STATE OF NORTH CAROLINA/BUNCOMBE COUNTY SCHOOLS
REQUEST FOR PROPOSAL RFP # 64-16

PROJECT: **Pisgah Elementary On-site Waste Water Treatment Facility**

PROJECT DESIGNER: **Clark Wyatt – Director Maintenance**

USING AGENCY: **Buncombe County Schools** **ISSUE DATE: December 12, 2016**

Sealed proposals subject to the conditions made a part hereof will be received until **4:00 p.m., January 11, 2017** for furnishing all labor, materials, equipment, and services incidental and implied, for completion of the project described herein.

Pre-Bid Conference: 9:00 a.m. Wednesday, December 21, 2016 at Pisgah Elementary School Main Office 1495 Pisgah Hwy, Candler, NC 28715

SEND ALL PROPOSALS DIRECTLY TO THE ADDRESS AS SHOWN BELOW:

Buncombe County Schools, Purchasing Division
175 Bingham Road
Asheville, NC 28806
FAX: (828) 251-1730 (fax is not guaranteed, call to confirm 828-255-5890)

NOTE: Indicate firm name and RFP number on the front of each sealed proposal envelope or package, along with the date for receipt of proposals specified above.

Direct inquiries concerning this RFP to: Clark Wyatt Phone: 828-232-4244
Ron Venturella, Purchasing Officer Phone: 828-255-5891

THE PROCUREMENT PROCESS

The following is a general description of the process by which a firm will be selected to provide services.

1. Request for Proposals (RFP) is issued to prospective contractors.

2. A pre-proposal conference and/or deadline for written questions is five days prior to due date.

3. Proposals in one original will be received from each offeror in a sealed envelope or package. Each original shall be signed and dated by an official authorized to bind the firm. Unsigned proposals will not be considered.

4. All proposals must be received by the issuing agency not later than the date and time specified on the cover sheet of this RFP.

5. At that date and time the proposals from each responding firm will be opened. Interested parties are cautioned that these costs and their components are subject to further evaluation for completeness and correctness and therefore may not be an exact indicator of an offeror's pricing position. Informal proposals (less than $ 300,000) are confidential until such time that award has been made. Thereafter, the purchasing division will furnish bid tabs upon request.

6. At their option, the evaluators may request oral presentations or discussion with any or all offerors for the purpose of clarification or to amplify the materials presented in any part of the proposal. However, offerors are cautioned that the evaluators are not required to request clarification; therefore, all proposals should be complete and reflect the most favorable terms available from the offeror.

7. Proposals will be evaluated according to completeness, content, experience with similar projects, ability of the offeror and its staff, and cost. Award of a contract to one offeror does not mean that the other proposals lacked merit, but that, all factors considered, the selected proposal was deemed most advantageous to the State.

8. Offerors are cautioned that this is a request for offers, not a request to contract, and the State/Buncombe County Schools reserves the unqualified right to reject any and all offers when such rejection is deemed to be in the best interest of the State.

(NOTE: THIS PAGE MUST BE FULLY EXECUTED AND RETURNED FOR CONSIDERATION OF PROPOSAL)

PROPOSAL FORM
Pisgah Elementary On-site Waste Water Treatment Facility
RFP# 64-16 DUE DATE: 01/11/17

By submitting this proposal, the potential contractor certifies the following:

** This proposal is signed by an authorized representative of the firm.
** It can obtain and submit to the Owner insurance certificates as required within 5 calendar days after notice of award.
** The cost and availability of all equipment, materials, and supplies associated with performing the services described herein have been determined and included in the proposed cost.
** All labor costs, direct and indirect, have been determined and included in the proposed cost.
** All taxes have been determined and included in the proposed cost.
** The offeror has attended the conference *(if applicable*) or conducted a site visit and is aware of prevailing conditions associated with performing these services.
** The potential contractor has read and understands the conditions set forth in this RFP and agrees to them with no exceptions.

Therefore, in compliance with this Request for Proposals, and subject to all conditions herein, the undersigned offers and agrees, if this proposal is accepted within 60 days (normally less) from the date of the opening, to furnish the subject services for a cost not to exceed:

Complete Installation of on-site waste water treatment facility. Per specifications and drawings.

$ _____ dollars and _____/100 ($).

Addenda received: _____ Attended Pre-bid conference _____

OFFEROR: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

TELEPHONE NUMBER: _____ FAX: _____

FED ID No: _____ Type & License #: _____

E-MAIL: _____ MBE Status: _____

Principal Place of Business if different from above (See General Information on Submitting Proposals, Item 18.):

_____

BY: (Signature) _____ TITLE: _____

DATE: _____ (Typed or printed name) _____

END OF PROPOSAL FORM

GENERAL INFORMATION ON SUBMITTING PROPOSALS

1. **EXCEPTIONS:** All proposals are subject to the terms and conditions outlined herein. All responses shall be controlled by such terms and conditions and the submission of other terms and conditions, price lists, catalogs, and/or other documents as part of an offeror's response will be waived and have no effect either on this Request for Proposals or on any contract that may be awarded resulting from this solicitation. Offeror specifically agrees to the conditions set forth in the above paragraph by signature to the proposal.

2. **CERTIFICATION:** By executing the proposal, the signer certifies that this proposal is submitted competitively and without collusion (G.S. 143-54), that none of our officers, directors, or owners of an unincorporated business entity has been convicted of any violations of Chapter 78A of the General Statutes, the Securities Act of 1933, or the Securities Exchange Act of 1934 (G.S. 143-59.2), and that we are not an ineligible vendor as set forth in G.S. 143-59.1. False certification is a Class I felony.

3. **ORAL EXPLANATIONS:** The State/Buncombe County Schools shall not be bound by oral explanations or instructions given at any time during the competitive process or after award.

4. **REFERENCE TO OTHER DATA:** Only information which is received in response to this RFP will be evaluated; reference to information previously submitted shall not be evaluated.

5. **ELABORATE PROPOSALS:** Elaborate proposals in the form of brochures or other presentations beyond that necessary to present a complete and effective proposal are not desired.

   In an effort to support the sustainability efforts of the State of North Carolina we solicit your cooperation in this effort.
   It is desirable that all responses meet the following requirements:

- All copies are printed **double sided**.
- All submittals and copies are printed on **recycled paper with a minimum post-consumer content of 30%** and indicate this information accordingly on the response.
- Unless absolutely necessary, all proposals and copies should **minimize or eliminate use of non-recyclable or non re-usable materials** such as plastic report covers, plastic dividers, vinyl sleeves, and GBC binding. Three-ringed binders, glued materials, paper clips, and staples are acceptable.
- Materials should be submitted in a format which allows for **easy removal and recycling** of paper materials.

6. **COST FOR PROPOSAL PREPARATION:** Any costs incurred by offerors in preparing or submitting offers are the offerors' sole responsibility; the State of North Carolina/Buncombe County Schools will not reimburse any offeror for any costs incurred.

7. **TIME FOR ACCEPTANCE:** Each proposal shall state that it is a firm offer which may be accepted within a period of 45 days. Although the contract is expected to be awarded prior to that time, the 45 day period is requested to allow for unforeseen delays.

8. **TITLES:** Titles and headings in this RFP and any subsequent contract are for convenience only and shall have no binding force or effect.

9. **CONFIDENTIALITY OF PROPOSALS:** In submitting its proposal the offeror agrees not to discuss or otherwise reveal the contents of the proposal to any source outside of the using or issuing agency, government or private, until after the award of the contract. Offerors not in compliance with this provision may be disqualified, at the option of the State/Buncombe County Schools, from contract award. Only discussions authorized by the issuing agency are exempt from this provision.

10. **RIGHT TO SUBMITTED MATERIAL:** All responses, inquiries, or correspondence relating to or in reference to the RFP, and all other reports, charts, displays, schedules, exhibits, and other documentation submitted by the offerors shall become the property of the State/Buncombe County Schools when received.

11. **OFFEROR'S REPRESENTATIVE:** Each offeror shall submit with its proposal the name, address, and telephone number of the person(s) with authority to bind the firm and answer questions or provide clarification concerning the firm's proposal.

12. **SUBCONTRACTING:** Offerors may propose to subcontract portions of the work provided that their proposals clearly indicate what work they plan to subcontract and to whom and that all information required about the prime contractor is also included for each proposed subcontractor.

13. **PROPRIETARY INFORMATION:** Trade secrets or similar proprietary data which the offeror does not wish disclosed to other than personnel involved in the evaluation or contract administration will be kept confidential to the extent permitted by NCAC T01:05B.1501 and G.S. 132-1.3 if identified as follows: Each page shall be identified in boldface at the top and bottom as "CONFIDENTIAL". Any section of the proposal which is to remain confidential shall also be so marked in boldface on the title page of that section. Cost information may not be deemed confidential. In spite of what is labeled as confidential, the determination as to whether or not it is shall be determined by North Carolina law.

14. **HISTORICALLY UNDERUTILIZED BUSINESSES:** Pursuant to General Statute 143-48 and Executive Order #150, Buncombe County Schools invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled, disabled business enterprises and non-profit work centers for the blind and severely disabled.

    The Contractor agrees in particular to maintain open hiring and employment practices and to receive applications for employment in compliance with all requirements of applicable federal, state and local laws and regulations issued pursuant thereto relating to nondiscriminatory hiring and employment practices. Each Prime Contractor shall undertake an affirmative action program to ensure that no person shall be excluded from participation in any employment activities because of age, sex, race, religion, color, national origin or handicap.

15. **PROTEST PROCEDURES**: If an offeror wants to protest a contract awarded pursuant to this solicitation, they must submit a written request to the Purchasing Officer, Buncombe County Schools, 175 Bingham Road, or PO Box 16771, Asheville, NC 28806. This request must be received by the Purchasing Division within thirty (30) consecutive calendar days from the date of the contract award, and must contain specific sound reasons and any supporting documentation for the protest. NOTE: Contract award notices are sent only to those actually awarded contracts, and not to every person or firm responding to this solicitation. Contract status and award notices are available through the purchasing division or the project designer with contact information as shown on the first page of this solicitation. Offeror's may call to obtain a verbal status of contract award. All protests will be handled pursuant to the North Carolina Administrative Code, Title 1, Department of Administration, Chapter 5, Purchase and Contract, Section 5B.1519.

