

INVITATION FOR BIDS (IFB) MGL Chapter 30B

SUBJECT: Sludge Dewatering/ Processing

Awarding Authority:

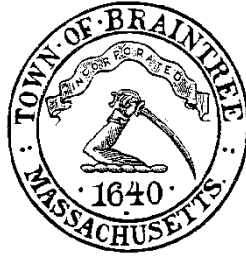
Mayor of the Town of Braintree

Contact:

Name & Title:	Louis R. Dutton, Water Works Superintendent
Town Department:	Water and Sewer Dept
Mailing Address:	85 Quincy Ave
E-Mail Address:	ldutton@braintreema.gov
Telephone Number:	781-843-9205

IFB Documents Available (Date & Time): 10-9-2017

Submission Deadline (Date & Time): 10-25-2017



Legal Advertisement

INVITATION TO BID

TOWN OF BRAINTREE

Sealed proposals for Sludge Dewatering/Processing at the Water Filtration Plant in the Town of Braintree, Massachusetts, will be received by the Water & Sewer Department until 11:00 A.M. October 25th, 2017, at the Braintree Water & Sewer Department office, 85 Quincy Avenue, Braintree, MA 02184, at which time the bids will be opened and read aloud.

Bid proposals must be submitted in a sealed envelope bearing on the outside the bidder's name and address. The envelope must be entitled "Bid for Sludge Dewatering/Processing" and addressed to the Braintree Water and Sewer Department c/o Louis Dutton, Town of Braintree, Massachusetts.

Contract is for a one-year period, with two one-year options for renewal at the Town's sole discretion. Specifications may be obtained from 7:00 AM to 3:00 PM, until Friday, October 20th, 2017, by calling 781-843-9205, or by emailing ldutton@braintreema.gov. They may also be obtained by accessing the Town website at www.braintreema.gov/municipalfinance/purchasing.html. Optional site visit on October 13, 2017 at 11:00AM, Water Treatment Plant, 300 King Hill Road, Braintree.

The Braintree Water & Sewer Department reserves the right to waive any informalities, reject any and all bids, and to accept the bid they deem to be best for the Town of Braintree.

This bid will be subject to Massachusetts Prevailing Wages.

This notice is also available at www.masspublicnotices.org

Braintree Water & Sewer Department

Louis R. Dutton, Water Works Superintendent

I. **INTRODUCTION**

This bid is for the Processing and Dewatering of our Treatment Plant residuals. We do this by the means of Geotubes in which solids are pumped and treated through a mobile processing system. Services will be provided on an “as-needed” basis for one-year, with two options for one-year renewals at the Town’s sole discretion. Town expenditures under this contract shall not exceed \$60,000.00 per year.

II. **KEY DATES FOR IFB**

10-9-2017	Notice Posted in Patriot Ledger
10-9-2017 (on or before)	Notice Posted on Department Bulletin Board
10-9-2017 (on or before)	Notice Posted on Town Website
10-9-2017	Notice Published in Goods/Services Bulletin (if applicable)
10-9-2017 (on or before)	Notice Published in COMMBUYS
10-23-2017, 12 Noon	Deadline for Questions
10-23-2017	Last Day Addenda will be issued
10-25-2017, 11:00 AM	Bids Due
10-30-2017	Notice of Award by this Date

III. **CONTRACT**

Within seven (7) business days after issuance of a Notice of Award, the successful bidder is required to execute a contract with the Town of Braintree. The contract form will be provided by the Town and will be in the form presented in Appendix E. By submitting a Bid, the Bidder is agreeing to the full Scope of Work, as well as awareness of the Town’s standard contract requirements, as shown in Appendix E. **Bidders are urged to pay careful attention to the Town’s insurance requirements.**

Any questions about the Contract, or requests for changes to any provisions of the Contract must be made by the Deadline for Questions, as noted in the Section: “Key Dates for IFB”. Any allowable changes to the Contract will be stated in an Addendum. No changes to the Standard Contract terms may be made after the bid due date, minor informalities excepted.

Governed by Law: This IFB is issued in accordance with the laws of the Commonwealth of Massachusetts. All pertinent laws and regulations are applicable as if fully written out in this document.

IV. **BID DEPOSIT**

Not Required

V. **MINIMUM QUALIFICATIONS**

See Bid Specs

VI. **BIDDING INSTRUCTIONS**

Note: Required Contents of Bid Package may be found in Section XI.

Note: If you have not obtained this IFB directly from the Department listed above, please register with the Department in order to receive any addenda which may become available.

- A. Bids are to be submitted by mail or in person to **Louis R. Dutton, Water Works Superintendent, Town of Braintree Water and Sewer Dept, 85 Quincy Ave. 02184** until the date and time shown under “Key Dates for this Proposal”.. Postmarks will not be considered. The Town shall not be responsible for bids arriving late due to couriers, deliveries to wrong locations, express mailing service errors, etc. If, at the time that bids are due, the office is closed due to uncontrolled events, bids will be accepted until 12 p.m. on the next full day that the office is open. For the purposes of determining whether a bidder has met the deadline, the clock in the office of the Department Director shall indicate the official time. No individual extensions of this deadline will be granted.
- B. Each bidder must submit one bid package, marked with the bidder’s name and address, and **Sludge Dewatering/ Processing**. Each envelope is to contain one original and four copies of the submission.
- C. A bidder may correct, modify, or withdraw a bid by written notice received by the Town prior to the due date and time. Each modification package must be marked with the bidder’s name and address, and “**Sludge Dewatering/ Processing, Modification #** ”. The envelope is to

contain one original and four copies of the submission. The highest numbered modification will be taken as the only submission by a bidder.

