludge produced over the noted period.

**TABLE 3: AVERAGE DAILY SLUDGE PRODUCTION**

<b>Sludge Hauled (scaled tons)</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
January	9.57	136.42	184.15
February	259.57	15.57	0
March	72.99	151.69	177.18
April	314.56	170.07	365.61
May	71.54	88.23	196.24
June	188.06	224.83	159.75
July	270.06	141.61	234.13
August	198.76	131.15	130.74
September	93.82	105.32	
October	141.93	57.32	
November	65.55	94.77	
December	0	84.55	
<b>Average Scaled Tons</b>	<b>141</b>	<b>117</b>	<b>181</b>
Average Scaled Pounds Per Day	9,241	7,680	11,900
<b>Average Dry Pounds Per Day*</b>	<b>2,310</b>	<b>1,920</b>	<b>2,975</b>

*\*Assumes scaled sludge weight is 25% solids concentration.*

As tabulated above, the average daily biosolids production of the facility is approximately 2,400 dry pounds per day. As noted previously in Part 2, at 2.3 MGD the sludge production was assumed to be 3,450 dry pounds per day. Assuming a linear increase in sludge production to an increase in average influent flow, the sludge production at a design of 2.6 MGD would be 3,900 dry pounds per day. However, realizing that the current waste sludge production at the facility is 2,400 dry pounds per day, at an average daily flow of 0.761 MGD, it becomes quite evident that the facility is producing significantly more waste sludge than estimated during design of the existing infrastructure.

At the current average influent flow, the facility is producing 62% of the design waste sludge of the design capacity of the plant.

Operationally, with the existing infrastructure at the facility, managing the sludge production and processing efforts associated with the facility is challenging. Currently, the existing 1.5m Parkson Corporation belt filter press is operated five (5) days a week, to keep up with the solids produced at the plant. Sludge is then transferred from the press, to the existing drying beds via truck. The sludge is then temporarily stored to allow further dewatering, until it can be hauled to the landfill within the constraints of the County's sludge utilization permit.

As a part of the sludge disposal requirements for the facility, sludge must be at a consistency of 35% solids concentration to haul without special hauling provisions to limit spilling. To achieve this, the County often uses sawdust, sand, or mulch to blend with the dewatered sludge to achieve the required solids concentration. Due to this, the County is required to devote excess time to further process the sludge so it can be removed from the site.

### **3.2 Aging Infrastructure**

The existing mechanical sludge dewatering equipment is currently reaching 30 years of installed use at the Ocean Pines WWTP. Despite being operational, the belt filter press, sludge pumps, polymer feed systems, and associated conveyors are approaching the end of their useful life. It should also be noted that, at this stage, technological advances in dewatering equipment have far exceeded the capacities and processing capabilities of the existing belt filter press. As the sludge production requirements at the facility increase, the aging dewatering equipment, when forced to accommodate the increased flows, will have to operate longer and at increased speeds. This will expose the equipment to potential damage or excessive wear. Due to the age of the equipment, procuring replacement parts in an expeditious manner will also grow increasingly difficult, and potentially cause significant downtime, resulting in operational issues at the facility.

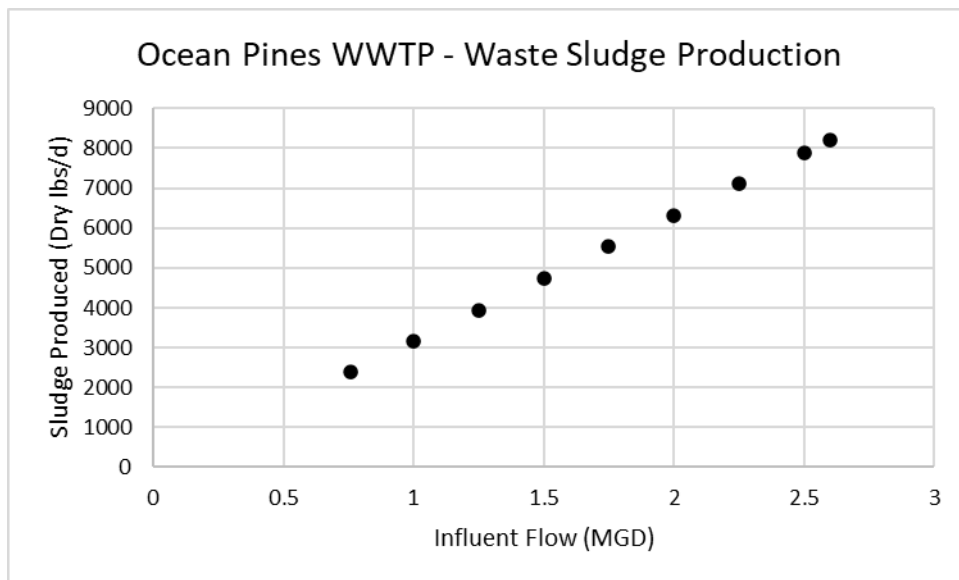
### **3.3 Process Deficiencies**

The existing dewatering equipment at the facility is not capable of fully supporting the anticipated sludge production at the facility. As part of understanding the sludge production of the facility as the influent flow increases, a design waste flow had to be chosen for evaluating the existing and proposed improvements at the facility. As a result of the influent flow and sludge hauling analysis for 2018, 2019, and 2020, a projection for the sludge production at the

facility can be estimated. Due to the nature of the treatment processes at the facility, the amount of sludge produced by the facility will be proportionate to the influent wastewater flow at the facility. As the average daily flow of the plant increases, assuming the influent strength stays consistent, the waste sludge generated from the facility will increase linearly with the increase in flow at the plant.

Based on the current average daily flow and dry solids production noted above, the facility's future sludge production was estimated at the 2.6 MGD capacity goal of the plant. Chart A below indicates the extent of the increased solids production as the influent flow increases at the facility.

**Chart A: The Waste Sludge Production at the Ocean Pines WWTP as a Function of Inlet Flow**



These results were then evaluated versus the existing 1.5m belt filter press' design loading rate of 700 dry pounds per hour to quantify its limitations with the projected facility solids loading rates. The existing belt press, in an 8-hour day, is estimated as being capable of processing sludge up to influent flows of 1.75 MGD. Despite being capable of meeting the demand of the facility to approximately 66% of the plant's anticipated influent capacity, it is not feasible to assume the nearly 30-year-old belt press will be able to serve as the sole source of mechanical dewatering at the plant. At the increased loading rate, the existing belt press will be pushed

further to its maximum capacity, exposing it to a greater risk of damage. It anticipated that the digesters and digested sludge pumps are of an adequate size to remain in service throughout the projected flows of the facility.

## **PART 4 – ALTERNATIVES CONSIDERED**

Described below are improvements that are recommended for the facility to address the solids dewatering needs at the facility. It is the intent of GMB to present improvements that will equip the plant for more efficient solids processing at current flows and economical solids processing at planned future flows.

### **4.1 Design Criteria**

After considering the performance of the facility at its current flows, a sludge production design flow had to be chosen to economically size the facility improvements proposed. Over the course of the facility's existence, the average daily flows of the plant have rarely surpassed 0.9 MGD, and as stated previously, flows have averaged 0.761 MGD. Based on this, it is not advisable to design any improvements for the facility at the ultimate capacity of the plant. Due to economic reasons and the turndown/low flow capacity of dewatering devices, significantly oversizing equipment can result in inefficient operation that could cause high solids carryover, excessive wash water use, and varying sludge cake consistencies.

Since the average daily flow of the plant is approximately 1/3 its anticipated capacity, GMB proposes to design the necessary improvements at an average daily flow of 1.73 MGD, which is 2/3 of the anticipated capacity of the plant. Based on previous flow data and population trends, it is probable that the plant will reach an average daily flow of 1.73 MGD within the useful life of the improvements proposed herein. As stated previously, sizing dewatering equipment for the full capacity of the facility will result in improvements that are inefficient and require much more operator-attention and fine tuning to ensure large amounts of solids are not returned to the plant.

Using the design flow, the current flow, and the current sludge production at the plant, the design sludge production at the facility can be calculated using the linear relationship between

the flow and the sludge production rate. Based on this, the solids production rate for the 1.73 MGD design capacity is estimated to be 5,450 dry pounds per day.

## **4.2 Proposed Project Alternatives and Improvements**

GMB is of the opinion that improvements to the facility which focus on the integration of additional mechanical dewatering equipment at the plant will economically ensure that the facility will be capable of meeting sludge dewatering needs throughout the reasonable growth of the facility.

### **4.2.1 Existing Facility Modifications (Common Improvement)**

Modifications to the existing infrastructure at the plant required to construct the proposed improvements herein are minimal. Necessary modifications will include the extension of the existing digested sludge pumps' force main to the proposed sludge buffer tank, the extension of the existing digester blower air feed to the proposed sludge buffer tank, the extension of potable and non-potable water supplies to the proposed dewatering building, the extension of drain piping from the dewatering building to the plant drain pump station, and modifications to the existing sludge storage building to allow for a conveyor to transport sludge from the mechanical dewatering device, into the sludge storage building. Due to the nature of the modifications to the existing facilities, it is unlikely that any major process delays with the existing facility would occur during the construction of the proposed improvements.

### **4.2.2 Sludge Buffer Tank (Common Improvement)**

Common to the alternatives outlined below, a sludge buffer tank will be constructed to provide storage upstream of the proposed sludge pumps to ensure minimal impact to the operation of the dewatering alternatives. The proposed tank will be constructed of concrete with an inside dimension of 12' X 12' square, and a 9' SWD. This tank will offer 9,700 gallons of buffer storage capacity, which equates to 4.5 hours of dewatering unit operation time at the dewatering improvement design capacity. The tank will be constructed with its invert at grade, and be provided with a coarse bubble, aerated mixing system that will be fed from the existing digester aeration system. The tank will be filled utilizing the digested sludge pumping system and will be controlled using a level transducer and backup floats. It is anticipated that the tank will require

approximately 100 SCFH of air flow at the design 1.5% solids concentration. An aluminum stair system and grating will be provided for operational access to the top of the tank for service of the controls systems for the tank or for regulating air flow to the mixing system.

#### **4.2.3 Dewatering Building (Common Improvement)**

Proposed is the construction of a new Dewatering Building to house new mechanical dewatering equipment at the Ocean Pines WWTP. The building will be approximately 2,000 SF for both of the mechanical dewatering alternatives proposed herein. The building will be constructed to the East of the existing sludge storage structure, and will require clearing of a wooded area, as well as potential filling of non-tidal wetland areas. It is anticipated that the following approvals will need to be considered to accomplish the construction of this new facility:

- Concept, site development, and Final Site Plan submittal and approval from the Worcester County Department of Development Review and Permitting
- Planning Commission site plan approval
- Site Construction and Grading Permit submittal
- Stormwater management concept, site development, and final site plan submittals
- Forest Conservation district approval
- Atlantic Coastal Bays Critical Area Permitting
- Flood Plain Base Flood elevation review
- Worcester Soil conservation District E&SC review and approval for the concept, site development, and final site plans
- Army Corp of Engineers and MDE Tidal/Non-tidal wetland and buffer disturbance
- County Fire Marshal approval
- Endangered species and critical habitat approval from DNR

The building will be of a masonry block construction and will have two (2) bays that will provide access to dewatering equipment and dewatered sludge via coiling doors. The building will house 150 gpm rotary lobe sludge pumps, operated with variable frequency drives that will transfer sludge from the proposed sludge buffer tank, to the proposed dewatering unit. Also within the building will be potable and non-potable water services for use in an eyewash and for washdown of the proposed equipment, respectively. The non-potable water service will also be

connected to the dewatering units for integral washing and cleaning of the devices. Non-potable water will also be connected to the polymer feed systems to provide polymer makeup water. The sludge storage portion of the building will use a track system to guide a roll-off container under the conveyor system for directing dewatered sludge discharge into the container. Conveying options will include a discharge conveyor from the mechanical dewatering equipment to a load-out conveyor to spread sludge out in the roll-off container. There will also be a conveyor that will protrude from the building to provide the County with an option to discharge dewatered sludge directly in the existing covered sludge storage area.

Using NFPA 820 (2020 Edition), Table 6.2.2(a), the Biosolids Building will be classified as Class I, Division 2 given the basis-of-design does not include the required six (6) air changes per hour (ACH). The classification impact of the providing six (6) ACH, in this case, is the difference between a Class I, Division 2 classification and an unclassified area. The financial impact is higher construction cost to install Class I, Division 2 rated equipment versus long-term operating costs to maintain the six (6) ACH with higher heating costs in the colder months.

The electrical distribution system will serve the sludge dewatering presses, two (2) sludge pumps, a polymer system, a system of off-loading conveyors, a dumpster, heating and ventilation equipment, lighting, and general power outlets. Given the Biosolids Building will be classified as Class I, Division 2, the main electrical equipment will be located on an exterior wall in an electrical closet type enclosure. Locating the main electrical equipment outside the classified area allows for non-rated electrical equipment to be used, thus helping to reduce the construction cost. Circuiting serving the classified area will require conduit seals to prevent the transfer of potential hazardous gases from the classified area. In addition, the electrical equipment, including but limited to, lighting, switches, emergency stops, and receptacles, in the classified area will be installed in accordance with the National Electrical Code for Class I, Division 2 areas.

The proposed Biosolids Building heating and ventilating system is anticipated to comprise two (2) 15 kW electric units and one (1) exhaust fan. The heating and ventilating equipment will be explosionproof equipment rated for a Class I, Division 2 location. Heating will be utilized during the winter months to maintain approximately 50 degrees F. During the summer months, the exhaust fan will operate when temperatures exceed 85 degrees F to remove hot stagnant air.

The exhaust fan will also operate when the building is occupied to remove potential hazardous gaseous.

NFPA 820 (2020 Edition) requires the Biosolids Building to be served by a fire alarm system. To provide a code compliant fire alarm system, the cost opinion includes a fire alarm panel located in a non-hazardous area, a hazardous location rated manual pull station, hazardous location rated smoke detectors, hazardous location rated horns, and hazardous location rated strobes.

The anticipated equipment serving the Biosolids Building is indicated in Table 4.

**TABLE 4: ANTICIPATED BIOSOLIDS BUILDING LOAD SUMMARY**

<b>ELECTRICAL LOAD SUMMARY Biosolids Building</b>	
	<b>Description</b>
(2) Screw Presses	<ul style="list-style-type: none"> <li>• Screw Drive Motors</li> <li>• Drum Drive Motors</li> <li>• Recycle Pumps</li> <li>• Transfer Pumps</li> <li>• Transfer Feeder Motors</li> <li>• Booster Pumps</li> </ul>
Sludge Transfer Equipment	<ul style="list-style-type: none"> <li>• Sludge Pumps</li> </ul>
Ancillary Loads	<ul style="list-style-type: none"> <li>• Water Heater</li> <li>• Lighting</li> <li>• Electric Unit Heaters</li> <li>• Exhaust Fan</li> <li>• Fire Alarm System</li> </ul>

**4.2.4 Electrical Service and Site Improvements (Common Improvement)**

**4.2.4.1 General**

The proposed alternatives have an estimated 75 HP of additional load. The estimated 75 hp load at 480/277 Volt is equivalent to 96 amperes. Allowing for additional loading with a multiplier of 1.25, the anticipated max load is 120 amperes. Using a conservative approach by assuming



100% utilization by the Dewater Building, the maximum load on the Plant's main electrical equipment would be 797 amperes of the 1,600 amperes. The estimated connected load will be approximately 50% does not exceed the capacity of the existing electrical service or the capacity of MCC-1.

#### **4.2.4.2 Electrical Option 1 – MCC 1**

The first option for powering the proposed Biosolids Building is to install a 200-ampere circuit breaker compartment in the existing MCC-1 located in the main electrical room. From this compartment, the 200-ampere feeder would be routed to an exterior location then proceed below grade to the proposed Biosolids Building. The exterior around the main electrical room is likely to be congested requiring soft digging techniques to avoid damaging the below grade conduits and piping.

#### **4.2.4.3 Electrical Option 2 – MCC 3 & MCC 4 – Alternative Power Source**

An alternative option to power the proposed Biosolids Building is from the existing MCC-3 in the existing Chemical Building. As indicated the previous paragraph the anticipated load of the proposed Biosolid Building is approximately 120 amperes. The proposed design would provide a 200-ampere feeder to the proposed Biosolids Building to serve the immediate loads plus future loads, if required. The existing Chemical Building has two MCC's, MCC-3 and MCC-4. According to the 1992 single line, MCC-3 and MCC-4 are served by a single 250-ampere feeder. Based on instantaneous ampere measurements recorded by the WWTP personnel, the 250-ampere feeder is lightly loaded with an average of 36 amperes per phase.

Given the proximity to the proposed Biosolids Building, utilizing a prepared space in the MCC-3 may assist in reducing the construction cost by reducing the linear footage of trenching, conduit, and cabling plus avoiding the most congested areas of the facility. Prior to deciding on the connection to MCC-3, a power study would be required to determine the average load of MCC-3 and MCC-4 over a longer period.

Using a three-phase power quality meter, ampere readings would be taken at regular intervals and recorded automatically. The information would be downloaded and presented numerically and graphically to indicate the average load served by MCC-3 and MCC-4. Should the power

quality meter ampere measurements confirm the instantaneous measurements, serving the proposed Biosolids Building from the existing Chemical Building would be a viable option.

This report anticipates a saving of at least \$10,000 for this option. The anticipated savings is based on less linear footage of trenching, conduit, and cabling. Plus, utilizing a smaller 150 ampere circuit breaker and feeder in lieu to serve only the loads indicated for the proposed Biosolids Building. Additional savings may be realized by avoiding the expected area of congestion around the main electrical room due to underground piping and feeders.

#### ***4.2.4.4 Existing Digested Sludge Pump System***

The Ocean Pines WWTP has an existing Digested Sludge Pump Station Building housing three (3) digested liquid sludge pumps that serve the existing Belt Filter Press Building. The proposed Biosolids Building design will intercept the below grade digested liquid sludge piping. A manual diversion valve will be installed at the interception point to divert flow to the proposed Biosolids Building buffer tank. Two (2) control permissives will be required to initiate the start sequence for the digested liquid sludge pumps. One permissive will be generated from the diversion valve position sensor, indicating the diversion valve is positioned to divert flow to the proposed Biosolids Building buffer tank. The second permissive will be generated from the proposed Biosolids Building buffer tank low level signal indicating additional liquid sludge is required. Removing either permissive during the run cycle for the digested liquid sludge pumps will terminate the run sequence.

As part of the controls design/work, the diversion valve position signal will be incorporated into the start/run/stop control scheme associated with the existing Belt Press Filter Building. Incorporating the diversion valve position signal will prevent the existing Belt Press Filter Building from initiating a digested sludge pump start command when the diversion valve is positioned to serve the proposed Biosolid Biosolids Building.

#### ***4.2.4.5 SCADA and Controls***

The vendor provided screw press programmable logic controller (PLC) along with corresponding modules will provide the required programming logic, inputs/outputs (I/O's), as well as the required ethernet connections to serve the proposed Biosolids Building. The digested sludge will

be transferred to the sludge buffer tank based on control signals from the screw press controls panel to the digested sludge pumps located in the Digested Sludge Pump Station Building. The screw press controls panel will control the various motors associated with the dewatering process based on buffer tank levels and sensors associated with the proposed screw presses.

Communications with the existing SCADA system will be accomplished via ethernet to the existing Office Building. As part of the proposed Biosolids Building project, a new below grade dedicated communications conduit with ethernet cabling will be installed from the proposed Biosolids Building to the existing Office Building. The vendor provided screw press controls panel will include an unmanaged ethernet switch to serve various local communications as well as the communications to the existing SCADA panel in the existing Office Building.

Given the age of the existing WWTP and minimal documentation associated with the SCADA system, the cost opinion includes additional time for discovery during the design and construction phase of the proposed Biosolids Building project. The cost opinion also includes costs associated with the communications infrastructure, network switch configuration, as well as programming for alarm and data points.

#### **4.2.5 Alternative 1 - Mechanical Dewatering Equipment (Belt Filter Press)**

Alternative 1 proposes the installation of a belt filter press to perform the sludge dewatering at the facility. The belt presses under consideration within this alternative were sized using the waste sludge production rate noted above of 5,450 dry pounds per day. Belt filter presses are typically sized based on their overall belt width, and both 1.5m and 2m presses were considered for use at the facility. In general, increasing the belt width of the press greatly increases the throughput capability of the press.

Two (2) presses were considered in the course of formulating this alternative; the 3DP 2.0m press from BDP, and the Klampress 1.5m press from Alfa Laval. Information regarding each press can be found in Appendix E. Both of the presses proposed are capable to handle the solids loading rate proposed for the mechanical dewatering system's design capacity; however, the 3DP press is more conservatively sized allowing shorter runtimes with higher throughput. The Klampress is well known as a robust belt filter press; however, its overall compact design,

elevated gravity zone, low solids discharge height (complicating conveyor layout), and long runtimes are not favorable in consideration for this analysis.

In most instances, a compact piece of equipment would be preferred due to spatial constraints within existing structures or sites; however, in this instance compact belt filter presses tend to cause a large amount of operational and maintenance difficulty. The 3DP press offers a much more spread out and open design, allowing for ease of maintenance and accessibility for service and repairs when necessary. The 3DP press is also provided with a gravity zone that is low to the floor level, allowing the operator to easily observe the sludge flow into the press, which allows the operator to quickly spot any process upsets, without the need to have ladders or stairs around the press.

It should be noted that for this application the Klampress by Alfa will have to operate 8 hours per day, 7 days per week to keep up with the sludge production of the facility. The 3DP press, however, is sized to process all of the waste sludge produced at the facility, by only operating 7 hours per day, 5 days per week. As the 3DP press from BDP is conservatively sized for the design sludge production at the facility, the reduced weekly runtime would come at a significantly lower operational cost than the Alfa press. Belt filter presses require continuous oversight when operating (due to the nature and complexity of the equipment as a whole), as such, lower runtimes will allow for more efficient use of manpower throughout the facility.

Based on the items noted above, the 3DP press from BDP was selected as the preferred piece of equipment for this application and will serve as the basis of design for this report. Despite the higher capital cost, the 3DP press' increased throughput, lower run times, serviceability, and operational benefits prove it to be the best option for this alternative.

Alternative-specific differences in the dewatering building are minimal as both Alternatives 1 & 2 share similar supplementary equipment (polymer system, conveyors, washwater booster pumps, etc.). The belt filter press will be surrounded by a curb wall to contain the wash water and filtrate, and direct it to the floor underdrain system. Sludge will be conveyed from the press using a screw conveyor that will operate with a discharge outlet onto a loadout conveyor that will distribute sludge throughout a dumpster. The loadout conveyor will also provide the option to discharge sludge into an auxiliary conveyor that will discharge sludge through the West wall of

the building to the existing sludge storage area, in the event the sludge dumpsters are not available.

#### **4.2.6 Alternative 2 – Mechanical Dewatering Equipment (Screw Press)**

Alternative 2 proposes the installation of screw press technology to perform the sludge dewatering at the facility. The screw presses under consideration within this alternative were sized using the waste sludge production rate noted above of 5,450 dry pounds per day. Screw presses are typically designed using an inclined screw design with flutes that compact and press the sludge together, creating pressure that eventually forces water out of the sludge.

Two (2) different screw presses were considered in the course of formulating this alternative; the DSP 3630 screw press from BDP (proposed as two independent units), and the ES-353 Volute dewatering Press from PWTech. Information regarding each screw press can be found in Appendix F. Both presses proposed are appropriately sized to handle the solids loading rate proposed for the mechanical dewatering system's design capacity.

In reviewing the design data and features of each unit considered, GMB has selected the BDP screw press option as the basis of design for this alternative. In terms of construction, the BDP screw press units appear to be significantly more robust and accessible for service and maintenance. The arrangement of the three (3) separate PWTech units in parallel as proposed by the manufacturer, would make servicing the center unit incredibly difficult. Also, operationally, not having direct access to the center unit would make cleaning and general washdown more difficult. In terms of operational features, the BDP unit comes equipped with an integral rotary drum thickener, which in the case of aerobically digested sludge, aids the sludge dewatering process of the press. The rotary drum thickener allows the operator the ability to increase the sludge thickness of feed stock entering the screw press, further increasing the cake dryness leaving the press.

In the BDP option, it should be noted that two (2) separate DSP 3630 screw presses will be needed to process the design loading rate. However, based on the current loading situation at the facility, one (1) DSP 3630 screw press will be capable of processing all sludge produced by the facility, with reasonable runtimes (four (4), eight-hour days). Therefore, the project under

consideration can be phased and include a single mechanical dewatering device initially, with space and improvements made to the dewatering building to install a second screw press in the future. The PWTech option also allows for the provision of an ES-353[2] press which will include the installation of two (2) out of three (3) presses; however, this option will only be able to process the current sludge production at the facility by operating for six (6), ten-hour days per week. As a result, the County would not be able to install the two-screw press from PWTech, and reasonably meet the facility's current needs.

As noted previously, the DSP 3630 screw press from BDP was selected as the preferred piece of equipment for this application. Despite the higher capital cost, the 3630 presses' robust construction, solids throughput capacities, and lower runtimes prove it to be the best option for this alternative.

Alternative-specific differences in the proposed dewatering building are minimal. The screw presses provided will be surrounded with a curb wall to contain wash water and filtrate, such that it can be directed to the floor underdrain system. Adequate space will be provided to install two (2) presses; however a phase installation approach is feasible depending on the County's funding allocation for the project. A conveyor system will be provided with the screw press units and can be installed expandable if only one (1) screw press is provided initially. The conveyors will include a loadout conveyor to distribute sludge uniformly within a roll-off container, as well as a through wall conveyor into the existing sludge storage area.

#### ***4.2.7 Sludge Transport Containers and Vehicle (Common Improvement)***

The Ocean Pines WWTP has a MDE issued Sewage Sludge Utilization (SSU) permit for the transport of sewage sludge to the Worcester County landfill, which is the site of ultimate sludge disposal. The SSU permit stipulates container requirements depending on the solids content of the sludge being transported. There are specific container requirements for sludges with 15-20% and 20-35% solids concentration content. The County's Permit with the specific container requirements is included in Appendix G.

The County does not currently employ specialized containers and must delay transport until the solids content of the sludge is >35% when the product can be transported in conventional roll-

off containers. This approach requires a significant amount residence time for sludge at the facility in order to reach this degree of dryness. Using mechanical dewatering methods alone, this sludge concentration is impossible to achieve. As a result, GMB recommends that Worcester County take the necessary steps to transport and dispose sludge cake with a solids content of between 15 and 20%. As part of the biosolids management improvement recommendations, it is proposed that the facility continue to operate and dispose of sludge under the existing SSU permit. However, it is recommended that the appropriate container(s) be purchased to transport and dispose of sludge which is at a solids content of between 15 and 20%. To avoid the challenges associated with other DPW operations, it is recommended that a dedicated truck and roll-off container(s) be purchased for specific use at the County's WWTPs. At this time it is estimated that two (2) specialized containers will be needed and that dewatering operations will be coordinated with the location of the containers. The exact size of the containers will be coordinated at a later date with input from WWTP operators, but a 20 CY container is likely adequate to serve the immediate needs of the facility. As mentioned earlier, the proposed dewatering building will include a track system for locating roll-off containers under the conveyor system.

The current solids processing method was evaluated in conjunction with the design solids processing rate proposed in this report. Hauling sludge under the existing sludge dewatering process, requires more operator involvement, but it does provide for a reduction in sludge volume and weight hauled; whereby the amount is approximately half of that discharged from the press. Although processing sludge to the point where it can be transported without the use of special containers will save in overall tipping fee costs, the operational involvement and manpower required to continually manipulate the sludge to achieved this will offset the savings from the reduced tipping costs. Also, in terms of solids processing and storage, stockpiling sludge for additional drying can prove to be problematic as there physically is not enough space on the site to store excessive amounts of sludge for additional processing. As the sludge production approaches design capacity, the increased solids produced at the plant will potentially cause a backup of solids at the facility due to the time required to achieve the high solids content cake. With this in mind, GMB elected to only consider the removal of sludge from the site using specialized containers that will allow the County to haul sludge as it is being dewatered.

#### **4.2.8 Site Improvements (Common Improvement)**

To construct the proposed project alternatives at the facility, improvements to the existing site are required. Primary site improvements are related to siting the new dewatering building on the existing property. As a result of previous expansions of the facility, and existing improvements, most all of the existing developed site has been utilized. Because of this, GMB is proposing to develop a wooded area of approximately 0.44 acres on the East of the existing sludge storage facility. This will provide the land necessary to construct the dewatering building and sludge buffer tank discussed previously.

Along with the site clearing, the proposed project will include the extension of piping from the existing digested sludge pumping building to the new dewatering building, the extension of air piping from the digester air supply to the sludge buffer tank, the extension of non-potable and potable water to the dewatering building, and the extension of drain piping, from the dewatering building, to the plant drain pump station. Other site improvements will include grading and pavement extension to the new improvements.

### **PART 5 – SELECTION OF AN ALTERNATIVE**

The Alternatives in Part 4 have been further evaluated to identify a recommended course of action for Worcester County. To select the recommended alternative, an analysis was completed which included construction, land requirements, and O&M Costs for both alternatives. A discussion of the merits of each alternative, based upon other factors specific to the County are also presented. Cost estimates are presented in Appendix H. The process for selection of the recommended alternative included:

- Completing a present worth analysis for each alternative
- Completing an analysis of the non-monetary factors including complexity, maintenance, attention requirements, and reliability

The proposed alternatives were assessed and ranked on a scale of 1 to 100, with the highest possible total of 400. The alternative that receives the highest score is typically the selected alternative for the proposed project.



## 5.1 Life Cycle Cost Analysis (Present Worth)

A present worth analysis takes into account the sum of all capital costs and O&M costs over 20 years, minus the present worth of the total salvage cost for each item in 20 years. Therefore, the total present worth equals a cost, if invested now at a given rate, that would provide exactly the funds required to make future payments. For this PER, total salvage cost has been excluded from the analysis. The basis for this is that in 20 years, it is difficult to quantify the salvage value of WWTP infrastructure (tanks, equipment, buildings, etc.) in an industry that changes so rapidly. Items deemed to have salvage value under this PER, may, in 20 years (whether in exceptional condition or not) not have any salvage value. This is based on the premise that these items may not be reusable as a part of a future process.

The present worth analysis provides an accurate comparison of future capital and O&M costs and is based on a 20-year planning period that has a 2020 “real” discount rate of -0.30%, based on the federal OMB circular No. A-94. This correlates to a factor of 20.64 that is multiplied with the annual O&M costs. Below is a table providing a summary of the capital cost of each alternative, present worth of operation and maintenance costs, and the present worth for each alternative described in Part 4. Detailed estimates for each Alternatives are provided in Appendix I.

The analysis of the O&M costs associated with the proposed alternatives includes electricity requirements, polymer usage, personnel requirements, and tipping fees. For polymer usage, personnel requirements, and energy consumption under each alternative, refer to the equipment design data for both alternatives in Appendix J.

Each alternative’s personnel requirements were taking into consideration when formulating the O&M costs. In both options, it is assumed that there will be an operator running the press, and another that will be in charge of the transportation of sludge. In the belt filter press configuration, the operations personnel will require a total of nine (9) dedicated manhours per day to oversee the sludge processing of the press. With the screw press option, however, it is projected that the operations personnel will only require a total of four (4) dedicated manhours per day to oversee the sludge production of the press. As a result of the operational requirements of the belt filter press, an operator will typically need to be completely focus on ensuring the press is operating

as required. The screw press, however, is a more reliable method of sludge processing that requires significantly less attention. As indicated in the final O&M Present Worth numbers, the screw press's lack of operator involvement causes a significant reduction in present worth costs for that alternative.

**TABLE 5: COST SUMMARY – DEWATERING ALTERNATIVES**

<b>Alternative</b>	<b>Capital</b>	<b>O&amp;M Present Worth</b>	<b>TOTAL PRESENT WORTH</b>
1 – Belt Filter Press	\$4,240,320	\$16,417,911	<b>\$20,658,231</b>
2 – Rotary Screw Press	\$5,231,489	\$14,428,096	<b>\$19,659,585</b>

## **5.2 Non-Monetary Analysis**

**Complexity:** Both alternatives were evaluated based on their complexity. This consideration includes the amount of moving pieces and varying modes of failure that are possessed by each type of dewatering equipment. As typical with belt filter presses, there are a significantly larger number of moving and rotating components to take into a count, in contrast to the few contained within the screw press assemblies.

**Maintenance:** This takes into account the amount of maintenance items possessed by each alternative. Similarly, belt filter presses, with the increased quantity of rotating components, will inevitably require more maintenance than the screw press alternative. It should also be noted that the belts used in the belt filter press alternative can be a wear item that will require replacement.

**Attention Requirements:** Both alternatives were considered with regard to the amount of operator attention required to ensure the process performs adequately. With regard to the operator attention of the process, belt filter presses require a significantly larger amount of operator attention. With the intricacy of the process, belt filter presses need operator attention to ensure there are no issues or upsets in the polymer dose, belt speed, or cake consistency. Screw presses, on the other hand, tend to involve significantly less operator involvement and can often be left to run without direct operator attention.

**Reliability:** The reliability of each alternative was considered. As with the complexity of the belt filter press, reliability can be a point of contention for this specific technology. As there are a large number of rotating and moving pieces, it is difficult to maintain the operational ability of the press. Belt or roller failures could potentially leave the unit out of service for extended periods of time, whereas screw presses include fewer moving parts and tend to be more reliable.

**TABLE 6: NON-MONETARY FACTOR ANALYSIS**

<b>Non-Monetary Factor</b>	<b>1 – Belt Filter Press</b>	<b>2 – Rotary Screw Press</b>
Complexity	65	85
Maintenance	70	80
Attention Requirements	60	90
Reliability	70	75
<b>Total*</b>	<b>265</b>	<b>330</b>

*\*Total score out of a possible 400 (100 points for each category).*

### **5.3 Alternative Selection**

As shown in Table 5, Alternative 2 has the lowest present worth cost and as shown in Table 6, Alternative 2 has the highest non-monetary factor analysis score. Based on this, Alternative 2 is the recommended alternative.

### **5.4 Existing Dewatering System**

It is GMB’s intent for the existing dewatering system to remain installed and in service after the new dewatering facility is constructed. As little change is proposed to the existing dewatering system, the existing belt filter press, conveyor system, sludge tank, sludge feed pumps, etc. can remain installed and maintained. This will allow the County the flexibility to have a backup mechanical dewatering system, and also provide additional dewatering capacity in the event a treatment tank requires draining for service.

If the County wishes, the existing dewatering building can also be remodeled and retrofitted with modern dewatering equipment in the future, if the solids processing demand of the facility were to surpass the design capacity of the new equipment proposed herein. As the proposed dewatering building is not directly designed for expansion, it is likely that the County will have to

install a supplementary piece of equipment in the existing dewatering building to meet the planned ultimate capacity of the facility.

## **PART 6 – Proposed Project (Recommended Alternative)**

### **6.1 Preliminary Project Design**

The recommended project is based on the evaluation of the alternatives that were previously detailed in the report.