16. **TABULATIONS:** Offeror's may call the purchasing division to obtain a verbal status of contract award.

17. **VENDOR REGISTRATION AND SOLICITATION NOTIFICATION SYSTEM:** Vendor Link NC allows vendors to electronically register free with the State to receive electronic notification of current procurement opportunities for goods and services available on the Interactive Purchasing System. Online registration and other purchasing information are available on the Internet web site: http://www.state.nc.us/pandc/.

18. **RECIPROCAL PREFERENCE:** G.S. 143-59 establishes a reciprocal preference law to discourage other states from applying in-state preferences against North Carolina's resident offerors. The "Principal Place of Business" is defined as the principal place from which the trade or business of the offeror is directed or managed.

NORTH CAROLINA GENERAL CONTRACT TERMS AND CONDITIONS
(Contractual and Consultant Services)

1. **GOVERNING LAW:** This contract is made under and shall be governed and construed in accordance with the laws of the State of North Carolina.

2. **SITUS:** The place of this contract, its situs and forum, shall be North Carolina , where all matters, whether sounding in contract or tort, relating to is validity, construction, interpretation and enforcement shall be determined

3. **INDEPENDENT CONTRACTOR:** The Contractor shall be considered to be an independent contractor and as such shall be wholly responsible for the work to be performed and for the supervision of its employees. The Contractor represents that it has, or will secure at its own expense, all personnel required in performing the services under this agreement. Such employees shall not be employees of, or have any individual contractual relationship with the Agency.

4. **KEY PERSONNEL:** The Contractor shall not substitute key personnel assigned to the performance of this contract without prior written approval by the Agency's Contract Administrator. The individuals designated as key personnel for purposes of this contract are those specified in the Contractor's proposal.

5. **SUBCONTRACTING:** Work proposed to be performed under this contract by the Contractor or its employees shall not be subcontracted without prior written approval of the Agency's Contract Administrator/Project Designer. Acceptance of an offeror's proposal shall include any subcontractor(s) specified therein.

6. **PERFORMANCE AND DEFAULT:** If, through any cause, the Contractor shall fail to fulfill in timely and proper manner the obligations under this agreement, the Agency shall thereupon have the right to terminate this contract by giving written notice to the Contractor and specifying the effective date thereof. In that event, all finished or unfinished deliverable items under this contract prepared by the Contractor shall, at the option of the Agency, become its property, and the Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such materials. Notwithstanding, the Contractor shall not be relieved of liability to the Agency for damages sustained by the Agency by virtue of any breach of this agreement, and the Agency may withhold any payment due the Contractor for the purpose of setoff until such time as the exact amount of damages due the Agency from such breach can be determined.
    In case of default by the Contractor, the State may procure the services from other sources and hold the Contractor responsible for any excess cost occasioned thereby. The State reserves the right to require performance bond or other acceptable alternative guarantees from successful offeror without expense to the State.

Upon the entering of a judgment of bankruptcy of insolvency by or against the Contractor, the Agency may terminate this contract for cause.

Neither party shall be deemed to be in default of its obligations hereunder if and so long as it is prevented from performing such obligations by any act of war, hostile foreign action, nuclear explosion, riot, strikes, civil insurrection, earthquake, hurricane, tornado, or other catastrophic natural event or act of God.

7. **TERMINATION:** The Agency may terminate this agreement at any time by *15 days* notice in writing from the Agency to the Contractor. In that event, all finished or unfinished deliverable items prepared by the Contractor under this contract shall, at the option of the Agency, become its property. If the contract is terminated by the Agency as provided herein, the Contractor shall be paid for services satisfactorily completed, less payment or compensation previously made.

8. **AVAILABILITY OF FUNDS:** Any and all payments to the Contractor are dependent upon and subject to the availability of funds to the Agency for the purpose set forth in this agreement.

9. **CONFIDENTIALITY:** Any information, data, instruments, documents, studies or reports given to or prepared or assembled by the Contractor under this agreement shall be kept as confidential and not divulged or made available to any individual or organization without the prior written approval of the Agency.

10. **CARE OF PROPERTY:** The Contractor agrees that it shall be responsible for the proper custody and care of any property furnished it for use in connection with the performance of this contract or purchased by it for this contract and will reimburse the State for loss of damage of such property.

11. **COPYRIGHT:** No deliverable items produced in whole or in part under this agreement shall be the subject of an application for copyright by or on behalf of the Contractor.

12. **ACCESS TO PERSONS AND RECORDS:** The State Auditor shall have access to persons and records as a result of all contracts or grants entered into by State agencies or political subdivisions in accordance with General Statute 147-64.7. The Contractor shall retain all records for a period of three years following completion of the contract.

13. **ASSIGNMENT:** No assignment of the Contractor's obligations nor the Contractor's right to receive payment hereunder shall be permitted. However, upon written request approved by the issuing purchasing authority, the State may:
    a. Forward the contractor's payment check(s) directly to any person or entity designated by the Contractor, or
    b. Include any person or entity designated by Contractor as a joint payee on the Contractor's payment check(s).

    In no event shall such approval and action obligate the State to anyone other than the Contractor and the Contractor shall remain responsible for fulfillment of all contract obligations.

14. **COMPLIANCE WITH LAWS:** The Contractor shall comply with all laws, ordinances, codes, rules, regulations, and licensing requirements (permits) that are applicable to the conduct of its business, including those of federal, state, and local agencies having jurisdiction and/or authority.

15. **AFFIRMATIVE ACTION:** The Contractor shall take affirmative action in complying with all Federal and State requirements concerning fair employment and employment of people with disabilities, and concerning the treatment of all employees without regard to discrimination by reason of race, color, religion, sex, national origin, or disability.

16. **INSURANCE:** During the term of the contract, the contractor at its sole cost and expense shall provide commercial insurance of such type and with such terms and limits as may be reasonably associated with the contract. As a minimum, the contractor shall provide and maintain the following coverage and limits:

    a. Worker's Compensation - The contractor shall provide and maintain Worker's Compensation Insurance, as required by the laws of North Carolina, as well as employer's liability coverage with minimum limits of $150,000.00, covering all of Contractor's employees who are engaged in any work under the contract. If any work is subcontracted, the contractor shall require the subcontractor to provide the same coverage for any of its employees engaged in any work under the contract.

    b. Commercial General Liability - General Liability Coverage on a Comprehensive Broad Form on an occurrence basis in the minimum amount of $2,000,000.00 Combined Single Limit. (Defense cost shall be in excess of the limit of liability.

    c. Automobile - Automobile Liability Insurance, to include liability coverage, covering all owned, hired and non-owned vehicles, used in connection with the contract. The minimum combined single limit shall be $500,000.00 bodily injury and property damage; $500,000.00 uninsured/under insured motorist; and $100,000.00 medical payment.

    Providing and maintaining adequate insurance coverage is a material obligation of the contractor and is of the essence of this contract. All such insurance shall meet all laws of the State of North Carolina. Such insurance coverage shall be obtained from companies that are authorized to provide such coverage and that are authorized by the Commissioner of Insurance to do business

in North Carolina. The contractor shall at all times comply with the terms of such insurance policies, and all requirements of the insurer under any such insurance policies, except as they may conflict with existing North Carolina laws or this contract. The limits of coverage under each insurance policy maintained by the contractor shall not be interpreted as limiting the contractor's liability and obligations under the contract.

The Contractor shall furnish a Certificate of Insurance as proof of the above coverages. Certificate will contain provision that the insurance coverages cannot be canceled, reduced in amount or coverage eliminated without 30 days written notice to the Buncombe County Board of Education. Owner's Protective insurance must list the Buncombe County Board of Education as a "Named Insured" as it's interest may appear. Owner's approval of Certificate of Insurance does not decrease or relieve the contractor's responsibility for maintaining insurance coverage as required in this Request for Proposal.

17. **ADVERTISING:** Contractor agrees not to use the existence of this contract, the name of the agency, or the name of the State of North Carolina as part of any commercial advertising.

18. **ENTIRE AGREEMENT:** This contract and any documents incorporated specifically by reference represent the entire agreement between the parties and supersede all prior oral or written statements or agreements. This Request for Proposals, any addenda thereto, and the offeror's proposal are incorporated herein by reference as though set forth verbatim.

    All promises, requirements, terms, conditions, provisions, representations, guarantees, and warranties contained herein shall survive the contract expiration or termination date unless specifically provided otherwise herein, or unless superseded by applicable Federal or State statutes of limitation.

19. **AMENDMENTS:** This contract may be amended only by written amendments duly executed by the Agency and the Contractor.

20. **TAXES:** G.S. 143-59.1 bars the Secretary of Administration from entering into contracts with vendors if the vendor or its affiliates meet one of the conditions of G. S. 105-164.8(b) and refuse to collect use tax on sales of tangible personal property to purchasers in North Carolina. Conditions under G. S. 105-164.8(b) include: (1) Maintenance of a retail establishment or office, (2) Presence of representatives in the State that solicit sales or transact business on behalf of the vendor and (3) Systematic exploitation of the market by media-assisted, media-facilitated, or media-solicited means. By execution of the bid document the vendor certifies that it and all of its affiliates, (if it has affiliates), collect(s) the appropriate taxes.

21. **GENERAL INDEMNITY:** The contractor shall hold and save the State/Buncombe County Schools, its officers, agents, and employees, harmless from liability of any kind, including all claims and losses, with the exception of consequential damages, accruing or resulting to any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm, or corporation that may be injured or damaged by the contractor in the performance of this contract and that are attributable to the negligence or intentionally tortious acts of the contractor provided that the contractor is notified in writing within 30 days that the State/Buncombe County Schools has knowledge of such claims. The contractor represents and warrants that it shall make no claim of any kind or nature against the State's agents who are involved in the delivery or processing of contractor goods to the State. The representation and warranty in the preceding sentence shall survive the termination or expiration of this contract.

22. **PAYMENT:** Payment will be issued per school when work is complete satisfying the specifications and copies of all permit and inspections are complete and provided to the owner.