- D. The contract will be awarded by the Town of Braintree within 60 days after the bid due date. The time for award may be extended by mutual agreement between the Town and the responsible and responsive bidder.
- E. Questions concerning this INVITATION FOR BIDS (IFB) must be made in writing no later than the date and time shown under “Key Dates for this Proposal”. Questions may be delivered or mailed to the contact person listed on the cover page of this document.

Owing to the possible interference of SPAM filters, etc. it is the responsibility of the bidder to ensure receipt of questions by the deadline for questions. If necessary to maintain a fair and equal bidding environment, the Town will issue addenda to all bidders who have requested bid packages. Addenda will be e-mailed to all Vendors on record as having requested the IFB. Nevertheless, bidders shall be responsible for ensuring that all addenda are in receipt prior to the bid deadline. The Town will require acknowledgement of any addenda issued to be included on the bid form. No addenda will be issued later than the date shown under “Key Dates for this Proposal”.

- F. After the bid due date, a bidder may not change any provision of the bid in a manner prejudicial to the interests of the Town or fair competition. Minor informalities will be waived or the bidder will be allowed to correct them. If a mistake and the intended bid are clearly evident on the face of the bid document, the mistake will be corrected to reflect the intended correct bid, and the bidder will be notified in writing.
- G. Any bid which is not according to prescribed form, incomplete, not properly signed, or contrary to the instructions and requirements contained in the INVITATION FOR BIDS may be rejected by the Town of Braintree. Conditional bids will not be accepted.
- H. The Town may cancel this IFB, or reject in whole or in part any and all bids, if the Town determines that the cancellation or rejection services the best interests of the Town of Braintree.
- I. Bids will be opened publicly at **Braintree Water and Sewer Dept, 85 Quincy Ave, Braintree, MA 02184** on the date & time that bids are due. A written register of all bids received, which shall include the name of the bidder, the number of modifications received, and the amount of services offered, will be available at 12:00 pm on the business day following the IFB opening. If, at the time of the scheduled bid opening, the bid opening location is closed due to uncontrolled events, bids will be opened at 12:00 p.m. on the next full day that the bid opening location is open.
- J. A bid must be signed as follows: 1) If the bidder is an individual, by her/him personally; 2) If the bidder is a partnership, by the name of the partnership, followed by the signature of each general partner; and 3) if the Bidder is a corporation, by the authorized officer.

- K. The successful vendor will not be permitted to assign or underlet the contract, nor assign either legal or equitably any monies hereunder, or its claim thereto, without the previous written consent of the Town of Braintree.
- L. It is understood and agreed that it shall be a material breach of any contract resulting from this bid for the Contractor to engage in any practice which shall violate any provision of Massachusetts General Laws, Chapter 151B, relative to discrimination in hiring, discharging, compensation, or terms, conditions or privileges of employment because of race, color, religious creed, ancestry, handicap, national origin, sex, age or sexual orientation.

VII. **SITE VISIT**

Optional site visit on Friday, October 13, 2017 at 11:00 AM. Location: Braintree Water Treatment Plant, 300 King Hill Road, Braintree, MA 02184.

VIII. **RULE FOR AWARD**

Contract will be awarded to the responsive and responsible bidder offering the lowest price.

In the event of a tie between two responsive and responsible bidders, a “second heat” will be conducted between the tied vendors. This entails inviting the tied vendors to submit a second sealed bid for the same contract by a specific date and time.

IX. **PROJECT SPECIFICATIONS AND QUALITY REQUIREMENTS**

See Appendix G

X. **REFERENCES**

Provide contact information for five municipalities for which you have provided Sludge DeWatering & Processing services in the past three years. Include municipality name, nature of project, project completion date, contact person name, contact person telephone, and contact person email. Omission of any of this information may result in rejection of the bid.

XI. REQUIRED CONTENTS OF BID PACKAGE

ITEMS MUST BE IN THE FOLLOWING ORDER

- A. Bid Form, (Appendix _A_)**
- B. Addenda Acknowledgement Forms (if Addenda were issued)**
- C. Certificate of Non-Collusion (Appendix __B__)**
- D. Certificate of Tax Compliance (Appendix __C_)**
- E. Certificate of Authorization (Appendix __D_)**
- F. References, see Section X.**

APPENDIX A---BID FORM
MUST COMPLETE ALL THREE PAGES

1. Name and Address of Company:

2. Contact Person for this Bid:

Name: _____

Phone: _____

E-Mail: _____

3. Minimum Qualifications:

Does the bidder meet the minimum qualifications as stated in Section V?

_____ YES _____ NO

4. Please disclose any conditions (bankruptcy or other financial problems, pending litigation, etc.) that may affect the Bidder's ability to perform contractually. This applies to the individual, partners, or corporate officers responding to this IFB. (Attach additional pages if necessary.)