The recommended project alternative is Alternative 2: Mechanical Dewatering Equipment (Screw Press), with the provision of the BDP DSP 3630 screw press units, and the proposed common improvements as outlined previously. This project will include the construction of the new dewatering building, the new sludge buffer tank, the provision of sludge storage/transport container and a sludge hauling vehicle, and the site piping requirements necessary to connect the proposed system to the existing facility. This project will include necessary electrical improvements to connect the proposed equipment to the facility's electrical service and emergency power, and the facility's SCADA system for remote monitoring.

### **6.2 Project Schedule**

After review and acceptance from Worcester County, it is anticipated that the design of the proposed improvements, with preparation of the Construction Documents, will span approximately nine (9) months. The bidding phase is expected to take three (3) months and the Construction Contract is estimated to occur over a period of twelve (12) months.

### **6.3 Permit Requirements**

The WWTP currently disposes of sludge under an existing Sludge Utilization Permit that will govern the sludge disposal of the biosolids produced at the facility. A construction permit through Maryland Department of the Environment will be required, as well as permits and approvals outlined previously in Part 4. It should be noted that both alternatives have the same permits/approval requirements.

#### **6.4 Total Project Cost Estimate**

Provided in Appendix H is an itemized cost estimate for the construction of the mechanical dewatering improvements at the facility. The total cost associated with the project are estimated at \$5,231,489, which includes design, permitting, and construction phase services.

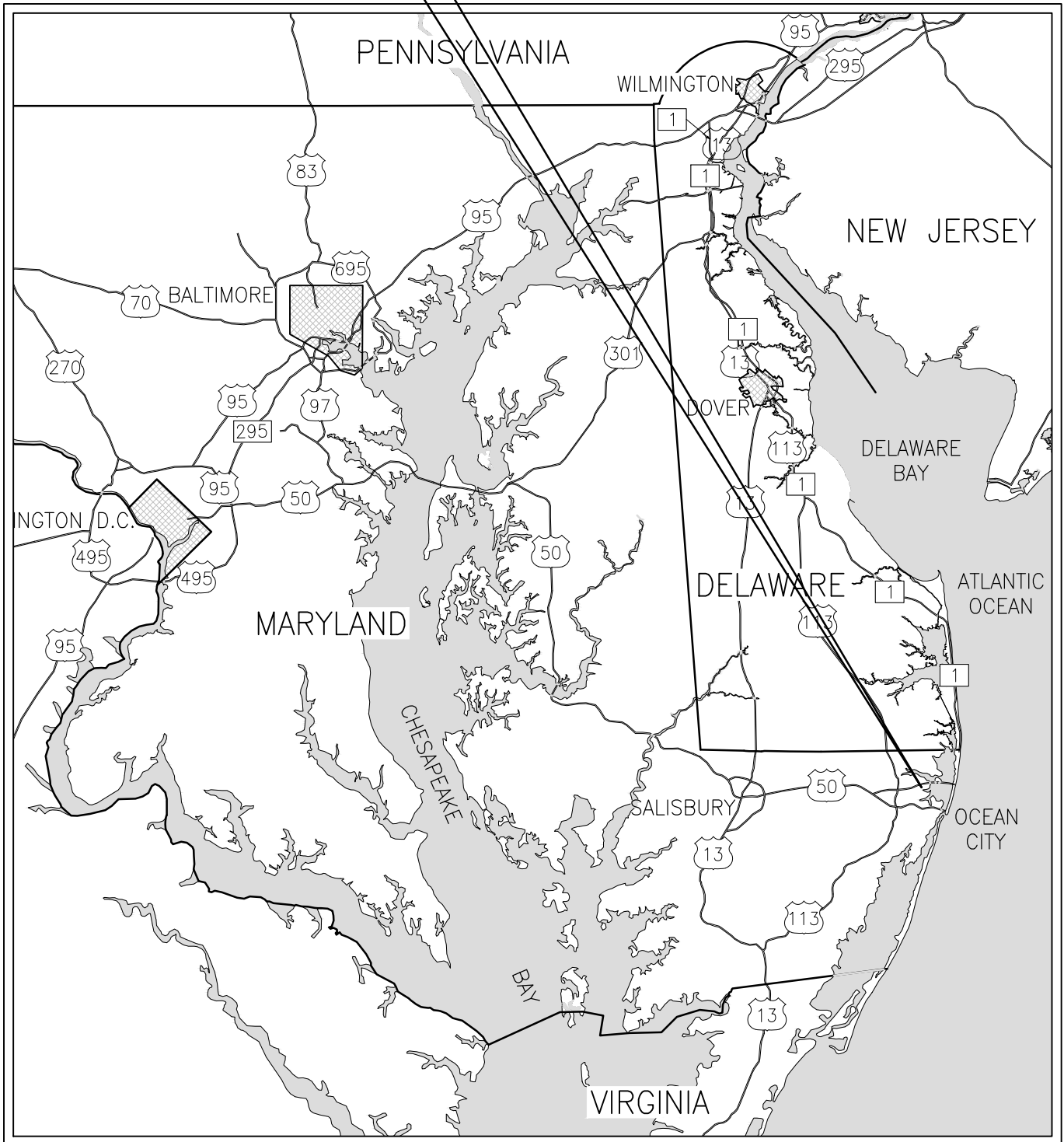
#### **6.5 Annual Operating Budget**

An estimated annual operating and maintenance budget for the recommended project operating at design capacity conditions can be found in Appendix I. In general, project viability and affordability will depend on the County's review of the proposed project alternative, overall cost, and O&M costs.

**\*\*\* END OF REPORT\*\***


**APPENDIX A**  
**LOCATION AND VICINITY MAPS**

# OCEAN PINES

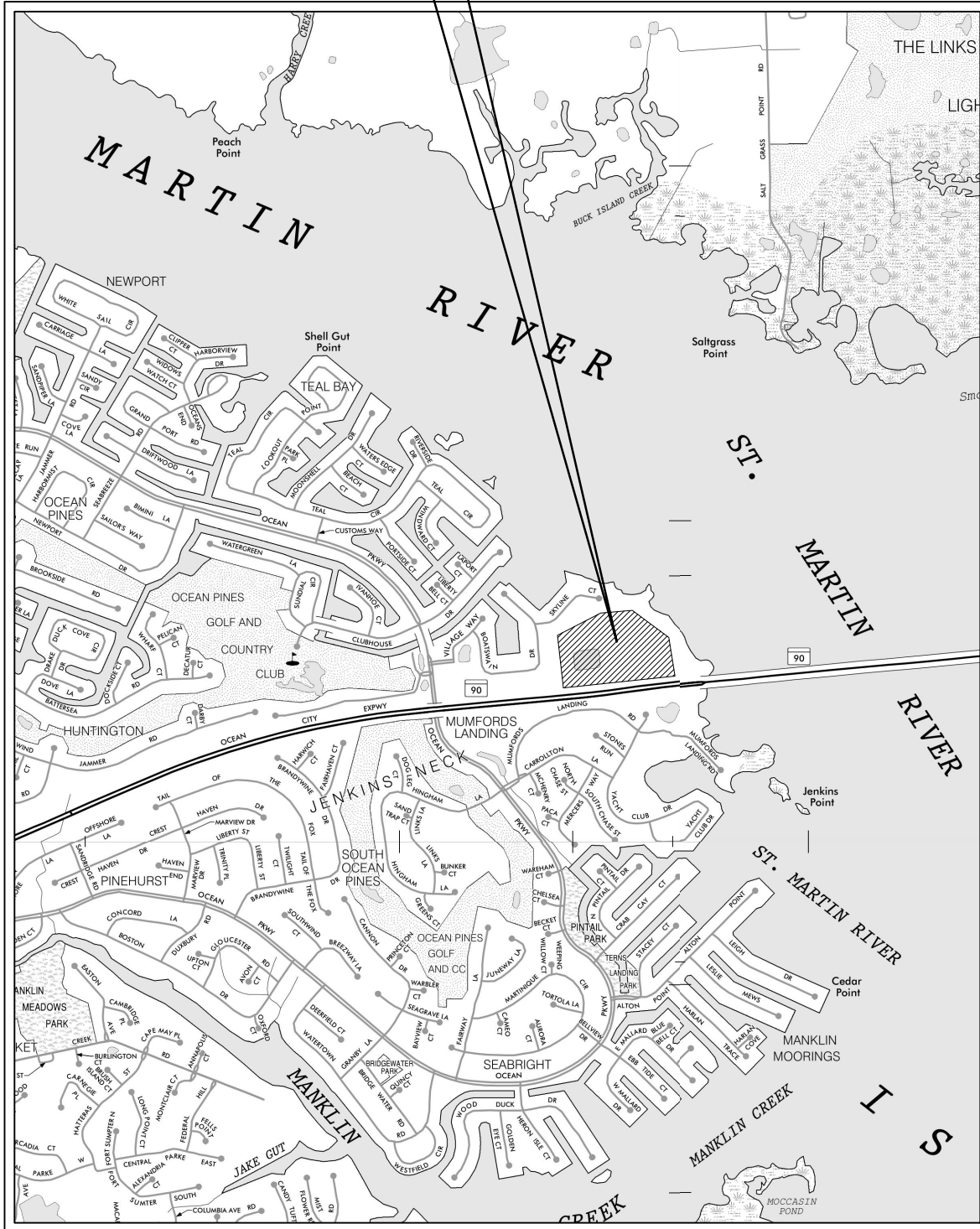


## VICINITY MAP

SCALE: 1" = 20 MILES

DRAWN BY : MMD	 GEORGE, MILES & BUHR, LLC ARCHITECTS & ENGINEERS SALISBURY • BALTIMORE • SEAFORD 206 WEST MAIN STREET SALISBURY, MARYLAND 21801 410-742-3115, FAX 410-548-5790 www.gmbnet.com	OCEAN PINES WWTP PER - SLUDGE DEWATERING  OCEAN PINES, MARYLAND	VICINITY MAP	EX-1  DRAWING NO.
CHECKED BY : MMH				
GMB FILE : 200155				
SCALE : AS NOTED				
DATE : FEB. 2021				

# PROJECT SITE



## LOCATION MAP

SCALE: 1" = 4000' ±

DRAWN BY : MMD

CHECKED BY : MMH

GMB FILE : 200155

SCALE : AS NOTED

DATE : FEB. 2021



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OCEAN PINES WWTP PER -  
 SLUDGE DEWATERING

OCEAN PINES, MARYLAND

LOCATION MAP

EX-2

DRAWING NO.



**APPENDIX B**  
**FLOODPLAIN MAP**

**NOTES TO USERS**

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the **Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations** tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only landward of 0.0' NAVD83. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 18. **Horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services  
NOAA, NIMS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, Maryland 20910-3282  
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

**BASE MAP SOURCE:** Base map information shown on this FIRM was provided in digital format. Streamline files, road centerline and political boundary files were provided by Worcester County. Digital aerial photography files were also provided by Worcester County. Adjustments were made to specific base map features to align them to the 1"=200' scale orthophotos.

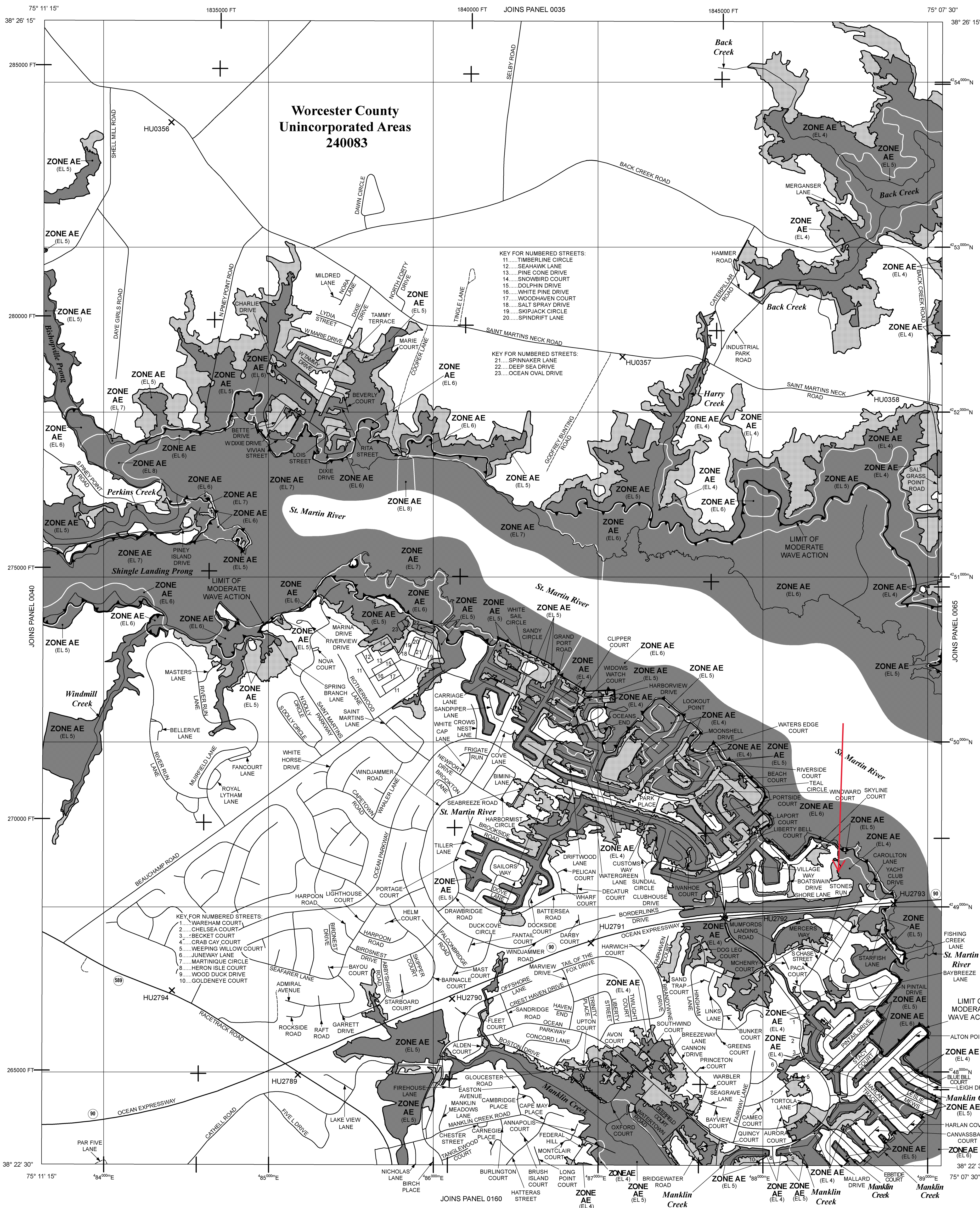
**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with the FIRM visit the **Map Service Center** website at <http://msc.fema.gov/>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

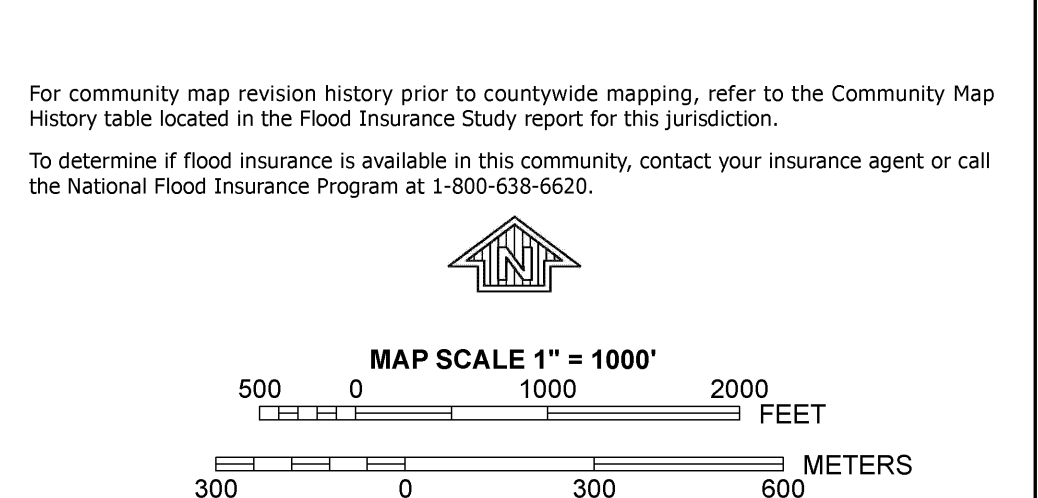
If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/mfp>.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.



**LEGEND**

- SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**  
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AD, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A**  
No Base Flood Elevations determined.  
Base Flood Elevations determined.
- ZONE AH**  
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO**  
Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR**  
Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99**  
Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V**  
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE**  
Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**  
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X**  
Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X**  
Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D**  
Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**  
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- OPAs boundary
- Boundary dividing Special Flood Hazard Areas and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities
- Limit of Moderate Wave Action
- Base Flood Elevation and value; elevation in feet\*
- Base Flood Elevation value where uniform within zone; elevation in feet\*
- \* Referenced to the North American Vertical Datum of 1988
- Bridge
- Footbridge
- Culvert
- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid values, zone 18 North
- 5000-foot grid ticks: Maryland State Plane coordinate system (FIPSZONE 1900), Lambert Conformal Conic projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile



**NATIONAL FLOOD INSURANCE PROGRAM**

PANEL 0045H

**FIRM FLOOD INSURANCE RATE MAP**

**WORCESTER COUNTY, MARYLAND AND INCORPORATED AREAS**

PANEL 45 OF 450  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS	COMMUNITY	NUMBER	PANEL	SUFFIX
	WORCESTER COUNTY	240083	0045	H

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for

**MAP NUMBER 24047C0045H**

**EFFECTIVE DATE JULY 16, 2015**

Federal Emergency Management Agency

**APPENDIX C**  
**WETLANDS INVENTORY**  
**MAP**



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

October 28, 2020

**Wetlands**

- Estuarine and Marine Deepwater
- Freshwater Forested/Shrub Wetland
- Freshwater Emergent Wetland
- Lake
- Estuarine and Marine Wetland
- Freshwater Pond
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

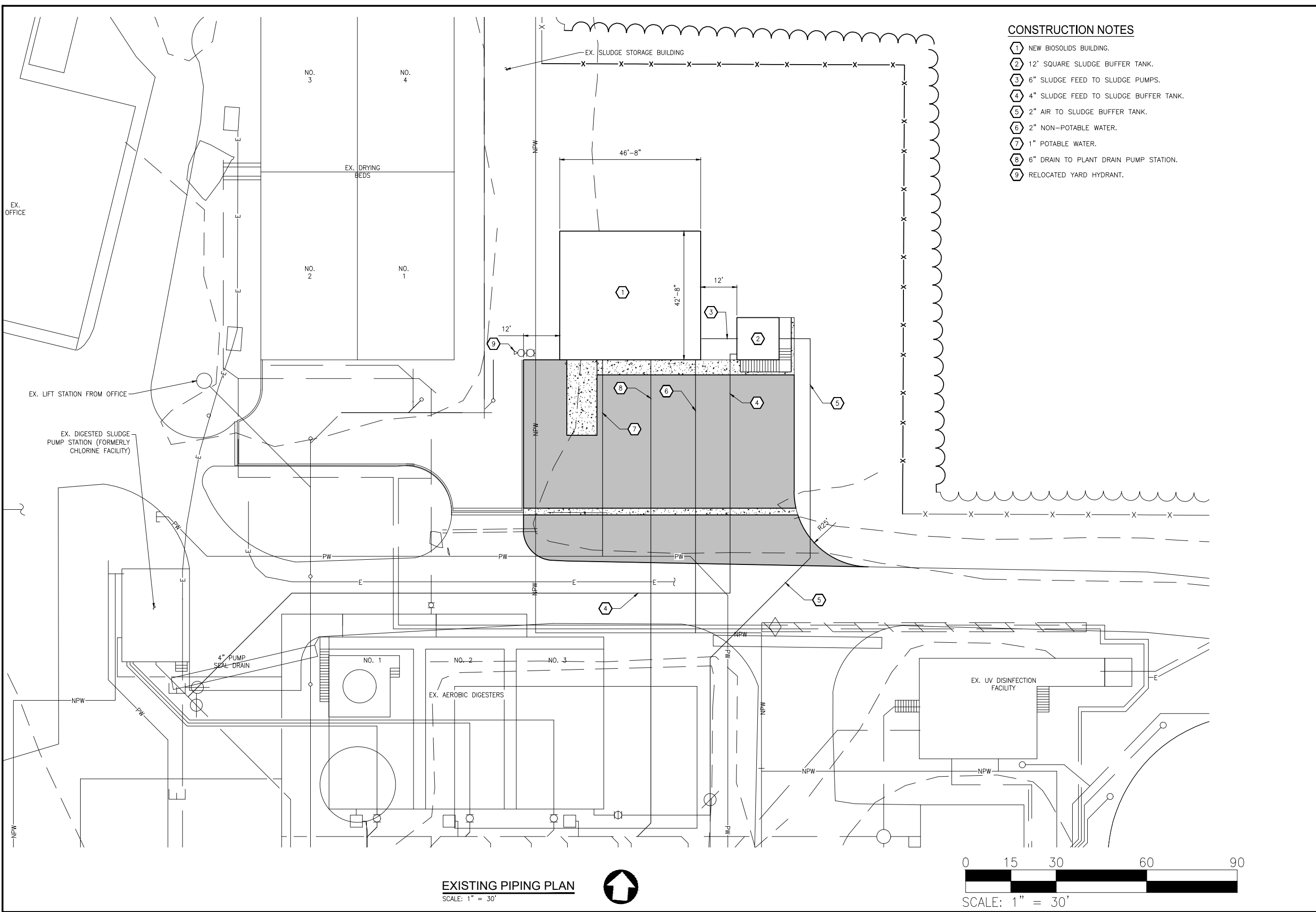
**APPENDIX D**  
**EXHIBIT DRAWINGS**









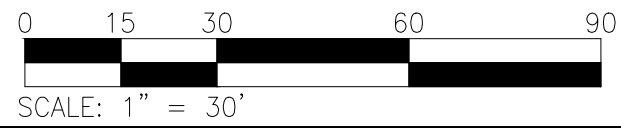


- CONSTRUCTION NOTES**
- 1 NEW BIOSOLIDS BUILDING.
  - 2 12' SQUARE SLUDGE BUFFER TANK.
  - 3 6" SLUDGE FEED TO SLUDGE PUMPS.
  - 4 4" SLUDGE FEED TO SLUDGE BUFFER TANK.
  - 5 2" AIR TO SLUDGE BUFFER TANK.
  - 6 2" NON-POTABLE WATER.
  - 7 1" POTABLE WATER.
  - 8 6" DRAIN TO PLANT DRAIN PUMP STATION.
  - 9 RELOCATED YARD HYDRANT.

LEGEND:

FW - RED	0.06 INCHES (1.5mm)
FW - YELLOW	0.07 INCHES (1.8mm)
FW - GREEN	0.10 INCHES (2.5mm)
FW - BROWN	0.14 INCHES (3.5mm)
FW - BLUE	0.20 INCHES (5.0mm)
FW - MAGENTA	0.27 INCHES (7.0mm)
FW - WHITE	0.39 INCHES (10.0mm)

**EXISTING PIPING PLAN**  
SCALE: 1" = 30'



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DATE	
REVISIONS	
NO.	

**GMB**  
 GEORGE, MILES & BUHR, LLC  
 ARCHITECTS & ENGINEERS  
 SALISBURY • BALTIMORE • SEAFORD  
 206 WEST MAIN STREET  
 SALISBURY, MARYLAND 21801  
 410-742-3115, FAX 410-548-5790  
 www.gmbnet.com

OCEAN PINES WWTP  
 PER - SLUDGE  
 DEWATERING

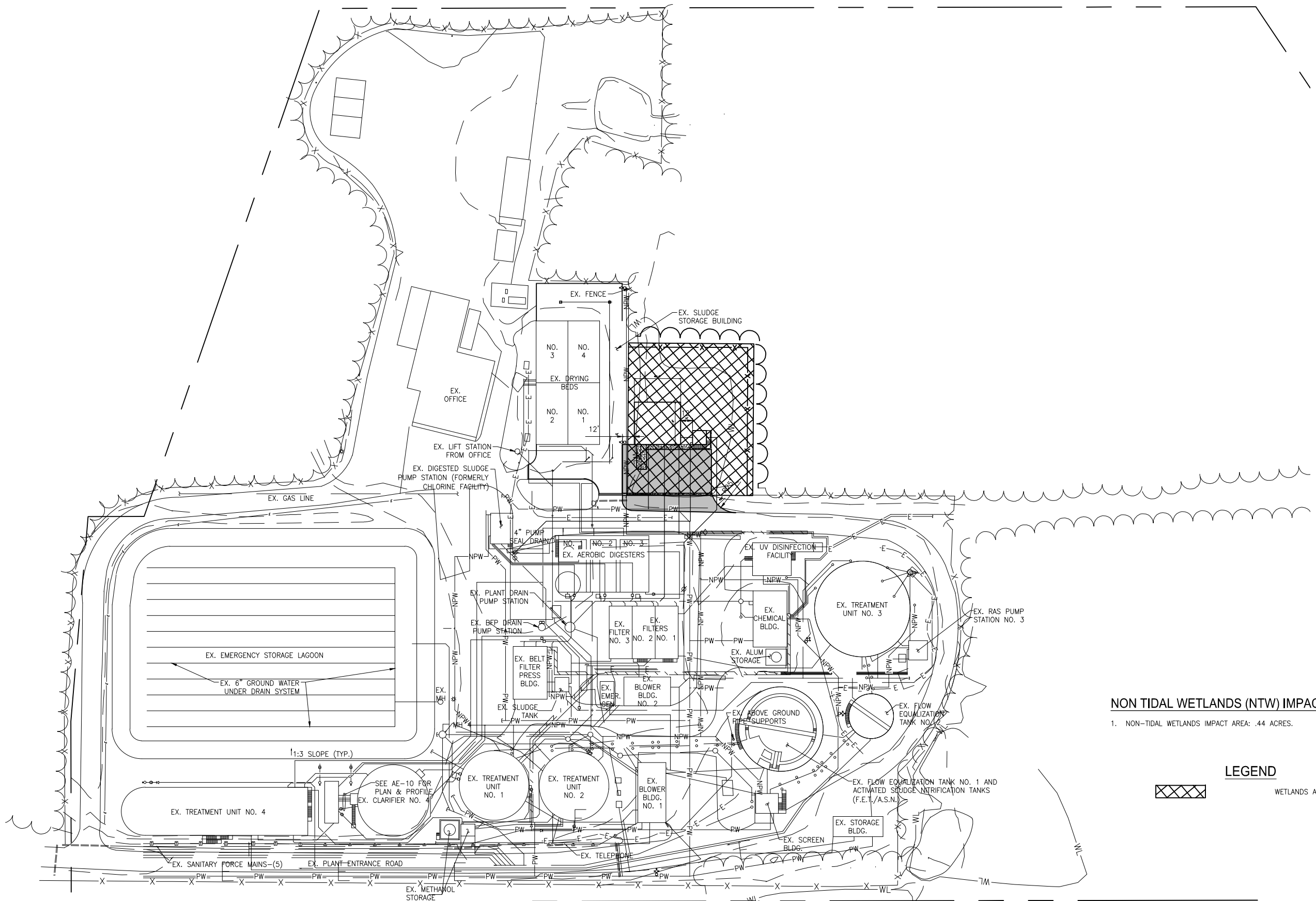
OCEAN PINES, MARYLAND

ENLARGED SITE PLAN

SCALE : AS NOTED	SHEET NO.
DESIGN BY : MMH	<b>EX-4</b>
DRAWN BY : MMD	
CHECKED BY : CBD	
GMB FILE : 200155	
DATE : SEPT, 2020	

- PNW-RED .200 INCHES (5mm)
- PNW-YELLOW .207 INCHES (5.26mm)
- PNW-GREEN .210 INCHES (5.33mm)
- PNW-BLUE .220 INCHES (5.59mm)
- PNW-ORANGE .227 INCHES (5.76mm)
- PNW-BROWN .239 INCHES (6.05mm)
- PNW-WHITE .239 INCHES (6.05mm)

PLOT CODE  
 PFM-CYAN .214 INCHES (5.44mm)  
 PFM-ORANGE .214 INCHES (5.44mm)



**EXISTING PIPING PLAN**  
 SCALE: 1" = 80'



**NON TIDAL WETLANDS (NTW) IMPACT AREAS**

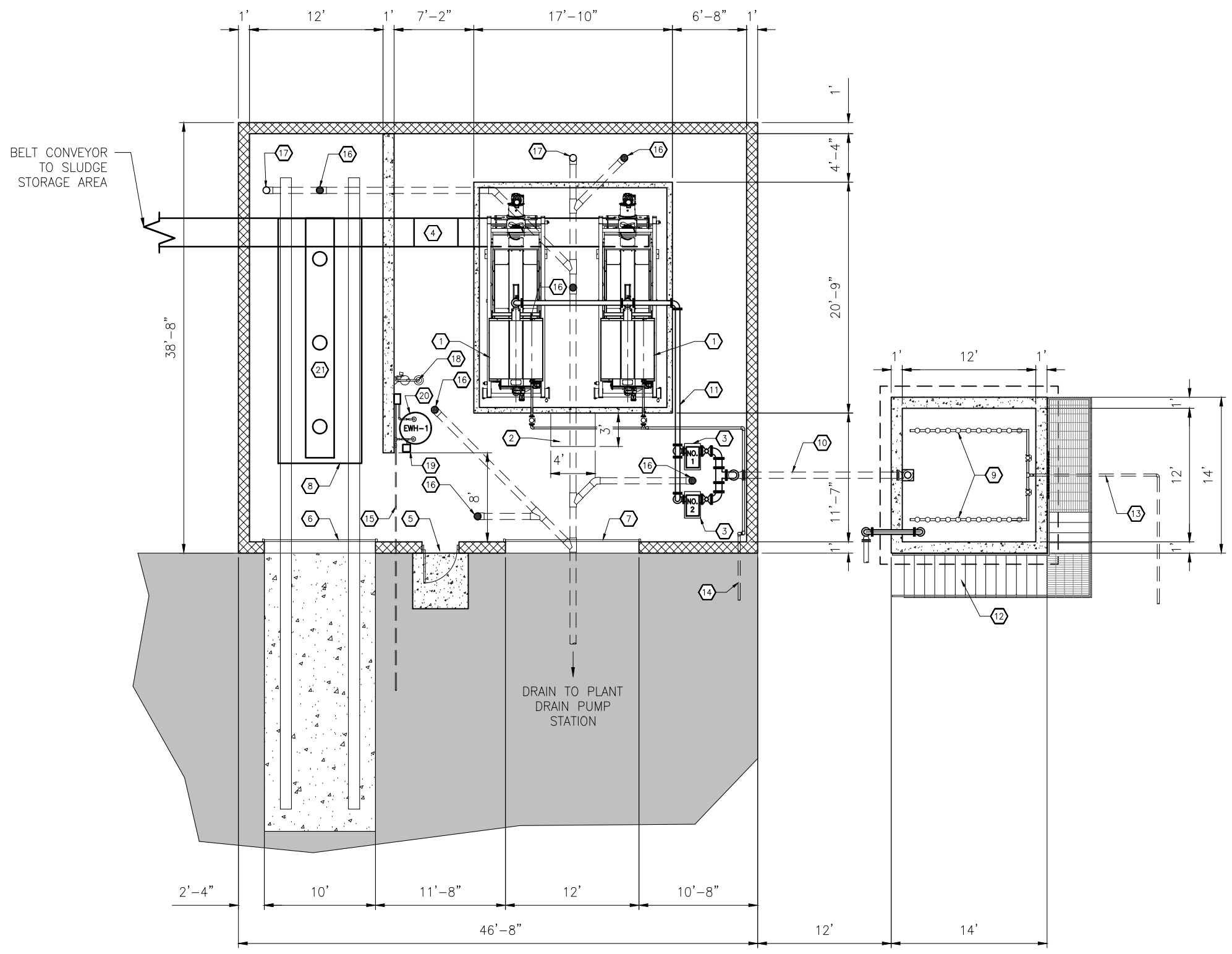
1. NON-TIDAL WETLANDS IMPACT AREA: .44 ACRES.