CONTRACTOR'S SALES TAX REPORT
Buncombe County Schools

NC State and Local Sales Taxes Paid

CONTRACTOR: _____ **PO#/RFP#** _____

Address:_____ **For Period:** _____

Invoice Date	Invoice #	Type of Property	NC Tax 4.75%	County Tax 2.25%	Name of County
		TOTAL	**$**	**$**	

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the building or structure. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the _____ day of _____, 20____

_____
Signed

_____
Notary Public

_____
Print or Type Name of Above & Title

My Commission Expires: _____

Seal

NOTE:
This certified statement may be subject to audit.

The North Carolina General Assembly has amended the Statute to provide refunds of sales and use tax to local school units in accordance with the provisions of G.S. 105-164. 14(c) effective with tax paid on or after July 1, 1998.

These refunds are to include the “sales and use taxes paid by contractors on building materials, supplies, fixtures and equipment that become a part of or annexed to a building or structure that is owned or leased by the governmental entity and is being erected, altered or repaired for use by the governmental entity (G.S. 1O5-164.14).”

Sales and Use Tax Technical Bulletin Section 18-2F specifies: “To substantiate a refund claim for sales or use taxes paid on purchases of building materials, supplies. Fixtures and equipment by its contractor, the claimant must secure from such contractor certified statements setting forth all of the following information:

a. the date the property was purchased;
b. the type of property purchased :
c. the project for which the property was used:
d. if the property was purchased in this State, the county in which it was purchased;
e. if the property was not purchased in this State, the county in which the property was used; and
f. the amount of sales and use taxes paid.

In the event the contractor makes several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices and the State and local sales and use taxes paid thereon. Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of sales and use tax paid thereon by the contractor. Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant. Any local sales or use taxes must be shown separately from the State sales or use taxes. The contractor’s statements must not contain sales or use taxes paid on purchases of tangible personal property purchased by such contractors for use in performing the contract which does not annex to, affix to or in some manner become a part of the building or structure that is owned or leased by a governmental agency and is being erected, altered or repaired for use by a governmental entity as defined by G.S. 105-164.14(c). Examples of property on which sales or use tax has been paid by the contractor and which shall not be included in the contractor's statement are scaffolding, forms for concrete, fuel for the operation of machinery and equipment, tools, repair parts and equipment rentals.

All information requested in these specifications and actual bids shall be entered on enclosed “Request for Proposal" All areas of this document must be completed in full, especially: (1) Name of Company, (2) By (signature), (3) Official Title, and (4) Quotation Date.

Please read entire specification package. You will be held accountable for all information. NO payment shall be made if specifications are not followed.

Pisgah Elementary On-site Waste Water Treatment Facility

Pre-Bid Conference: A pre-bid conference shall be held in the main lobby of Pisgah Elementary at 9:00 am on Wednesday, December 21, 2016 located at 1495 Pisgah Highway, Candler, NC 28715

Scope of Work: Work shall consist of furnishing all labor, materials, equipment, services and permits incidental and implied, to install a complete work system as designed according to the attached drawings and specifications.

Contractor's Responsibility: The Contractor shall be responsible for the construction site during the performance of the work. The Contractor shall be responsible for any and all damages to persons and property during the performance of work and shall further provide all necessary safety measures and shall fully comply with all federal state and local laws, building rules, and regulations to prevent accidents or injury to persons or property on or about the location of the work site. This is to include OSHA 1910, General Construction, or those regulations mandated by these specifications. Special attention shall be made to proper barricading of the work area.

Safety Regulations: The Contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974 Federal Register) which is hereby incorporated in these specifications.

Codes: All work shall be performed in accordance with the specifications and shall comply with North Carolina Building Code, National Electrical Code Underwriters' Rules and Regulations and Federal, State and Local Regulations covering work of this nature. Whenever specifications are in excess of such laws, codes and regulations, the specifications shall hold. All equipment shall have U. L. labels attached.

Permits: The Contractor shall hold the appropriate license for work to be performed and shall secure all permits required for the job completion, obtain and deliver to Owner, all certification of inspection issued by the Authorities Having Jurisdiction. All final certificates must be delivered to owner prior to request for final payment.

Scheduling: The Contractor must submit a precise time schedule as to when specific work will occur in specific areas within the building. This will be used to coordinate the work with the occupants of the building. The Electrical Supervisor or Principal may alter the schedule at any time to maintain the work process within the facility. Work must be scheduled during hours that are acceptable to each school and the Buncombe County Board of Education shall not incur any additional cost due to scheduling.

All work must be scheduled to avoid conflict with classroom instruction time, **and begin no earlier than January 1, 2017 and completed no later than August 1, 2017**. All permits and inspections will be the responsibility of the contractor, and copies of permits and final inspection will be submitted to Buncombe county Schools prior to final payment.

Workers on Job: All employees of the Contractor shall, while on Buncombe County Board of Education property, act in a professional and courteous manner. All workers shall be expected to wear long pants and shirts while on Board property. Also, all employees of the Contractor must "sign in" in the main office upon entering the facility and must "sign out" upon leaving the property. Any employee of the Contractor may be told to leave the property by either the Principal or the Electrical Supervisor, if they do not follow the above

procedure. The employee shall be replaced with another at no additional cost to the Buncombe County Board of Education. Smoking or use of Tabaco products is prohibited on Buncombe County School's property.

In accordance with G.S. 14-208.18, all persons who (1) are required to register under the Sex Offender and Public Protection Program AND (2) have been convicted of certain sexually violent offenses or any offense where the victim was under the age of 16 years at the time of the offense are expressly forbidden to knowingly be present on any property owned or operated by the school system, including school buildings, athletic fields, playgrounds, parking lots, school buses, activity buses or other property of any kind for any reason, including attendance at sporting events or other school related functions, whether before, during or after school hours. It is the responsibility of the contractor or vendor that their employees and sub-contractors are in accordance with G.S. 14-208.18.

E-Verify: Contractor shall comply with E-Verify, the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law and as in accordance with N.C.G.S. §64-25 et seq. In addition, to the best of Contractor's knowledge, any subcontractor employed by Contractor as a part of this contract shall be in compliance with the requirements of E-Verify and N.C.G.S. §64-25 et seq.

Iran Divestment Act: North Carolina Local Government Units may not enter into contracts with any entity or individual found on the State Treasurer's Iran Final Divestment List N.C.G.S. 143C-6A. By bidding on this project the bidder certifies it is not listed on the Final Divestment List created by the State Treasurer.

Equipment and Tools: The Contractor shall not use equipment or tools that are owned by the Buncombe County Board of Education. Also, employees of the Buncombe County Board of Education shall not be utilized by the Contractor except for opening locked doors and giving directions.

Materials: All materials stored on site must be stored in a safe and secure manner that does not interfere with the Schools daily operation. Buncombe County Board of Education is not responsible for any materials, equipment or tools lost or stolen from the site.

Clean Up: The area of work shall be cleaned daily so that the Buncombe County Board of Education shall not incur any additional costs to make the area suitable for the work process. Also, the Contractor shall utilize no trash receptacles or dumpsters owned by the Buncombe County Board of Education. All trash and removed materials shall be properly disposed of off the property. Onsite dumpsters shall not be used.

Performance of Work: All work shall be performed at the highest level of quality. The Owner shall be responsible for determining the quality of work, and may notify the Contractor of same. ANY WORK COMPLETED THAT IS NOT SUITABLE TO THE OWNER SHALL BE REPEATED BY THE CONTRACTOR AT NO COST TO THE OWNER. Any damage to existing area or utilities will be the responsibility of the Contractor. NO EXCEPTIONS.

Warranty: All labor, materials and equipment shall be unconditionally warranted for one (1) year from issuance of inspection "**green tag**".

Bonds: Bonds are not required for this project.

The Buncombe County Board of Education reserves the right to reject any or all bids for any or no reason, and to waive informalities**.**

BROOKS
ENGINEERING ASSOCIATES

Planning & Project Management / Civil Engineering / Surveying
Soil Science Services / Environmental Engineering & Services
17 Arlington Street / Asheville NC 28801 / www.brooksea.com / 828-232-4700

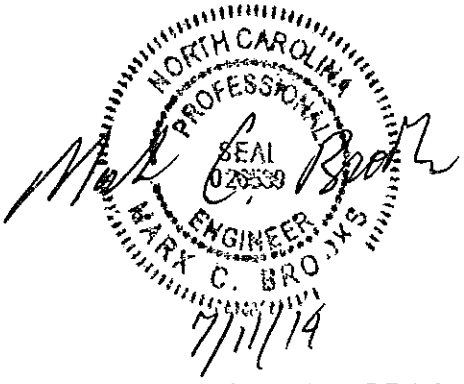
PISGAH ELEMENTARY SCHOOL
ONSITE WASTEWATER SYSTEM
BUNCOMBE COUNTY, NORTH CAROLINA

SYSTEM
SPECIFICATIONS & CALCULATIONS

PREPARED FOR:

BUNCOMBE COUNTY SCHOOLS
175 BINGHAM ROAD
ASHEVILLE, NC 28806

BY:
BROOKS ENGINEERING ASSOCIATES, P.A.



ORIGINAL: JULY 11, 2014

BROOKS ENGINEERING ASSOCIATES PROJECT NO.: 403314

TABLE OF CONTENTS

1.0 SYSTEM SUMMARY & PROJECT INFORMATION

1.1 Project Summary

The accompanying plans are for a repair septic system to serve the Pisgah Elementary School. The design flow is 2,700 gpd based upon 225 students at 12 gpd/student and County review of flow data for the facility. The existing septic system is to be abandoned in place. The new system consists of the following.

- Replacement of the existing three manholes and portions of the collection system piping.
- Installation of a new grease trap tank.
- A new septic tank and a new pump tank.
- A new dosing system consisting of a siphon pump for demand dosing and a pressure manifold for equal lateral distribution.
- 1400 linear feet of new conventional gravel drainfield based on Group III soil types.

System calculations and accompanying pump curves are provided in Section 6.0. The following calculations are included:

- Dose Volume & Tank Sizing Calculations.
- TDH calculations from the Dose Tank to each Manifold.
- Manifold Orifice Calculations calculating the minimum required flow to each manifold and the anticipated head on each manifold at the predicted pumping rate.