5. Has the bidder (individual, partners, or corporate officers) ever been dismissed or disqualified from a bid/contract within the past five years, and if yes, please state the reason(s). (Attach additional pages if necessary.)



Bid Sheet for Sludge Processing

Activity	Cost	Description
Geotubes Products		(1) Geotube 120' Circ x 100' L
Geotube® Installation		Cost to install tubes
Mobilization		Cost for Mobilization
De-mobilization		Cost for De-Mobilization
Processing (DAILY RATE)		Manpower, Equipment to Process
Polymer (DAILY RATE)		Chemical to Process
Filling Manifold (DAILY RATE)		All piping needed to process

Total	
-------	--

6. Bid Amount in Numbers: _____

7. Bid Amount in Words: _____

8. Signature*:

By signing this bid for the Town of Braintree, MA, I (we) hereby bind
_____ (name of company) to all comments made in the bid, and
accept all of the provisions made in the INVITATION FOR BIDS.

Signature

Name Title Date

Signature (2nd signature required in the case of a partnership)

Name Title Date

** A bid must be signed as follows: 1) If the bidder is an individual, by her/him personally; 2) If the bidder is a partnership, by the name of the partnership, followed by the signature of each general partner; and 3) if the Bidder is a corporation, by the authorized officer.*

APPENDIX B---NON-COLLUSION

CERTIFICATION OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or bid has been submitted in good faith and without collusion or fraud with any other person. As used in this certification, the work "person" shall mean any natural person, business, partnership, corporation, union committee, club or other organization, entity or group of individuals.

Name of Business

(signature of representative/position/title)

(print name of person signing above)

Date: _____

APPENDIX C---TAX COMPLIANCE

CERTIFICATION OF TAX COMPLIANCE

I, _____, for _____,
(Name of representative, position/title) (Company / Consultant)

a Company, Consultant or Corporation existing or formed under the laws of the

Commonwealth of Massachusetts, having a principal place of business at

_____, hereby certify that the
(Company/Consultant/Corporation Business Address)

Company/Consultant/Corporation is in full compliance with all laws of the

Commonwealth of Massachusetts relating to taxes, as required by

Massachusetts General Laws, Chapter 62C, Section 49A.

Signed under pains and penalties of perjury this _____ day of _____, 20__.

(signature of representative/position/title)

(print name of person signing above)

Date: _____

APPENDIX D---CERTIFICATE OF AUTHORIZATION

(NOTE: A certified vote of the corporation may be substituted for this form.)

The Vendor, _____ is: (CHECK ONE)
(Name of Company/Consultant/Corporation)

_____ A. a corporation formed and existing under the laws of the state of _____, and pursuant to the corporate by-laws,

(Insert Name and Title of Authorized Representative)

is authorized to execute contracts in the name of said corporation. Such execution of any contract or obligation in this corporation's name on its behalf by such duly authorized individual shall be valid and binding upon the corporation.

_____ B. a limited liability company or a partnership formed and existing under the laws of the state of _____, and pursuant to the limited liability company agreement or partnership agreement,

(Insert Name and Title of Authorized Representative)

is authorized to execute contracts in the name of said company or partnership. Such execution of any contract or obligation in this company or partnership's name on its behalf by such duly authorized individual shall be valid and binding upon the company or partnership.

_____ C. is a sole proprietorship owned and operated exclusively by the undersigned.

(Insert Name and Title of Authorized Representative)

Execution of any contract or obligation in this sole proprietorship's name by such duly authorized individual shall be valid and binding.

(Signature)---Must be signed by a Corporate Officer, or a Certified Vote of the Corporation may be substituted for this form.

Print Name of Above

Title

APPENDIX E---LONG-FORM CONTRACT

SAMPLE---DO NOT FILL OUT

CONTRACT BETWEEN THE TOWN OF BRAINTREE
AND
(VENDOR)

This Agreement is made on this ____ day of _____, 20__ between the Town of Braintree, acting by and through its duly elected Mayor (hereinafter, the "Town") and (VENDOR), whereby the parties contract for services under the terms and conditions set forth herein.

I. PARTIES

The parties to this contract are the Town of Braintree, acting by and through its duly elected Mayor and (VENDOR). The Town of Braintree is a municipal corporation of the Commonwealth of Massachusetts having a principal place of business at One J. F. K. Memorial Drive, Braintree, MA 02184 and (VENDOR) is a (corporation/sole proprietorship/limited liability company/ partnership) with a principal place of business at (Insert Address).

II. DESIGNATED REPRESENTATIVES

The Town designates (Name), (Title) and (VENDOR) designates (name), (Title), as their authorized representatives to provide approvals, directives, and permissions including changes, and to receive notices or other communications under this Agreement at the addresses stated above.

III. CONTRACT DOCUMENTS

The contract documents shall consist of the following:

- 1) This Agreement;
- 2) The Town's Invitation for Bids, dated _____;
- 3) (VENDOR's) bid);
- 4) (VENDOR's) Certificate of Non-Collusion;
- 5) (VENDOR's) Certificate of Tax Compliance;
- 6) (VENDOR's) Certificate of Authorization;
- 7) (VENDOR's) Certificates of Insurance;
- 8) (VENDOR's) Additional Insured Endorsement Page;
- 9) Prevailing Wages Rates from Division of Occupational Services; (*if applicable*) and
- 10) (VENDOR's) performance and payment bonds (*not applicable*).