**LEGEND**

WETLANDS AND WOODS IMPACT AREA

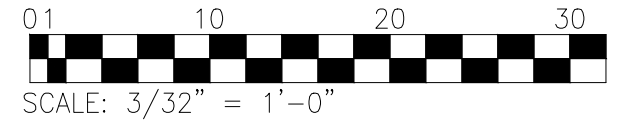
PRINTS ISSUED FOR: REVIEW	
DATE	
REVISIONS	
NO.	
<b>GMB</b> GEORGE, MILES & BUHR, LLC ARCHITECTS & ENGINEERS <small>SALISBURY • BALTIMORE • SEAFORD</small> 206 WEST MAIN STREET SALISBURY, MARYLAND 21801 <small>410-742-3115, FAX 410-548-5790</small> <small>www.gmbnet.com</small>	
<b>OCEAN PINES WWTP          PER - SLUDGE          DEWATERING</b>	
<b>OCEAN PINES, MARYLAND</b>	
<b>WETLANDS IMPACT</b>	
SCALE : AS NOTED	SHEET NO.
DESIGN BY : MMH	<b>EX-5</b>
DRAWN BY : MMD	
CHECKED BY : CBD	
GMB FILE : 200155	
DATE : SEPT, 2020	
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PLOT CODE  
 PEN-YELLOW .007 INCHES (0.18mm)  
 PEN-GREEN .010 INCHES (0.25mm)  
 PEN-CYAN .014 INCHES (0.35mm)  
 PEN-BLUE .020 INCHES (0.50mm)  
 PEN-MAGENTA .027 INCHES (0.70mm)  
 PEN-WHITE .039 INCHES (1.00mm)



**CONSTRUCTION NOTES**

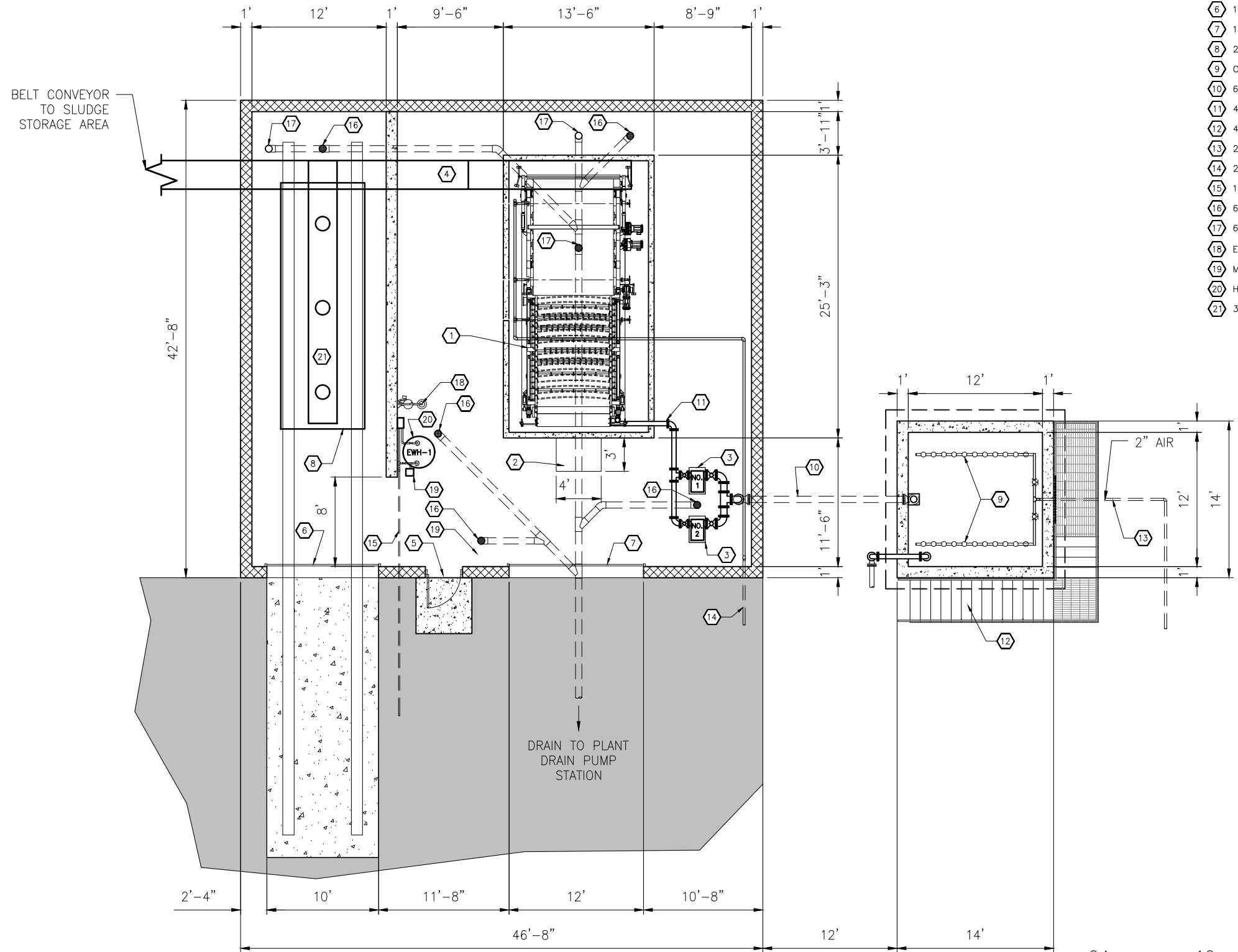
- ① SCREW PRESS.
- ② POLYMER FEED SYSTEM.
- ③ SLUDGE PUMP.
- ④ BELT CONVEYOR.
- ⑤ 3-FOOT PERSONNEL DOOR.
- ⑥ 10-FOOT COILING DOOR.
- ⑦ 12-FOOT COILING DOOR.
- ⑧ 20 CUBIC YARD DUMPSTER.
- ⑨ COARSE BUBBLE DIFFUSERS.
- ⑩ 6-INCH SLUDGE SUCTION.
- ⑪ 4-INCH SLUDGE FEED.
- ⑫ 4-INCH SLUDGE INFLUENT.
- ⑬ 2-INCH AIR PIPING.
- ⑭ 2-INCH NON-POTABLE WATER.
- ⑮ 1-INCH POTABLE WATER.
- ⑯ 6-INCH FLOOR DRAIN.
- ⑰ 6-INCH CLEANOUT.
- ⑱ EMERGENCY EYEWASH/SHOWER.
- ⑲ MIXING VALVE.
- ⑳ HOT WATER HEATER.
- ㉑ 3 OUTLET LOADOUT CONVEYOR.



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<b>GEORGE, MILES &amp; BUHR, LLC</b> ARCHITECTS & ENGINEERS SALISBURY • BALTIMORE • SEAFORD 206 WEST MAIN STREET SALISBURY, MARYLAND 21801 410-742-3115, FAX 410-548-5790 www.gmbnet.com	
<b>OCEAN PINES WWTP          PER - SLUDGE          DEWATERING</b>	
OCEAN PINES, MARYLAND	
<b>PROPOSED          BIOSOLIDS          DEWATERING          BUILDING - SCREW          PRESS</b>	
SCALE : AS NOTED	SHEET NO.
DESIGN BY : MMH	<b>EX-6</b>
DRAWN BY : MMD	
CHECKED BY : CBD	
GMB FILE : 200155	
DATE : SEPT, 2020	

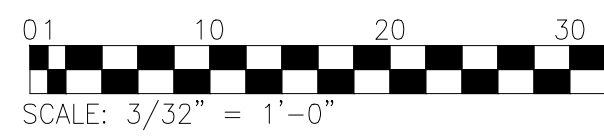
PEN-YELLOW .007 INCHES (0.18mm)  
 PEN-GREEN .010 INCHES (0.25mm)  
 PEN-DRAWN .014 INCHES (0.35mm)  
 PEN-BLUE .020 INCHES (0.51mm)  
 PEN-MAGENTA .027 INCHES (0.69mm)  
 PEN-WHITE .039 INCHES (1.00mm)

PLOT CODE  
 P1M-D1M



CONSTRUCTION NOTES

- 1 SCREW PRESS.
- 2 POLYMER FEED SYSTEM.
- 3 SLUDGE PUMP.
- 4 BELT CONVEYOR.
- 5 3-FOOT PERSONNEL DOOR.
- 6 10-FOOT COILING DOOR.
- 7 12-FOOT COILING DOOR.
- 8 20 CUBIC YARD DUMPSTER.
- 9 COARSE BUBBLE DIFFUSERS.
- 10 6-INCH SLUDGE SUCTION.
- 11 4-INCH SLUDGE FEED.
- 12 4-INCH SLUDGE INFLUENT.
- 13 2-INCH AIR PIPING.
- 14 2-INCH NON-POTABLE WATER.
- 15 1-INCH POTABLE WATER.
- 16 6-INCH FLOOR DRAIN.
- 17 6-INCH CLEANOUT.
- 18 EMERGENCY EYEWASH/SHOWER.
- 19 MIXING VALVE.
- 20 HOT WATER HEATER.
- 21 3 OUTLET LOADOUT CONVEYOR.



PRINTS ISSUED FOR:  
REVIEW

DATE	REVISIONS

NO.

OCEAN PINES WWTP  
PER - SLUDGE  
DEWATERING  
OCEAN PINES, MARYLAND

PROPOSED  
BIOSOLIDS  
DEWATERING  
BUILDING - BELT  
FILTER PRESS

SCALE : AS NOTED	SHEET NO.
DESIGN BY : MMH	EX-7
DRAWN BY : MMD	
CHECKED BY : CBD	
DATE : SEPT, 2020	

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**APPENDIX E**  
**BELT FILTER PRESS**  
**CUT SHEETS**

**Date: Sunday, December 6, 2020**

**Page 1 of 6**

**To: GMB**  
**206 West Main Street**  
**Salisbury, MD 21801**

**Attn: Matthew M. Hall, EIT**  
**Phone: 410-742-3115**  
**E-mail: [mhall@gmbnet.com](mailto:mhall@gmbnet.com)**

**Re: Ocean Pines WWTP, MD**  
**One (1) 2.0 meter 3DP belt press – Sludge Dewatering System**  
**BDP Budget Quotation # 120620-1915**

BDP Industries, Inc. is pleased to offer our quotation for one (1) 3DP Belt Filter Presses and accessories. The belt presses will be designed to dewater sludge from the aerobically digested sludge treatment process at the Ocean Pines WWTP. The attached design calculations list the expected loading rate and performance of the machines. BDP can confirm expected loading, polymer dosage and cake solids with bench testing if sludge samples are available.

Below is a summary of our scope of work.

### **EQUIPMENT DESCRIPTION**

The 3DP equipment package includes two complete belt filter presses and appurtenant equipment described as follows:

1. One (1) 2.0 meter 3DP, **3-belt**, belt filter presses with the following design features:
  - a.) Hot dipped galvanized tubular frame per **ASTM A123**.
  - b.) Frame safety factor of 10.
  - c.) Polyurethane clear coat gravity zone slide decks and wedge zone.
  - d.) Machined bearing pads.
  - e.) Up-flow feedbox.
  - f.) Variable speed paddle distributor wheel for feedbox.
  - g.) Ten foot **independent**, variable speed gravity section at operator level.
  - h.) ¼" x 3" stainless steel gravity deck support spaced every 12 inches.
  - i.) Eight (8) rows of adjustable, furrowing plows with 316 stainless steel support bars.
  - j.) Curved wedge section.
  - k.) 304L stainless steel, 24" diameter, perforated roller.
  - l.) Eight s-wrap pressure section.

- m.) UHMW scraper blades.
  - n.) Nylon covered rollers.
  - o.) 304 stainless steel wetted parts.
  - p.) 304 stainless steel hardware.
  - q.) 70 PLI hydraulic tensioning and tracking.
  - r.) Stainless steel Rack and Pinion tensioning in the pressure section.
  - s.) Corrosion resistant composite cylinders with 316 stainless steel rods and stainless steel hardware.
  - t.) Self-cleaning, adjustable angle belt showers with Victualic connections.
  - u.) Dodge, closed end, split case bearings rated for 1,000,000 hours at 70 PLI at 15 ft/min.
  - v.) TEFC, IP 65 severe duty variable speed motors.
  - w.) Dual 3 HP drives in the pressure section.
  - x.) PVC conduit.
  - y.) Zero speed switches for the gravity and press belts.
  - z.) NEMA 4X low voltage junction boxes.
  - aa.) Main incoming power 460/3/60
2. One (1) complete NEMA 4X, wall mount, 304 stainless steel electrical control panels for all the dewatering system control functions and drives. The PLC based panels shall contain all interlocks and controls for the belt press, polymer systems, sludge pumps, booster pumps, hydraulic units, discharge conveyors, and press mounted drives. The control panel shall include Allen Bradley 12" color Panelview Plus OIT and Allen Bradley Compact Logix PLC.
  3. One (1) 316L stainless steel polymer injection and polymer/sludge mixing systems consisting of an injection ring, variable vortex mixer and reducing fittings.
  4. One (1) 4" magnetic flow meter with grounding rings and remote display.
  5. One (1) automatic emulsion polymer blending unit with 2400 GPH dilution water capability and 10 GPH neat polymer feed pump.
  6. One (1) Progressive Cavity sludge feed pumps capable of 300 GPM at 300 RPM at 50 PSI with 20 HP TEFC drive motors and variable frequency drives.
  7. One (1) 2 HP hydraulic power unit with a 20-gallon, 304 stainless steel reservoir.
  8. One (1) 15 HP Goulds model SSH-F wash water booster pump capable of boosting from 40 to 120 PSI at a flow rate of 100 GPM. The wash water system will include a low water pressure switch and pressure gauge.



354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

9. One (1) 12" diameter x 30 foot inclined, u-trough, shaftless, 304 stainless steel, screw conveyor with 5 HP TEFC drive motor and zero speed sensor.
10. One (1) 12" diameter x 22-foot long, horizontal, u-trough, shaftless, 304 stainless steel, screw conveyor with 5 HP TEFC reversing motor and zero speed switch. The load out conveyor will have three discharge points and one electrically actuated slide gate for the middle discharge.
11. One (1) lot of hot dipped galvanized conveyor support structure.
12. One (1) lot of spare parts.
13. All start-up, mechanical checkout and operator training as specified. Service to include three (3) separate trips with eight (8) days of on-site services.
14. One-year machine warranty.
15. Freight to the jobsite.

Each model 3DP belt press will come completely factory-assembled, tested and will be shipped in two pieces. The polymer injection device, hydraulic unit, belt media, booster pump, polymer system, discharge conveyor system, and electrical control panels will be packed separately. This quotation is for furnishing equipment only and does not include any other installation labor or field services other than checkout, start up and testing services as listed above. All installation, on-site assembly, anchorage, pads and other work required to facilitate the setting of the equipment is to be by others. All labor and material for interconnecting between the press and the auxiliary equipment is to be completed by others.

#### **ITEMS NOT INCLUDED IN THIS SCOPE OF SUPPLY**

1. Unloading at the jobsite.
2. Installation of equipment.
3. Operator platforms.
4. Sump grating.
5. Anchor bolts.
6. Applicable taxes of any kind.
7. Temporary Dewatering.

#### **SUBMITTAL DATA**

Submittals will be made in the number of copies specified and will be available within 4 to 8 weeks after firm purchase order and all information is received at the factory.

#### **SHIPMENT**

Approximate shipping weight of the unit is 27,000 pounds. Estimated shipping time is 22 to 24 weeks after receipt of submittal approval.

#### **FIELD SERVICE**





354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

Installation observation, testing and operator instruction services as listed above will be supplied. Additional service can be supplied at a service rate of \$1,000 per day plus travel expenses.

### **BUDGET PRICING**

The budget pricing is as follows in US Dollars.

Qty	Description	Unit Price	Total Price
1	2.0m 3DP – 70 PLI	\$340,000	\$340,000
1	PLC OIT Panel	\$30,000	\$30,000
1	Booster Pump	\$4,000	\$4,000
1	Flow Meter	\$4,500	\$4,500
1	Polymer Systems	\$28,000	\$28,000
1	Sludge Pumps	\$30,000	\$30,000
1	Equipment Skid	\$30,000	\$30,000
1	Conveyor System	\$127,000	\$127,000
1	Conveyor Support Structure	\$30,000	\$30,000
1	Start Up Spare Parts	\$12,500	\$12,500
1	Freight & Startup Services	\$22,000	\$22,000
	Total		\$658,000.00

**This price includes the shipping cost to the job site unloading point. The price does not include unloading cost and applicable taxes of any kind. This quotation will be valid for sixty (60) days from the date of this proposal.**

### **TERMS**

Terms of payment are 90% with upon shipment of equipment and 10% upon start up.

We appreciate this opportunity to extend our quotation. If we can answer questions or supply additional information, please do not hesitate to contact Dave Kachman of Kappe Associates at 301-788-7132

Sincerely,

A.J. Schmidt  
BDP Industries, Inc.

cc: Dan Fronhofer, BDP Industries, Inc.  
&  
Kappe Associates, Inc.  
100 Wormans Mill court  
Frederick, MD 21701  
Phone (301) 846-0200  
Cell (301) 788-7132



354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

## **CONDITIONS OF SALE - COS 5-86**

### **1.1. General –**

This contract will exist between BDP Industries, Inc. (hereafter referred to as BDP) and the buyer only when accepted in writing by an officer of BDP. The prices quoted herein are firm for a period of 60 days if a contract is entered within thirty (30) days from the date on the face of this proposal. Any amendment to this contract must be in writing and acknowledged by both parties.

### **1.2. Terms of Payment –**

Payment is to be made on a net basis within thirty (30) days after invoice, subject to credit approval by BDP. The buyer's payment obligation is not dependent upon the buyer's receipt of payment from any other party. BDP reserves the right to invoice on partial shipments. Any balance owed by the buyer beyond thirty (30) days or more after due is subject to delinquency charges of 1.5% per month or any fraction thereof. This shall be in addition to any other amounts due and buyer shall reimburse BDP for all collection costs, including attorney's fees BDP may incur with respect to collection of past due amounts from the buyer.

### **1.3. Taxes –**

This proposal does not include any Federal, State or Local Sales, Privilege, Use or any other taxes of any kind applicable to the sale of the equipment covered under this agreement. The buyer shall pay these taxes or the buyer shall provide BDP with a tax exemption certificate applicable to proper taxing authority.

### **1.4. Shipment –**

All shipment will be F.O.B. factory. Shipping estimates contained herein are based on time of receipt at BDP's factory of all details pertaining to the order which are essential to contract completion.

### **1.5. Force Majeure –**

BDP shall not be liable for any loss or damage of any nature whatsoever incurred or suffered as a result of any failures or delays in performance due to any cause or circumstances beyond its, or its subcontractors' or suppliers' control, including, but not by way of limitation, failure or delays in performance caused by strikes, lockouts or labor disputes, acts of purchaser, fires, acts of God or the public enemy, riots, incendiaries, interferences by civil or military authorities, compliance with the laws of the United States or with the orders or policies of any Governmental authority, delays in transit or delivery on the part of transportation companies or communication facilities or failure of sources of raw material. In the event of such delay, the time of delivery or completion shall be extended by a period of time equal to the period of delay plus such time as needed for start-up and/or remobilization, provided however, should the Force Majeure situation extend beyond six months the contract may be canceled by either party. Purchaser shall reimburse BDP for all costs and expenses including overhead costs which BDP may have reasonably incurred in terminating the contract, plus an amount as reasonable profits on those portions to the contract which has been completed.

### **1.6. Warranty –**

BDP warrants the equipment manufactured by it to be free from defects in materials and workmanship for a period of 24 months from the date of shipment or 18 months from the date of start-up, whichever occurs first. BDP will repair or replace, at its option, F.O.B. its factory, any defective part or material, provided prompt notification is rendered in writing. The repair or replacement of items such as light bulbs, grease, oil, drive belts or chains, pump seals, etc. are not covered by this warranty and are considered normal consumption and routine maintenance items. In addition to the replacement of defective parts, BDP will also provide such labor as it deems necessary, to repair a defect in the main frame structure. BDP will not assume the cost of any modification or repair of its equipment unless it specifically gives authority for such action. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS. BDP MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR PARTICULAR PURPOSE OR MERCHANTABILITY.



354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

**1.7. Limitation of Liability –**

In no event, be it due to breach of any warranty hereunder or any other cause rising out of performance or non-performance of the obligations herein, whether any such breach or cause be or sound in tort, contract or otherwise, shall BDP be liable for:

- a) Indirect, special or consequential damages (such as, but not limited to, loss of profits, plant downtime, fines, penalties, or cost of replacement services) or sued by third parties against the purchaser (excluding suits regarding patents on title to the goods furnished hereunder).
- b) BDP's total cumulative liability for any and all reasons shall not exceed an amount equal to the contract price.

**1.8. Claims –**

The buyer shall immediately inspect equipment within ten (10) days after receipt, BDP is not obligated to consider any claim for shortages or non-conformance unless notified by the buyer within ten (10) days after his receipt of the goods in question, BDP is not responsible for loss of damage in transit, however they will lend any possible assistance to the buyer in his pursuit of claim recovery.

**1.9. Cancellation –**

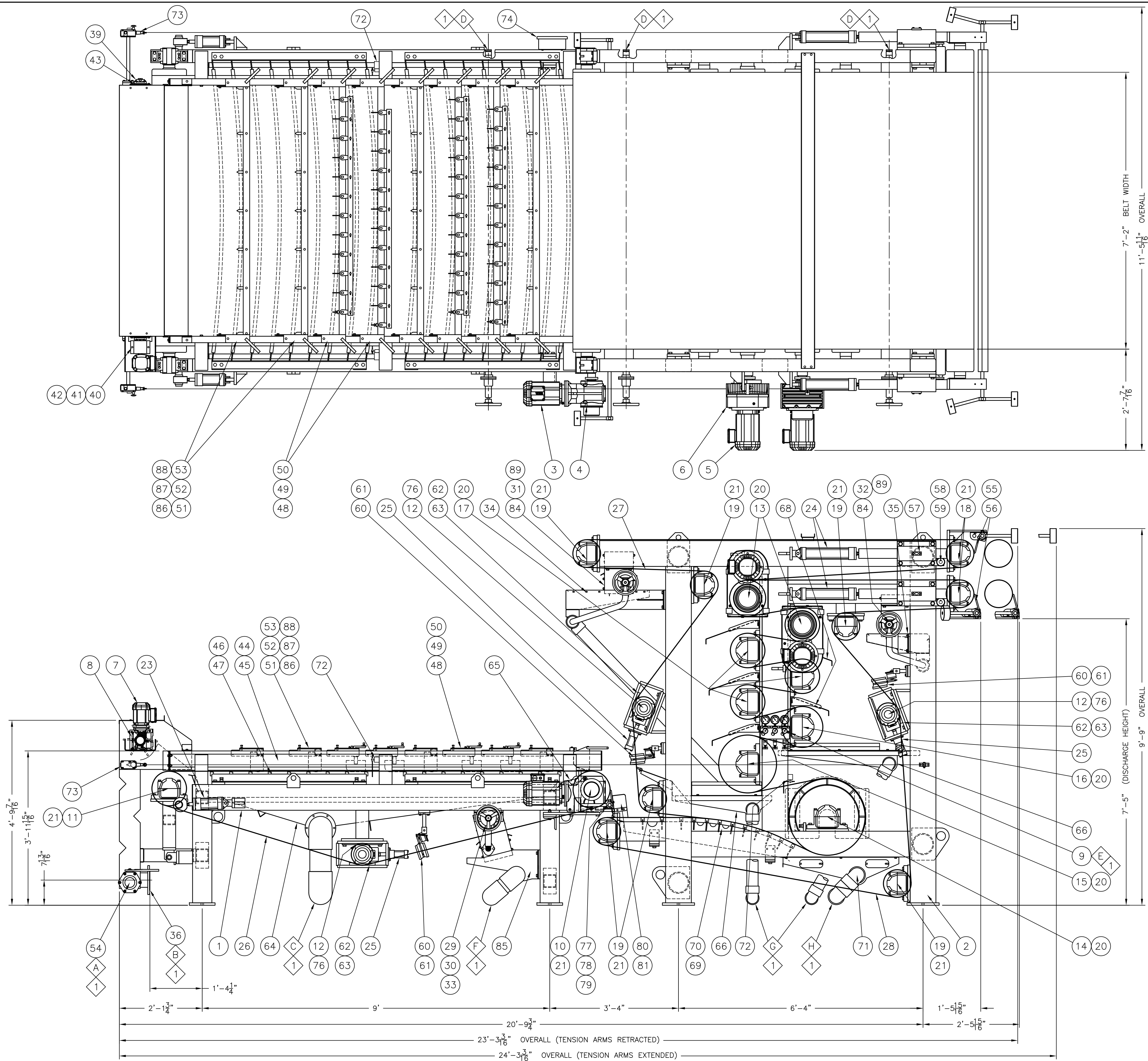
BDP will accept cancellation of this order upon receipt of payment for percentage of the contract equal to a percentage of the work completed. This shall be, at a minimum, 20% of the contract price.

**1.10. Storage –**

If the buyer delays shipment, then the buyer agrees to pay all invoices as they become due. The buyer further agrees to pay, in addition, storage charges computed at 1.5% per month of the invoice price of equipment stored.

**1.11. Permits –**

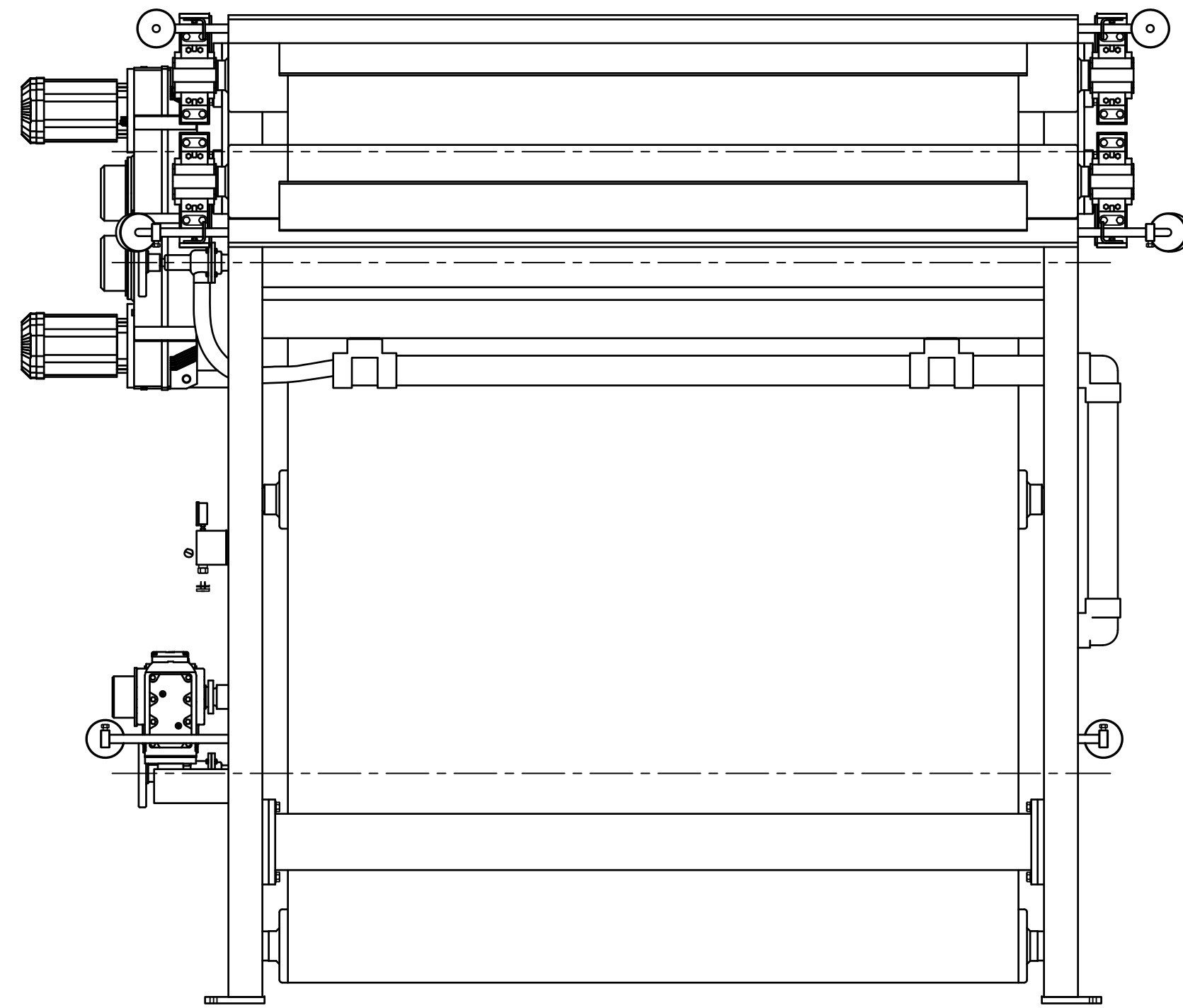
The buyer shall assume full cost and responsibility to obtain all permits or licenses with respect to the installation and operation of the equipment covered under this agreement. This shall include all requirements by Federal, State and Local governmental bodies. This contract shall be governed in accordance with the laws of the State of New York. These conditions and terms are the only terms and conditions that will be binding upon the parties unless amended, and acknowledged, in writing by both parties. No assignment of this proposal or any purchase order resulting here from shall be binding on BDP unless accepted in writing by BDP.



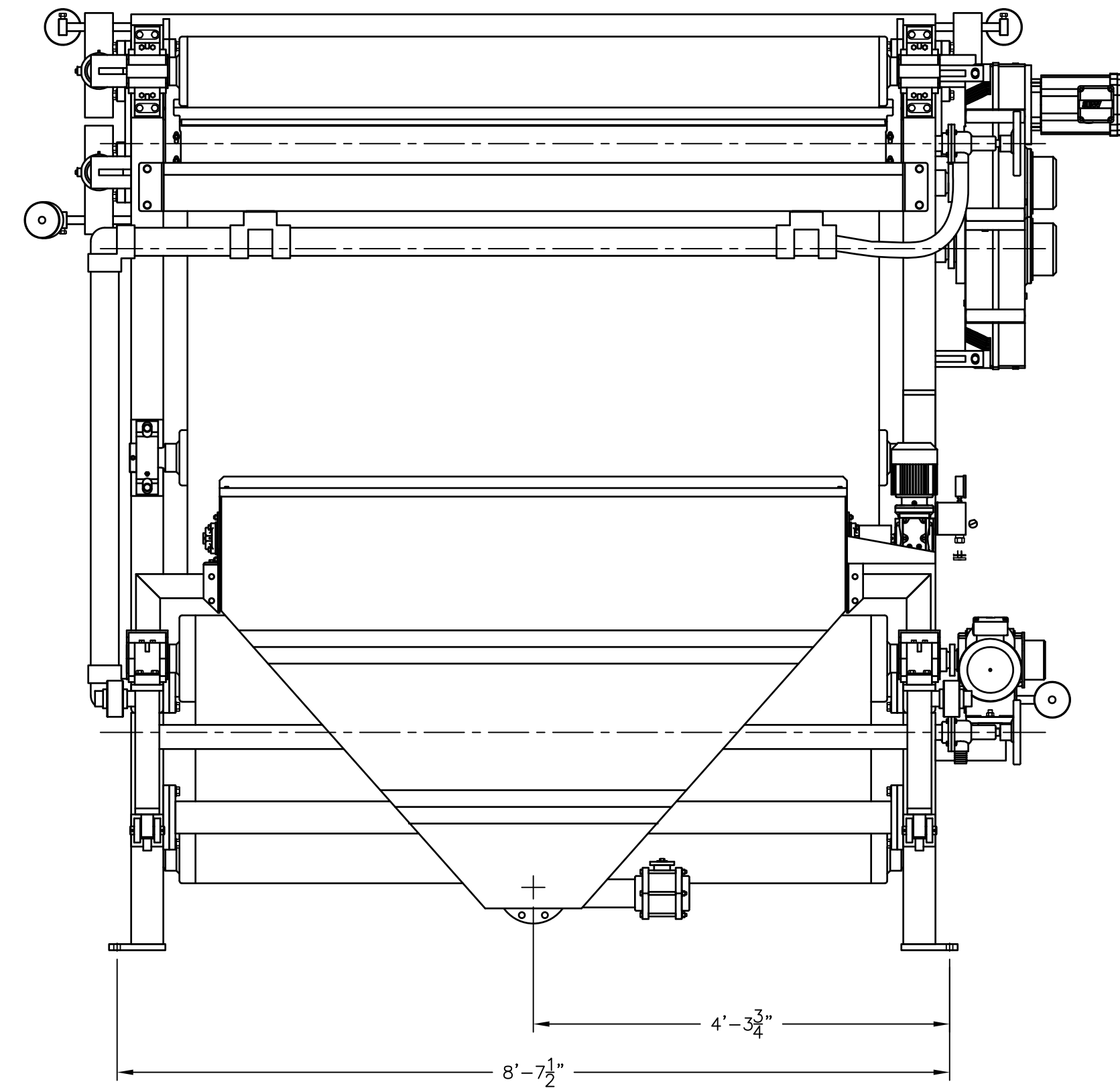
BFP-NORTH

SEE SHEET 3 FOR HOOD DETAILS

QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
		<b>BDP INDUSTRIES, INC.</b> GREENWICH, N.Y. 12834		
CUSTOMER: PLATTSBURG, NY	MACHINE: 2.0m 3DP	DWG TITLE GENERAL ARRANGEMENT 2.0m 3DP w/10' GBT (RH)		
BDP JOB NO. 1550	DWN BY: MJG	DATE: 4/16/20		
APPD BY:	SCALE:	SHT. OF 1 4	DWG NO. 1-1550-1	REV. 2