Section 7.0 includes system components' product specification (cut) sheets.
All specifications are subject to North Carolina Laws and Rules for Sewage Treatment and Disposal Systems 15A NCAC 18A .1900 and North Carolina State Plumbing Code and North Carolina State Electrical Code, where applicable. Any use of "equivalent products" shall first be approved by the Project Engineer prior to installation.

1.2 Contacts

Engineer – Mark Brooks, PE, Brooks Engineering Associates (828) 232-4700
Buncombe County Health Department – Stan Crownover, LSS, PhD (828) 250-5026
Owner Contact – Belvin Hall, Buncombe County Maintenance (828) 232-4244
Tank Manufacturers – Dellinger Tank Company (800) 948-1666

1.3 Scope & Qualifiers

This specifications manual is intended only for the use of permitting and construction of the specified wastewater system. Any changes to these plans and specifications shall be approved by the Project Engineer. Any changes in layout and/or equipment specifications not approved by the Engineer shall release the Engineer from any potential liability associated with the system.

Notify Engineer in sufficient time to permit inspection of underground work before backfilling is begun. A final inspection shall be required with the Owner, Engineer, Environmental Health Department (EHD) representative, and Contractor. Only the set of engineering plans with revision labeled "RELEASED FOR CONSTRUCTION" shall be utilized for construction.

All construction lines shall conform to the latest County and State of North Carolina specifications as defined by *Laws & Rules for Sewage Treatment and Disposal Systems 15A NCAC 18A .1900 et.sec.* and the North Carolina Building Code. Where two (2) standards conflict, the more stringent shall apply.

In the event that the Contractor or another supplier proposes an alternate component to the specified manufacturer or component type, certain procedures must be followed. If proposing an alternate, the Contractor (supplier) must submit, no less than 10 business days in advance of the bid date (if during the bid review period) or 10 days prior to the need for installation. If needed, the contractor must provided a system hydraulic analysis based on the proposed component (including pipe sizes, flows, velocities, retention times, etc.), a list of exceptions to the governing specifications herein and/or demonstration of compliance to of these specifications. This information must be submitted to the Engineer for pre-approval of the alternate equipment being proposed and determination of compliance with these Contract Documents. If the equipment differs materially or differs from the dimensions given on the Drawings, the Contractor (supplier) shall submit complete drawings showing elevations, dimensions, or any necessary changes to the Contract Documents for the proposed equipment and its installation. Pre-approval, if granted, will be provided in writing by the Engineer to the Contractor (supplier) at least five business days in advance of the bid or installation date. If the Engineer's approval is obtained for Alternate Equipment, the Contractor (supplier) must make any needed changes in the structures, system design, piping or electrical systems necessary to accommodate the proposed equipment at the expense of the Contractor (supplier).

2.0 COLLECTION SYSTEM AND GENERAL CONVEYANCE LINES

2.1 Location Of Collection System

The exact location of the collection system lines is not known as no as-built drawings exist. BEA has utilized survey data on invert elevations and manhole pipe penetrations to estimate the line locations. The lines and manholes to be replaced are identified on the engineering drawings.

2.2 Sewer Line General Specifications

Non-pressure pipe and fittings shall be Schedule 40 PVC (polyvinyl chloride) with solvent-cemented or gasketed joints (ASTM D3034). All non pressurized piping shall maintain a minimum slope of 1/8-inch fall per lineal foot. Bedding and compaction shall be to a 95% Standard Proctor Test (ASTM Standard D 698) and trenching and installation shall be consistent with ASTM D2321.

Force Mains and all pressurized lines shall be constructed of Schedule 40 PVC or as noted on the engineering plans.

The following are general location and separation guidelines:

- Typically a 3-foot minimum cover shall be maintained on all sewer lines.
- Sewer lines may cross a water line if 18 inches clear separation is maintained, with the sewer line passing under the water line. The sewer line shall be constructed of ductile iron pipe and the water line shall be constructed of ferrous material equivalent to water main standards for at least 10 feet on either side of each crossing.
- Sewer lines may cross a storm drain if at least 12 inches of clear separation is maintained or the sewer pipe is of ductile iron or encased in ductile iron pipe for at least 5 feet on either side of the crossing.
- Sewer lines may cross a stream if at least three feet of stable cover can be maintained with a horizontal boring or the sewer line is of ductile iron pipe or encased in ductile iron pipe for at least 10 feet on either side of the crossing and protect against the normal range of high and low water.

2.2.1 *Sizing*

No public gravity sewer main conveying wastewater shall be less than 8 inches in diameter. No private gravity sewer main conveying wastewater shall be less than 6 inches in diameter. Individual residential gravity sewer main lines shall not be less than 4 inches in diameter. Building Sewers shall be in accordance with the state plumbing code and approved by the local building inspector.

Pressurized sewer lines shall be sized according to lines sizes depicted in the engineering construction drawings. All pressure sewer lines shall be sized to have velocities no less than 2 feet per and no more than 8 feet per second from the supplying pump at typical head conditions to maintain scour velocity and minimize hammer conditions.

Three (3) feet minimum cover shall be provided for all sewers unless ferrous material pipe is specified. Ferrous material pipe, or other pipe with proper bedding to develop design supporting strength, shall be provided where sewers are subject to traffic bearing loads. Additional protection shall be provided for sewers that cannot be placed at a depth sufficient to prevent damage.

2.2.2 *Steep Slope Installation*

No slopes greater than 20 percent are anticipated based on the available topographic data. However, should conditions prove different, sewers on 20 percent slopes or greater shall be anchored securely with concrete, or equal, with the anchors spaced as follows:

a. Not greater than 36 feet center to center on grades 21% to 35%;
b. Not greater than 24 feet center to center on grades 35% to 50 %; and
c. Not greater than 16 feet center to center on grades 50% and over.

Mechanically fastened joints (such as Megalug™ or Certa-Lok™ couplings) may be utilized in lieu of slope anchors in certain circumstances. The project engineer should be consulting if a substitution to the slope anchors is desired.

2.2.3 *Trenching*

Trench excavation shall conform to the line, depth and dimensions shown on the plans or as directed by the Engineer. The trench shall be properly braced and shored so that workmen may work safely and efficiently. If unstable conditions are encountered, the Engineer shall be notified in order that proper bedding materials may be selected. Trench excavation or excavation for pipelines shall consist of excavation necessary for the construction of sewers,

conduits and other pipelines and all appurtenant facilities thereof, pipe embedment materials, and pipe protection, insulating and sleeving in ductile iron pipe, as called for on the plans. It shall include site preparation, backfilling and tamping of pipe trenches and around tanks and the disposal of waste materials, all of which shall conform to the applicable provisions of these specifications. When rock, excessive organics, muck, quicksand, soft clay, swampy or other material unsuitable for foundations or subgrade are encountered which extend beyond the limits of the excavation, such material shall be removed and replaced with pipe foundation material as specified in the engineering drawings. Surface drainage shall not be allowed to enter excavated areas.

2.2.4 Rock in Pipe Trenches

Rock encountered in trench excavation shall be removed for the overall width of trench which shall be as shown on the plans. It shall be removed to a minimum depth of three (3) inches below the bottom of the pipe and replaced with a suitable compacted (to standard) fill material. If surcharges are to be levied due to excavation of rock, the Engineer must be notified to inspect and verify the rock conditions prior to backfilling.

2.2.5 Pipe Installation

The pipe material listed above shall be installed in accordance with the manufacturer's recommendations and the requirements of these specifications. All sewer lines shall be laid to the line and grade shown on the plans. No deviations from line and grade shall be made, unless they have been approved by the Engineer. The pipe interior shall be kept clean before and after laying by means approved by the Engineer. Pipe ends shall be plugged at the end of each work day or when work is temporarily stopped. The plugs shall be watertight so that water and debris will not enter the pipe.

2.2.6 Backfilling

(a) All backfilling shall be done in such manner as will not disturb or injure the pipe or structure over or against which it is being placed. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be excavated, repaired and then re-backfilled as specified herein. All backfill shall be compacted to a minimum of 95% Standard Proctor. The contractor is responsible for procuring testing from a qualified geotechnical testing firm and providing documentation of testing if requested.

(b) The Contractor shall replace all surface materials and shall restore paving, curbing, sidewalks, gutters, shrubbery, fences, sod, and other surfaces disturbed, to a condition equal

to that before the work began, furnishing all labor and materials incidental thereto as provided elsewhere in contracting agreements. The backfilling of the trench after the pipe installation and testing shall be in accordance with the standard trenching detail in the engineering construction drawings.

2.2.7 Testing

No testing shall be performed until at least two days after all pipe connections have been made. For hydraulic testing, the testing system shall have the ability to pressurize and seal the line on both ends and have pressure readings on both ends of the installed system. Testing procedures shall consist of pressurizing the distribution system with water with pressure equivalent to the capacity of the specified pump. As this system has a siphon pump, the hydraulic head will be sufficient for testing. Once the line has been sealed and the pressure equilibrated, the system shall be inspected for leaks. The equilibrated pressure shall be maintained for two hours with a pressure drop of less than 2 psig.

2.2.8 Valving

Valving on all piping shall be consistent with material types and sizes of attached piping as shown on the Engineering Plans. Air release valves must be continuous acting air/vacuum relief valves sized as indicated on the engineering drawings.

3.0 PRETREATMENT & DISPOSAL SYSTEM

The wastewater pretreatment system consists of new tanks as described below. The disposal system shall consist of the drainfields, the dosing pumps, controls, conveyance lines, and control valves.

3.1 Pretreatment System

3.1.1 Existing System

The existing system is to be abandoned in place once the new system has been installed, but not activated.

3.1.2 Grease Trap

The proposed grease trap consists of a new 2500 gallon precast reinforced tank configured to act as a grease trap. The tank structural loading must be traffic rated. Refer to engineering drawings for baffling and outlet piping requirements. All precast tanakge must meet requirements set forth in 15A NCAC 18A .1954 *Minimum Standards for Precast Reinforced Concrete Tanks.* Only the kitchen sinks and dishwasher are to be plumbed to this tank. No domestic sewage is to be plumbed to this tank.