Such contract documents shall be incorporated herein by reference and made a part of this Contract, which represents the entire agreement and understanding between the Parties. If the terms of any of the documents are in conflict, the terms of this agreement shall prevail.

IV. SERVICES

The scope of services to be provided by (VENDOR) is as follows:

V. QUALITY OF WORK

(VENDOR) represents that it will perform services for the Town using that degree of care and skill ordinarily exercised by and consistent with the standards applicable to persons performing similar services under similar conditions in the same locality. (VENDOR) shall be liable for its services rendered under this Contract.

VI. COMPENSATION

On a monthly basis, VENDOR shall submit invoices to the Town with any reasonable supporting documentation requested by the Town, reflecting the services performed during said month. Upon satisfactory review of said invoices and documentation, the Town shall remit payment to VENDOR. Total compensation to be paid to VENDOR pursuant to this contract shall not exceed \$_____.

VII. TIME FOR PERFORMANCE

All services to be performed pursuant to this contract shall be completed by _____.

VIII. SUBJECT TO APPROPRIATION

Notwithstanding anything in the contract documents to the contrary, any and all payments which the Town is required to make under this contract shall be subject to appropriation or other availability of funds, as certified by the Town Accountant.

IX. ENFORCEABILITY OF CONTRACT

This contract is binding upon and enforceable against the Town if this contract is signed by the Mayor, endorsed by the Town Accountant as to appropriation or availability of funds, and endorsed as to form by the Town Solicitor. This contract is binding and enforceable against (VENDOR) if signed by their authorized representative.

X. ASSIGNMENT

(VENDOR) shall not delegate, assign or transfer its duties or interest in this Contract without the express written consent of the Town. If approved by the Town, this contract shall be binding upon (VENDOR's) assigns, transferees and/or successors in interest.

XI. PREVAILING STATUTORY AUTHORITY

The validity, interpretation and performance of this Contract shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts.

XII. CONFLICT OF INTEREST

Both the Town and (VENDOR) stipulate to the applicability of Massachusetts General Law Chapter 268A, the Conflict of Interest Statute. The Parties further stipulate that the terms and conditions of this contract expressly prohibit any activity which constitutes a violation of this statute. By executing

this contract, (VENDOR) certifies that neither it nor any of its agents, employers or subcontractors is in violation of Massachusetts General Laws Chapter 268A.

XIII. INSURANCE

(VENDOR) shall maintain the insurance coverage listed below. With the exception of Workers' Compensation and Professional Errors and Omissions insurance coverage, (VENDOR) is required by this agreement to name the Town of Braintree as an additional insured and to provide the Town with certificates of insurance coverage indicating that the Town of Braintree has been added as an additional insured under all insurance coverages required by this contract. Further, (VENDOR) is required to provide the Town of Braintree with a copy of the current additional insured endorsement page, reflecting that the Town of Braintree has been listed as an additional insured, for each insurance policy to which the Town of Braintree has been added. If Subcontractors are used, all of the provisions of this section apply to the Subcontractor(s).

- A. General Comprehensive Liability in the amount of \$1,000,000 for each occurrence and \$2,000,000 in the aggregate;
- B. Automobile Liability (applicable for any vendor/consultant who has an automobile operating exposure) in the amount of \$1,000,000 for bodily injury and property damage per accident;
- C. Professional Errors and Omissions Liability (applicable for any vendor/consultant providing design, architectural, engineering, financial advising or similar services) in the amount of \$1,000,000 for each occurrence and \$3,000,000 in the aggregate;--NOT APPLICABLE
- D. Pollution Liability (applicable for any vendor/consultant who has pollution exposure) in the amount of \$3,000,000 for each occurrence and \$3,000,000 in the aggregate; NOT APPLICABLE
- E. Umbrella Liability of \$2,000,000 for each occurrence and \$2,000,000 in the aggregate; and
- F. Workers' Compensation and Employer's Liability in the amount as may be required by Massachusetts General Laws Chapter 152.

The parties acknowledge that the types of insurance and coverage limits listed herein are the minimum necessary for the (VENDOR) to be awarded this contract. The types of insurance and coverage limits stated herein are not intended in any way to limit the (VENDOR)'s liability for any damages arising from the (VENDOR)'s performance of services under this contract.

The (VENDOR) is required to maintain the above-referenced insurance coverage throughout the duration of this contract. If, at any time while this contract is in effect, any of the above insurance coverages should lapse, the (VENDOR) shall immediately notify the Town of Braintree, and within thirty (30) days of said lapse, the (VENDOR) shall provide the Town of Braintree with a new certificate of insurance coverage.

XIV. INDEMNIFICATION

(VENDOR) hereby indemnifies and agrees to hold harmless the Town against any liability including all claims for bodily injury or property damage that may arise out of (VENDOR's)

performance of its obligations under this contract by itself or a subcontractor, officer, agent or employee.