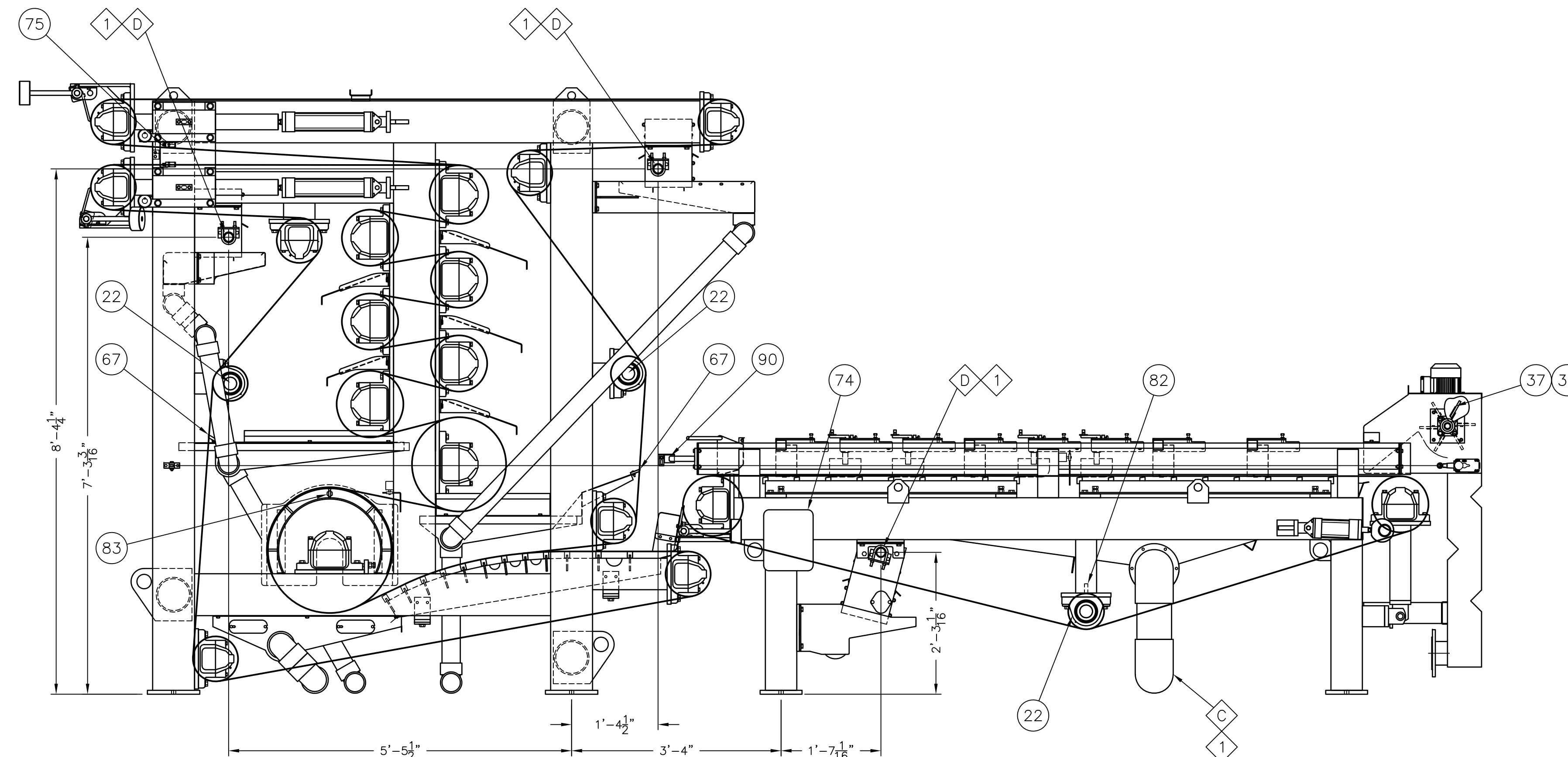


DISCHARGE END VIEW



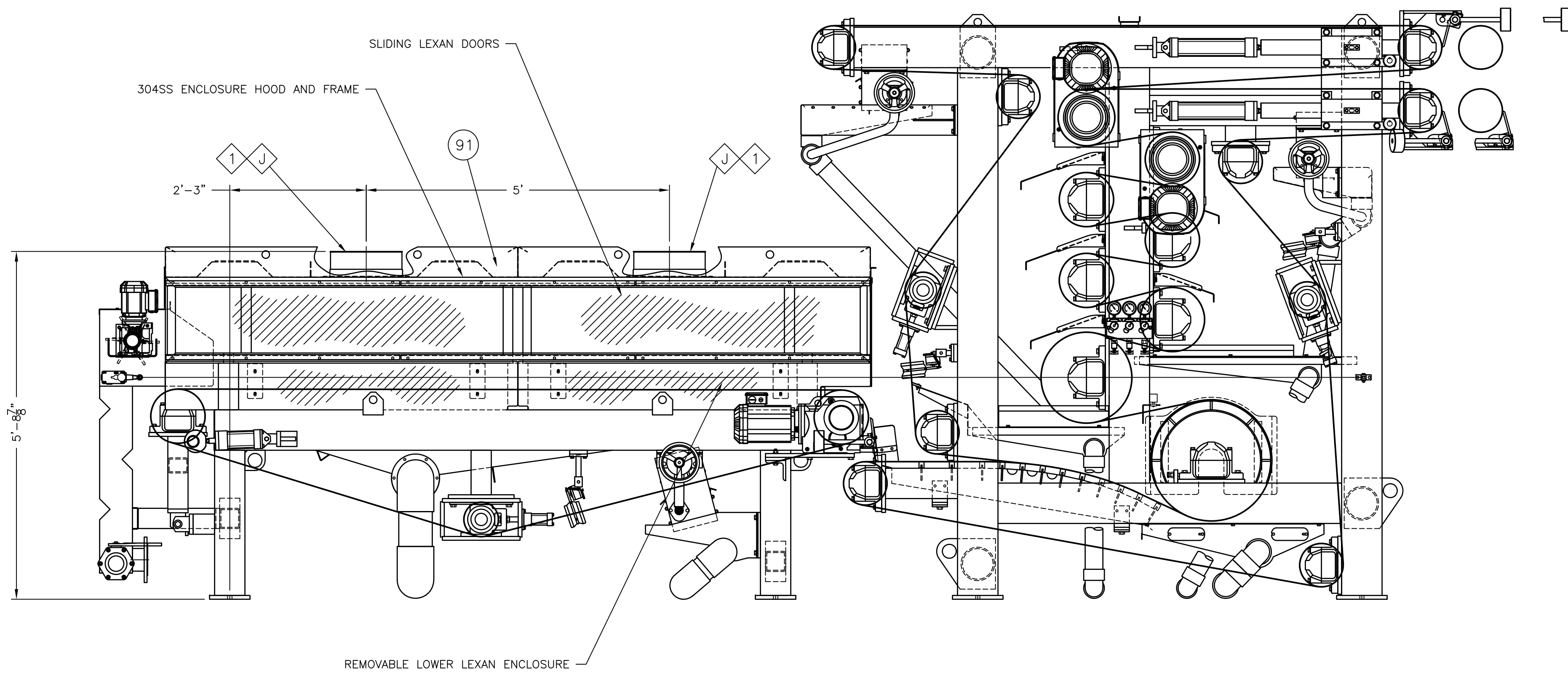
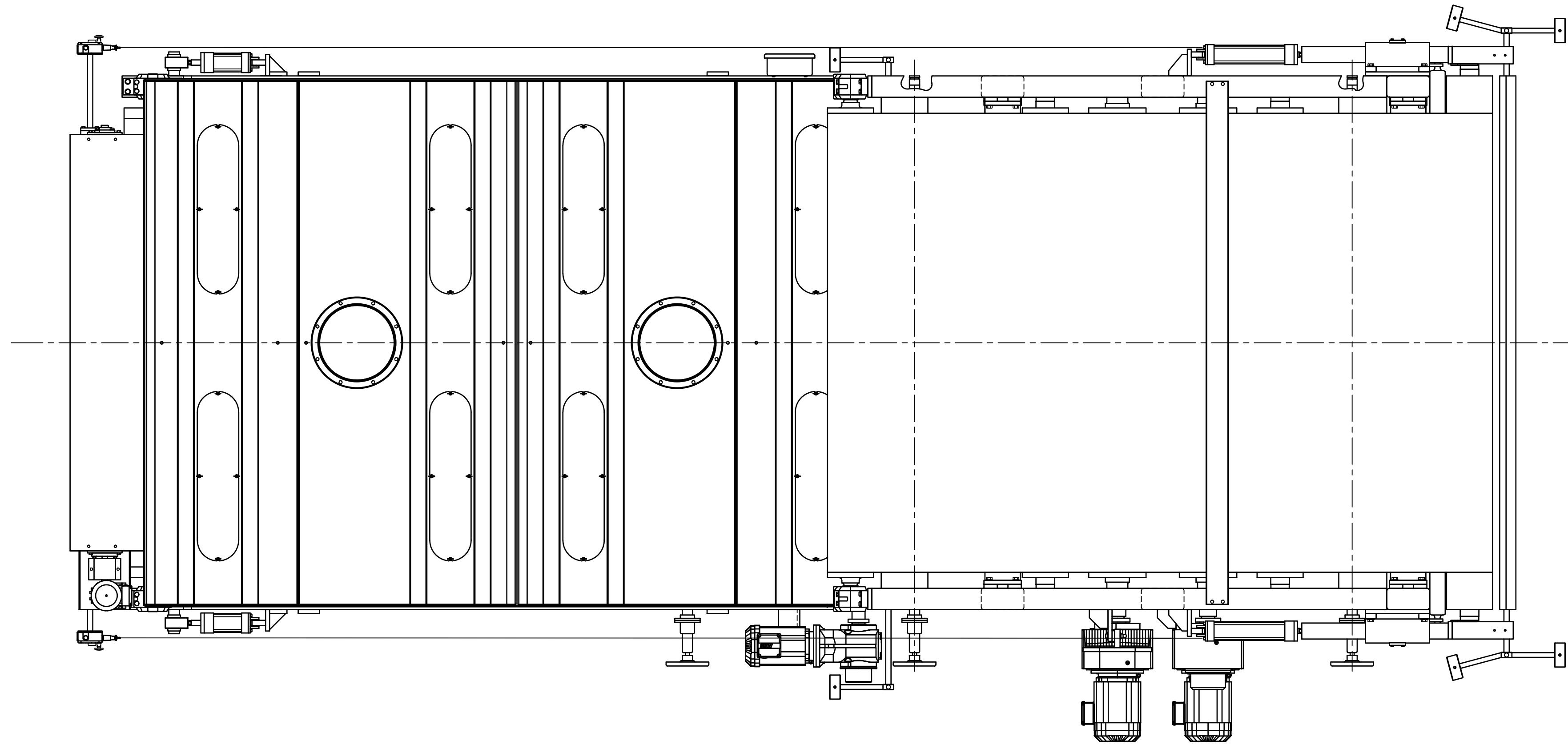
INLET END VIEW

BFP-NORTH




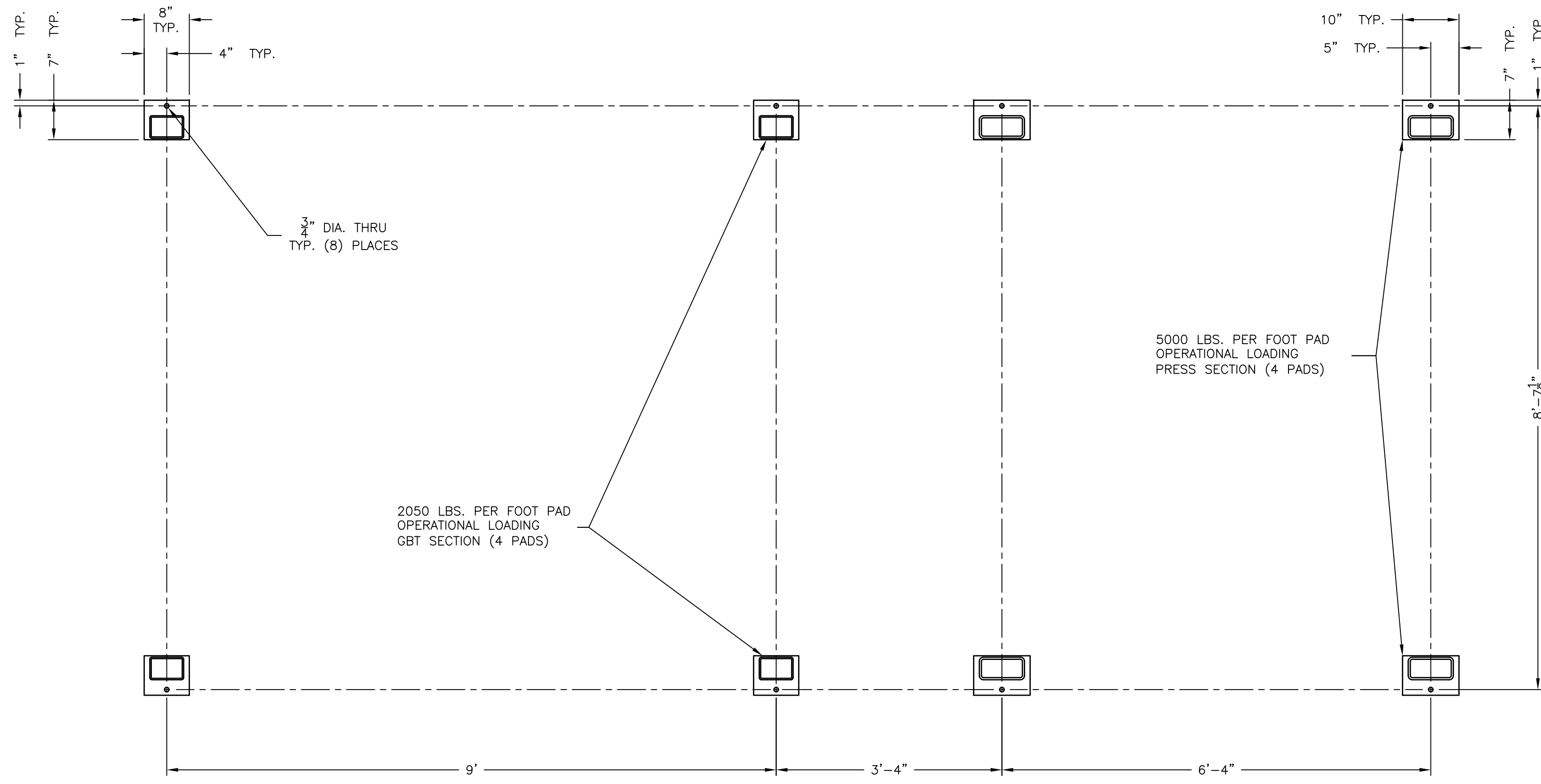
NON-OPERATOR SIDE VIEW

QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
		<b>BDP INDUSTRIES, INC.</b> GREENWICH, N.Y. 12834		
CUSTOMER: PLATTSBURG, NY		MACHINE: 2.0m 3DP		DWG TITLE GENERAL ARRANGEMENT 2.0m 3DP w/10' GBT (RH)
BDP JOB NO. 1550	DWN BY: MJG	DATE: 4/16/20		
APPD BY:	SCALE:	SHT. OF 2 4	DWG NO. 1-1550-1	REV. 2



BFP-NORTH

QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
		<b>BDP INDUSTRIES, INC.</b> GREENWICH, N.Y. 12834		
CUSTOMER: PLATTSBURG, NY		MACHINE: 2.0m 3DP		DWG TITLE GENERAL ARRANGEMENT 2.0m 3DP w/10' GBT (RH)
BDP JOB NO. 1550	DWN BY: MJG	DATE: 4/16/20		
APP'D BY:	SCALE:	SHT. OF 3 4	DWG NO. 1-1550-1	REV. 2



FOOT PAD LAYOUT

NOTES:

1. PIPING BEYOND THIS POINT INDEPENDENTLY SUPPORTED (NOT BY BDP).
2. FRAME IS HOT DIP GALVANIZED PER ASTM A123.
3. ALL WETTED STAINLESS STEEL SHEET AND PLATE IS TYPE 304SS. ALL FASTENERS AND HARDWARE ARE TYPE 316SS.
4. ITEMS NOT OTHERWISE PROTECTED ARE COATED WITH 8 MILS NAPA URETHANE ENAMEL PER BDP PAINT SPECIFICATION QA94-006.
5. HYDRAULIC TUBING AND FITTINGS ARE TYPE 316 SS.
6. APPROXIMATE WEIGHT: 25,000 LBS DRY  
28,200 LBS OPERATING
7. ELECTRICAL CONDUIT IS PVC.
8. SEW-EURODRIVE GEAR MOTOR FT8DRN100LM4-IP66/TH; 228.93:1, 2.4375" BORE, SHAFT ENTRY 'A', NON-SYMMETRICAL, MOUNTING POSITION M1 AND M3, 3 HP, 460V/3PH/60Hz.
9. SEW-EURODRIVE GEAR MOTOR KT77DRN100LM4-IP66/TH; 97.05:1, 2.00" BORE, SHAFT ENTRY 'A', NON-SYMMETRICAL, MOUNTING POSITION M1, 3 HP, 460V/3PH/60Hz.
10. SEW-EURODRIVE GEAR MOTOR S47DRS71S4-IP66/TH; 1/3 HP MOTOR, 1750 RPM, 460V, 1" OUTPUT SHAFT, M4 MOUNT, SHAFT SIDE 'B', CONDUIT BOX AT 90°, CABLE ENTRY '1', 54.59:1.
11. 85mm BEARING ASSEMBLY CONSISTS OF A HOUSING (CH4S-217-USAF), BEARING INSERT (22217C3), AND SEAL (42TTDN315). DRIVE BEARING ASSEMBLY WITH HOUSING (H4S-217-USAF) WITH ADDITIONAL SEAL (32TTDN303).
12. 75mm BEARING ASSEMBLY CONSISTS OF A HOUSING (CH4S-215-USAF), BEARING INSERT (22215C3), AND SEAL (38TTDN307). DRIVE BEARING ASSEMBLY WITH HOUSING (H4S-215-USAF) WITH ADDITIONAL SEAL (24TTDN213).

CONNECTION LEGEND:

- ⊠ 4" 150# FLANGED FEED INLET
- ⊡ 3" FEED BOX DRAIN
- ⊞ (2) 6" GBT MAIN COLLECTION PAN DRAIN
- ⊞ (3) 1-1/2" VICTAULIC SHOWER INLET
- ⊞ 1/2" SAE-8 HYDRAULIC MANIFOLD INLET/RETURN
- ⊞ 4" GBT SHOWER COLLECTION PAN DRAIN
- ⊞ (2) 3" COMPRESSION PAN OUTLET
- ⊞ (2) 4" PERFORATED PAN OUTLET
- ⊞ (2) 14" DUCT ENCLOSURE OUTLET

BFP-NORTH

QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
1	GBT HOOD ENCLOSURE ASSEMBLY	304 SS	91	SEE SHEET 3
1	WEDGE ZONE LEVEL SENSOR	NEMA 4X	90	45DMS-BBLGT1-D5
2	PRESS BELT SHOWER W/CHAINWHEEL	APPLETON	89	149720
4	EXCELSIOR UPRIGHT (LEFT)	UHMW	88	3-310-790 (P3)
4	EXCELSIOR UPRIGHT (RIGHT)	UHMW	87	3-310-790 (P2)
20	EXCELSIOR UPRIGHT (CENTER)	UHMW	86	3-310-790 (P1)
1	GBT SHOWER COLLECTION PAN	304 SS	85	
8	PRESS SHOWER SEALS	RUBBER	84	3-710-1494 (P2)
1	PRESS ZERO SPEED	ALLEN BRADLEY	83	871TM-BH8N18-H2
1	GBT ZERO SPEED	ALLEN BRADLEY	82	871TM-BH8N18-H2
2	TRANSITION SIDE DEFLECTOR SEAL	RUBBER	81	3-710-1600
2	TRANSITION SIDE DEFLECTOR	304 SS	80	GBT
1	DOCTOR/BELT TRANSITION SEAL	RUBBER	79	3-310-1421 (P2)
1	GBT DOCTOR BLADE	UHMW	78	3-310-1421 (P1)
1	DOCTOR BAR ASSEMBLY	304 SS	77	GBT
3	2-7/16" TAKE-UP BEARING	LINKBELT	76	TB22439E7E7CSS
2	BELT TENSION LASER SENSOR	NEMA 4X	75	45DMS-BBLGT1-D5
1	120V JUNCTION BOX	316 SS	74	NEMA 4X

2	EMERGENCY STOP ASSEMBLY	ALLEN BRADLEY	73	440E-L13133
4	BELT MISALIGNMENT SWITCH	ALLEN BRADLEY	72	802MC-AYS
1	PERFORATED ROLL PAN	304 SS	71	(2) 4" OUTLETS
1	ELLIPTICAL WEDGE ASSEMBLY	304 SS	70	
12	WEDGE SLIDE BAR	UHMW	69	3-710-994 (P3)
5	DRIP DEFLECTION PAN	304 SS	68	
2	DRIP PAN BELT SCRAPER	UHMW	67	3-710-565
2	COMPRESSION SECTION PAN	304 SS	66	
1	GBT DRIVE ROLL SEAL	RUBBER	65	3-310-678 (P6)
1	GBT COLLECTION PAN	304 SS	64	
3	ALIGNING BEARING SLIDE	UHMW	63	3-710-547 (P1)
3	ALIGNING BEARING GUIDE	BRASS	62	3-710-547 (P2)
3	BELT ALIGNING PADDLE ASM.	316 SS	61	3-710-1916
3	BELT ALIGNING VALVE	MICROTORK	60	375-SST
4	TENSION PINION SHAFT BEARING	304 SS	59	3-710-1426 (G1)
4	TENSION RACK GEAR	303 SS	58	3-710-567
2	TENSION ASSEMBLY	STEEL	57	
2	PRESS BELT DOCTOR BLADE	UHMW	56	3-310-98 (P3)
2	DOCTOR BAR ASSEMBLY	304 SS	55	PRESS
1	3" BALL VALVE	PVC	54	
8	EXCELSIOR END BLADE	UHMW	53	3-310-794 (P1)
16	EXCELSIOR CENTER BLADE	UHMW	52	3-310-793
4	EXCELSIOR PLOW SUPPORT ASM.	STEEL	51	GALVANIZED
48	PIVOT PLOW BLADE LEVER	POLY-E	50	450510
48	PIVOT PLOW BLADE	POLY-E	49	240560
4	PIVOT PLOW SUPPORT ASSEMBLY	STEEL	48	GALVANIZED
18	GRAVITY SLIDE BAR	UHMW	47	
2	SLIDE BAR SUPPORT ASSEMBLY	304 SS	46	ADJUSTABLE HEIGHT
2	GUIDE RAIL SEAL	RUBBER	45	3-310-825 (P2)
2	GUIDE RAIL ASSEMBLY	304 SS	44	
2	1" SHAFT SEAL	HARWAL	43	1.000 1.500 .250ADL
1	COUPLING INSERT	LOVEJOY	42	EDP11070
1	PADDLE 1" HALF COUPLING	LOVEJOY	41	EDP11091
1	DRIVE 1" HALF COUPLING	LOVEJOY	40	EDP11091
2	1" 4-BOLT FLANGE BEARING	LINKBELT	39	F3U216E3
6	AGITATOR BAR PADDLE FLAP	RUBBER	38	3-310-684
1	FEEDBOX AGITATOR BAR	304 SS	37	
1	GBT FEED BOX; 4" INLET	304 SS	36	
1	LOWER SHOWER DRIP PAN	304 SS	35	
1	UPPER SHOWER DRIP PAN	304 SS	34	
4	GBT SHOWER SEALS	RUBBER	33	3-710-1494 (P2)
1	PRESS SHOWER ENCLOSURE	304 SS	32	LOWER BELT
1	PRESS SHOWER ENCLOSURE	304 SS	31	UPPER BELT
1	GBT SHOWER ENCLOSURE	304 SS	30	
1	GBT BELT WASH SHOWER	APPLETON	29	149720
1	LOWER PRESS BELT, 86" x 707"	CLEAR EDGE	28	HF7-7052
1	UPPER PRESS BELT, 86" x 707"	CLEAR EDGE	27	HF7-7052
1	GBT BELT, 84" x 302"	CLEAR EDGE	26	HF7-7030
3	ALIGNING CYLINDER	SPRINGVILLE	25	S000169
4	TENSION CYLINDER, PRESS	SPRINGVILLE	24	S000163
2	TENSION CYLINDER, GBT	SPRINGVILLE	23	S000162
3	2-7/16" UNIBLOCK BEARING	LINKBELT	22	PB22439E7E7CSS
20	75mm SPLIT-CASE BEARING	DODGE	21	NOTE 12
16	85mm SPLIT-CASE BEARING	DODGE	20	NOTE 11
6	9" IDLER ROLL, PRESS	NYLON	19	2-710-310
2	9" TENSION ROLL, PRESS	NYLON	18	2-710-315
3	11" COMPRESSION ROLL, PRESS	NYLON	17	2-710-314
1	12" COMPRESSION ROLL, PRESS	NYLON	16	2-710-313
1	18" COMPRESSION ROLL, PRESS	NYLON	15	2-710-312
1	24" PERFORATED ROLL	304 SS	14	2-710-311 (G1)
2	11" DRIVE ROLL, PRESS	EAA	13	2-710-316
3	7" ALIGNING ROLL	EAA	12	3-710-1876
1	11" TENSION ROLL, GBT	NYLON	11	2-310-454
1	11" DRIVE ROLL, GBT	EAA	10	2-310-455
1	HYDRAULIC VALVE STATION	R.W. EARL	9	09194A
1	FEEDBOX REDUCER;	SEW	8	NOTE 10
1	FEED BOX MOTOR; 1/3 HP	SEW	7	NOTE 10
2	PRESS REDUCER	SEW	6	NOTE 8
2	PRESS DRIVE MOTOR; 3HP	SEW	5	NOTE 8
1	GBT REDUCER	SEW	4	NOTE 9
1	GBT DRIVE MOTOR; 3HP	SEW	3	NOTE 9
1	PRESS TUBULAR STEEL FRAME	A500 GR.E	2	GALVANIZED
1	GBT TUBULAR STEEL FRAME	A500 GR.E	1	GALVANIZED

**BDP INDUSTRIES, INC.**  
GREENWICH, N.Y. 12834

**BDP**

CUSTOMER: PLATTSBURG, NY      MACHINE: 2.0m 3DP  
 BDP JOB NO. 1550      DWN BY: MJG      DATE: 4/16/20  
 APPD BY:      SCALE:      SH. OF: 4 4

DWG TITLE: GENERAL ARRANGEMENT  
2.0m 3DP w/10' GBT (RH)

DWG NO. 1-1550-1      REV. 2

REV.	DESCRIPTION	DATE	BY
2	UPDATE HOOD DETAILS	5/4/20	SKD



# Alfa Laval AS-H Belt Press G3

## Sludge dewatering machine

### Introduction

The Alfa Laval AS-H Belt Press G3 is considered the industry standard for superior value, performance and durability for sludge dewatering. The G3 belt press is designed for low polymer consumption, high throughput rates, and high solids content and is available in a wide size range and extensive modular options to meet individual process requirements.

### Application

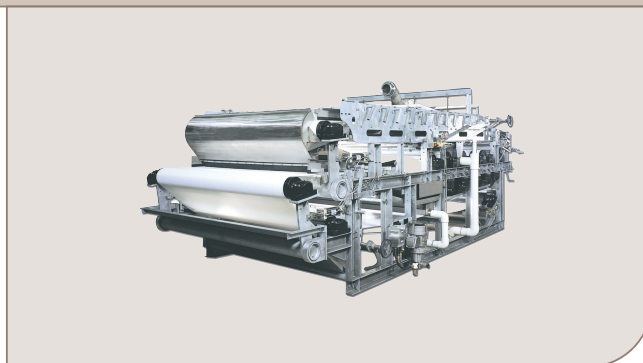
The Alfa Laval AS-H Belt Press G3 is a sludge dewatering machine suitable for all municipal wastewater sludge types and a wide variety of industrial solid / liquid separation applications, such as paper, petrochemical, mineral, food processing, pharmaceutical and chemical. The G3 belt press incorporates variable energy mixing, flocculation, gravity drainage and pressure filtration within a single mechanical framework. The G3 belt press offers the versatility of a wide size range and extensive modular options to meet individual process requirements.

### Benefits

- Thorough uniform mixing of polymer into sludge
- Higher volumetric throughput and solids loading
- Higher cake dry solids
- Low power consumption
- Low polymer usage
- Better filtrate quality
- Low maintenance requirements
- Long life design
- Modular design allows upgrades to add more rollers in the pressure zone or an extended gravity zone

### Features

- Available in 8 roller and 12 roller designs in the pressure section
- Extended gravity deck model for thinner sludges
- Open frame design allows for maximum access for normal maintenance
- Enclosed design available ensures any odours, aerosols and spillages are contained
- Adjustable wedge dewatering zone for process optimization
- Pre-installed hydraulic system for automatic belt tensioning and steering
- Lifetime rated bearings
- Radial grid and perforated roller to accelerate dewatering



### Features description

#### Sludge/polymer mixer valve

- Variable orifice, in-line polymer mixer that combines polymer and sludge instantly
- Optimizes polymer effectiveness and minimized polymer consumption

#### Gravity drainage zone

- Even sludge distribution prior to a two stage high efficiency gravity drainage areas fitted with easy to operate and maintain sludge ploughs and precisely arranged support grid to optimize filtrate removal

#### Adjustable wedge dewatering zone

- Initiates application of pressure to the dewatering process
- Adjustable during operation

#### Radial pressure dewatering zone

- Radial grid and perforated roller to prevent pressure-shock of sludge in the pressure zone

#### Full pressure dewatering zone

- Optional number of pressure rollers depending on dewatering requirements
- Belt wrap of 180 degrees or greater maximizing cake dry solids



## Belt alignment and tensioning

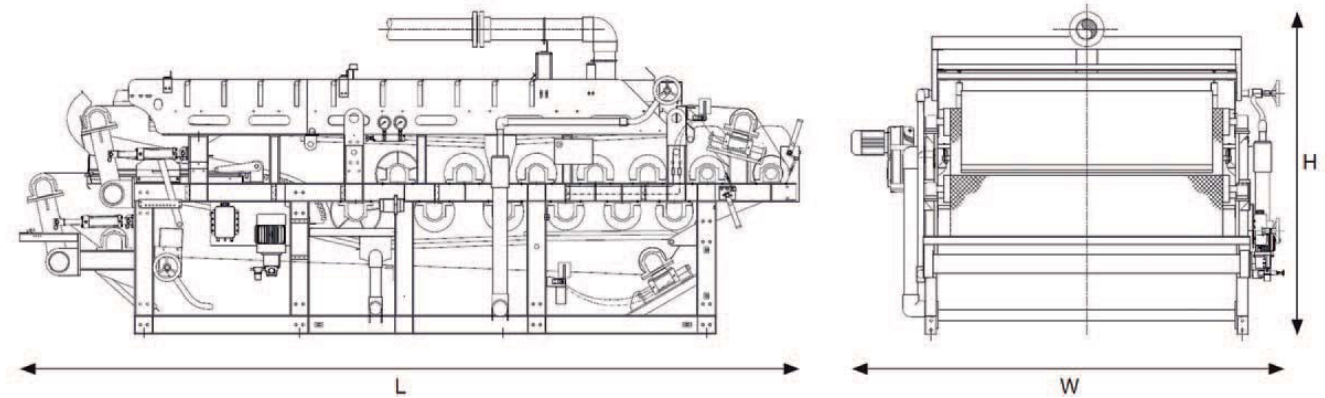
- Pre-installed and press-mounted to minimize on site installation requirements
- Hydraulically controlled and adjustable for continuous operation, reduced belt wear and optimum performance for a prolonged belt life

## Bearings

- Lifetime rated bearings with triple labyrinth seal and specially designed shaft mounted splash guards
- Extended lubrication cycle (6 monthly)

## Roller design

## Dimensions



12 roller version							
Model	Length		Width		Height		
	mm	inches	mm	inches	mm	inches	
Belt Press 100	6,242	246	2,407	95	2,546	100	
Belt Press 150	6,242	246	2,964	117	2,546	100	
Belt Press 200	6,242	246	3,516	139	2,597	102	
Belt Press 250	6,242	246	4,030	159	2,600	102	
Belt Press 300	6,242	246	4,572	180	2,680	106	

- Specialized forged end construction
- Rubber coated drive roller and thermoplastic nylon coated pressure rollers for corrosion resistance

## Working principle

Its operating principle is to condition the feed sludge with a polyelectrolyte and drain the flocculated sludge over an endless, horizontal porous filter belt. The thickened sludge is then sandwiched by a second filter belt before further dewatering by a series of decreasing diameter rollers. Final moisture removal is achieved by shear rollers arranged to give minimum 180 degree belt wrap in order to optimize dewatering.

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## How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)

December 7, 2020



To: Mr. Matthew M. Hall, E.I.T.  
Engineer  
GMB

Alfa Laval Inc.  
5400 International Trade Drive  
Richmond, VA 23231  
Tel: 804-236-1265

Subject: Ocean Pines Biosolids PER, MD  
Budget Proposal – ALDEC 75 Centrifuge and Belt Filter Press  
Alfa Laval Reference No: 0125439

Dear Mr. Hall:

On behalf of Alfa Laval and our local representative Sherwood-Logan, we are pleased to present this Non-Binding Budget Proposal for Alfa Laval Centrifuge for dewatering of sludge based on the following information:

<i>Schedule of operation</i>	<i>8 hours/day</i>
<i>Flow rate</i>	<i>91 gpm @ 1.5%.</i>
<i>Type of sludge</i>	<i>Two-stage sludge (without Primary).</i>

#### **OPTION: DECANTER CENTRIFUGE**

**One (1) ALDEC 75 Centrifuge** will come complete and include the following scope of supply:

- Modular frame with process contact areas in 316 SS
- Vibration isolators
- Singular cover in 316 SS (covers belts, rotating assembly and gearbox)
- Abrasion protection (Tungsten Carbide on wear surfaces)
- Rotating assembly complete with 4.5 kNm Planetary gearbox and pillow block bearings
- All bearings grease lubricated
- Vibration and temperature sensors in main bearing housings
- Main drive Motor: 50 Hp AC VFD
- Back drive Motor: 15 Hp AC VFD
- Starter Panel: NEMA 12 Free-Standing
- Local Control Panel: NEMA 4 X (304 SS) Wall mounted
- PLC: Allen Bradley CompactLogix
- HMI: Allen Bradley – 10 inch
- Main Drive VFD: ABB ACS880
- Back drive VFD: ABB ACS880
- Control of centrifuge during power loss or outage



- 
- Flexible connectors
  - Solids discharge chute
  - Centrate discharge chute
  - Factory Paint System
  - One (1) set required lubricants
  - One (1) set of required spares
  - Freight to jobsite, DDP Incoterms 2020 (unloaded by others)

**Also included** with pricing:

- One (1) year warranty against defects in workmanship
- Up to Ten (10) days of service and Two (2) round trips for on Start-up, Training, and Testing.
- Submittals and O&M Manuals
- Required Tools including bowl lifter and conveyor lifter

**Not included** in pricing:

- Field wiring, conduit, flexible connections
- Piping, Venting & Valves
- Anchor bolts
- Polymer & Polymer System
- Flow meters and Pressure gauges
- Conveyor and/or Diverter gate
- Feed pump and Grinder/Macerator
- Laboratory Fees
- Unloading at jobsite
- Storage and Handling fees
- Taxes and bonds

**Control of centrifuge during power loss or outage:**

The control of centrifuge during power loss or outage will allow the centrifuge to run through a short duration power blip, generally defined as 3-5 seconds. If the power outage extends past the 3-5 seconds the system will shut down the feed pump and polymer pump and put the centrifuge into the production standby mode for a programmed set time. If power is restored during this time the feed pump and polymer pump will automatically restart and production will resume.

Should the power not be restored, the control system will allow the centrifuge to be brought to a stop in a normal shutdown mode (as if it had power) maintaining the differential speed during the coast down period. This system will allow the centrifuge to scroll the solids out and be available for an immediate restart, once power is restored.

**The water supply** available at each unit must be as follows:

- |    |                |                    |
|----|----------------|--------------------|
| a. | Bowl Flushing: | 50 gpm @ 22-45 psi |
| b. | CIP Flushing   | 22 gpm @ 22-45 psi |
| c. | Temperature:   | Up to 140° F       |

**Cake capacity** during a power loss condition: 6.4 cu ft/0.24 cu yd



---

## OPTION: BELT FILTER PRESS

**One ( 1 ) Alfa Laval AS-H Belt Press G3 150 (Klampress®)**, 1.5 Meter Belt Filter Press (BFP), complete with hydraulic system for belt tensioning and steering. All components will be fabricated of the finest in corrosion resistant material: the frame will be carbon steel, hot dipped galvanized, chicane rods and holders shall be carbon steel galvanized, and all sheet metal components will be Type 316L stainless steel. This will be our current production model Klampress.

**One ( 1 ) Main Control Panel**, will be powered from a 480 VAC power source, supplied by others. IEC style motor starters will be supplied for the hydraulic pump and washwater pump, with an Allen Bradley PowerFlex style VFD for the belt drive. All other starters / controllers, and 120 VAC power for the polymer system, will be supplied by others.

The BFP Control Panel will be a UL Type 4X Stainless Steel enclosure. The controls for the BFP and ancillary equipment will be either manually or automatically controlled. START/STOP pushbuttons with RUNNING status lights will be provided for control of the washwater pump/valve, hydraulic pump, belt drive, conveyor, sludge pump, and polymer pump.

Speed control and speed/flow indication will be provided for the belt drive, sludge pump, and polymer pump.

Operator interface will be accomplished using Allen Bradley, Type 800H pilot devices. All logic will be performed via an Allen Bradley MicroLogix 1400 programmable logic controller (PLC), with Ethernet network communication capabilities.

**One ( 1 ) Inline, Non-clog, Variable Orifice Mixer**, complete with an injection manifold system and a four port vortex polymer injection ring.