3.1.3 Septic tank

The proposed septic tank consists of a new 3160 gallon precast reinforced tank with standard septic tank baffling. All precast tanakge must meet requirements set forth in 15A NCAC 18A .1954 *Minimum Standards for Precast Reinforced Concrete Tanks.* The tank shall be outfitted with a commercial effluent filter. The filter specified is a Zoeller P/N 5000 Commercial Effluent Filter. The filter must be supported by manufacturer provide support posts and have the handles that extend in to the tank riser as depicted in the engineering drawings.

3.2 Dosing and Control System

3.2.1 Dosing System Tankage

The proposed pump tank consists of a new 2500 gallon precast reinforced pump tank with no baffling. All precast tanakge must meet requirements set forth in 15A NCAC 18A .1954 *Minimum Standards for Precast Reinforced Concrete Tanks.* The tank shall be outfitted with a commercial siphon pump and high water alarm (see bleow).

3.2.2 Float Switches

Float switches are only a single high water alarm switch for the external high water alarm. Float switches must be sealed mercury control switches.

3.2.3 Pump

The pump is a dosing siphon pump capable of delivering at least 100 gpm at low water. A Fluid Dynamics Model # 417 is specified. Refer to Section 7.0 for cut-sheets.

3.2.4 Controls

The siphon pump does not require any dosing controls. A stand alone high water alarm is to be installed with an audible/visible alarm. Refer to Specifications in Section 7 for cut-sheets on a recommended alarm system.

3.3 Drainfield Distribution System

The drainfield distribution consists of the effluent force main, pressure distribution manifold, distribution supply lines to the laterals, flow splitter tees and drainfield laterals.

3.3.1 Effluent Force Mains

Pipe and fittings shall be Schedule 40 PVC (polyvinyl chloride) with gasketed joints (ASTM D3034). Sizing shall be in accordance with the engineering construction drawings.

3.3.2 Installation

Bedding and installation shall be consistent with ASTM Standard D 2774. Thirty inches minimum cover shall be provided for all force mains unless ferrous material pipe is specified. Ferrous material pipe, or other pipe with proper bedding to develop design supporting strength, shall be provided where sewers are subject to traffic bearing loads. Additional protection shall be provided for sewers that cannot be placed at a depth sufficient to prevent damage. Thrust blocks shall be utilized on all force main fittings if the design velocities in the pipe are projected to be greater than 6 feet per second. The location and sizing of the thrust blocks are shown on the engineering drawings if required.

3.3.3 Testing

All pressurized lines shall be tested. Distribution piping from manifolds to drainfield laterals does not need to be tested. No testing shall be performed until at least two days after all pipe

connections have been made. For hydraulic testing, the testing system shall have the ability to pressurize and seal the line on both ends and have pressure readings on both ends of the installed system. Testing procedures shall consist of pressurizing the distribution system with water with pressure equivalent to the capacity of the specified pump. Once the line has been sealed and the pressure equilibrated, the system shall be inspected for leaks. The pressure shall be maintained for two hours with a pressure drop of less than 2 psig.

3.3.4 Flow Splitter Tee

Each distribution line from the manifold to the drainfield lateral has a flow splitter tee to equally split flows between the lateral on either side. The flow splitter shall be of a manufacturer make and model approved by the Division of Public Health Onsite Water Protection Branch. A Zabel ZS-300 model (or equal) is specified. Flow splitters must be installed precisely level. The distribution piping must be also be level for a minimum of 5' before the connection to the flow splitter.

3.3.5 Manifolds

The manifolds are to be constructed of 6" Sch 80 PVC with threaded tap sizes as shown on the engineering drawings. Threaded PVC couplings shall be of material (Schedule 40 or 80 PVC) and size to match the specified tap size as depicted on the engineering drawings. Bushings and couplings shall be applied as needed to match the Schedule 40 distribution piping. All valves and cleanouts should be installed as shown on the engineering plans. The ½" lines from the manifold should transition to 4" gravity lateral supply lines as shown on the engineering plans.

3.3.6 Lateral Supply Lines

The lateral supply lines are the lines connecting the manifold to the drainfield laterals. The lines are designed to drain after each dose event, so burial depth can be shallower than typical force mains. An approximate 12 " burial depth is sufficient. The lines are constructed of schedule 40 PVC or SDR 35, sized as shown on the engineering plans, with adequate coupling/bushing connections to the drainfield laterals.

3.3.7 Drainfield Laterals

The county LHD has specified conventional gravel drainfield trenches with a 36" width and 30" depth on the trench bottom and 12" of gravel. Drainfield trench construction shall be in accordance with 15A NCAC 18A 1955.

4.0 SITE PREPARATION

4.1 Clearing & Grubbing

The drainfield disposal areas should be completely cleared and grubbed. Care should be taken to minimize soil disturbance during the clearing process. Stumps may be pulled due to the deep depth of the drainfields as long as the soil disturbance is no greater than 48".

4.2 Seeding & Mulching

Fertilizing, seeding, and mulching of disturbed areas shall be completed within ten (10) working days following completion of system installation and final inspection of the system by the project engineer or local health department. This may require that a temporary seeding mixture be used during given dates of the year when permanent seeding would not be allowed. Permanent seeding should also be added to the mix and may be necessary after the initial temporary seeding has established cover. Permanent seeding mix shall be determined by the contractor based on final topsoil conditions and time of year.

4.2.1 Jute, Excelsior or Mulching

All seeded areas shall be mulched. Grain straw may be used as mulch at any time of the year. If permission to use material other than grain straw is requested by the Contractor and the use of such material is approved by the Engineer, the seasonal limitations, the methods and rates of application, the type of binding material, or other conditions governing the use of such material will be established by the Engineer at the time of approval.

Applying Mulch:

(1) Mulch shall be applied within 24 hours after completion of seeding unless otherwise permitted by the Engineer. Care shall be exercised to prevent displacement of soil or seed or other damage to the seeded area during the mulching operations.

(2) Mulch shall be uniformly spread by hand or by approved mechanical spreaders or blowers which will provide an acceptable application. An acceptable application will be that which will allow some sunlight to penetrate and air to circulate but also partially shade the ground, reduce erosion, and conserve soil moisture.

(3) Straw mulch shall be applied at the rate of not less than 2 tons per acre.

Maintenance of Seed and Mulching:

Areas where seeding and mulching have been performed shall be maintained in a satisfactory condition until final acceptance of the project.

4.2.2 Erosion Control

(a) During the construction of the project, the Contractor shall be required to take the necessary steps to minimize soil erosion and siltation of rivers, streams, lakes and property. The Contractor shall comply with the applicable regulations of the appropriate governmental agencies in regard to soil erosion control and sedimentation prevention.

(b) The Owner will limit the area over which clearing and grubbing and excavation operations are performed.

(c) Prior to the end of each work day on the project, the Contractor shall take the necessary measures to protect the construction area from erosion.

(d) Temporary and permanent erosion control measures shall be accomplished at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent measures to insure economical effective and continuous erosion control during the life of the project.

(e) Temporary erosion control measures shall include, but are not be limited to the use of temporary berms, dams, dikes, drainage ditches, silt ditches, silt fences, vegetation, mulches, mats, netting or any other methods or devices that are necessary.

(f) Erosion control measures installed by the Contractor shall be suitably maintained by the Contractor until the site is fully stabilized.

(g) Where excavation is adjacent to streams, lakes or other surface waters, the Contractor shall not place excavated materials between the excavation and the surface waters.

(h) Where live streams are crossed by the project, the Contractor shall exercise particular care to minimize siltation of the stream. Temporary erosion control measures shall be constructed. These may include but not be limited to use of coffer dam in the stream, dikes, diversion ditches and/or temporary sediment traps at the top of the banks, and silt fences on all creek banks. All temporary erosion control measures shall be acceptably maintained until permanent erosion control measures are established.

(i) Where runoff on natural ground may cause erosion of the trench or erosion of the backfill in the trench, the Contractor shall construct temporary erosion control measures. These may include but not be limited to diversion ditches, check dams and silt basins or other suitable erosion control measures.

(j) Permanent seeding of disturbed areas shall be accomplished at the earliest practicable time.

(k) Gravel construction entrances shall be installed at all locations used regularly as ingress and egress to the project site.

(l) Stream and River Crossings

Diversion ditches shall be constructed at or near the top of each river bank at river crossings. Localized stormwater runoff shall be diverted by way of the diversion ditches away from the disturbed stream bank. Other specified erosion control material shall be used in ditches and swales.

5.0 INSPECTION AND MONITORING PROCEEDINGS

5.1 Pre-Construction Meeting

A pre-construction meeting shall be scheduled which shall include the contractor, the County EHD representative, the engineer or his representative, and the owner's representative. Scheduling this meeting shall be the responsibility of the installation contractor and all parties shall receive a minimum of one week's notice prior to the meeting date scheduled. Any changes to the plans requested by the contractor or DEH representative will be discussed at this meeting and responded to within 3 business days by the engineer.

5.2 Intermediate Inspection of the System during Construction

The contractor shall notify the engineer in time to inspect the site and insure proper installation of the system components prior to backfilling.

Periodic inspections by project soil scientist, engineer and health department during installation to assure compliance with agreed-upon installation procedures for drainfield installation shall be required. A specific schedule can be established at the preconstruction meeting.

5.3 Final Inspection & System Start-Up

A copy of the engineer's Inspection Form shall be provided at the pre-construction meeting. This document shall be utilized during final system inspection and start-up.

5.3.1 Start-up Procedures

Start-up testing shall be required for all electrical and pressurized components of the onsite wastewater system. Testing of all components to insure operation in accordance with intended function shall be checked and recorded. Potable water shall be utilized for all system testing.

5.3.2 *Pumps and Controls*

Potable water shall be introduced into the pump tank sufficient to activate (either by float switches or time-dose) the pumping system for 2 on/off dosing cycles. The dosing volume shall be estimated by checking tank levels before and after each dose cycle. Pump run-times and estimated dose volumes shall be recorded for review by the project engineer. If alternating drainfields are utilized, pump sequencing should be checked. Electrical system components shall be approved by the local building inspector.

5.3.3 *Pressure Distribution*

Dynamic pressure shall be checked at manifolds. Pressures shall meet specified engineering requirements. See the attached project calculations for the particular requirements for this project. Pressure testing connection locations shall be installed as shown on the engineering drawings.