XV. TERMINATION

This contract may be terminated by either party upon receipt of thirty (30) days advance written notice by certified mail to the Designated Representative identified in Paragraph II. In case of such written notice of termination, all services under this contract shall cease with the exception of such work as may be necessary to bring the work in progress to a reasonable and safe condition. (VENDOR) shall then submit a final bill based on work actually performed. There shall be no penalty for termination for the convenience of the Town.

XVI. BREACH OF CONTRACT

Failure of (VENDOR) to comply with any of the terms or conditions of the contract shall be deemed a material breach of contract, and the Town shall have all the rights and remedies provided in the contract documents, including the right to terminate or suspend the contract and to pursue its rights in any and all actions of law or equity or other proceedings with respect to a breach of contract.

In the event that a breach of contract may occur, this contract may be deemed null and void upon fourteen (14) days written notice by certified mail to the Designated Representative identified in Paragraph II, and the Town may pursue any remedies deemed necessary to secure the interests of the Town, provided, however, that this contract shall be and remain in full force and effect, and no action shall be taken by the Town if (VENDOR) cures said breach within the fourteen day period.

XVII. CERTIFICATION OF TAX COMPLIANCE

This contract shall include a certification by (VENDOR) that (VENDOR) is in full compliance with all laws of the Commonwealth of Massachusetts relating to taxes, as required by Massachusetts General Laws Chapter 62C, §49A. Said Certification is attached hereto.

XVIII. PREVAILING WAGE RATES (applicable to any public works or public building project, including tree removal)

(VENDOR) represents that it shall comply with the provisions for prevailing wages as governed by M.G.L.c.149, §§26-27, and as established by the Department of Labor, Division of Occupational Safety. (VENDOR) shall furnish the Town a copy of (VENDOR's) certified weekly payroll records throughout the duration of this Agreement.

In addition, (VENDOR) shall be responsible for ensuring that it, and any of its subcontractors, furnish the Department of Labor and Workforce Development/Division of Occupational Safety a Statement of Compliance with the provisions of M.G.L.c.149, §§26-27 upon completion of the services performed under this Agreement.

For (VENDOR):

(Signature, Title)
Date: _____

Approved As to Form:

Lisa S. Maki
Town Solicitor

For the Town of Braintree:

Joseph C. Sullivan, Mayor
Date: _____

Joseph H. Reynolds, Chief of Staff
and Operations

Recommended by:

Department Director

Approved as to Available Funds

Mark Lin, Town Accountant
Account No.: _____
Purchase Order No.: _____

**APPENDIX F
PREVAILING WAGE SCHEDULE**

If you have received this document without the Prevailing Wage Schedule, please contact Mr. Lou Dutton at ldutton@braintreeema.gov . In addition, the Prevailing Wage schedule for this bid is available under the document section for the Sludge DeWatering bid on the Town Website Purchasing Page:

www.braintreeema.gov/municipalfinance/purchasing.html

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DEWATERING CONTAINER
(Standard Dewatering Specification)
Updated 3/2014

PART 1 - GENERAL INFORMATION

1.1 Description

- A. Scope.** CONTRACTOR shall furnish all labor, materials, equipment, polymer, polymer feed system, and incidentals as shown, specified, and required in connection with deployment, and filling of the container, in accordance with the lines, grades, design, and dimensions shown on the drawings as specified herein.
- B. General.** CONTRACTOR shall furnish the container by positioning it on a prepared surface that is level across the width of the container with a maximum slope 1% for the first 100 ft. and not to exceed 0.5% in the overall length direction of the Dewatering container and to be filled with dredged or pumped material to a height not to exceed the manufacturer's specifications.

1.2 Quality Assurance

Manufacturer Qualifications. All containers and ancillary products shall be the standard product of a manufacturer who has been regularly engaged in the integral design, manufacture, and fabrication of the products, and whose product has proven reliable in similar service for 5 years. The container manufacturer must be ISO 9001 certified and can provide a current ISO certification. The container manufacturer must have an on-site company lab that has a current A2LA certification.

1.3 Submittals

A. Plan of Construction

- 1.) The contractor must submit prior to award of contract a detailed Plan of Construction. This plan shall include, but not be limited to, site plan, dewatering containment cell, dewatering container layout, dredging or pumping methods, implementation of a mass-balance system showing density, percent solids, flow measurement all integrated into a real time controller, polymer type, polymer injection system/location, flocculation monitoring, filling method, covering in-place, beneficial use, or disposal alternatives.
- 2.) A copy of the manufacturer's installation instructions detailed for this project.
- 3.) A copy of the bench-scale, Pressure- Dewatering Test or hanging bag test report for the specific material to be dewatered.

APPENDIX G: PROJECT SPECIFICATIONS

B. Drawings

- 1.) Submit shop drawings of the materials, equipment, and method of installation details for the complete system.
- 2.) Submit manufacturer's product literature and specifications for material(s) utilized to construct dewatering containers, including Filling Port details, connection details, site layout, piping, manifold, and related components.
- 3.) Provide a mass balance of the pumping flow rates, chemical make-down, amount of dilution water, filtrate volume, density measurement, and percent solids — all integrated into a real time control system, showing a method of collection, and discharge point.
- 4.) Details and layout of the dry or emulsion polymer make-down and metering system.