**( 1 ) Lot Spare Parts**, which shall be provided as follows:

- One set of filter belts
- Two sets of doctor blades
- Two sets of rubber seals for the gravity zone & washbox
- One set of bearings of each size used

**( 1 ) Lot Field service**, one service technician shall be supplied as follows:

- Up to Three trips and eight days for installation inspection and start up, training and performance testing of the belt filter press

**( 1 ) Lot Freight**, this shall be to the jobsite. DDP per Incoterms 2020. (Offloading to be by others).

Also included in the pricing:

- Operation and Maintenance Manuals
- Submittals with drawings

Not included in pricing are the following:

- Interconnecting piping and wiring between Alfa Laval ASH equipment and other ancillary equipment
- Equipment installation
- Polymer and Lab services for the performance test and start up (unless noted otherwise)



- Local motor disconnect devices and / or local motor lockouts
- Offloading at jobsite
- Storage and Handling charges

WASH WATER REQUIREMENTS:

- 60 GPM at minimum of 85 PSI at the BFP

POWER REQUIREMENTS:

- 2 HP BELT DRIVE, 1 HP HYDRAULIC UNIT

<b>BUDGET PRICE FOR ONE (1) ALDEC 75 CENTRIFUGE, AS DESCRIBED ABOVE</b>	<b><u>\$278,000.00</u></b>
<b>BUDGET PRICE FOR ONE (1) 1.5M KP AS DESCRIBED ABOVE</b>	<b><u>\$257,900.00</u></b>
<b>PAYMENT TERMS</b>	10% upon Receipt of Order 10% upon Submittal Approval, NET 30 days 75% upon Delivery, NET 30 days 5% upon Final Acceptance, NET 30 days

**NOTES OF CLARIFICATION:**

1. This is a budgetary quotation. Consequently, this quotation is not binding. Please understand, therefore, that the price, scope and other terms contained in this budgetary quotation may be subject to considerable variations when preparing our binding quotation.
2. Warranty covers defects in materials and workmanship for twelve (12) months after startup or beneficial use or eighteen (18) months after shipment whichever comes sooner. Alfa Laval reserves the right to review operating and maintenance records to ensure compliance.
3. Service time for start-up assistance is included with this price. Any additional service time resulting from non-warranty delays will be charged at the rate in effect at the time of service.
4. Alfa Laval will recommend anchor bolt sizing. Anchor bolts are to be supplied by the installing contractor. Contractor shall remain responsible for meeting all relevant electrical codes.
5. The process performance (cake solids, loading, hydraulic throughput, etc.) achieved by the centrifuge can be guaranteed after confirmation of the quality of the feed sludge through the analysis of a representative sample.
6. Anything not explicitly stated in this proposal is not included.



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If you have any questions or require any additional information, please contact our representative, Bob Fairweather with Sherwood Logan at 410-353-9224 or me at 804-517-7298.

Sincerely,

*Sean Tierney*

Sean Tierney  
Northeast Regional Sales Manager  
Food and Water Division

cc: Bob Fairweather, Sherwood Logan  
Sipke Verbeek, Alfa Laval

## **SLG® Technology**

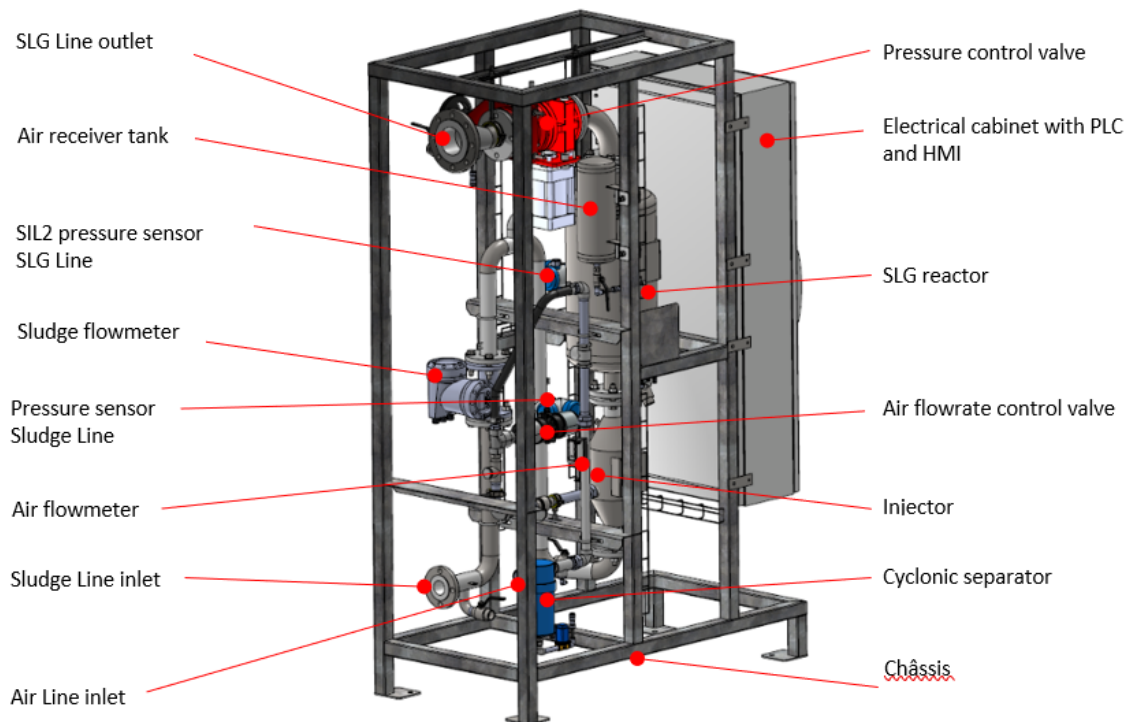
### **Added value for new Alfa Laval Belt Presses and Rebuilds done by Alfa Laval**

The SLG® Solution is a proprietary and patented technology designed and built by Orege for the enhancement of existing sludge dewatering operations using new Alfa Laval belt presses and also with rebuilds performed by Alfa Laval on existing belt presses. SLG® Solutions increase cake dryness, improve filtrate quality, and enhance odor/ corrosive gas control. Additional SLG® benefits may also include reduced polymer usage and increased throughput.

The SLG® Solution is unique in that it transforms with only compressed air, the physical and microbiological characteristics of the sludge, creating an emulsified air/sludge mixture before it enters the dewatering/ thickening device. This emulsified SLG® sludge often requires a re-evaluation and re-optimization of the existing dewatering/ thickening program to achieve the best results from the transformed emulsion.

### **SLG® Solution Scope**

- SLG® skid
- Air compressor skid
- HMI panel
- Deaerator
- Equipment installation (described below)
- Commissioning start-up, operator training
- One (1) year of Optimization Services
- Operations and Maintenance documentation



**General overview of SLG skid**



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The SLG® Solution scope excludes polymer unit (if required), shipping, or any required process changes to the sludge line identified during the installation.

**Orege Turnkey Installation Scope if requested:**

The turnkey installation includes placement and connection of the SLG® Solution to existing utilities, connection to new or existing sludge piping and polymer feed system.

The Customer will be responsible for any required regulatory permitting, providing adequate site utilities within 5 feet of the SLG® installation location, structural and/or site improvements, instrumentation and control improvements, and/or programming of control systems.

**SLG® Performance**

Project completion will be determined by successfully meeting the predetermined performance criteria which is to demonstrate an average increase in cake solids from the belt filter press greater than or equal to 2.0% DS.

**SLG® Solution Optimization Services by Orege (after 1<sup>st</sup> year) – Optional Adder**

Orege is vested in the successful operations of our customers' plants. To that end, Orege offers Optimization and Support Services to the Customer with renewal options available annually. This optional service will be performed by qualified Orege personnel and Alfa Laval can help you contact Orege directly if this option is elected.

Please contact us for more information and if you require a proposal.



**APPENDIX F**  
**SCREW PRESS**  
**CUT SHEETS**



354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

**Date: Sunday, December 6, 2020**

**Page 1 of 6**

**To: GMB**  
**206 West Main Street**  
**Salisbury, MD 21801**

**Attn: Matthew M. Hall, EIT**  
**Phone: 410-742-3115**  
**E-mail: [mhall@gmbnet.com](mailto:mhall@gmbnet.com)**

**Re: Ocean Pines WWTP, MD**  
**Two (2) 3630 Screw Presses & Ancillary Equipment**  
**BDP Quotation #: 102820-1816**

BDP Industries, Inc. is pleased to offer our quotation for two (2) 3630 Screw Presses and accessories for dewatering sludge from the aerobically digested sludge treatment process at the Ocean Pines WWTP. The attached design calculations list the expected loading rate and performance of the machines. BDP can confirm expected loading, polymer dosage and cake solids with bench testing if sludge samples are available.

Below is a summary description of our scope of supply.

### **EQUIPMENT DESCRIPTION**

Two (2) BDP Model DSP 3630, Screw Presses, equipped to dewater swine manure sludge as required. The equipment packages include a complete presses and appurtenant equipment described as follows:

1. Two (2) 316L stainless steel polymer injection and polymer/sludge mixing system consisting of an injection ring, variable vortex mixer and reducing fittings.
2. Two (2) Screw Presses, 30" diameter, with the following design features:
  - a.) 304L stainless steel frame.
  - b.) 304L stainless steel wetted parts.
  - c.) 304 stainless steel hardware.
  - d.) Replaceable wear flights.
  - e.) Oscillating screen shower.
  - f.) Filtrate recycle system.
  - g.) Pneumatically actuated adjustable discharge cone.
  - h.) TEFC IP65 severe duty variable speed motor, 3 HP.
  - i.) PVC conduit.
3. Two (2) 36" diameter Rotary Drum Thickener.



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Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

- a.) 304L stainless steel frame.
  - b.) 304L stainless steel wetted parts.
  - c.) 304 stainless steel hardware.
  - d.) Screen shower.
  - f.) TEFC IP65 severe duty variable speed motor, 0.75 HP.
  - i.) PVC conduit.
4. Two (2) complete NEMA 4X, floor mount, 304 stainless steel, electrical control panels for all the dewatering system control functions and drives. The panel shall contain interlocks and controls for the screw presses, polymer systems, sludge pumps, booster pumps, air compressor, and press mounted drives. The control panel shall include Allen Bradley Power Flex series variable frequency drives and PLC based controls. The PLC will be an Allen Bradley Compact Logix and will communicate via Ethernet. The OIT will be an Allen Bradley 12" color Panel View Plus 7. As necessary, VFDs will be mounted external to the control panel in NEMA 4X enclosures.
  5. One (1) 5 HP Ingersoll Rand air compressor with 80-gallon reservoir.
  6. One (1) Ingersoll Rand air dryer.
  7. One (1) 3 HP Gould's wash water booster pump capable of boosting from 40 to 70 PSI at a flow rate of 35 GPM.
  8. Two (2) 1.5" Duplex basket strainer for the wash water supply line.
  9. Two (2) Seepex NS-70-6L Progressive Cavity pump with 10 HP TEFC motor and Variable Frequency Controller for flow control. Pump will be capable of 150 GPM at 50 TDH discharge pressure and less than 300 rpm.
  10. Two (2) BDP Emulsion polymer blending unit with 10 GPH progressive cavity neat polymer pump and 2400 GPH dilution water capability.
  11. Two (2) HDG steel equipment skid with aluminum grating and 304 stainless steel sump pan. The skid will be pre-wired with rigid PVC coated conduit and pre-plumbed with schedule 80 PVC for the hydraulic unit, booster pump, sludge pump, polymer system, control panel and press mounted to the skid. The discharge conveyors will ship loose.
  12. One (1) 12" diameter x 12-foot long 304 stainless steel, U-trough, Inclined horizontal conveyor, 5 HP TEFC drive motor and zero speed sensor.
  13. One (1) 12" diameter x 30-foot long 304 stainless steel, U-trough, Inclined discharge conveyor with discharge hopper, 5 HP TEFC drive motor and zero speed sensor.



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14. One (1) 12" diameter x 22-foot long 304 stainless steel, u-trough, horizontal load out conveyor with electric slide gate, reversing motor starter, 5 HP TEFC drive motor, and zero speed sensor.
15. Freight to the jobsite.
16. All start-up, mechanical checkout and operator training as specified. Service to include 8 days of on-site services spread over three (3) trips.
17. One (1) year machine warranty.

The model DSP screw press will come completely factory-assembled, tested and will be shipped in one piece mounted to the equipment skid. The polymer injection devices, hydraulic unit, belt media, polymer system, booster pump, sludge pump, and electrical control panel will be mounted to the equipment skid. The discharge conveyors will be packed separately. This quotation is for furnishing equipment only and does not include any other installation labor or field services other than checkout, start up and testing services as listed above. All installation, on-site assembly, anchorage, pads and other work required to facilitate the setting of the equipment is to be by others. All labor and material for interconnecting between the press and the auxiliary equipment is to be completed by others.

#### **ITEMS NOT INCLUDED IN THIS SCOPE OF SUPPLY**

1. Unloading at the jobsite.
2. Installation of equipment.
3. Conveyor supports.
4. Operator platforms.
5. Sump grating.
6. Anchor bolts.
7. Applicable taxes of any kind.
8. Temporary dewatering.

#### **SUBMITTAL DATA**

Submittals will be made in the number of copies specified and will be available within 4 to 8 weeks after firm purchase order and all information is received at the factory.

#### **SHIPMENT**

Approximate shipping weight of each unit is 25,000 pounds. Estimated shipping time is 22 to 26 weeks after receipt of submittal approval.

#### **FIELD SERVICE**



354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

Ten days spread over 3 trips of on-site installation observation, testing and operator instruction services will be supplied. Additional service days can be supplied at a cost of \$1,000 per man day.

### **PRICING**

The total price for the above equipment is listed below in US Dollars.

<b>Qty.</b>	<b>Description</b>	<b>Unit Price</b>	<b>Total Price</b>
2	30" DSP Screw Press with RDT	\$360,000	\$720,000
2	Control Panel with OIT/PLC	\$30,000	\$60,000
2	HDG equipment skid	\$35,000	\$70,000
2	Sludge Feed Pump	\$25,000	\$50,000
2	Polymer make down unit	\$30,000	\$50,000
2	Flow Meter	\$4,500	\$9,000
2	Booster Pump	\$4,000	\$8,000
1	Discharge Conveyor	\$100,000	\$125,000
1	Start-up services	\$16,500	\$16,500
2	Freight	\$10,000	\$20,000
	<b>Total</b>		<b>\$1,128,500.00</b>
	<b>OPTIONAL ADDERS</b>		
1	Start-up spare parts		\$30,000

This price includes the shipping cost to the job site. The price does not include applicable taxes of any kind. This quotation will be valid for ninety (90) days from the date of this proposal.



354 State Route 29, Greenwich, New York 12834  
Phone No 518-695-6851  
E-mail: [aj@bdpindustries.com](mailto:aj@bdpindustries.com)

## **TERMS**

Terms of payment are 30% upon receipt of purchase order, 60% upon shipment of equipment and 10% upon startup. The attached Conditions of Sale are hereby made a part of this proposal.

We appreciate this opportunity to extend our quotation. If we can answer questions or supply additional information, please do not hesitate to contact Dave Kachman of Kappe Associates at 301-788-7132

Sincerely,

A.J. Schmidt  
BDP Industries, Inc.

cc: Dan Fronhofer, BDP Industries, Inc.  
&  
Kappe Associates, Inc.  
100 Wormans Mill court  
Frederick, MD 21701  
Phone (301) 846-0200  
Cell (301) 788-7132

### **CONDITIONS OF SALE - COS 5-86**

GENERAL -- This contract will exist between BDP Industries, Inc. (hereafter referred to as BDP) and the buyer only when accepted in writing by an officer of BDP. The prices quoted herein are firm for a period of 180 days if a contract is entered within thirty (30) days from the date on the face of this proposal. Any amendment to this contract must be in writing and acknowledged by both parties.

TERMS OF PAYMENT -- Payment is to be made on a net basis within thirty (30) days after invoice, subject to credit approval by BDP. The buyer's payment obligation is not dependent upon the buyer's receipt of payment from any other party. BDP reserves the right to invoice on partial shipments. Any balance owed by the buyer beyond thirty (30) days or more after due is subject to delinquency charges of 1.5% per month or any fraction thereof. This shall be in addition to any other amounts due and buyer shall reimburse BDP for all collection costs, including attorney's fees BDP may incur with respect to collection of past due amounts from the buyer.

TAXES -- This proposal does not include any Federal, State or Local Sales, Privilege, Use or any other taxes of any kind applicable to the sale of the equipment covered under this agreement. These taxes shall be paid by the buyer or the buyer shall provide BDP with a tax exemption certificate applicable to proper taxing authority.

SHIPMENT -- All shipment will be F.O.B. factory. Shipping estimates contained herein are based on time of receipt at BDP's factory of all details pertaining to the order which are essential to contract completion.

FORCE MAJEURE -- BDP shall not be liable for any loss or damage of any nature whatsoever incurred or suffered as a result of any failures or delays in performance due to any cause or circumstances beyond its, or its subcontractors= or suppliers= control, including, but not by way of limitation, failure or delays in performance caused by strikes, lockouts or labor disputes, acts of purchaser, fires, acts of God or the public enemy, riots, incendiaries, interferences by civil or



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military authorities, compliance with the laws of the United States or with the orders or policies of any Governmental authority, delays in transit or delivery on the part of transportation companies or communication facilities or failure of sources of raw material. In the event of such delay, the time of delivery or completion shall be extended by a period of time equal to the period of delay plus such time as needed for start-up and/or remobilization, provided however, should the Force Majeure situation extend beyond six months the contract may be canceled by either party. Purchaser shall reimburse BDP for all costs and expenses including overhead costs which BDP may have reasonably incurred in terminating the contract, plus an amount as reasonable profits on that portions to the contract which has been completed.

**WARRANTY** -- BDP warrants the equipment manufactured by it to be free from defects in materials and workmanship for a period of 18 months from the date of shipment or 12 months from the date of start-up, whichever occurs first. BDP will repair or replace, at its option, F.O.B. its factory, any defective part or material, provided prompt notification is rendered in writing. The repair or replacement of items such as light bulbs, grease, oil, drive belts or chains, pump seals, etc. are not covered by this warranty and are considered normal consumption and routine maintenance items. In addition to the replacement of defective parts, BDP will also provide such labor as it deems necessary, to repair a defect in the main frame structure. BDP will not assume the cost of any modification or repair of its equipment unless it specifically gives authority for such action. **THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS. BDP MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR PARTICULAR PURPOSE OR MERCHANTABILITY.**

**LIMITATION OF LIABILITY** -- A. In no event, be it due to breach of any warranty hereunder or any other cause rising out of performance or non-performance of the obligations herein, whether any such breach or cause be or sound in tort, contract or otherwise, shall BDP be liable for indirect, special or consequential damages (such as, but not limited to, loss of profits, plant downtime, fines, penalties, or cost of replacement services) or suet by third parties against the purchaser (excluding suits regarding patents on title to the goods furnished hereunder). B. BDP's total cumulative liability for any and all reasons shall not exceed an amount equal to the contract price.

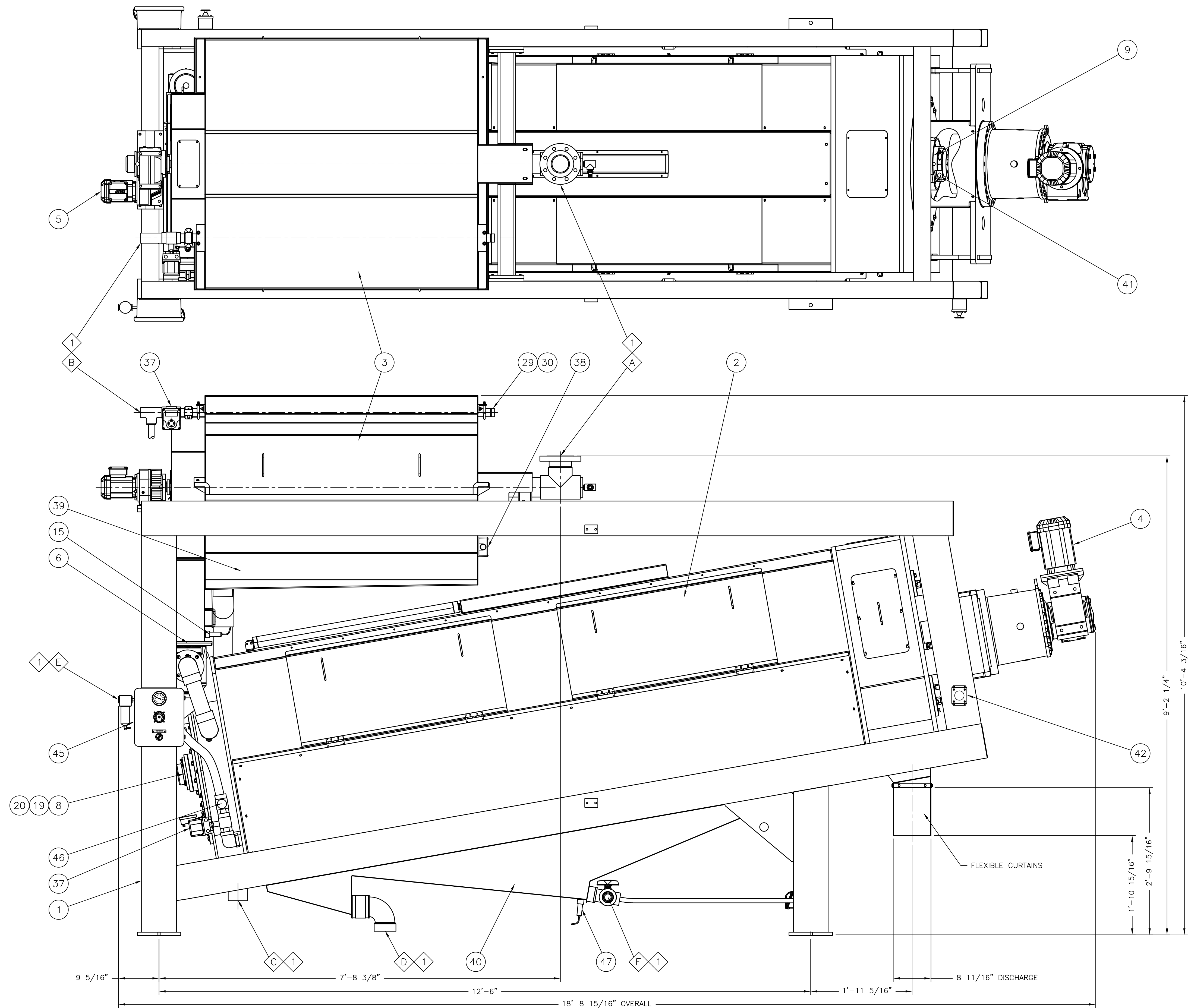
**CLAIMS** -- The buyer shall immediately inspect equipment within ten (10) days after receipt, BDP is not obligated to consider any claim for shortages or non-conformance unless notified by the buyer within ten (10) days after his receipt of the goods in question, BDP is not responsible for loss or damage in transit, however they will lend any possible assistance to the buyer in his pursuit of claim recovery.


**CANCELLATION** -- BDP will accept cancellation of this order upon receipt of payment for percentage of the contract equal to a percentage of the work completed. This shall be, at a minimum, 20% of the contract price.

**STORAGE** -- If the buyer delays shipment, then the buyer agrees to pay all invoices as they become due. The buyer further agrees to pay, in addition, storage charges computed at 1.5% per month of the invoice price of equipment stored.

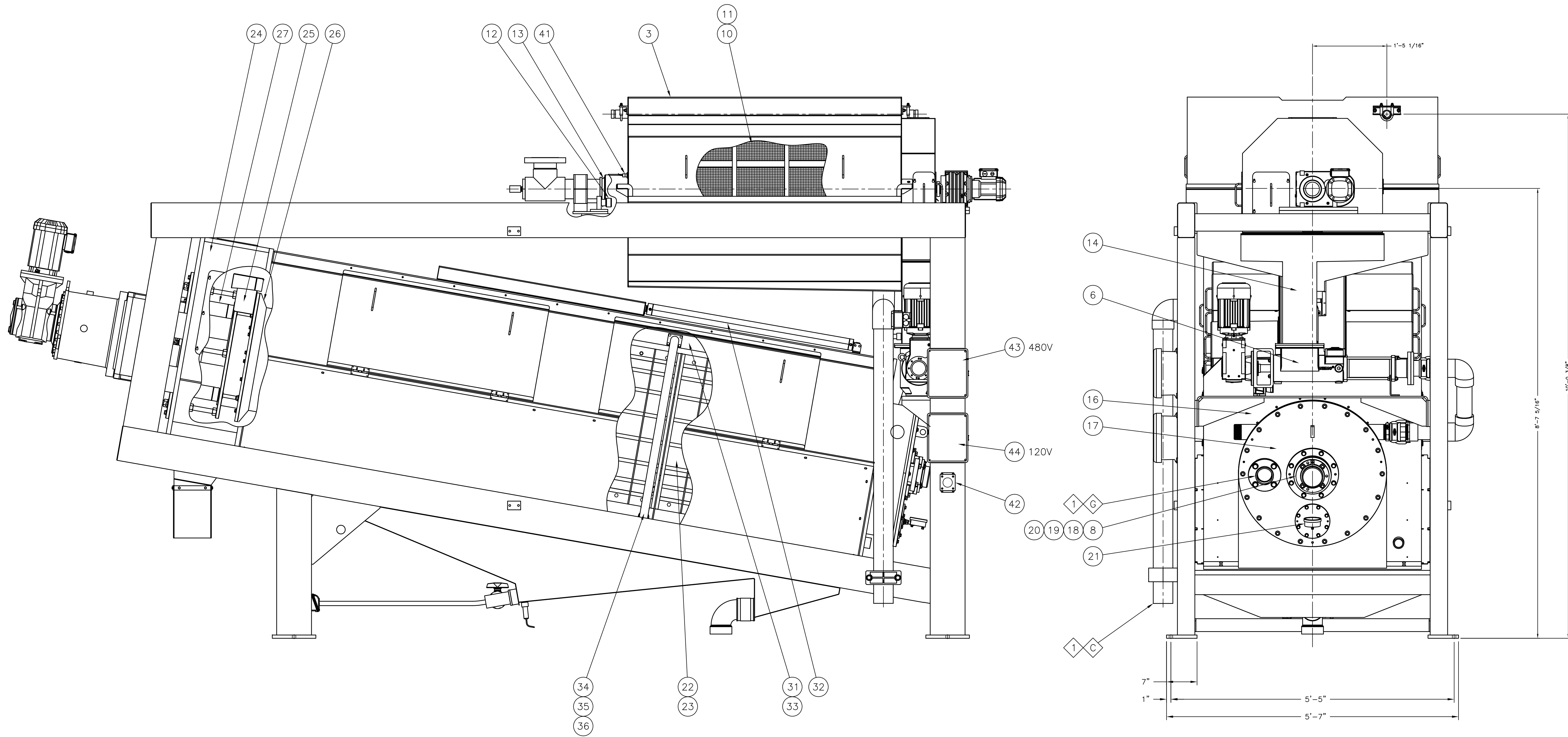
**PERMITS** -- The buyer shall assume full cost and responsibility to obtain all permits or licenses with respect to the installation and operation of the equipment covered under this agreement. This shall include all requirements by Federal, State and Local governmental bodies.

**OTHER** -- This contract shall be governed in accordance with the laws of the State of New York. These conditions and terms are the only terms and conditions that will be binding upon the parties unless amended, and acknowledged, in writing by both parties. No assignment of this proposal or any purchase order resulting here from shall be binding on BDP unless accepted in writing by BDP.

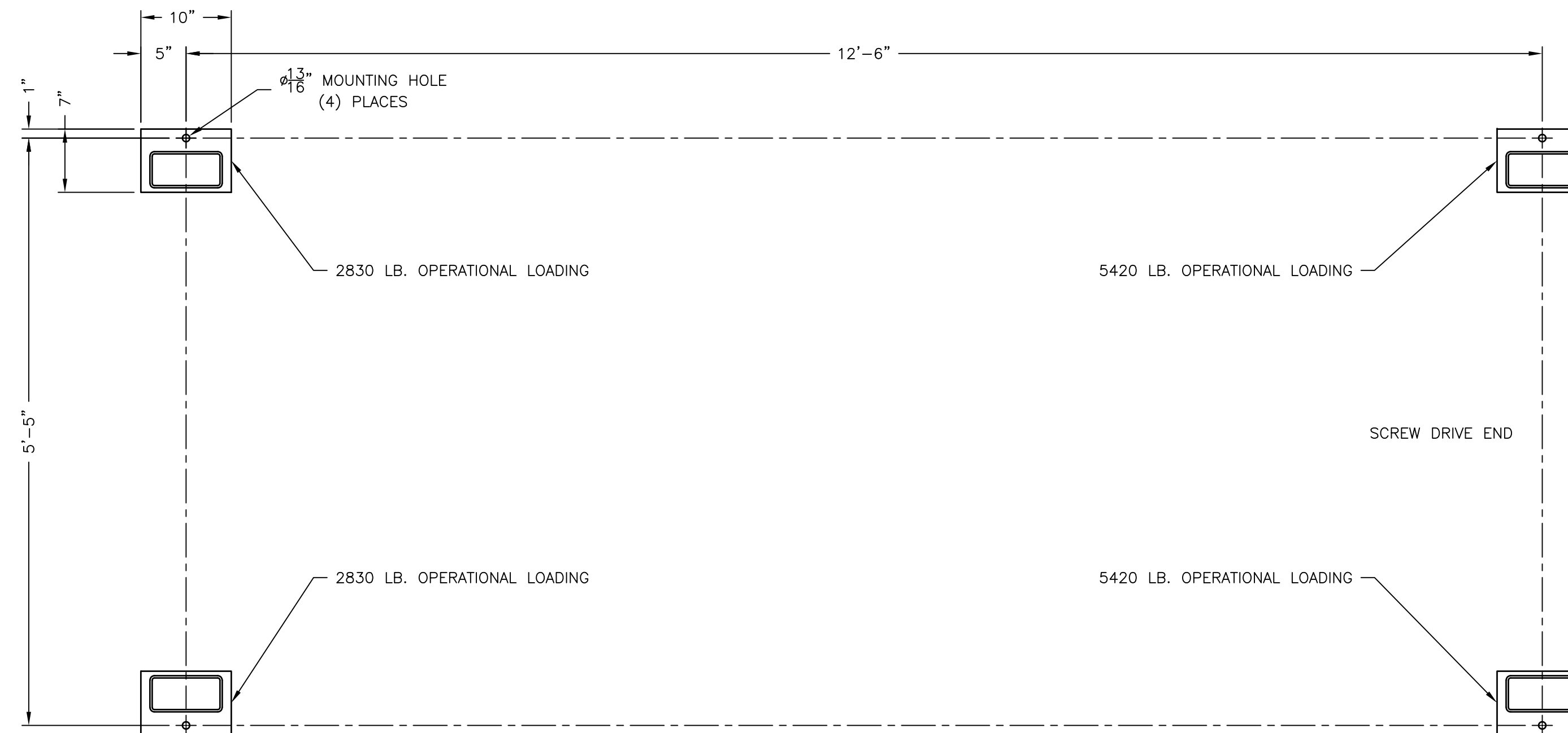


QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
		<b>BDP INDUSTRIES, INC.</b> GREENWICH, N.Y. 12834		
CUSTOMER: GREGG TOWNSHIP		MACHINE: DSP 3630		DWG TITLE GENERAL ARRANGEMENT MODEL 3630 DSP SCREW PRESS
BDP JOB NO. 1542	DWN BY: SKD	DATE: 4/1/20		
APPD BY:	SCALE:	SHT. OF 1 3	DWG NO. 1-1542-1	REV. 2

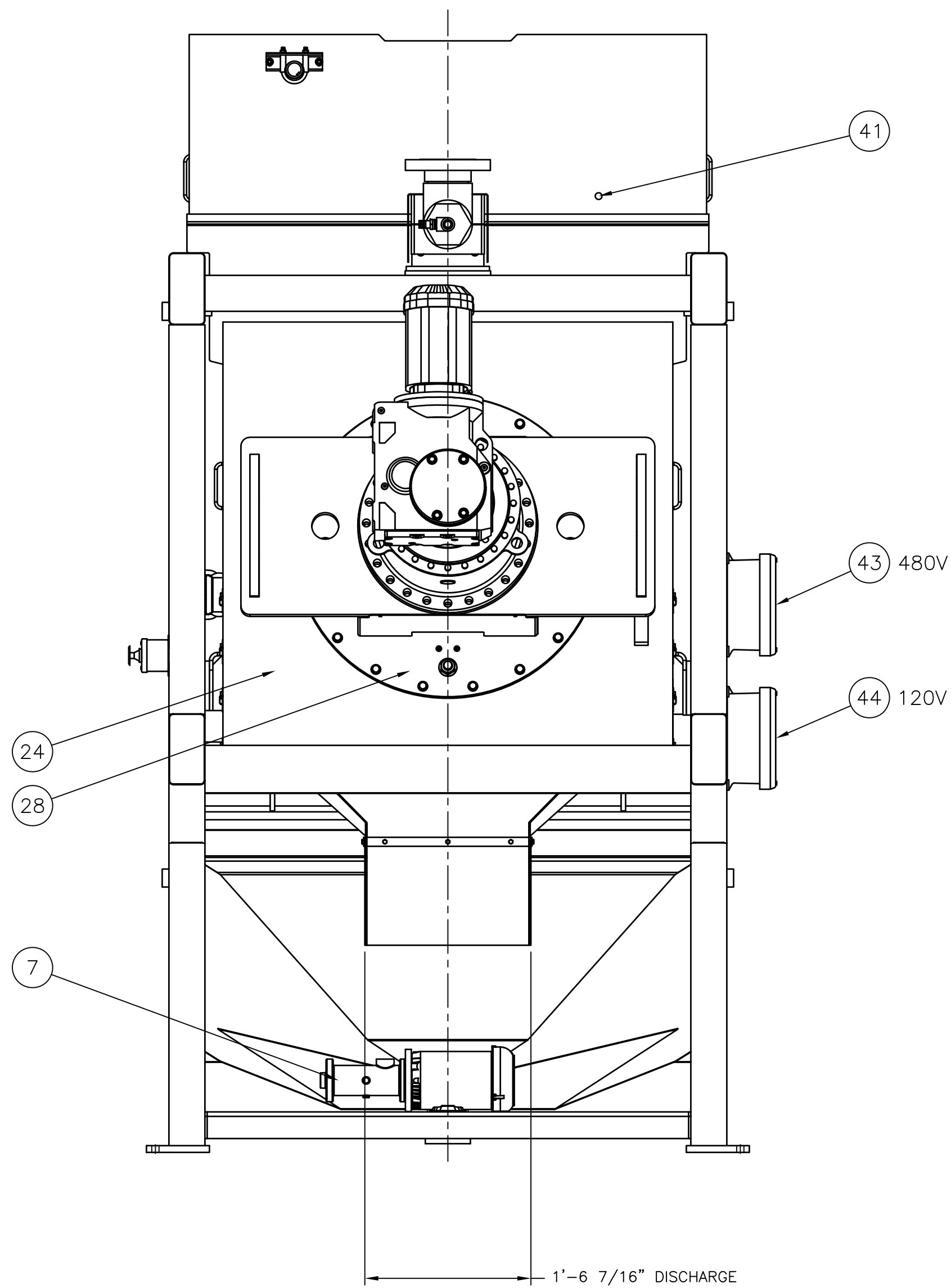




QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
		<b>BDP INDUSTRIES, INC.</b> GREENWICH, N.Y. 12834		
CUSTOMER: GREGG TOWNSHIP		MACHINE: DSP 3630		DWG TITLE GENERAL ARRANGEMENT MODEL 3630 DSP SCREW PRESS
BDP JOB NO. 1542	DWN BY: SKD	DATE: 4/1/20		
APPD BY:	SCALE:	SHT. OF 2 3	DWG NO. 1-1542-1	REV. 2



FOOTPAD LAYOUT



CONNECTION LEGEND

- ◇ A 4"-150# ANSI FEED INLET FLANGE
- ◇ B 1-1/2" NPTF WASHWATER INLET
- ◇ C 4" DRUM FILTRATE DRAIN
- ◇ D 4" SCREW SUMP PAN DRAIN
- ◇ E 1/2" NPTF PNEUMATIC PANEL INLET
- ◇ F 3/4" RECYCLE PAN SECTION DRAIN
- ◇ G 3"-150# SCREW RELIEF OUTLET FLANGE

NOTES:

- ◇ PIPING BEYOND THIS POINT INDEPENDENTLY SUPPORTED (NOT BY BDP).
- 2. FRAME IS TUBULAR STEEL A554-MT304, SAND BLASTED WITH TOP CLEAR COAT.
- 3. ALL STAINLESS STEEL SHEET AND PLATE IS TYPE 304 SS. ALL FASTENERS AND HARDWARE IS TYPE 316 SS.
- 4. ITEMS NOT OTHERWISE PROTECTED ARE COATED WITH NAPA URETHANE ENAMEL PER BDP SPECIFICATION QA94-006.
- 5. APPROXIMATE WEIGHTS: 14,500 LBS. DRY  
16,500 LBS. OPERATING
- 6. ELECTRICAL CONDUIT IS PVC.
- 7. SEW-EURODRIVE MODEL PHF022KF87DRE100LC4-IP66; 5HP, 1929:1 RATIO, 460V, M1-M4/10"/F MOUNTING POSITION, PRIMARY GEAR UNIT @ 270° 'A', CONDUIT BOX @ 0°, CABLE ENTRY '1', CCW OUTPUT ROTATION
- 8. SEW-EURODRIVE MODEL FT67BDRS71M4-IP66; .75HP, 228.99:1 RATIO, 460V, 1.625" BORE, M6A MOUNT, CONDUIT BOX AT 0°, CABLE ENTRY 'X', NON-SYMMETRICAL TORQ-LOC, RAIL HOLES
- 9. TURCK STRK-PS003V-303-LI2UPN8X-H1141/S1685.