5.4 Regular Monitoring

Routine inspections of the system are required per NCAC 18A .1961. From Table V(a) the system is to be monitored in accordance with Type III requirements which does not specify a minimum inspection or reporting frequency.

Periodic routine inspections shall include at a minimum:

1. Cleaning the septic tank filters.
2. Checking the pumping system to insure all pumps are operational, including an alarm check.
3. Inspecting the drainfield areas for soil wetness.
4. Monthly checking the grease level in the grease trap and initiate pumping if needed.
5. Annually checking the sludge levels in the septic and pump tank and have the tanks pumped out if necessary.

5.5 Residuals Management

The tankage should be pumped by a licensed septage hauler for disposal at a local POTW permitted for off-site septage processing.

6.0 CALCULATIONS

6.1 Dose Volume & Tank Sizing Calculations

6.2 TDH Calculations from Dose Tank to Manifold (& Pump curves)

6.3 Manifold Orifice Calculations

6.1 Dose & Tank Sizing Calculations

MINIMUM DOSE VOLUME CALCULATIONS FOR DRAINFIELD

DOSE VOLUME SUMMARY

	Length (ft)	Diameter (in)	Volume (gal.)
Laterals	1400	4.00	913.391

75% times Lateral Volume = 685.0 gal.

6.2 TDH Calculations from Dose Tank to Manifold (& Pump curves)

PUMP TANK TO D BOX
TDH CALCULATIONS

TDH = $\Delta H + h_m$

where:

ΔH = elevation head

h_m = major pipe losses, utilize Hazen Williams equation with equivalent lengths for fittings

$h_m = (4.727\ L/\ d^{4.87})\ (Q/C)^{1.85}$ where: Q in cfs, L in feet, d in ft.

no user input
user input req'd

Piping: sch. 40 PVC
Diameter = 4 inches (nominal) equals 3.998 inches (ID)
0.3331667 ft.

NODE: PT to D Box

INPUTS			Elevation Head Loss		Major Losses		Equiv. Length	Sum
No. inputs	Fittings	Details	Initial Elev.	Final Elev.	L	"C"	(FT)	Eq. Length
1	Pipe		2194.0	2184.0	408	150		408.1
4	90 DEG ELL						14	56.00
2	45 DEG ELL						8	16.00
0	90 DEG TEE						21	0.00
20	COUPLING						4	81.60
1	GATE VALVE						2.7	2.70
0	GLOBE VALVE						125	0.00
0	ANGLE VALVE						55	0.00
1	CHECK VALVE						38	38.00
								602.42

Q (gpm)	ΔH	hm (feet)	TDH	PSI	Velocity
10	**-10.00**	0.05	**-9.95**	-4.3	0.26
20	**-10.00**	0.18	**-9.82**	-4.3	0.51
40	**-10.00**	0.64	**-9.36**	-4.1	1.02
60	**-10.00**	1.35	**-8.65**	-3.7	1.53
80	**-10.00**	2.30	**-7.70**	-3.3	2.04
100	**-10.00**	3.48	**-6.52**	-2.8	2.55
120	**-10.00**	4.88	**-5.12**	-2.2	3.07
140	**-10.00**	6.49	**-3.51**	-1.5	3.58
160	**-10.00**	8.31	**-1.69**	-0.7	4.09

6.3 Manifold Orifice Calculations

MANIFOLD ORFICE CALCULATIONS FOR DRAINFIELD LINES

Orfice Equation:
$Q = 12.38\ d^2\ h^{1/2}$

MINIMUM DOSE RATE CALC

Manifold	Dose Rate (gpm)	No. Taps	Flow per Tap (gpm)	Pressure Head (ft.)	Orfice Size (in.)	Actual Or. Dia. (in.)	Threaded Tap Type
LPP SUPPLY	**99.31**	14	7.09	2.5	1/2	0.602	sch 40

RESIDUAL HEAD PRESSURE AT PROJECTED PUMPING RATE

Manifold	Dose Rate[(3)] (gpm)	No. Taps	Flow per Tap (gpm)	Pressure Head (ft.)	Pipe Dia. (in.)	Actual Orfice Dia. (in.)
M-1	100	14	7.1	**2.53**	0.5	0.602

Notes:
1) Min. tap size = 1/2 inch
2) Max. deviation = 5% between taps
3) Pump Rate from Pump Curve

7.0 ATTACHMENTS

Attachment A – Tank & Effluent Filter Cut-sheet

Attachment B – Siphon Pump Cut-sheet

Attachment C – Alarm Cut-sheet

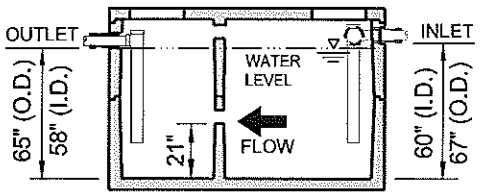
Attachment D – Splitter Tee Cut-sheet

ATTACHMENT A

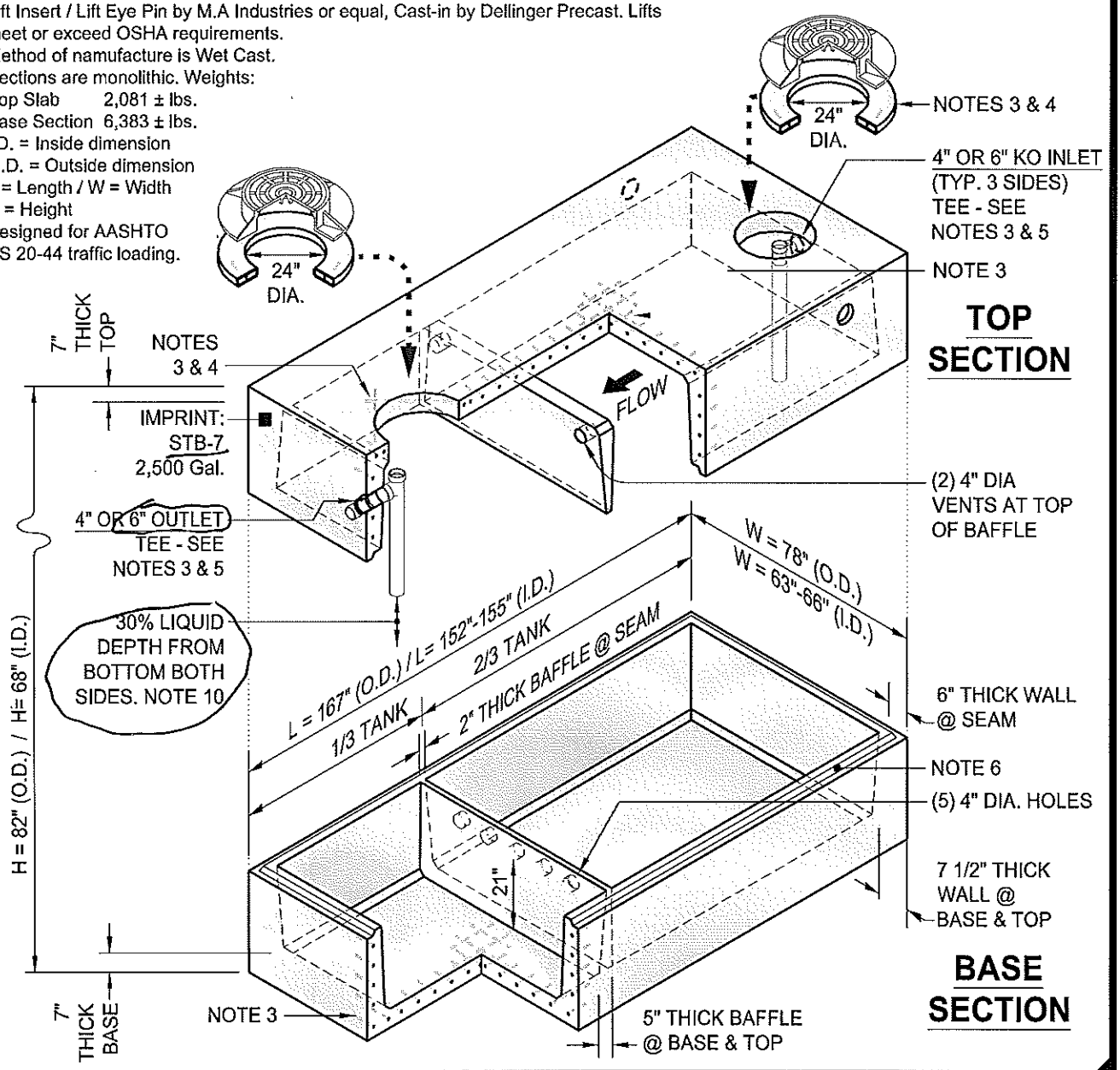
Tanks & Effluent Filter

GENERAL NOTES:

1. Design specifications conform to latest ASTM C1227 specifications "Precast Concrete Water and Wastewater Structures"
2. Concrete compressive strength 4,000 psi minimum.
3. Steel reinforcing design to conform to the requirements of ASTM C890 specifications for "Structural Design Loading for Water and Wastewater Structures" and shall utilize grade 60 re-bars conforming to the requirements of ASTM A615 or WWF conforming to the requirements of ASTM A185 or both. Place Additional reinforcing at all openings.
4. Cast Iron casting with 24" dia. access in top section per NCDOT standards or as otherwise specified. Supplied by either Dellinger Precast or customer. To be field adjusted using approved methods by contractor.
5. Pipe penetration locations as per job requirements. Pipe inlet and outlet locations to have PSX Direct Drive boots or equal. Pipe Inlet locaions (typical 3 sides) to be knock out pannels. Inlet & outlet Tee & Pipe supplied & installed by contractor.
6. Joints to be sealed with ConSeal CS102, butyl rubber joint sealant or equal. Sealant meets or exceeds the requirements of latest federal specification SS-S-0021(210-A), AASHTO M-198B, and ASTM C-990-91.
7. Lift Insert / Lift Eye Pin by M.A Industries or equal, Cast-in by Dellinger Precast. Lifts meet or exceed OSHA requirements.
8. Method of namufacture is Wet Cast.
9. Sections are monolithic. Weights:
   Top Slab 2,081 ± lbs.
   Base Section 6,383 ± lbs.
10. I.D. = Inside dimension
    O.D. = Outside dimension
    L = Length / W = Width
    H = Height
11. Designed for AASHTO HS 20-44 traffic loading.