C. Submit a signed certification from the manufacturer indicating that the materials utilized meet the project specification requirements and are designed specifically for this purpose. The manufacturer must be ISO 9001 certified and have an on-site A2LA certified laboratory.

1.4 Product Delivery, Handling, and Storage

A. Product Delivery

Dewatering container and related components shall be delivered to the project site in a protective wrap or cover. Each tube shall be clearly labeled for easy identification. All containers greater than 1,000 lbs. gross weight or installed in the wet shall be rolled on a steel pipe and the ends fitted with PVC protective caps.

B. Product Handling

No hooks, tongs, or other sharp instruments shall be used for handling the dewatering containers. Also, the container should not be dragged along the ground. Dewatering containers should be unrolled into position as recommended by the manufacturer.

C. Product Storage

Dewatering containers shall be stored in areas where water cannot accumulate, elevated off of the ground, and protected from conditions that will affect the proper ties or performance of the container. Dewatering containers should not be exposed to temperatures in excess of 180°. Duration of storage time shall not exceed manufacturer's recommendation.

PART 2 - PRODUCTS

2.1 Dewatering Container

- A. Dewatering Container Material:** The Dewatering container material shall be fabricated from GT 500, a “Specially Engineered Dewatering Textile” manufactured from high tenacity polypropylene multifilament and monofilament yarns, which are woven into a stable network such that the yarns retain their relative position. The container material shall be inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.
- B. The Dewatering container shall be fabricated by sewing together mill widths of the GT 500 woven engineered textile to form a tubular shape. The seams shall be parallel stitch lines with 1.4” spacing. The sewing thread shall be multi-ply polyester filament yarn.
- C. Dewatering containers fabricated 45 ft. or greater in circumference must be fabricated with the mill roll length of the GT 500 woven engineered textile and the adjacent seams being in the circumferential direction with the closure of the container having a longitudinal seam on the bottom of the container. Each Dewatering container shall be fabricated with one or more PVC filling ports located along the top centerline of the container. The filling port is comprised of 1.5” thick inside and outside flange rings that sandwiches the GT 500 woven engineered textile surface between 1/8” thick rubber gaskets and secured with 3/4” bolts. This provides a connection that exceeds the strength of a traditional sewn seam. In addition to the flanges, the fill port includes a fabric sleeve that clamps around the feed line to prevent leakage.
- D. PVC Fill Ports are for the attachment of the dredge or pump discharge line to the dewatering container and shall be located at intervals of no more that 100 feet, or as recommended by the manufacturer. Fill ports shall be ridged PVC with an inner port body and outer port body each comprising one or more cellular surfaces capable of distributing a force caused by the clamping of the inner port body and outer port body together with steel bolts and nuts. Fill ports shall be either **4” (GP-4)** or **8” (GP-8)** in diameter with a 48-inch long, flexible non-woven 8 oz. geotextile sleeve.
- E. “Specially Engineered Dewatering Textile” material and factory-sewn seams utilized in the construction of the container shall meet or exceed the values shown below in Table 1.

**Chart 1:
Fill Heights & Dewatered Volume**

Estimated Dewatered Height is calculated by using Tube Volume X 90%

Circumference (feet)	Recommended Fill Height (feet)	Factor of Safety	Dewatered Volume in Cubic Yds. Per Linear Foot.**
22.5'	5.5'	3.3	1.26
30'	6.5'	3.1	2.07
45'	7.0'	4.9	3.78
60'	7.5'	4.4	5.76
75'	8.0'	3.9	7.90
80'	8.0'	3.4	8.55
90'	8.5'	3.4	10.40
120'	9.0	3.2	14.60

**At the recommended fill height, the unit will hold this amount of volume.
The % solids will depend on the material, proper chemical conditioning, and the time allowed to dewater.

The above information to be used as a guideline for estimated purposes.

**Table 1:
GT 500 Polypropylene - “Specially Engineered Dewatering Textile”**

GT 500 is composed of high-tenacity polypropylene yarns, which are woven into a stable network such that the yarns retain their relative position. GT 500 is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			Machine Direction	Cross Direction
Wide Width Tensile Strength (at ultimate)	ASTM D 4595	kN/m (lbs/in)	70 (400)	96.3 (550)
Wide Width Tensile Elongation	ASTM D 4595	%	20 (max.)	20 (max.)
Factory Seam Strength	ASTM D 4884	kN/m (lbs/in)	70.1 (400)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve #)	0.425 (40)	
Water Flow Rate	ASTM D 4491	l/m/m ² (gpm/ft ²)	813 (20)	
Mass/Unit Area	ASTM D 5261	g/m ² (oz/yd ²)	585 (17.3) (Typical Value)	
UV Resistance (% strength retained after 500 hrs.)	ASTM D 4355	%	80	

PRODUCT AND MANUFACTURER

Containers provided by: TenCate

3680 Mount Olive Road
 Commerce, GA 30529
 Phone: (706) 693-1897
 Fax: (706) 693-1896

Or: Engineer Approved Equal

PART 3 - PLAN OF CONSTRUCTION AND EXECUTION

Prior to performing any work, the contractor shall submit a "Plan of Construction" describing the sequences of operations for the installation of the Dewatering container. The plan shall address site preparation, deployment, chemical/polymer selection, mixing, injection, and filling of the tubes, and anchoring or securing methods. Equipment used for these operations shall also be outlined.