QTY.	DESCRIPTION	MAT.	ITEM	REMARKS
1	SCREW SUMP PRESSURE SENSOR	PMC	47	PMC-MN/S-15"WC-CER-CV/P
1	PRESSURE REDUCING VALVE	MCMMASTER	46	45805K71
1	PNEUMATIC CONTROL PANEL	FRP	45	1-1534-2
1	120V ELECTRICAL JUNCTION BOX	FRP	44	
1	480V ELECTRICAL JUNCTION BOX	FRP	43	
2	EMERGENCY STOP BUTTON	ALLEN-BRADLEY	42	800H-FRXJT6A1
2	ZERO SPEED SWITCH	ALLEN-BRADLEY	41	871TM-BH8N18-H2
1	SCREW FILTRATE PAN	304 SS	40	
1	DRUM FILTRATE PAN	304 SS	39	
1	LOW WASHWATER SWITCH	SOR	38	6NN-K3-N4-F1A
2	1-1/2" ELECTRIC BALL VALVE	TRIAC	37	22-TX-150/WEA1-XX
36	SCREW SHOWER FLOODJET NOZZLE	SPRAYING SYSTEMS	36	1/8K-2
48	SCREW SHOWER VEEJET NOZZLE	SPRAYING SYSTEMS	35	H1/8VW-8004
6	SCREW SHOWER MANIFOLD	304SS	34	
4	SHOWER CARRIAGE WHEEL	NYLON	33	3-810-297
1	SCREW SHOWER AIR CYLINDER	ALLENNAIR	32	CV-2.5x44-0-SL-WR-VCR
1	SCREW SHOWER CARRIAGE	304SS	31	
4	DRUM SHOWER VEEJET NOZZLE	SPRAYING SYSTEMS	30	H1/8VW-6508
1	DRUM SHOWER HEADER	304 SS	29	3-810-520 P1
1	SCREW OUTLET BEARING PLATE	304 SS	28	
4	CONE PNEUMATIC CYLINDER	BIMBA	27	SS-703-DW
1	BACKPRESSURE CONE	UHMW	26	2-810-104 P3
1	SCREW BACKPRESSURE ASSEMBLY	304 SS	25	
1	SCREW OUTLET HOUSING	304 SS	24	
4	SCREW FILTER SCREEN ASSEMBLY	304 SS	23	
1	DEWATERING SCREW ASSEMBLY	304 SS	22	
1	SCREW PRESSURE SENSOR	TURCK	21	NOTE 9
1	SCREW INLET SHAFT SEAL	PALMETTO	20	9155-0095-981P
1	SCREW INLET SHAFT SEAL	HARWAL	19	2.438x3.25x.375 HHP1
1	INLET BEARING CARRIER ASSM.	304 SS	18	
1	INLET HOUSING END PLATE	304 SS	17	
1	SCREW INLET HOUSING	304 SS	16	
1	TRANSFER CHUTE PRESSURE SENSOR	PMC	15	PMC-MN/S-15"WC-CER-CV/P
1	DRUM TRANSFER CHUTE	304 SS	14	
1	DRUM INLET SEAL	PALMETTO	13	9155-0120-981P
2	CAM FOLLOWER BEARING, 2"	CARTER	12	SC-64-SBEU
1	DRUM FILTER MEDIA, 50" x 116"	CLEAR EDGE	11	HF7-7021
1	DEWATERING DRUM	304 SS	10	1-810-108
1	5-15/16" FLANGED BEARING	TIMKEN	9	QMCW30J515SM
1	2-7/16" FLANGED BEARING	LINKBELT	8	FCB22439E7E7CSS
1	RECYCLE PUMP, 1.5HP	SEEPEX	7	BW 2-0/A1-J0-F0-GA
1	PC SCREW FEED PUMP, 2HP	NETZSCH	6	NMO45BS01S12B
1	DRUM DRIVE	SEW-EURODRIVE	5	NOTE 8
1	SCREW PRESS DRIVE	SEW-EURODRIVE	4	NOTE 7
1	FLOCCULATION DRUM ENCLOSURE	304 SS	3	
1	SCREW PRESS ENCLOSURE	304 SS	2	
1	TUBULAR STEEL FRAME		1	A554-MT304



**BDP INDUSTRIES, INC.**  
GREENWICH, N.Y. 12834

CUSTOMER: GREGG TOWNSHIP		MACHINE: DSP 3630		DWG TITLE GENERAL ARRANGEMENT	
BDP JOB NO. 1542	DWN BY: SKD	DATE: 4/1/20	MODEL 3630 DSP SCREW PRESS		
APPD BY:	SCALE:	SHT. OF	3	3	REV. 2
DWG NO. 1-1542-1					

2	UPGRADED TO OPEN HOPPER TRANSFER	7/14/20	SKD
REV.	DESCRIPTION	DATE	BY



# PROPOSAL

PROCESS WASTEWATER TECHNOLOGIES, LLC. | 9004 Yellow Brick Rd, Suite. D, Rosedale, MD, 21237  
Phone: 410 238 7977 | Facsimile: 410 238 7559 | Email: [Volute@PWTech.us](mailto:Volute@PWTech.us) | Web: [www.PWTech.us](http://www.PWTech.us)

<b>PROJECT / REF:</b> Worcester County DPW Ocean Pines WWTP, MD	
<b>TO:</b> Matthew M. Hall	<b>DATE:</b> 9 December 2020
<b>COMPANY:</b> GMB	<b>PWT #:</b> VDPMD17103
<b>ADDRESS:</b> 206 West Main Street Salisbury, MD 21801	<b>REV:</b> 1
	<b>REP:</b> Dwight Swan
	<b>FIRM:</b> Envirep/TLC
	<b>CONTACT:</b> DSwan@Envirep.com
<b>SUBJECT:</b> Budget Price and Scope for Volute* Dewatering Press model ES-352 or ES-353 and appurtenances for the Ocean Pines WWTP	
<b>SIZING:</b> Sized to dewater 43,544 Gallons/Day of 1.5% sludge in 10 hours/6 days per week = ~85 GPM	
<b>SIZING NOTES:</b> ES-352 will handle the flow comfortably in 60 hours per week. ES-353 option is included for 40 hour a week operation, or future growth.	

### Scope of supply:

- One (1) Volute\* Dewatering Press – PWTech® Model ES-352 unit

or

- One (1) Volute\* Dewatering Press – PWTech® Model ES-353 unit

and

- One (1) Polymer Preparation System - VeloDyne Model VeloBlend VM-10P-1200-X0D
  - One (1) Influent Sludge flowmeter - Rosemount™ Model 8750W with 3" or 4" ANSI Flange connections.
  - One (1) Control system for the above
  - Documentation (Submittals and O&M Manuals)
  - Start-up and commissioning services
  - Delivery to site
- 
- Option for One (1) Volute\* Dewatering Press – PWTech® Model ES-353[2] is also included in pricing only.

\*Volute is registered with the U.S. Patent and Trademark Office as a registered trademark of AMCON, Inc., Yokohama, Japan



## Notes on Dewatering Press, PWTech Model ES-352 or ES-353

### Base unit supply

- The unit to be supplied will be an ES-352 with a MAXIMUM capacity of ~130 GPM of 1% sludge
- The Dewatering Press consists of:
  - Flash mixing tank including gear motor and tilted blade impeller mixer
  - Flocculation tank including gear motor and large cross-sectional area impeller
  - Two (2) x 350 Series Dewatering Drums, each with a drive motor,
  - Filtrate collection pan and support frame.
  - Integrated, pre-wired control panel for the unit and appurtenances mounted on the flocculation tank. (may be provided mounted separately if requested).
- Connections are:
  - Inlet: DN 3" ANSI B16.5 Class 150
  - Filtrate outlet: DN 8" ANSI B16.5 Class 150
  - Washwater Water inlet: ¾" FNPT

Or

### Base unit supply

- The unit to be supplied will be an ES-353 with a MAXIMUM capacity of ~200 GPM of 1% sludge
- The Dewatering Press consists of:
  - Flash mixing tank including gear motor and tilted blade impeller mixer
  - Flocculation tank including gear motor and large cross-sectional area impeller
  - Three (3) x 350 Series Dewatering Drums, each with a drive motor,
  - Filtrate collection pan and support frame.
  - Integrated, pre-wired control panel for the unit and appurtenances mounted on the flocculation tank. (may be provided mounted separately if requested).
- Connections are:
  - Inlet: DN 4" ANSI B16.5 Class 150
  - Filtrate outlet: DN 8" ANSI B16.5 Class 150
  - Washwater Water inlet: ¾" FNPT

### Construction

- The unit is all stainless steel. No carbon steel is used in the manufacture of the press.
- Unit is manufactured and assembled in the USA. All components are sourced from the USA or Japan.
- Electrical components are manufactured and tested prior to shipment to site in the United States.
- Dewatering drum gear drives are SEW Eurodrive gear motors utilizing helical-bevel gear reduction.
- Flocculation tank gear drives are Brother/Nissei GTR gear motors utilizing heloid gear reduction, one piece construction and are sealed for life.

### Supplied spare parts

- One (1) Washwater Solenoid Valve

See additional notes on the press appended to this proposal.



## Notes on VeloBlend Polymer Preparation unit VM-10P-1200-X0D

Polymer preparation system consists of the following components:

### Polymer Mixing Chamber

- A high energy, multi-zoned, hydro-mechanical mixing device designed to effectively activate, dilute and mix polymer and dilution water utilizing an impeller designed to produce variable intensity, back-flow mixing action to optimize polymer performance without damage to the polymer's molecular structure.
- Mixer Motor: ½ HP, 90 VDC, 1750 RPM, Wash-Down Duty with keyless shaft and left hand impeller mounting screw
- Mechanical Mixer Shaft Seal and Seal Flushing Assembly with ON/OFF Valve
- Velo-Check® neat polymer poppet style check valve specifically designed to isolate neat polymer and dilution water. The check valve shall be held in place by a quick release pin for easy assembly and disassembly
- Materials of construction are PVC and Lexan (Body), Viton, SS304 and ceramic (Seals) and SS304
- Pressure Rating: 100 psi

### Neat Polymer Metering Pump

- A stainless steel & Viton 10 GPH progressive cavity metering pump shall be provided
- ½ HP, 2500 RPM, 90 VDC, TEFC Motor with 10:1 Gear Reducer
- Thermal type loss of polymer flow sensor
- Metering pump calibration assembly with isolation valves: (1000 ml)

### Dilution Water Inlet and Solution Outlet Assembly

- Primary 120-1200 GPH controllable dilution water flow
- 1" FNPT water inlet connection with Dilution Water ON/OFF Solenoid Valve
- Low differential pressure alarm switch
- 0-160 psi inlet water pressure gauge (stainless steel, liquid filled)

### Construction

- Frame and fasteners are 304 stainless steel. Frame is open design for access to all components and is designed for bolt-down installation.

## Notes on Magnetic flowmeter, Rosemount™ Model 8750W

- 3 or 4 inch ANSI 150# flange connections.
- Coated Carbon Steel construction with a polyurethane, ceramic, neoprene, or Teflon liner as required by the application.
- All metallic wetted parts are stainless steel type 316
- Suitable for direct burial and constant flooding (IP 68).
- Includes grounding rings
- Flowmeter out-puts analogue signal (4-20 mA) to Volute\* Press Control panel

## Notes on Electrical and Control

The Volute\* unit is supplied with a pre-mounted, pre-wired control panel designed to control all aspects of the thickening/dewatering operation unless otherwise specified and noted.

- Panel is fed by a single 208, 240, or 480VAC, 3-phase, 60 Hz, power supply (client specified)



- Control panel is NEMA 4X rated manufactured in Stainless Steel type 304
- Control Panel is manufactured in a UL accredited facility and is UL listed
- Panel includes HMI and PLC control modules. Unless specified otherwise, PLC/HMI is a single Unitronics Unistream PLC unit.
- All manual switching operations are undertaken via switches on the HMI
- Unit includes complete control system for unit and ancillary equipment including operation of the polymer preparation system and VFD control for feed pump.
- Control system may utilize a system flow meter and PID loop to allow operator to set the system flow.
- System may include interlocks for Conveyor start-up, shut down and E-stop if required
- Control panel includes system running and system fault outputs to plant PLC and the ability to connect via Ethernet (ModBus TCP/IP) to external controls.
- A junction box on the polymer preparation skid is pre-wired to the polymer preparation components and designed for easy on-site connection to the main Volute\* system control panel.
- Junction box is NEMA 4X FRP and includes numbered terminal block & wires with terminal block legend.

## General Notes

### Documentation:

Scope includes all documentation including electronic copies of submittals and O&M manuals in hard copy and electronic (PDF) form.

### Start-up services:

Scope includes the following start-up services -

- Start-up and training services for four (4) consecutive days (8 hours per day, Monday-Friday) of on-site services by a PWTech field service engineer and/or manufacturer's representative including polymer and pump start-up service.
- Phone consultation regarding installation will also be provided.
- Should additional services be deemed necessary by the PURCHASER, the additional services can be procured from PWTech on a per diem basis. The current rate is \$800 per day plus travel.

### Items not included in this scope

- Engineer stamped drawings or seismic calculations.
- Taxes, permits and bonding
- Any civil works including, but not limited to, any building works, construction of suitable foundations, and access structures.
- Installation including, but not limited to, mechanical, plumbing, and electrical hook-ups
- Unloading on site and storage
- Polymer supply beyond that required for start-up unless otherwise specified herein.

### Delivery and Freight

- Submittals issued approximately six (6) weeks from receipt of written Purchase Order
- Delivery is approx. eighteen (18) weeks from receipt of written acceptance of Submittal documents
- Deliver to site for all components **is INCLUDED in this scope.**

### Governing Terms and Conditions and Warranty

- This Scope is subject to Process Wastewater Technologies, LLC. Standard Terms and Conditions and Standard Warranty as attached with the exception of the following:
  - No exceptions



## PRICE

Total price for an ES-352 and appurtenances as per this proposal:	<b>\$360,000.00</b>
Total price for an ES-353 and appurtenances as per this proposal:	<b>\$450,000.00</b>
Total price an ES-353[2]* and appurtenances as per this proposal:	<b>\$364,000.00</b>

\*This is an ES-353 but with only two dewatering drums so it has the same capacity as the ES-352. An additional drum can be added at a later date increasing the capacity of the unit by 50% to be the same as an ES-353.



## Volute Dewatering Press Data Sheet - ES-352

<b>General Data</b>	<b>Model Information</b>	Model:	ES-352	
		Over All Dimensions:	178" x 61" x 88" (L x W x H)	
		Optimal Space requirement of installation:	238" x 145" x 144" (L x W x H)	
		Minimum Opening dimensions for installation:	61" x 88"	
		Weight	Empty:	5500 lbs
			Operating:	8140 lbs
		MAX Solids throughput (Solids >4%):	1300 Dry pounds per hour	
		MAX Hydraulic throughput (Solids <1%):	130 GPM	
		Power use:	6 HP	
Washwater use (@ 50 PSI):	20 GPM intermittent, 40 GPH total			

<b>Dewatering Drum</b>	<b>General</b>	Dimension:	13.75" diameter x 72" long	
		Quantity:	2	
		Material:	Thickening Zone:	Type 304 Stainless Steel
			Dewatering Zone:	Type 304 Stainless Steel
			Screw:	304 Stainless Steel with CoCr coating
	<b>Drive info</b>	Gear Motor Supplier:	SEW Eurodrive	
		Model:	KH97 R57 DV100M4	
		Motor Power:	1.5 kW (2.2HP) 4-Pole	
		Insulation:	TEFC / IP65	
		Gear Reduction:	504 : 1	

<b>Flash mixing tanks</b>	<b>General</b>	Dimensions:	20" x 33" x 39" (L x W x H)
		Volume	112.3 Gallons
		Working Volume:	98.2 Gallons
		Material	Type 304 Stainless Steel
	<b>Drive Info</b>	Gear Motor Supplier:	Nissei Corporation
		Model:	FSW-30-15-T020 WEX
		Motor Power:	0.2 kW 4-Pole
		Motor Insulation:	TENV / IP65
		Gear Reduction:	15 : 1



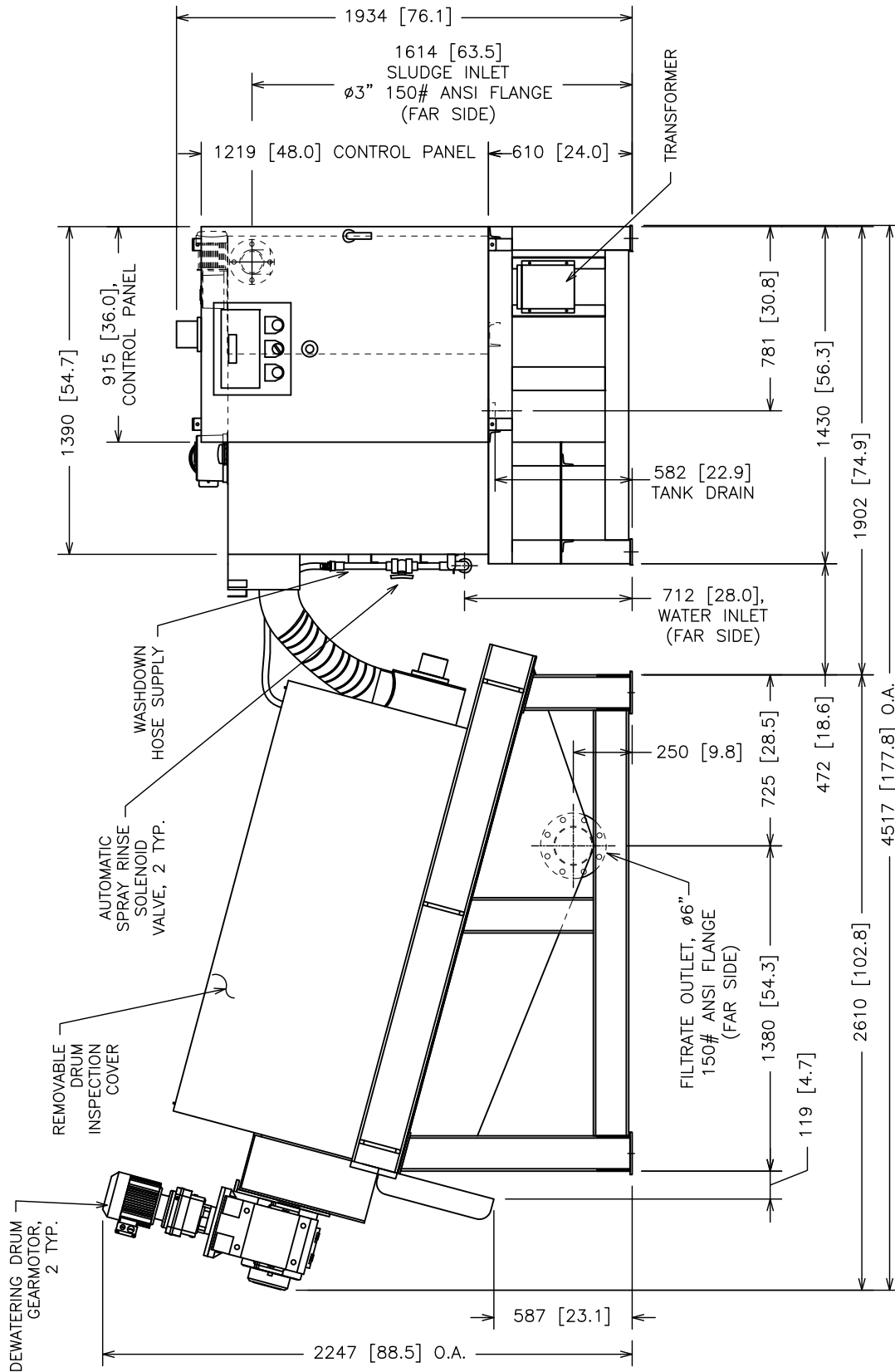
<b>Flocculation tank</b>	<b>General</b>	Dimensions:	33" x 33" x 39" (L x W x H)
		Volume	190.9 Gallons
		Working Volume:	167.0 Gallons
		Material	Type 304 Stainless Steel
	<b>Drive Info</b>	Gear Motor Supplier:	Nissei Corporation
		Model:	FSW-45-60-075 WEX
		Motor Power:	0.75 kW (1.0HP) 4-Pole
		Motor Insulation:	TEFC / IP65
		Gear Reduction:	60 : 1

<b>Electrical</b>	<b>General</b>	Supply Voltage:	208/240/440/480 VAC
		Service:	3-Phase, 3-Wire (No Neutral)
		Control Voltage:	Dual - 24VDC & 115VAC
		Minimum Required Breaker Size*:	26 Amps * 480 VAC
	<b>Panel</b>	Typical Panel Size*:	8"(w) x 48"(h) x 12"(d)
		Panel Material:	Type 304 Stainless Steel
		Panel Rating:	Nema 4X
		Standard Control Module*:	Unitronics Unistream / AB CompactLogix

<b>Polymer System</b>	Supplier:	Velocity Dynamics, Inc.
	Model:	VM-10P-1200-X0D
	Mixing Type:	Variable - Mechanical & Hydraulic
	Feed Pump Type:	Progressive Cavity
	Polymer Feed Capacity:	0.5 - 10 Gallons per hour
	Water Use:	120 - 1200 Gallons per hour
	Dimensions:	24" x 34" x 42" (L x W x H)
	Weight:	~200 lbs

<b>Connections</b>	Feed Sludge:	3" ANSI 150# Flange
	Filtrate:	6" ANSI 150# Flange
	Drain:	2" FNPT Coupling
	Water:	3/4" FNPT Coupling
	Polymer Water Inlet:	1" FNPT
	Polymer Solutions Outlet:	1"FNPT
	Raw Polymer Feed Inlet:	1"FNPT

\* Standard or typical information supplied here may be varied by the attached offer or project specifications



SIDE ELEVATION

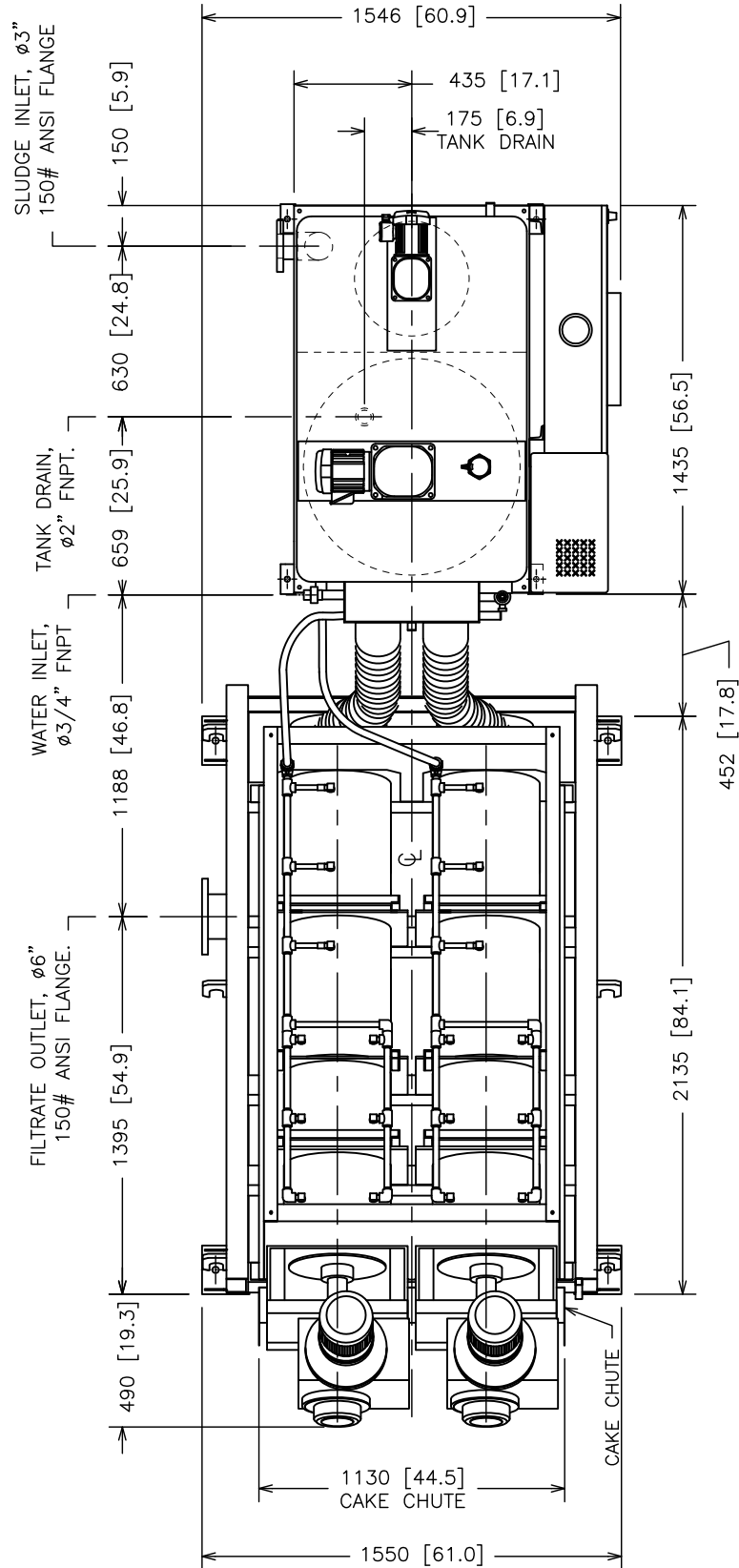
\*\*ALL METAL COMPONENTS ARE STAINLESS STEEL

DIMENSIONS: MM [INCHES]



**VOLUTE DEWATERING PRESS  
ES-352 GA DRAWING  
ELEVATION VIEW**

JOB# PWT VDP ES-352	SCALE
DATE SEPT. 2018	NTS
DRAWN PWTech Inc.	SHEET
APPROV. ALEX DAVEY	1 OF 4



PLAN VIEW

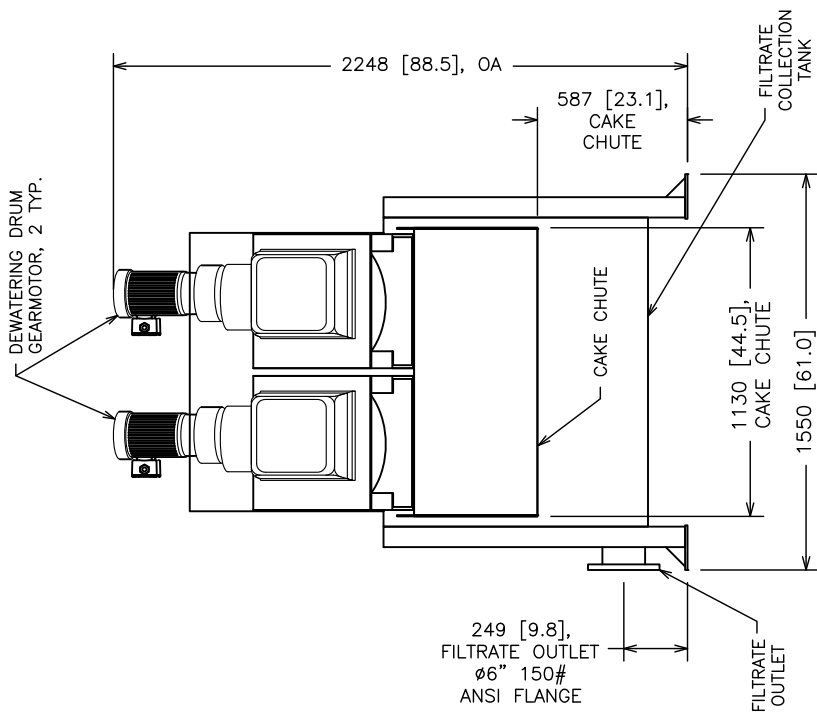
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DIMENSIONS: MM [INCHES]

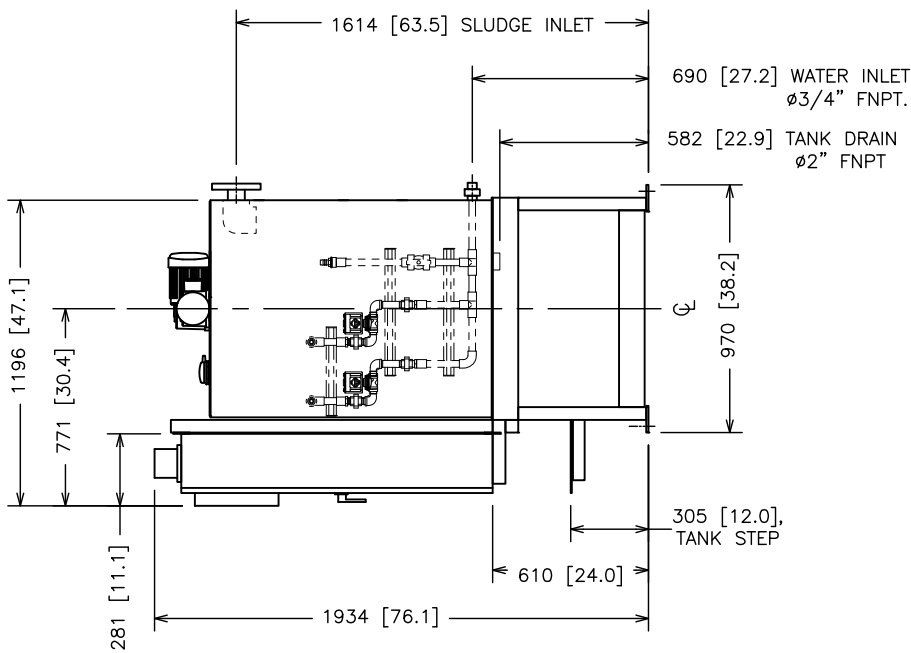


VOLUTE DEWATERING PRESS  
ES-352 GA DRAWING  
PLAN VIEW

JOB# PWT VDP ES-352	SCALE
DATE SEPT. 2018	NTS
DRAWN PWTech Inc.	SHEET
APPROV. ALEX DAVEY	2 OF 4



PRESS END ELEVATION



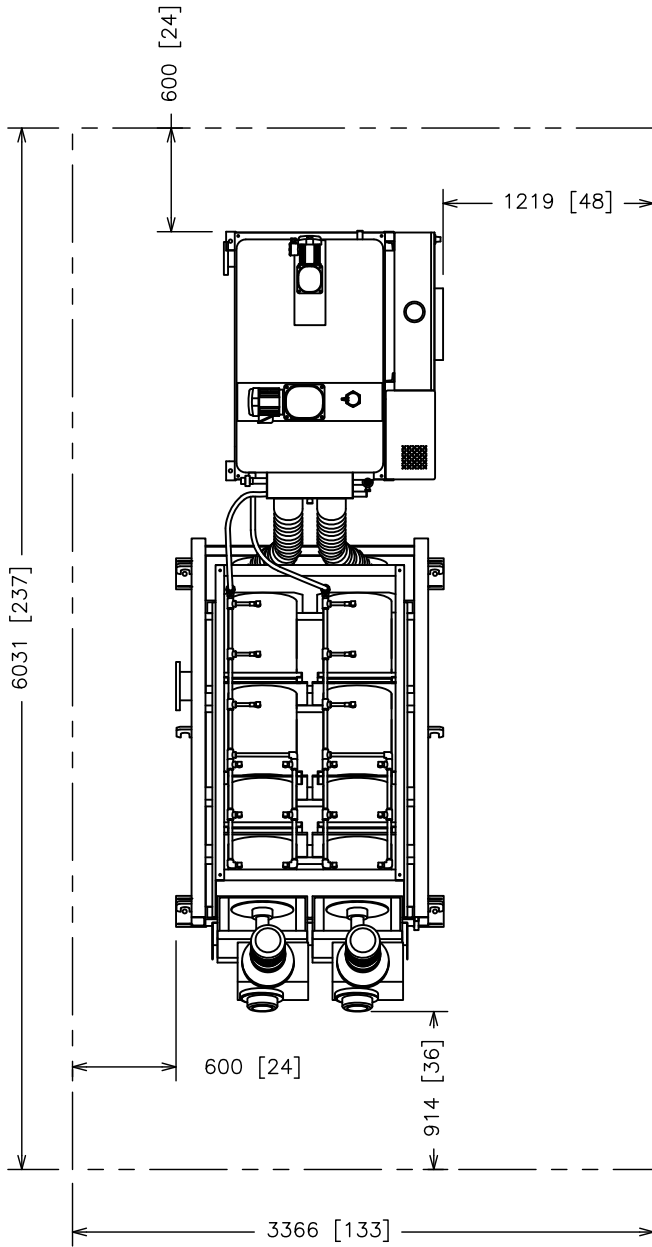
TANK END ELEVATION

DIMENSIONS: MM [INCHES]

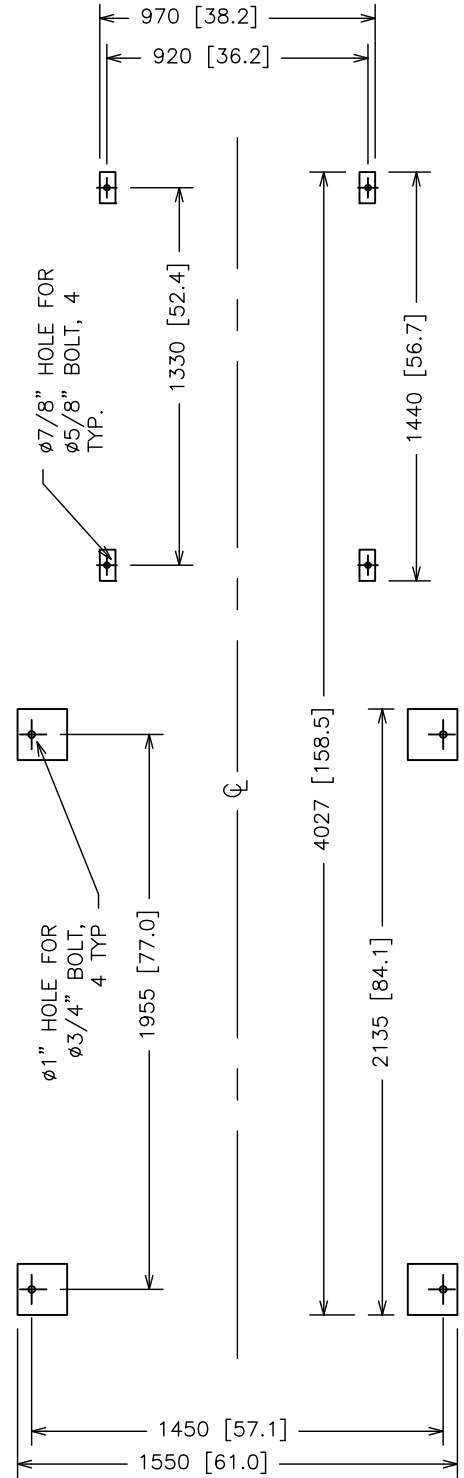


**VOLUTE DEWATERING PRESS  
ES-352 GA DRAWING  
END ELEVATIONS**

JOB# PWT VDP ES-352	SCALE
DATE SEPT. 2018	NTS
DRAWN PWTech Inc.	SHEET
APPROV. ALEX DAVEY	3 OF 4



RECOMMENDED SPACE



ANCHOR POINTS

\*\*ALL METAL COMPONENTS ARE STAINLESS STEEL

DIMENSIONS: MM [INCHES]



VOLUTE DEWATERING PRESS  
 ES-352 GA DRAWING  
 REC. SPACE & ANCHORS PTS.