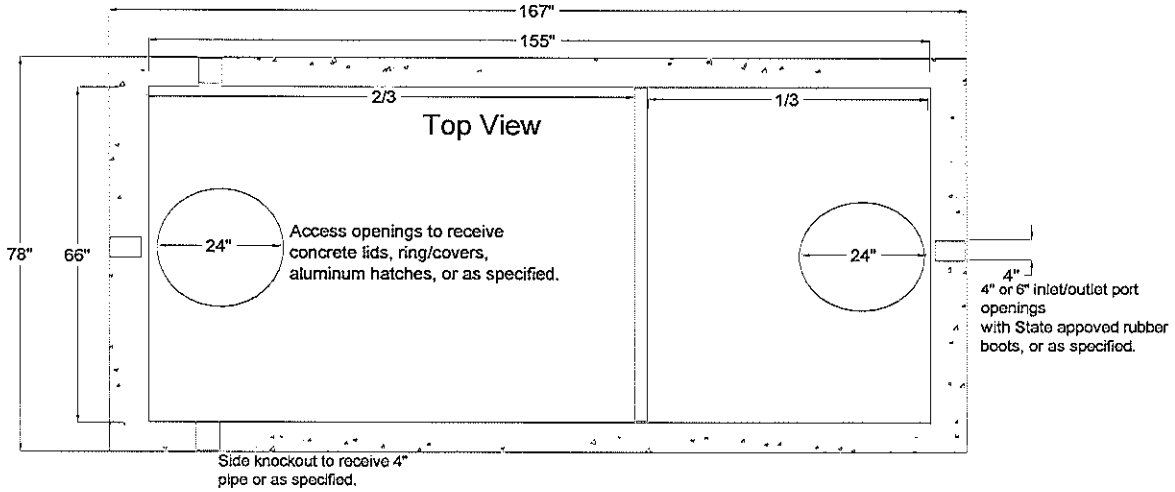
ELEVATION

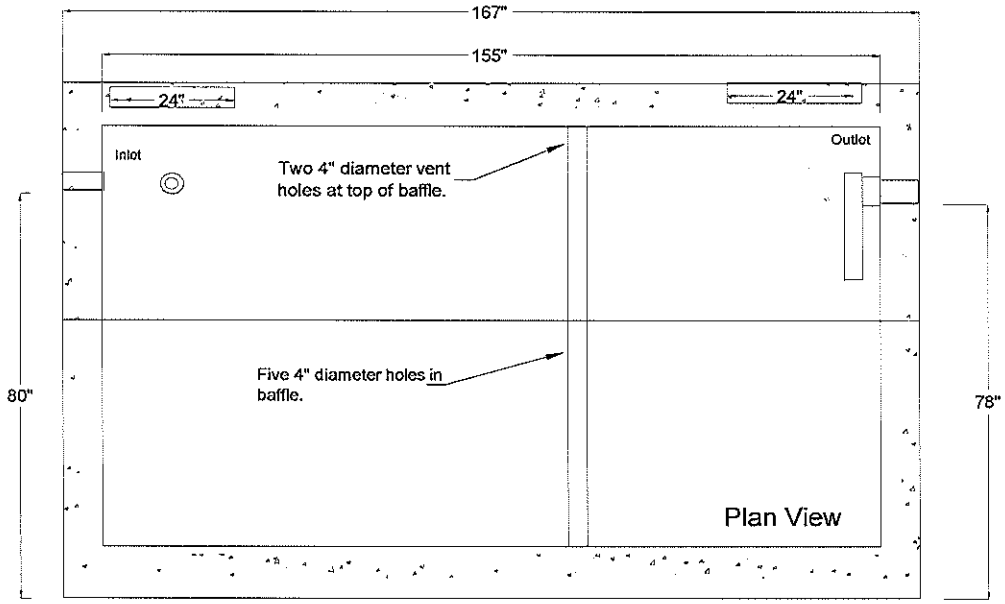


DELLINGER PRECAST
4531 North Hwy 16 ▪ Denver, N.C. 28037 ▪ Phone: 800-948-1666 ▪ 704-483-2868 ▪ Fax: 704-483-2363

2,500 Gallon (Mid Seam) GREASE TRAP (HS 20-44)

Scale: Not To Scale
Revision Date: February 2008
Detail # GT-2,500-HS20





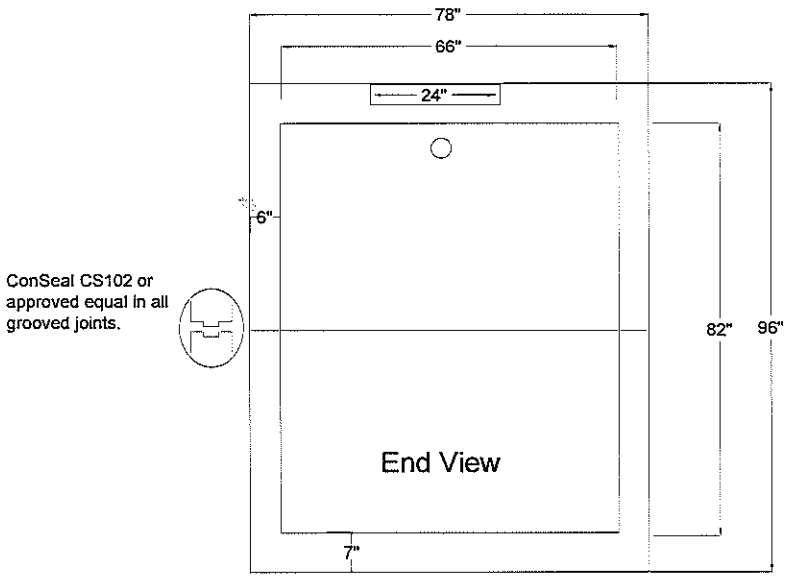
STB - 447 - Mid-seam

H-20 Traffic Rated
Liquid Capacity 3,160 Gallons
4000 PSI (min) concrete
Est. Weight: Top 19,287 lbs.; Bottom 13,837 lbs. (+-)
(Note: length, width & wall thickness at mid-seam)

Manufactured By:
Dellinger Precast, Inc.

4531 North Hwy 16
Denver, NC 28037
Phone 800-948-1666
704-483-2868
Fax 704-483-2363

NPCA Certified Plant
44.29 Gallons/inch



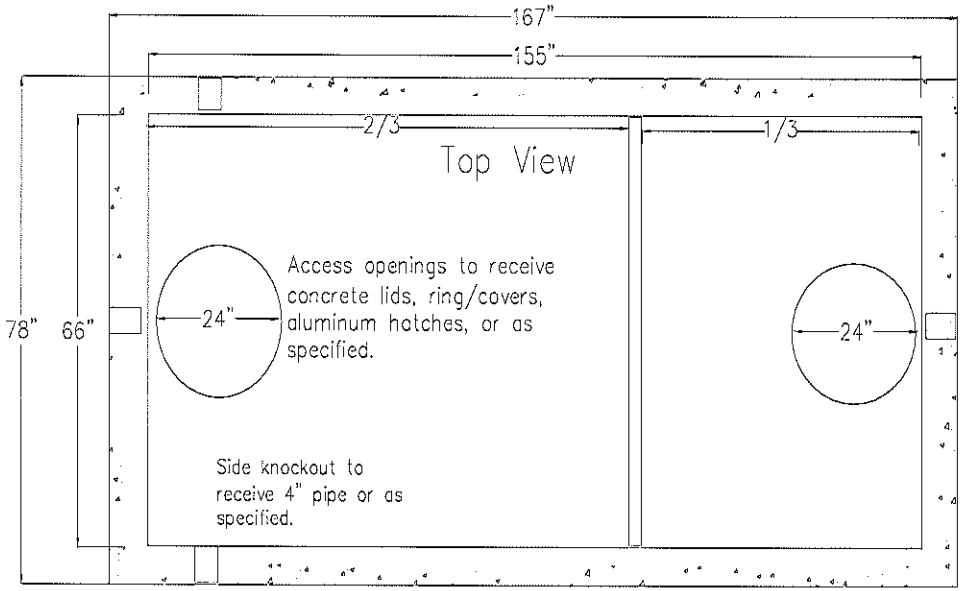
PT - 404 - Mid-seam

H-20 Traffic Rated
Liquid Capacity 2,500 Gallons
4000 PSI (min) concrete
Est. Weight: Top 15,797 lbs.; Bottom 16,347 lbs. (+-)
(Note: length, width & wall thickness at mid-seam)

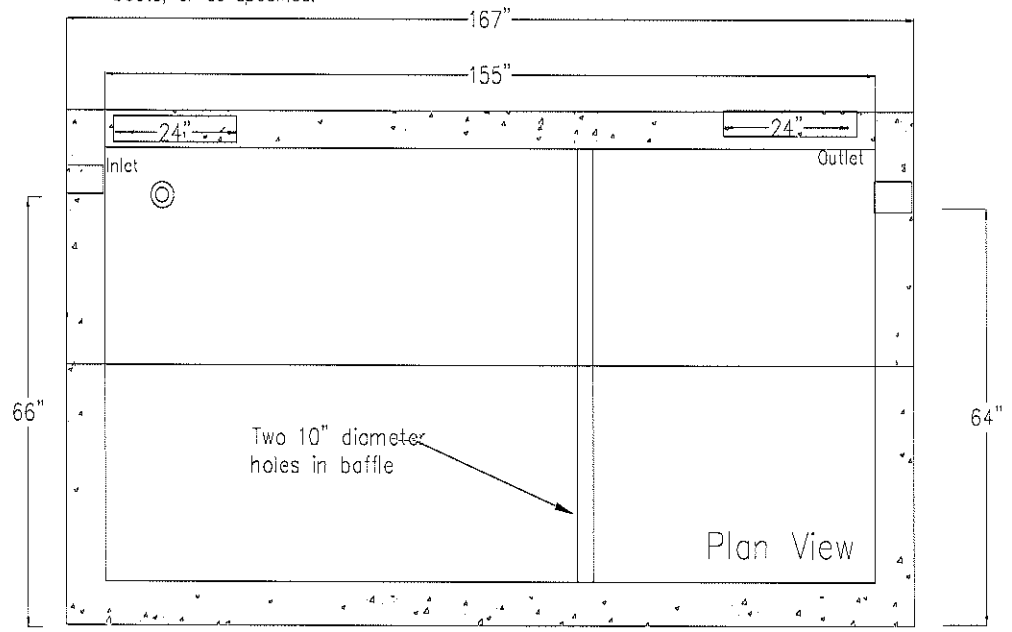
Manufactured By:
Dellinger Precast, Inc.