3.1 Site Preparation

- A. Areas in which Dewatering containers are to be placed shall be constructed according to the lines and grades shown on the Drawings. Where such areas are below the allowable grades, they shall be brought to grade. All obstructions that could damage the containers, such as roots and projecting stones, shall be removed. The site surface shall be designed with a level grade 0° slope across the width of the container and a maximum slope 1% for the first 100 ft. and not to exceed 0.5% in the overall length direction of the container. This will require a drainage system such as an aggregate system on a sloped cover that drains to a sump or lower outlet, or a three-dimensional filtration fabric with a ditch system around the perimeter that allows the filtrate to flow unobstructed. It is preferred that the perimeter of the dewatering cell be complete with a 2 ft. high containment berm with 1:1 side slopes.
- B. The site must have an impervious membrane such as NT100 or similar material placed on the prepared surface to underlay the entire dewatering site and to cover the perimeter containment berms.
- C. On top of the NT100 membrane and under the dewatering containers (also when stacking), a drainage medium shall be required as described in paragraph A. Acceptable materials would be Filtration Fabric (FF) or a minimum of 4 inches of washed free draining aggregate. If used, the three-dimensional filtration fabric shall be installed prior to placement of the container and may be installed in between each layer. The FF provides drainage beneath the containers for each layer especially when stacking.
- D. The NT100 membrane must meet the specification shown in Table 2 on page 10.
- E. The FF must meet the specification shown in Table 3 on page 11.
- F. Immediately prior to placing the dewatering containers, the ENGINEER shall inspect the prepared area, and no tubes shall be placed thereon until the area has been favorably reviewed and approved by the engineer.

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**Table 2:
NT100 Membrane**

Mechanical Properties	Test Method	Unit	Typical Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632-91	kN (lbs)	1.29 (290)	1.00 (225)
Grab Tensile Elongation	ASTM D 4632-91	%	31	40
Trapezoid Tear Strength	ASTM D 4533-91	kN (lbs)	0.30 (67)	0.20 (45)
Puncture Strength	ASTM D 4833-00	kN (lbs)	0.53 (120)	
Permeability	ASTM D 4491-99A	cm/sec	< 1 x 10 ⁻¹⁴	
Abrasion Resistance	ASTM D 4886-88 (sliding block)	% strength retained	90	
UV Resistance after 500 hours	ASTM D 4355-02	% strength retained	> 70	
Physical Properties	Test Method	Unit	Typical Value	
Mass/Unit Area	ASTM D 5261-92	g/m ² (oz/yd ²)	287 (8.4)	
Thickness	ASTM D 5199-01	mm (mils)	0.43 (17.0)	
Roll Dimensions (width x length)	--	m (ft)	4 x 100 (13.1 x 328)	
Roll Area	--	m ² (yd ²)	400 (477)	
Estimated Roll Weight	--	kg (lbs)	120 (266)	

NT100 is Provided by:

TenCate
3680 Mount Olive Road
Commerce, GA 30529
Phone: (706) 693-1897
Fax: (706) 693-1896

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**Table 3:
FF — Filtration Fabric**

Mechanical Properties	Test Method	Unit	Typical Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.891 (425)	1.558 (350)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.935 (210)	0.690 (155)
Puncture Strength	ASTM D 4833	kN (lbs)	0.734 (165)	
Mullen Burst Strength	ASTM D 3786	kPa (psi)	5511.112 (800)	
Air Flow	ASTM D 737	cfm	1300	
Thickness	ASTM D 5199	mm (mils)	4.826 (190)	

Physical Properties	Test Method	Unit	Typical Value
Weight	ASTM D 5261	g/m ² (oz/y ²)	342.390 (10.1)
Fiber Content			100% PP
Construction		EPI x PPI	26 x 18

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TenCate
 3680 Mount Olive Road
 Commerce, GA 30529
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 Fax: (706) 693-1896

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3.2 Testing

Rapid Dewatering Test (RDT) in conjunction with Pressure- Dewatering Test (P-DT) shall be conducted to help determine proper drainage, volume reduction, and type and dosage of conditioners and or polymers

- A. The RDT test log (See attachment A) shall be completed and submitted to engineer for review of which chemical conditioning program meets project goals
- B. The RDT Dose Rate Log (See attachment B) shall be completed and submitted to engineer for review of chemical dose rate design capacity required for project
- C. The P-GDT test log (See attachment C) shall be completed and submitted to engineer for review of water/ solids mass balance projected for filtration area.

The RDT and P-GDT can assist in determining filtration parameters which chemical feed system will maintain in full-scale material flow rates. The Filtration Manager must approve the chemical program.

3.3 Placement of Dewatering Container

- A. Place containers within the limits shown on the Drawings.
- B. The unrolled container should be placed on top of the drainage media and be unrolled down the longitudinal direction of the dewatering site and unfolded.
- C. Fill ports should be on the top and down the centerline of the unrolled container. The dimensions of the feed pipe and the opening of the ports should be measured prior to connecting the flanges.