JOB# PWT VDP ES-352	SCALE
DATE SEPT. 2018	NTS
DRAWN PWTech Inc.	SHEET
APPROV. ALEX DAVEY	4 OF 4



## Volute Dewatering Press Data Sheet for Model ES-353

Please note - All information here is generic and for preliminary reference only. Detailed dimensions, and other data is very project specific and this sheet has not been altered to reflect that. Project specific data would be available from PWTech at the appropriate time.

<b>General Data</b>	<b>Model Information</b>	Over All Dimensions:	183" x 83" x 88" (L x W x H)
		Optimal Space requirement of installation:	232" x 147" x 144" (L x W x H)
		Min Opening dimensions for installation:	60" x 84"
		Weight	Empty: 7480 lbs
			Operating: 11,550 lbs
		MAX Solids throughput (Solids >4%):	2000 Dry pounds per hour
		MAX Hydraulic throughput (Solids <1%):	200 GPM
		Power use:	12.4 HP
	Washwater use (@ 50 PSI):	20 GPM intermittent, 60 GPH total	

<b>Dewatering Drum</b>	<b>General</b>	Dimension:	13.75" diameter x 72" long	
		Quantity:	3	
		Material:	Rings, Tierods, spacers:	Type 304 Stainless Steel
			Screw:	304 Stainless Steel with CoCr coating
	<b>Drive info</b>	Gear Motor Supplier:	SEW Eurodrive	
		Model:	KH97R57DRN90L4-504	
		Motor Power:	1.5 kW (2.0HP) 4-Pole	
		Insulation:	TEFC / IP65	
		Gear Reduction:	199 : 1	

<b>Flash mixing tanks</b>	<b>General</b>	Dimensions:	24" x 39" x 43" (L x W x H)
		Volume	174.4 Gallons
		Working Volume:	154.6 Gallons
		Material	Type 304 Stainless Steel
	<b>Drive Info</b>	Gear Motor Supplier:	Nissei Corporation
		Model:	FSW-35-15-T040 WEX
		Motor Power:	0.4 kW 4-Pole
		Motor Insulation:	TENV / IP65
		Gear Reduction:	15 : 1

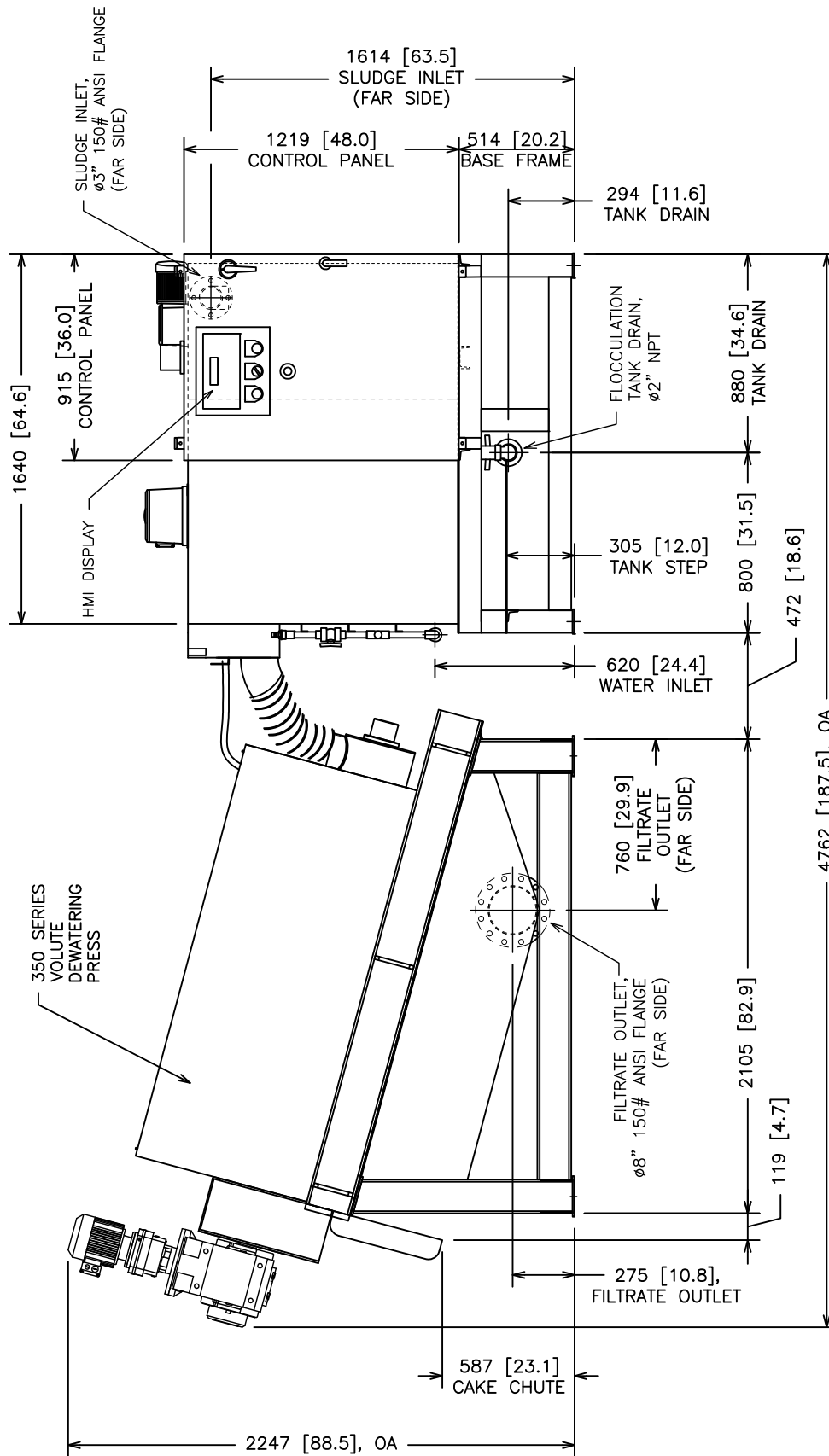
<b>Flocculation tank</b>	<b>General</b>	Dimensions:	39" x 39" x 43" (L x W x H)
		Volume	290.6 Gallons
		Working Volume:	154.6 Gallons
		Material	Type 304 Stainless Steel
	<b>Drive Info</b>	Gear Motor Supplier:	Nissei Corporation
		Model:	FSW-55-60-150 WEX
		Motor Power:	1.5 kW (2.0HP) 4-Pole
		Motor Insulation:	TEFC / IP65
	Gear Reduction:	60 : 1	

<b>Electrical</b>	<b>General</b>	Supply Voltage:	208/240/440/480 VAC
		Service:	3-Phase, 3-Wire (No Neutral)
		Control Voltage:	Dual - 24VDC & 115VAC
		Minimum Required Breaker Size:*	40 Amps * 480 VAC
	<b>Panel</b>	Panel Size:	36"(w) x 48"(h) x 12"(d)
		Panel Material:	Type 304 Stainless Steel
		Panel Rating:	Nema 4X
	Std. Control Module:	Unitronics Unistream 10.4 / AB CompactLogix PLC	

<b>Polymer System</b>	Supplier:	Velocity Dynamics, Inc.
	Model:	VM-10P-1200-X0D
	Mixing Type:	Variable - Mechanical & Hydraulic
	Feed Pump Type:	Progressive Cavity
	Polymer Feed Capacity:	0.5 - 10 Gallons per hour
	Water Use:	120 - 1200 Gallons per hour
	Dimensions:	24" x 34" x 42" (L x W x H)
	Weight:	~200 lbs

<b>Connections</b>	Feed Sludge:	3 or 4" ANSI 150# Flange
	Filtrate:	8" ANSI 150# Flange
	Drain:	2" FNPT Coupling
	Water:	3/4" FNPT Coupling
	Polymer Water Inlet:	1" FNPT
	Polymer Solutions Outlet:	1"FNPT
	Raw Polymer Feed Inlet:	1"FNPT

\* Breaker sizing for control panel is impacted by many site specific factors including feed pump and conveying requirements. This number is simply provided as an indication of what may be expected in a typical installation.



DIMENSIONS: MM [INCHES]

SIDE ELEVATION

\*\*ALL METAL COMPONENTS ARE STAINLESS STEEL



**VOLUTE DEWATERING PRESS**  
**ES353 GA DRAWING**  
**ELEVATION VIEW**

JOB# PWT VDP ES353

DATE 03 MARCH, 2015

DRAWN PWTech LLC.

APPROV. ALEX DAVEY

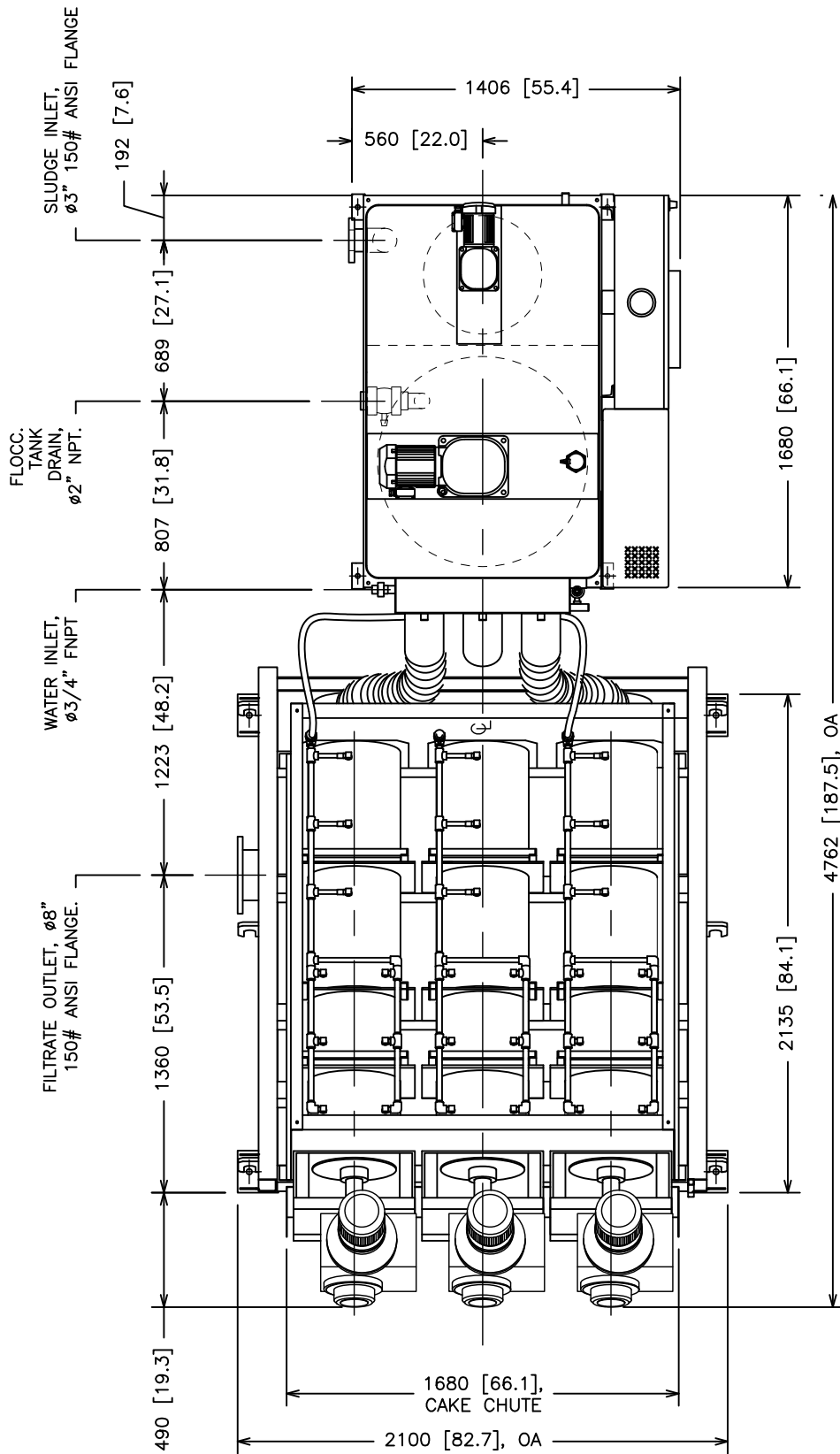
SCALE

NTS

SHEET

1 OF 4





PLAN VIEW

\*\*ALL METAL COMPONENTS ARE STAINLESS STEEL

DIMENSIONS: MM [INCHES]



VOLUTE DEWATERING PRESS  
ES353 GA DRAWING  
PLAN VIEW

JOB# PWT VDP ES353

DATE 03 MARCH, 2015

DRAWN PWTech LLC.

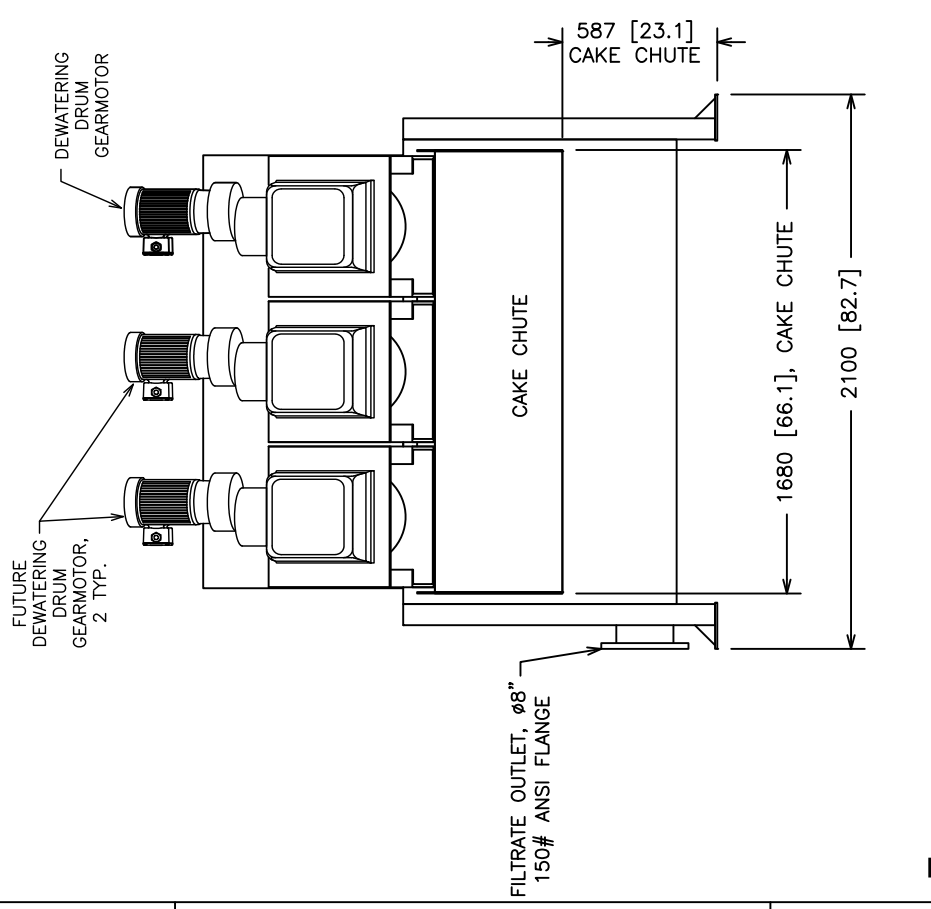
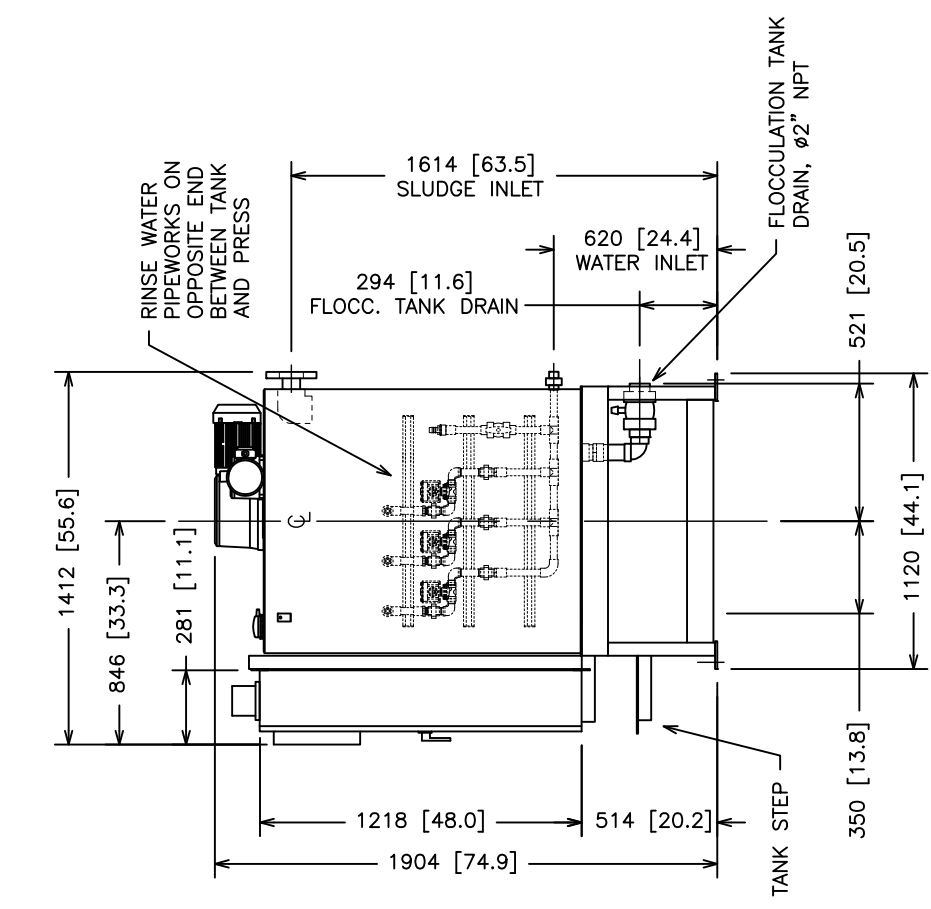
APPROV. ALEX DAVEY

SCALE

NTS

SHEET

2 OF 4



DIMENSIONS: MM [INCHES]

TANK END ELEVATION

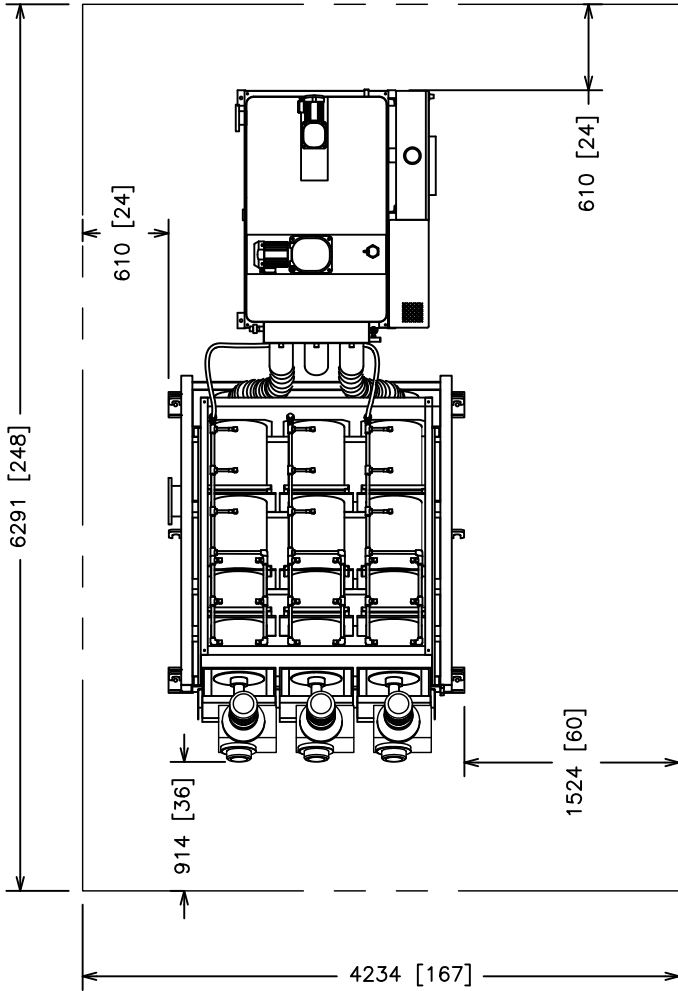
PRESS END ELEVATION

\*\*ALL METAL COMPONENTS ARE STAINLESS STEEL

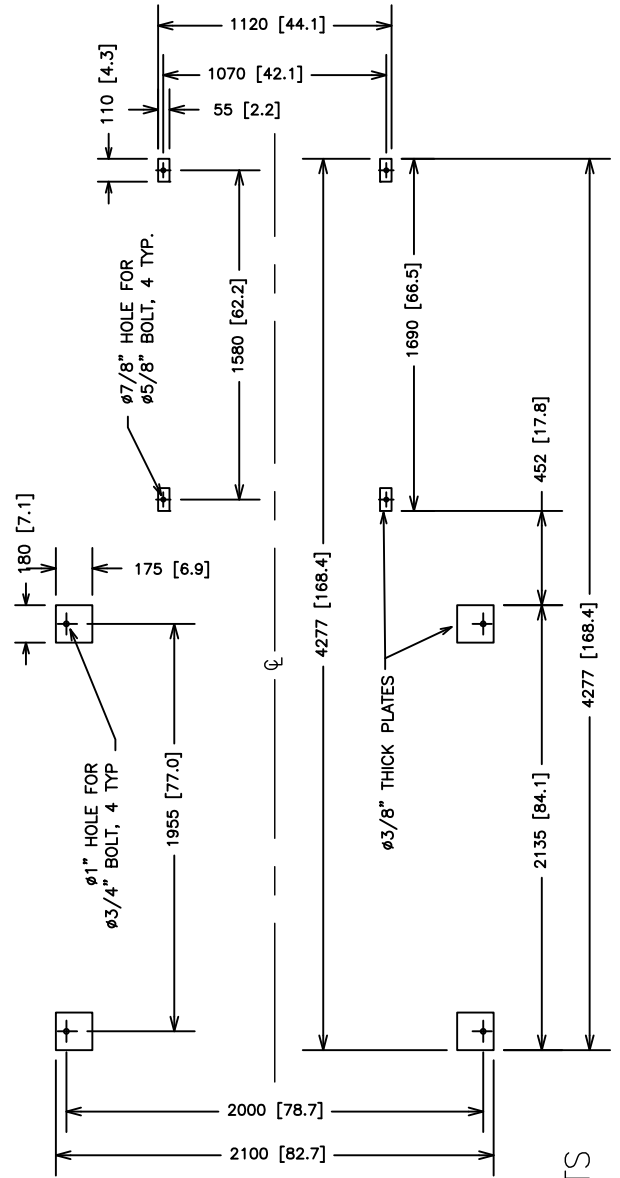


**VOLUTE DEWATERING PRESS  
ES353 GA DRAWING  
END ELEVATION**

JOB# PWT VDP ES353	SCALE
DATE 03 MARCH, 2015	NTS
DRAWN PWTech LLC.	SHEET
APPROV. ALEX DAVEY	3 OF 4



RECOMMENDED SPACE



ANCHOR POINTS

DIMENSIONS: MM [INCHES]



VOLUTE DEWATERING PRESS  
 ES353 GA DRAWING  
 REC. SPACE & ANCHORS PTS.

JOB# PWT VDP ES353	SCALE NTS
DATE 03 MARCH, 2015	
DRAWN PWTech LLC.	SHEET
APPROV. ALEX DAVEY	4 OF 4

VELOBLEND MODEL: VM-0P-XXX-X

DILUTION WATER:

1.  $\phi 1$ " FNPT INLET
2. X TO XX GPM FLOW RANGE

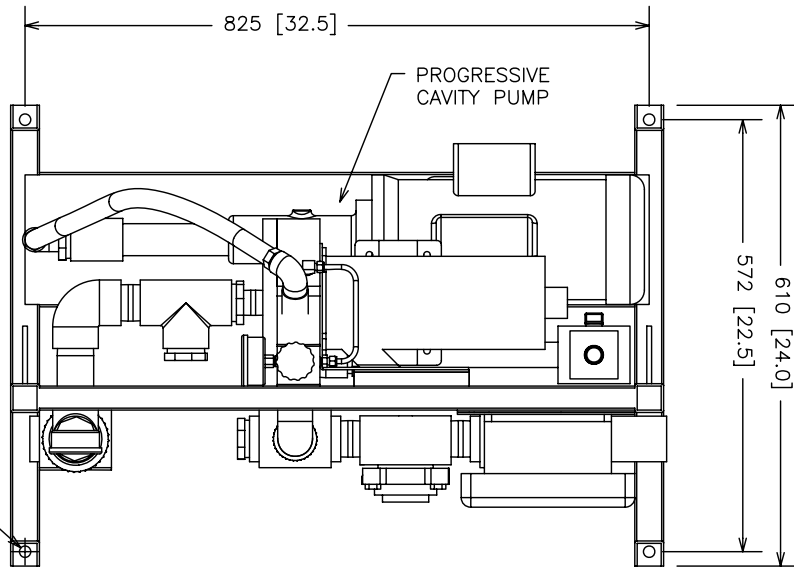
POLYMER:

1.  $\phi 1$ " FNPT INLET
2. X.XX TO X GPH FLOW RANGE

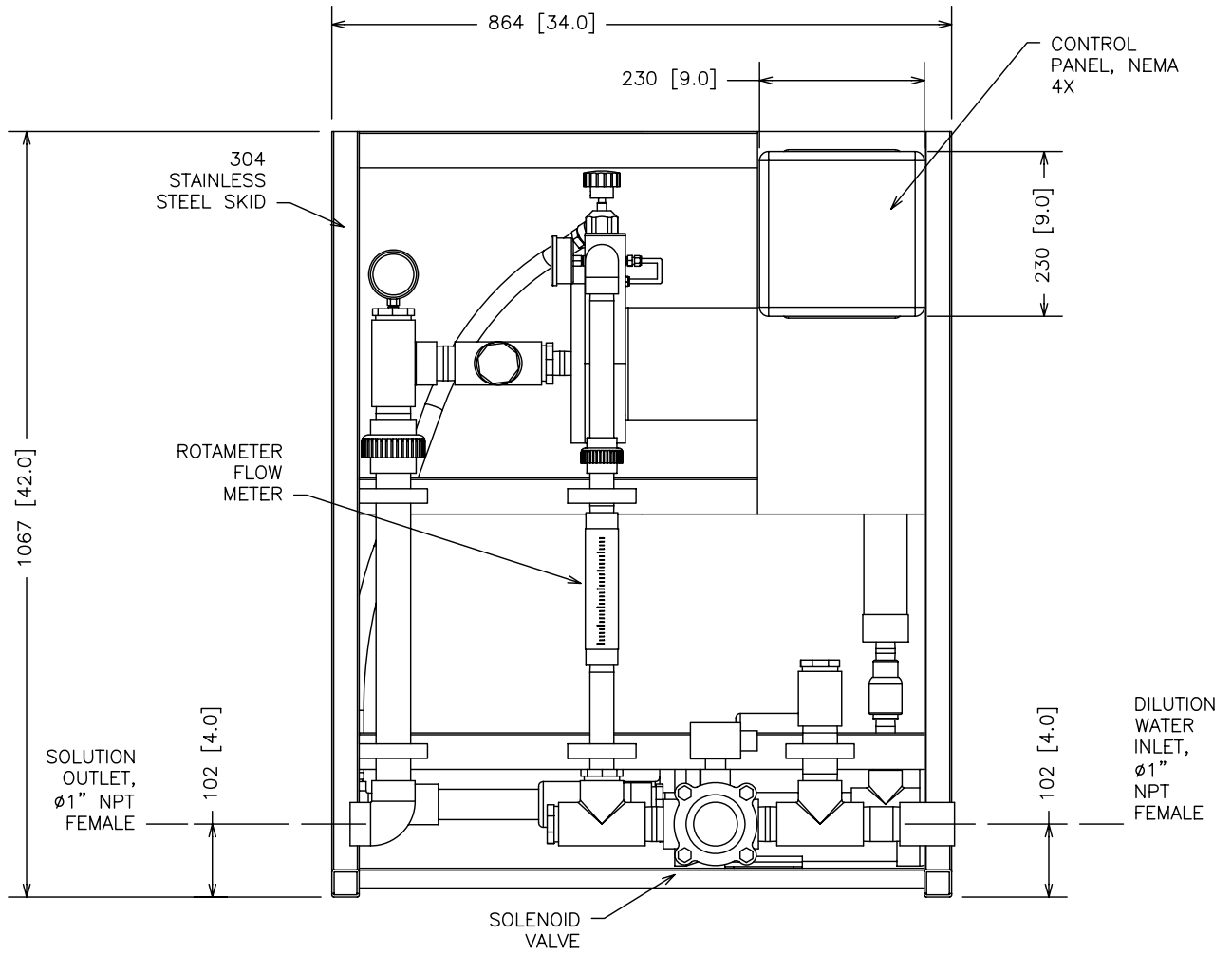
SOLUTION:

1.  $\phi 1$ " FNPT OUTLET

$\phi 15$  [ $\phi 0.6$ ]  
THRU, 4 TYP.



PLAN



ELEVATION

DIMENSIONS: MM [INCHES]



VELODYNE POLYMER PUMP  
VM-P-XXX-X GA DRAWING  
FRONT ELEVATION & PLAN

JOB# PWT VM-P-XXX-X

DATE 23 MAR 2009

DRAWN PWTech Inc.

APPROV. ALEX DAVEY

SCALE

NTS

SHEET

1 OF 2

VELOBLEND\_MODEL: VM-P-XXX-X

DILUTION WATER:

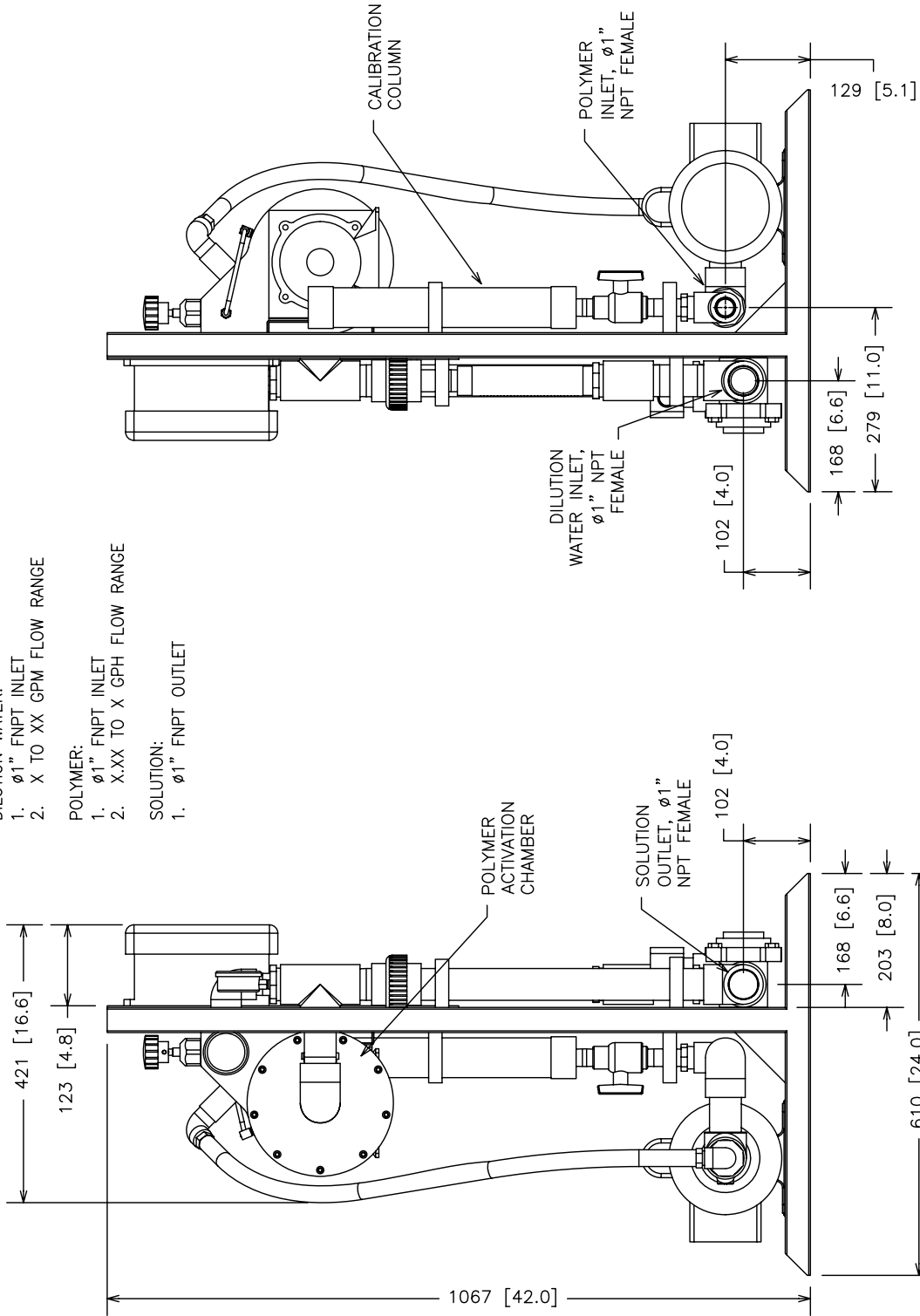
1.  $\phi 1$ " FNPT INLET
2. X TO XX GPM FLOW RANGE

POLYMER:

1.  $\phi 1$ " FNPT INLET
2. X:XX TO X GPH FLOW RANGE

SOLUTION:

1.  $\phi 1$ " FNPT OUTLET



RIGHT ELEVATION

LEFT ELEVATION

DIMENSIONS: MM [INCHES]



VELODYNE POLYMER PUMP  
VM-P-XXX-X GA DRAWING  
RIGHT & LEFT ELEVATION

JOB# PWT VM-P-XXX-X

DATE 23 MAR 2009

DRAWN PWTech Inc.

APPROV. ALEX DAVEY

SCALE

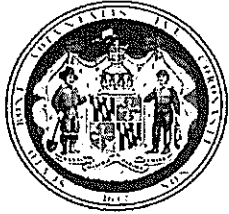
NTS

SHEET

2 OF 2

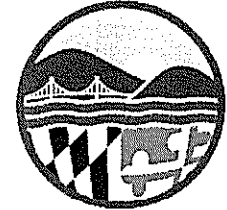
**APPENDIX G**  
**SLUDGE UTILIZAITON**  
**PERMIT**

# MARYLAND DEPARTMENT OF THE ENVIRONMENT



Larry Hogan  
Governor

Land Management Administration • Resource Management Program  
1800 Washington Boulevard • Suite 610 • Baltimore, Maryland 21230-1719  
410-537-3314 • 800-633-6101 x3314 • [www.mde.maryland.gov](http://www.mde.maryland.gov)



Ben Grumbles  
Secretary

## Sewage Sludge Utilization Permit Number: 2016-STR-4965

**ISSUE DATE:** February 22, 2017

**EXPIRATION DATE:** February 21, 2027

**Issued to:** Worcester County

**Authorizing:** The transportation of sewage sludge as specified in this permit

**From:** The Ocean Pines Wastewater Treatment Plant located in Worcester County

**To:** The Central Municipal Landfill located at 7901 Central Site Lane in Worcester County, Maryland

*This permit is renewed pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder, and is subject to the attached terms and conditions, and compliance with all applicable laws and regulations.*

Hilary Miller, Director  
Land Management Administration

*This permit is granted in accordance with the referenced documents in Part I, and subject to the terms and conditions specified in Parts II and III of this permit as follows:*

**Part I: Referenced Documents** - Permit application, plans and specifications and other pertinent documents submitted to the Department:

1. Sewage Sludge Utilization (SSU) Permit Application and supporting documents submitted by Worcester County Department of Works, Water and Wastewater Division, dated January 21, 2003 and received on January 27, 2003.
2. SSU Permit Renewal Application and supporting documents submitted by Worcester County Department of Works, Water and Wastewater Division, dated August 28, 2007 and received on September 7, 2007.
3. SSU Permit Renewal Application and supporting documents submitted by Worcester County Department of Works, Water and Wastewater Division, dated January 23, 2012 and received on January 25, 2012.
4. SSU Permit Renewal Application and supporting documents submitted by Worcester County, dated December 1, 2016 and received on December 13, 2016.

**Part II: Site Specific Conditions (Applicable to Sewage Sludge Transportation)** - conditions which amend all other permit conditions applicable to this activity should any discrepancies or conflicts exist.

**Transportation Authorization:**

1. This permit authorizes only the transportation of aerobically digested sewage sludge generated by the Ocean Pines Wastewater Treatment Plant to the Central Municipal Landfill located in Worcester County, Maryland.
2. The permittee shall not transport sewage sludge to destinations other than authorized by this permit, including out-of-State, without first obtaining a separate SSU Permit issued by the Department.



**Part III: General Conditions (Applicable to Sewage Sludge Transportation)** - conditions which are generally applicable to transportation of sewage sludge.

**A. Property Rights:**

The issuance of this permit does not intend to convey any property rights in either real or personal property, or any exclusive privilege or franchise, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

**B. Suspension or Revocation:**

1. This permit may be suspended or revoked if the permittee lacks, or is in violation of, any federal, State or local approval necessary to conduct the activity authorized by this permit.
2. The Department may suspend, revoke, or modify this permit if the Department finds that:
  - a. False or inaccurate information was contained in the permit application, the information and forms required as part of the permit application, or the information required under the permit;
  - b. There has been a substantial deviation from:
    - i. The documents accepted by the Department as part of this permit application; or
    - ii. Any requirement established by the Department;
  - c. A representative of the Department has been denied entry to any area in which activities regulated by this permit are conducted or to any documents required to be maintained by this permit;
  - d. Conditions exist which constitute a health nuisance or danger to the environment, or result in persistent or repeated odors;
  - e. The permittee has been negligent or incompetent in the utilization of sewage sludge;
  - f. There is or has been a violation of the terms and conditions of this permit or any applicable State law or regulation; or
  - g. There is any other good cause.

**C. Civil or Criminal Liability:**

Nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for non-compliance with Title 9 of the Environment Article, Annotated Code of Maryland, or any federal, local or other State laws or regulations.

**D. Right of Entry:**

The permittee shall ensure that the Secretary of the Maryland Department of the Environment, or the local health official, or their authorized representatives are permitted, at reasonable times and upon presentation of credentials to:

1. Enter upon the permittee's premises or where any records are required to be kept under the terms and conditions of this permit;
2. Have access to and copy any records required to be kept under the terms and conditions of this permit;
3. Inspect any collection, transport vehicles, treatment, pollution management, or control facilities required under this permit;
4. Perform any activities to determine compliance status with the terms and conditions of this permit or the applicable regulations; and
5. Obtain any photographic documentation or evidence.

**E. Transportation:**

1. The permittee is authorized to transport sewage sludge as specified in the SSU Permit Application and its supporting documents referenced in Part I of this permit.
2. The haul route shall be in accordance with a plan as specified in the SSU Permit Application and its supporting documents referenced in Part I of this permit.
3. Liquid sewage sludge (with solids content less than 15%) may be pumped and transported by pipeline. If liquid sewage sludge is transported by truck, rail, or barge, the permittee shall use closed watertight vessels such as tank trucks and railroad tank cars.
4. Sewage sludge cake with solids content between 15 and 20% may be transported in watertight boxes, such as dump trucks or dump trailers properly sealed to prevent leaks, or closed body vehicles (such as concrete

mixer trucks). When sewage sludge cake is transported in dump trucks or dump trailers, the permittee shall comply with the following standards:

- a. The trucks shall be equipped with metal splash guards firmly attached horizontally at the front and rear of the trailer;
- b. Each splash guard shall cover at least 25% of the trailer's open area and have no gaps through which sewage sludge may escape; and
- c. A minimum two feet of freeboard shall be maintained between the sewage sludge and the top of the trailer unless the top of the trailer is completely sealed.

5. Sewage sludge cake with solids content between 20 and 35% may be transported in watertight boxes, such as dump trucks or dump trailers properly sealed to prevent leaks, or closed body vehicles (such as concrete mixer trucks). When sewage sludge cake is transported in dump trucks or dump trailers, the permittee shall comply with the following standards:

- a. The permittee shall ensure that the transporting trucks are equipped with metal splash guards firmly welded horizontally to the front and rear body of the trailer. Each splash guard shall cover at least four feet of the length of the trailer. No gaps through which sewage sludge may escape shall exist between the splash guards and the trailer body;
- b. A medium to heavy-duty solid vinyl tarp shall cover the open area of the trailer and shall overlap the splash guards horizontally by a minimum of one foot. The tarp shall be drawn tightly across the top of the trailer and be firmly held in place with straps that are attached to ratchets bolted to the trailer. The tarp shall cover the top of the trailer so that there is no vertical gap through which sewage sludge may escape between the tarp and the sides of the trailer, or the tarp and the splash guards;
- c. For sewage sludge cake with solids content between 20 and 25%, a minimum of two feet of freeboard must be maintained between the sewage sludge and the top of the transport vehicle.
- d. For sewage sludge cake with solids content between 25 and 35%, a minimum of one foot of freeboard must be maintained between the sewage sludge and the top of the transport vehicle.

6. Dried sewage sludge (with solids content greater than 35%) may be transported in open boxes, such as dump trucks, which are properly sealed to prevent leakage. The permittee shall cover the trucks with tarps or the equivalent.
7. The permittee shall clean the transport vehicle(s) on site to prevent drag-out of dirt or sewage sludge onto public roads. In the event dirt or sewage sludge is tracked out onto the roads, the permittee shall immediately initiate clean-up activities.
8. The permittee shall have available in the cab of each transport vehicle(s) a copy of page one of this SSU Permit, and a copy of the sewage sludge analysis report that was submitted to the Department as part of this permit application submittal.

**F. Spill Control:**

1. The permittee shall report to the Department, within one hour of becoming aware of its occurrence, any spills or unauthorized discharges of sewage sludge occurring either in transit or due to site conditions at either (410) 537-3315 during working hours, or at (866) 633-4686 during non-working hours.
2. In the event of a spill, the permittee shall ensure that cleanup procedures are initiated as soon as possible, but no later than two hours after becoming aware of the spill. The permittee shall complete the cleanup to the satisfaction of the Department.

**G. Recordkeeping and Reporting Requirements:**

1. The permittee shall keep all records required by this permit and the following information:
  - a. The source(s) and type(s) of sewage sludge that was transported;
  - b. The quantity, including documentation, of the sewage sludge that was transported;
  - c. The types of treatment the transported sewage sludge received;
  - d. The dates of transportation of treated and untreated sewage sludge;
  - e. The destinations and final utilization of treated and untreated sewage sludge;
  - f. Descriptions of problems encountered and their solutions;

- g. Other related information regarding transportation of sewage sludge as required by this permit; and
  - h. Other information as requested by the Department.
2. The permittee shall submit these records to the Department by **February 15** of each year this permit is in effect on the form provided by the Department.
  3. The permittee shall maintain all records required by this permit for a period of ten years after generation of the records.
  4. The permittee shall submit all reports required by this permit to:

**Maryland Department of the Environment  
Land Management Administration  
Resource Management Program  
1800 Washington Boulevard, Suite 610  
Baltimore, Maryland 21230-1719.**

**H. Modification:**

Any modification to this activity must be approved by the Department in writing before implementation by the permittee.

**I. Application for Renewal:**

At least two calendar weeks before the expiration date of this permit, unless the Department has granted permission for a later date, the permittee shall submit an application for a permit renewal or notify the Department of the intent to cease operating by the expiration date. In the event that a timely and complete permit renewal application has been submitted and the Department is unable, through no fault of the permittee, to issue a permit renewal before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable until a new permit is issued or a determination is made on the status of the renewal application.

**J. Transfer of Permit or Ownership:**

1. This permit is only valid for the permittee named unless the Department has transferred the permit in writing after a request by the permittee under Code of Maryland Regulations (COMAR) 26.04.06.72.
2. Within 30 calendar days of any change in control or ownership of the property, the permittee shall provide the succeeding owner(s), by certified

mail, with a copy of this permit, and notify the succeeding owner(s) of any outstanding permit noncompliance. At the same time, the permittee shall provide the Department with a copy of the notification.

**K. Compliance:**

1. The permittee shall comply with the terms and conditions of this permit, and with all applicable federal, local and State laws and regulations.
2. If for any reason the permittee does not comply or is unable to comply with any of the terms or conditions of this permit, the permittee shall notify the Department at (410) 537-3315 on the same day or on the next working day, following any noncompliance. Within five (5) calendar days after this notification, the permittee shall provide the Department with the following information in writing:
  - a. Description of the noncompliance, including dates, time, and type of noncompliance;
  - b. Cause of the noncompliance;
  - c. Anticipated time the noncompliance is expected to continue or if such condition has been corrected;
  - d. Steps taken by the permittee to correct the noncompliance; and
  - e. Steps to be taken by the permittee to prevent recurrence of the noncompliance.
3. If the permittee discovers through any means, including notification by the Department, that a noncompliance with any condition of this permit has occurred, the permittee shall immediately take all necessary steps to eliminate the condition of noncompliance and to minimize the adverse impact on public health, safety, welfare, or the environment.
4. If the permittee discovers that a noncompliance with any condition of this permit has affected the public health, safety, welfare, or the environment, the permittee shall immediately notify the Department.

**L. Severability:**

If any provision of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect, and such invalid provision shall be considered severed and deleted from this permit.

**M. Signatory Requirements:**

All applications, request for modifications or transfer, renewal requests, reports, or information submitted to the Department shall be signed and verified in accordance with Section 1-201 of the Environment Article, Annotated Code of Maryland, by the permittee or authorized representative of the permittee as being true.

## Sewage Sludge Utilization (SSU) Permit Annual Report

Reporting period \_\_\_\_ / \_\_\_\_ / \_\_\_\_ to \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Permittee: \_\_\_\_\_ SSU Permit #: \_\_\_\_\_ Exp. Date: \_\_\_\_\_

Please use a separate report form for each SSU Permit. Questions or for additional information, please call the Department at (410) 537-3314. This report is due to the Department by **February 15** following each year the SSU Permit is in effect. Mail completed form to:

Maryland Department of the Environment  
Land Management Administration  
Resource Management Program  
1800 Washington Blvd, Suite 610  
Baltimore MD 21230-1719

*Please check the applicable permit type and provide the required information on the established report form.*

- Transportation Permit
- Disposal or Alternative Utilization at a Municipal Landfill Permit

Quantity of sewage sludge transported from the facility and its final utilization - Please use Table 2 on Page 3.

Destination Name: \_\_\_\_\_ County: \_\_\_\_\_  
*(where the sewage sludge is being transported to/disposed at)*

Destination Address: \_\_\_\_\_

- Composting Facility Permit
- Treatment Facility Permit
- Energy Generation/Incineration Facility Permit
- Marketing Permit
- Storage Facility Permit
- Distribution Facility Permit

Facility Name: \_\_\_\_\_ County: \_\_\_\_\_

Facility Address: \_\_\_\_\_

Sources, types, and quantity of sewage sludge received to be composted/treated/ marketed/incinerated/stored - Please use Table 1 on Page 3 and use the origination facility(ies) as the "Sewage Sludge Source".

Quantity of sewage sludge transported from the facility and its final utilization - Please use Table 2 on Page 3 and use your facility as the "Sewage Sludge Source". For **Composting/Treatment Facilities**, please provide information on both composted/treated and untreated sewage sludge. For **Energy Generation/Incineration Facilities**, please provide information on both unincinerated sewage sludge and the ash generated by the facility and record the information separately.

Description of problems encountered and their solutions (including time periods which the facility was inoperational \_\_\_\_\_)  
(please attach separate page if more space is needed)



- Innovative Permit
- Research Permit

Site Name: \_\_\_\_\_ County: \_\_\_\_\_

Site Address: \_\_\_\_\_

Please attach the current status/results of the project.

Sources, types, and quantity of sewage sludge utilized – Please use Table 1 on Page 3 and use the origination facility(ies) as the “Sewage Sludge Source”.

Quantity of sewage sludge transported from the site – Please use Table 2 on Page 3 and use your site as the “Sewage Sludge Source”. Please provide information on both utilized and unutilized sewage sludge.

Description of problems encountered and their solutions (including time periods which the project was inoperational  
 (please attach separate page if more space is needed)

**Tables Instructions:**

1. **Source:** The permitted sewage sludge source(s) (Wastewater Treatment Plant, Lagoon, etc) as described above and also specified in Table 1 and Table 2. *Please use only 1 source per line.*
2. **Quantity:** List the quantity of sewage sludge received, transported, or distributed *in wet tons (WT)* as well as *dry tons (DT)*, as specified in Table 1 and Table 2. Total *WT* are tallied by weight tickets or converted from Gal to WT and DT. Use additional sheet or provide copy of records to support this information.
3. **% Solids:** List the *average percent solids* of sewage sludge at time of receiving, transportation, or based on recent sewage sludge analysis, as specified in Table 1 and Table 2.
4. **Treatment Method:** Please indicate the sewage sludge treatment method (Untreated, Lime Stabilized, Anaerobically digested, Heat dried, etc...), as specified in Table 1 and Table 2.
5. **Destination:** List the site, County, and State that received the sewage sludge, as specified in Table 2.
6. **Utilization:** Final Utilization of the material (examples: further treatment, seeding, distributed to public, etc...), as specified in Table 2.

**Conversions Formulas:**

*To convert Gal to lb; lb = (total gallons) x (8.34)*  
*To convert lb to WT; WT = (weight in pounds) ÷ (2000)*  
*To convert WT to DT = (WT) x (% Solids)*

**CERTIFICATION:**

*I, as an authorized representative of the permittee named on this form, do solemnly affirm under the penalties of perjury, that the contents of this document are true to the best of my knowledge, information, and belief. Information in this form is subject to audit by the Maryland Department of the Environment (the “Department”). I hereby authorize the representatives of the Department, upon request, to have access to any records supporting the information provided in this form.*

Name (Printed)	Title	Representing (Town, Company,...)
Signature	Date	Phone Number
Fax Number	Email Address	

**APPENDIX H**  
**CONSTRUCTION COST**  
**ESTIMATES**

<b>Alternative 1 - Belt Filter Press</b>		
<b>Ocean Pines WWTP - Dewatering Improvements</b>		
<b>Estimate of Total Project Cost</b>		
Items		Estimated Cost
<b>Capital Cost</b>		
Site Modifications		151,053
Sludge Buffer Tank		102,350
Dewatering Building		720,475
Solids Handling Containers and Transport		308,200
Sludge Transport Vehicle		150,000
Mechanical Dewatering Equipment (BFP)		894,769
Electrical Improvments		569,250
Subtotal - Construction Items		\$ 2,896,097
General Conditions	10%	\$ 289,610
Permits, Bonds, & Insurance	3.5%	\$ 101,363
<b>Total Construction Cost</b>		<b>3,287,070</b>
Design, & Construction Phase Services		
Design & Permitting	8%	262,966
Construction Management & Inspection	13%	427,319
Admin., Legal, Financial	3%	98,612
Construction Contract Contingency	5%	164,353
Subtotal, Design & Construction Services		953,250
<b>Total Project Cost</b>		<b>\$ 4,240,320</b>

<b>Alternative 2 - Screw Press</b>		
<b>Ocean Pines WWTP - Dewatering Improvements</b>		
<b>Estimate of Total Project Cost</b>		
Items		Estimated Cost
<b>Capital Cost</b>		
Site Modifications		151,053
Sludge Buffer Tank		102,350
Dewatering Building		720,475
Solids Handling Containers and Transport		308,200
Sludge Transport Vehicle		150,000
Mechanical Dewatering Equipment (Screw Press)		1,571,728
Electrical Improvements		569,250
Subtotal - Construction Items		\$ 3,573,056
General Conditions	10%	\$ 357,306
Permits, Bonds, & Insurance	3.5%	\$ 125,057
<b>Total Construction Cost</b>		<b>4,055,418</b>
Design, & Construction Phase Services		
Design & Permitting	8%	324,433
Construction Management & Inspection	13%	527,204
Admin., Legal, Financial	3%	121,663
Construction Contract Contingency	5%	202,771
Subtotal, Design & Construction Services		1,176,071
<b>Total Project Cost</b>		<b>\$ 5,231,489</b>

Item/Structure	Quantity		Material		Labor & Const. Equip.		Bid Costs		Total Derived Cost
	Number	Unit	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	
<b>Site Modifications</b>									
4" DI Digested Sludge Force Main	1	LS					\$ 15,000	\$ 15,000	
4" DI Air Piping	1	LS					\$ 8,000	\$ 8,000	
2" PVC NPW Piping	1	LS					\$ 1,000	\$ 1,000	
1" PVC Potable Water Piping	1	LS					\$ 500	\$ 500	
6" PVC Drain Piping	1	LS					\$ 10,000	\$ 10,000	
Asphalt Restoration	100	SY					\$ 15	\$ 1,500	
New Pavement and Base	650	SY					\$ 35	\$ 22,750	
Clearing and Grubbing	0.44	AC					\$ 15,000	\$ 6,600	
Fill Dirt and Grading	1100	CY					\$ 60	\$ 66,000	
<b>Subtotal 1</b>				\$0		\$0		\$131,350	
Overhead & Profit				\$0		\$0			
<b>Subtotal 2</b>				\$0		\$0			
Subtotal 3									\$131,350
<b>Contingency - 15%</b>									\$19,703
<b>TOTAL</b>									\$151,053
<b>Sludge Buffer Tank</b>									
Precast Sludge Buffer Tank	1	LS					\$ 50,000	\$ 50,000	
Aluminum Steps	1	LS					\$ 9,000	\$ 9,000	
Coarse Bubble Diffusers	2	LS					\$ 12,000	\$ 24,000	
Level Control System	1	LS					\$ 6,000	\$ 6,000	
<b>Subtotal 1</b>				\$0		\$0		\$89,000	
Overhead & Profit				\$0		\$0			
<b>Subtotal 2</b>				\$0		\$0			
Subtotal 3									\$89,000
<b>Contingency - 15%</b>									\$13,350
<b>TOTAL</b>									\$102,350
<b>Dewatering Building</b>									
Building Construction (Explosion Proof)	2000	SF					\$ 200	\$ 400,000	
Building Electrical (Explosion Proof)	1	LS					\$ 80,000	\$ 80,000	
Building Electrical (Separated from Classification)	1	LS					\$ 25,000	\$ 25,000	
Sludge Feed Piping	1	LS					\$ 18,000	\$ 18,000	
Sludge Suction Piping	1	LS					\$ 6,000	\$ 6,000	
Sludge Pumps	2	EA					\$ 30,000	\$ 60,000	
Concrete Divider Wall	1	LS					\$ 2,000	\$ 2,000	
Concrete Slab	1	LS					\$ 12,000	\$ 12,000	
Underslab Piping	1	LS					\$ 5,500	\$ 5,500	
Coiling Doors	2	LS					\$ 3,000	\$ 6,000	
Dumpster Slide System	1	LS					\$ 12,000	\$ 12,000	
<b>Subtotal 1</b>				\$0		\$0		\$626,500	
Overhead & Profit				\$0		\$0			
<b>Subtotal 2</b>				\$0		\$0			
Subtotal 3									\$626,500
<b>Contingency - 15%</b>									\$93,975
<b>TOTAL</b>									\$720,475
<b>Solids Hauling and Containment</b>									
Sealed 20 CY Containers	2	LS					\$ 9,000	\$ 18,000	
2021 Peterbuilt Dumpster Snatch Truck	1	LS					\$ 250,000	\$ 250,000	
<b>Subtotal 1</b>				\$0		\$0		\$268,000	
Overhead & Profit				\$0		\$0			
<b>Subtotal 2</b>				\$0		\$0			
Subtotal 3									\$268,000
<b>Contingency - 15%</b>									\$40,200
<b>TOTAL</b>									\$308,200
<b>Electrical Improvements</b>									
Electrical Improvements	1	LS					\$ 340,000	\$ 340,000	
SCADA Improvements	1	LS					\$ 155,000	\$ 155,000	
<b>Subtotal 1</b>				\$0		\$0		\$495,000	
Overhead & Profit				\$0		\$0			
<b>Subtotal 2</b>				\$0		\$0			
Subtotal 3									\$495,000
<b>Contingency - 15%</b>									\$74,250
<b>TOTAL</b>									\$569,250

Item/Structure	Quantity		Material		Labor & Const. Equip.		Bid Costs		Total Derived Cost
	Number	Unit	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	
<b>Alt 1 - Belt Filter Press</b>									
2M 3DP belt press	1	EA	\$ 435,000	\$ 435,000	\$ 44,000	\$ 44,000			
Polymer System	1	EA	\$ 28,000	\$ 28,000	\$ 2,000	\$ 2,000			
Conveyor System	1	EA	\$ 157,000	\$ 157,000	\$ 20,000	\$ 20,000			
Flow Meter	1	EA	\$ 4,500	\$ 4,500	\$ 500	\$ 500			
Wash Water Booster Pump	1	EA	\$ 4,000	\$ 4,000	\$ 200	\$ 200			
<b>Subtotal 1</b>				\$628,500		\$66,700		\$0	
Overhead & Profit				\$62,850		\$20,010			
<b>Subtotal 2</b>				\$691,350		\$86,710			
Subtotal 3									\$778,060
<b>Contingency - 15%</b>									\$116,709
<b>TOTAL</b>									\$894,769

Item/Structure	Quantity		Material		Labor & Const. Equip.		Bid Costs		Total Derived
	Number	Unit	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Cost
<b>Alt 2 - Screw Press</b>									
30" Screw Press with RDT	2	EA	\$ 450,000	\$900,000	\$ 42,500	\$ 85,000			
Polymer System	2	EA	\$ 35,000	\$70,000	\$ 2,000	\$ 4,000			
Flow Meter	2	EA	\$ 4,500	\$9,000	\$ 500	\$ 1,000			
Wash Water Booster Pump	2	EA	\$ 4,000	\$8,000	\$ 200	\$ 400			
Conveyor System	1	EA	\$ 125,000	\$125,000	\$ 20,000	\$ 20,000			
<b>Subtotal 1</b>				\$1,112,000		\$110,400			\$0
Overhead & Profit				\$111,200		\$33,120			
<b>Subtotal 2</b>				\$1,223,200		\$143,520			
Subtotal 3									\$1,366,720
<b>Contingency - 15%</b>									\$205,008
<b>TOTAL</b>									\$1,571,728

**APPENDIX I  
PRESENT WORTH  
ANALYSIS**



<b>Alternative</b>	<b>Capital Cost</b>	<b>O&amp;M Present Worth</b>	<b>Total PW</b>
1 - Belt Filter Press	\$ 4,240,320	\$ 16,417,911	\$20,658,231
2 - Screw Press	\$ 5,231,489	\$ 14,428,096	\$19,659,585

Year #	Discount Rate	Belt Filter Press						Screw Press					
		Personnel	Electricity	Polymer	Tipping Fees	Trips to Landfill	Maintenance	Personnel	Electricity	Polymer	Tipping Fees	Trips to Landfill	Maintenance
1	1.00301	\$ 152,558	\$ 3,399	\$ 57,472	\$ 441,770	\$ 16,399	\$ 126,078	\$ 67,803	\$ 4,314	\$ 114,946	\$ 441,770	\$ 16,399	\$ 55,767
2	1.00603	\$ 153,017	\$ 3,409	\$ 57,645	\$ 443,099	\$ 16,449	\$ 126,458	\$ 68,007	\$ 4,327	\$ 115,292	\$ 443,099	\$ 16,449	\$ 55,935
3	1.00905	\$ 153,477	\$ 3,420	\$ 57,819	\$ 444,432	\$ 16,498	\$ 126,838	\$ 68,212	\$ 4,340	\$ 115,639	\$ 444,432	\$ 16,498	\$ 56,103
4	1.01209	\$ 153,939	\$ 3,430	\$ 57,993	\$ 445,770	\$ 16,548	\$ 127,220	\$ 68,417	\$ 4,353	\$ 115,987	\$ 445,770	\$ 16,548	\$ 56,272
5	1.01514	\$ 154,402	\$ 3,440	\$ 58,167	\$ 447,111	\$ 16,597	\$ 127,603	\$ 68,623	\$ 4,366	\$ 116,336	\$ 447,111	\$ 16,597	\$ 56,442
6	1.01819	\$ 154,867	\$ 3,451	\$ 58,342	\$ 448,456	\$ 16,647	\$ 127,987	\$ 68,830	\$ 4,380	\$ 116,686	\$ 448,456	\$ 16,647	\$ 56,611
7	1.02125	\$ 155,333	\$ 3,461	\$ 58,518	\$ 449,806	\$ 16,698	\$ 128,372	\$ 69,037	\$ 4,393	\$ 117,037	\$ 449,806	\$ 16,698	\$ 56,782
8	1.02433	\$ 155,800	\$ 3,471	\$ 58,694	\$ 451,159	\$ 16,748	\$ 128,758	\$ 69,245	\$ 4,406	\$ 117,389	\$ 451,159	\$ 16,748	\$ 56,953
9	1.02741	\$ 156,269	\$ 3,482	\$ 58,871	\$ 452,517	\$ 16,798	\$ 129,145	\$ 69,453	\$ 4,419	\$ 117,742	\$ 452,517	\$ 16,798	\$ 57,124
10	1.03050	\$ 156,739	\$ 3,492	\$ 59,048	\$ 453,878	\$ 16,849	\$ 129,534	\$ 69,662	\$ 4,432	\$ 118,096	\$ 453,878	\$ 16,849	\$ 57,296
11	1.03360	\$ 157,211	\$ 3,503	\$ 59,225	\$ 455,244	\$ 16,899	\$ 129,924	\$ 69,871	\$ 4,446	\$ 118,452	\$ 455,244	\$ 16,899	\$ 57,468
12	1.03671	\$ 157,684	\$ 3,513	\$ 59,404	\$ 456,614	\$ 16,950	\$ 130,315	\$ 70,082	\$ 4,459	\$ 118,808	\$ 456,614	\$ 16,950	\$ 57,641
13	1.03983	\$ 158,158	\$ 3,524	\$ 59,582	\$ 457,988	\$ 17,001	\$ 130,707	\$ 70,293	\$ 4,473	\$ 119,166	\$ 457,988	\$ 17,001	\$ 57,815
14	1.04296	\$ 158,634	\$ 3,534	\$ 59,762	\$ 459,366	\$ 17,052	\$ 131,100	\$ 70,504	\$ 4,486	\$ 119,524	\$ 459,366	\$ 17,052	\$ 57,989
15	1.04610	\$ 159,112	\$ 3,545	\$ 59,941	\$ 460,748	\$ 17,104	\$ 131,495	\$ 70,716	\$ 4,500	\$ 119,884	\$ 460,748	\$ 17,104	\$ 58,163
16	1.04925	\$ 159,590	\$ 3,556	\$ 60,122	\$ 462,135	\$ 17,155	\$ 131,890	\$ 70,929	\$ 4,513	\$ 120,245	\$ 462,135	\$ 17,155	\$ 58,338
17	1.05240	\$ 160,071	\$ 3,566	\$ 60,303	\$ 463,525	\$ 17,207	\$ 132,287	\$ 71,142	\$ 4,527	\$ 120,607	\$ 463,525	\$ 17,207	\$ 58,514
18	1.05557	\$ 160,552	\$ 3,577	\$ 60,484	\$ 464,920	\$ 17,259	\$ 132,685	\$ 71,357	\$ 4,540	\$ 120,969	\$ 464,920	\$ 17,259	\$ 58,690
19	1.05875	\$ 161,035	\$ 3,588	\$ 60,666	\$ 466,319	\$ 17,311	\$ 133,084	\$ 71,571	\$ 4,554	\$ 121,333	\$ 466,319	\$ 17,311	\$ 58,866
20	1.06193	\$ 161,520	\$ 3,599	\$ 60,849	\$ 467,722	\$ 17,363	\$ 133,485	\$ 71,787	\$ 4,568	\$ 121,699	\$ 467,722	\$ 17,363	\$ 59,043
<b>Totals</b>	<b>20.64410</b>	<b>\$3,139,968</b>	<b>\$ 69,961</b>	<b>\$1,182,907</b>	<b>\$9,092,580</b>	<b>\$ 337,531</b>	<b>\$ 2,594,964</b>	<b>\$1,395,541</b>	<b>\$ 88,796</b>	<b>\$2,365,835</b>	<b>\$9,092,580</b>	<b>\$ 337,531</b>	<b>\$ 1,147,812</b>
							<b>\$16,417,911</b>						<b>\$14,428,096</b>

**APPENDIX J**  
**ALTERNATIVE DESIGN DATA**

OCEAN PINES, MD  
DESIGN CALCULATIONS  
Dewatering Options  
Aerobically Digested Sludge

Design Performance	30" Screw Press	30" Screw Press	30" Screw Press	BDP 2.0m 3DP	BDP 2.0m 3DP	BDP 2.0m 3DP	UNITS
	Current	Average	Design	Current	Average	Design	
Weekly Pounds of Dry Solids	14490	38129	49574	14490	38129	49574	# per Week
Weekly Sludge Flow	115,829	304,808	396,249	115,829	304,808	396,249	Gallons Per Week
Average Feed Solids	1.5	1.50	1.50	1.5	1.50	1.50	%wt
Dry Solids - Yearly	377	991	1289	377	991	1289	Dry Tons per Year
Operational Days	4	5	6	2	5	5	Days per Week
Operational Hours	8	7	8	8	7	8	Hours per Day
Number of Units in service	1	2	2	1	1	1	Units
#/hr per/ unit	453	1089	1033	906	1089	1239	#/hr per meter
Hydraulic Loading per unit	60	145	138	121	145	165	GPM on each Unit
Expected Avg Polymer Dosage	40	40	40	20	20	20	Pounds per Dry Ton - Active
Expected Discharge Solids	18	18	18	18	18	18	%wt
<b>Operating Costs</b>							<b>UNITS</b>
Hours per Day of operation	8	7	8	8	7	8	hours
Days per Week operating	4	5	6	2	5	5	Days
Total Hours per year	1664	3640	4992	832	1820	2080	Hours (total for both units)
<b>Polymer Costs</b>							
Total Polymer Usage	15070	39654	51557	7535	19827	25778	Pounds of Active Polymer per year
Total Polymer Cost	\$43,551	\$114,601	\$149,000	\$21,776	\$57,300	\$74,500	\$ per year (based on \$1.30 per pound neat)
<b>Energy Consumption</b>							
Feedbox/Floc Tank/transfer pump	3.00	3.00	3.00	0.33	0.33	0.33	HP
GBT Drive/RDT	1	1	1	3	3	3	HP
Press Section	5	5	5	6	6	6	HP
Hydraulic Unit	3	3	3	2	2	2	HP
Booster Pump	7.5	7.5	7.5	15	15	15	HP
Total kW	9.8472	9.8472	9.8472	15.5168	15.5168	15.5168	kW/hr
Yearly Energy Cost	\$1,966.3	\$4,301.3	\$5,898.9	\$1,549.2	\$3,388.9	\$3,873.0	\$ per Year (at \$0.12 / kW-hr)
<b>Water Usage</b>							
Total Wash Water Usage	10	10	10	92	92	92	GPM per Unit
Hourly Usage	600	1200	1200	5520	5520	5520	Gallons Per Hour
Yearly Usage	0.9984	4.368	5.9904	4.59264	10.0464	11.4816	MG per Year
<b>Total Costs</b>	<b>\$46,197</b>	<b>\$120,388</b>	<b>\$156,937</b>	<b>\$23,665</b>	<b>\$61,432</b>	<b>\$79,222</b>	<b>\$ per year</b>