3.4 Filling Process

- A. Following the tube placement, filling with materials from the source shall be accomplished in accordance with the approved Plan of Construction. Any excess discharge shall be directed away from the tubes into a designated area. Before filling, the fill ports not being used for filling shall be closed according to the manufacturer's recommendations to prevent loss of material during filling of the containers.
- B. The dredge or pump discharge pipe shall be free of protrusions that could tear the container surface. The dredge or pump discharge pipe shall be supported above the fill port in a manner which reduces stress on the PVC fill port. Excessive movement of the dredge or pump discharge pipe during filling can result in damage to the container or to the PVC fill port. The Connection Detail supplied by the manufacturer should be followed for the best method to affix the dredge or pump discharge pipe to the process trailer.
- C. The process trailer shall be a pre-wired and mechanically complete skid or trailer with computer operation interface installed inline between the dredge and the filling pipe manifold. The filtration

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parameters resulting from the RDT & P-GDT testing are to be entered in to the program prior to start up by Filtration Mgr.

- D. The system is to have chemical make down and delivery capacity of chemicals at dilution and gpm as specified in “*RDT test dose rate log*” The process system is to evaluate the following parameters every 15 seconds during filling of containers:
 - a. Slurry pH
 - b. Slurry Conductivity
 - c. Slurry Flow
 - d. Slurry Density
 - e. Slurry Percent of Dry Solids
 - f. Chemical shear inversion velocity during mixing with slurry
- E. The process system shall not use rocks, sand and debris in it’s calculations for dry solids slurry concentrations for conditioning.
- F. The Filtration manger shall be responsible to maintain and operate the process system. Additional project support shall be as follow:
 - a. Provide daily process logs: gallons processed , dry tons processed
 - b. Provide daily trend analysis of: gpm, slurry percent solids, polymer consumption and ph
 - c. Provide effluent water quality measurement: Ntu’s, TSS, pH, Salinity
 - d. Provide a daily mass balance of water solids processed.
 - e. Filtration manager shall provide optimization recommendations to Project Manager to increase efficiency of operation using process reports.
- G. Process system to be able operate at the following:
 - a. Process up to 1,200 gpm slurry flow process
 - b. Condition up to 12% d.s. raw feed
 - c. Deliver up to 70 gpm of .5% polymer dilution
- H. Upon filling the tube, the Fill Port sleeves shall be closed by rolling the sleeve down to the top of the port and closing with a clamp. The containers shall be filled as evenly as possible until the design height has been achieved. Effluent water shall be allowed to adequately drain away from the container.
- I. Container recommended filling heights will be supplied by the manufacturer.
- J. Overall compliance with the manufacturer’s installation instructions is required.

3.5 Manufacturer’s Representative and Filtration Manager

A manufacturer’s representative shall be present for the installation of the first containers unless the contractor can prove adequate, successful experience with this technology. A properly vetted Filtration Manager shall supervise operation throughout the project.

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3.6 Manufacturer's Warrantees

Designated manufacture distributor will supply a process warranty for full-scale operation for water quality as total suspended solids TSS of filtrate discharge and consolidations rates dewatered percent dry solids when operations use specified means and methods resulting from in lab-scale testing.

3.7 Terminology & Attachments

- A. Container** — A large tube [greater than 7.5 ft. (2.3 m) in circumference] fabricated from high strength engineered textiles in lengths greater than 20 ft. (6.1 m). Containers are used for containment and dewatering of high moisture content sludge and other fine grain material. Also, containers are used for coastal and riverine erosion control, and cores for marine structures such as sand dunes and levees. The tubes can also be filled by a combination mechanical and hydraulic method.
- B. The Filling Port**, also known as “Injection Port”, are PVC flanges which the inner port body and outer port body each comprise one or more cellular surface capable of distributing a force caused by the clamping of the two bodies together. Once bolted to the top of the container, the dredge or pump discharge line can be attached. Ports are typically 4 to 12 inches in diameter with a 3 to 5 feet long flexible sleeve. Ports are spaced along the top of the tube to provide access by the contractor. Spacing is usually between 50 and 75 ft. Additional ports may be added by designated distributor in the field to accommodate high content sand slurry dredged or pumped materials.
- C. “Specially Engineered Dewatering Textile”** — A woven synthetic textile used to construct the container.
- D. Polymers** — Polyacrylamide polymers can be non-ionic, anionic, or cationic.
- E. Chemical conditioning system** provides polymer storage, metering pump, static mixers, calibration cylinder, flow control, related piping, flow meter, density and dry solids meters and related equipment for properly pacing of polymer injection. Data acquisition is supplied for daily project process reports.
- F. Bench-Scale** — Rapid Dewatering Test (RDT) is a fast and easy test to determine how well a sludge dewateres through the GT 500 textile. The test is designed to: evaluate the efficiency of the polymer, measure the volume of effluent filtered from the sludge, record the time of filtration, and analyze the quality of the effluent water. Contact your local representative for assistance in conducting this test.
- H. Pressure-Dewatering Test (P-DT)** is a demonstration of the methodology of the sludge dewatering by means of a container. The purpose of the test is to: visualize the dewatering methodology, evaluate the efficiency of the selected polymer, analyze the clarity and quality of the effluent, and indicate achievable percent solids. Contact your local representative for assistance in conducting this test.