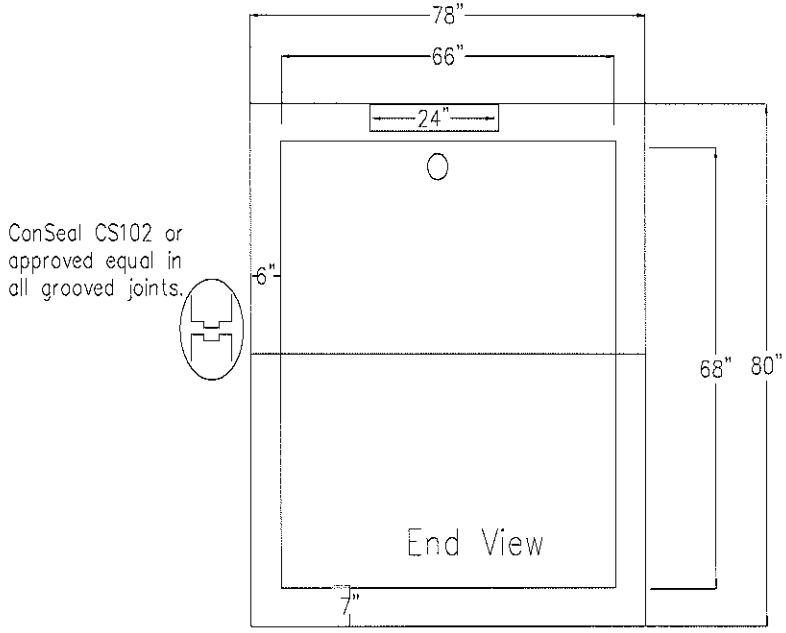
4531 North Hwy 16
Denver, NC 28037
Phone 800-948-1666
704-483-2868
Fax 704-483-2363

NPCA Certified Plant
44.29 Gallons/inch



4" or 6" inlet port openings with State appoved rubber boots, or as specified.





* Add commercial pump to dwg

"Quality Pumps Since 1939"

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER® PUMP CO.

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
(502) 778-2731 • 1 (800) 928-PUMP • FAX (502) 774-3624

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0705
Supersedes
0604

visit our web site:
www.zoeller.com

ZOELLER ON-SITE WASTEWATER PRODUCTS

INTRODUCING ZOELLER SEPTIC SYSTEM FILTERS

Zoeller Deluxe/Commercial Septic Tank Effluent Filter P/N 5000-0007

NEW!

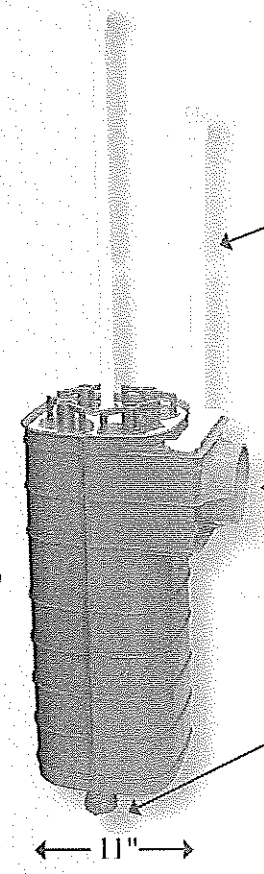
Covered by US Patent Numbers 6,136,190; 6,331,247 and 6,495,040

Application:
Residential and Commercial septic tank filter.

Filter Area:
528 linear feet of 1/16" filtration.

Flow Rate:
4,000 GPD

NSF
Residential Application Certified to ANSI/NSF Standard 46



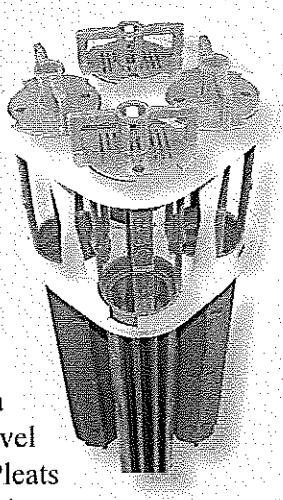
Filter handles provided to extend up inside riser.

Outlet socket designed for gluing to 4" dia. schedule 40 or SDR 35 pipe.

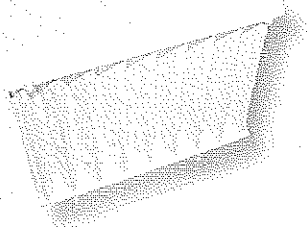
Integral pipe bosses for support legs.

SECONDARY FILTER

PRIMARY FILTER

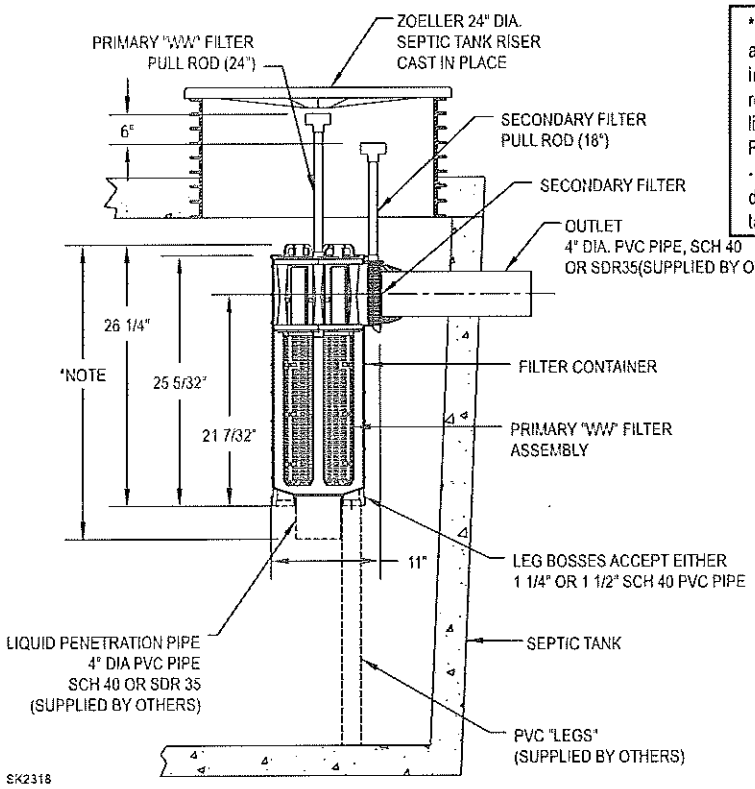


By-Pass Protection:
Secondary filter remains in the outlet when the primary filter is removed for servicing. Solids are prevented from leaving the tank.



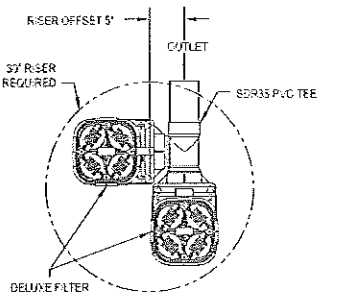
Deep Pleated Construction:
Design adds more effective filter area below the water level where it matters. Pleats retain solids to aid in servicing.

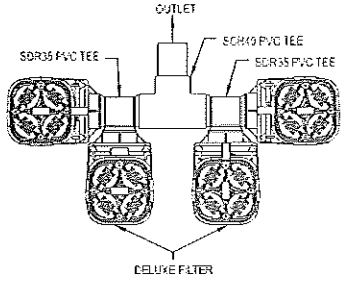
Deluxe Effluent Filter Specifications



***NOTE:** State and local plumbing codes may require a specific liquid penetration. For example, 25% -45% into the liquid depth or 9" off the tank bottom.

Covered by US Patent Numbers 6,136,190, 6,331,247 and 6,495,040





Filters may be manifolded together to provide additional flow rate.

Application: Any residential or commercial filtering application.
Filter Area: 528 Linear feet of 1/16" filtration slots.
Flow Rate: 4,000 gpd.

Application: For commercial filtering requiring 1/32" filtering, add Filter Sock P/N 5000-0010 to Deluxe Filter.
Filter Area: 960 square inches of 1/32" filtration.
Flow Rate: 1,500 gpd.

Materials: All materials are noncorrosive in the septic tank environment (PVC, ABS, and Polyethylene).

Replacement Parts: Primary "WW" Filter Assembly P/N 5000-0011. Secondary Filter Assembly P/N 5000-0012. Filter Sock P/N 5000-0010.

Easy to maintain: This filter will require periodic service. By needing service, this filter facilitates needed system inspections and maintenance. Modern septic tanks can be affected by some common household chemicals and fail to digest waste. Under those circumstances, the Zoeller filter will protect ALL downstream components. If your filter clogs frequently, your tank is likely not operating correctly.

The Zoeller filter should be cleaned each time the septic tank is pumped or as needed. More frequent cleaning will not hurt the filter and could even improve the performance of your septic tank. For installations that exceed the design flow rate of one filter, use a manifold type arrangement to add as many filters as required. To clean, simply withdraw the primary element filter (long handle) and rinse back into the septic tank. Next, after the flow has stopped, remove the secondary filter (short handle), rinse and replace.

Lifetime Warranty: Every Zoeller filter is guaranteed to be free from defects in materials and workmanship for the lifetime of the homeowner/purchaser. Free repair or replacement, excluding labor, will be made on return of the filter prepaid to the factory. This warranty is limited to product proven to be free from abuse or improper installation.

ALL ZOELLER ONSITE PRODUCTS MUST BE INSTALLED IN ACCORDANCE WITH PLUMBING AND HEALTH DEPARTMENT CODES.

Distributed By:

ZOELLER PUMP CO.

1-800-928-PUMP
www.zoeller.com

ATTACHMENT B

Siphon Pump

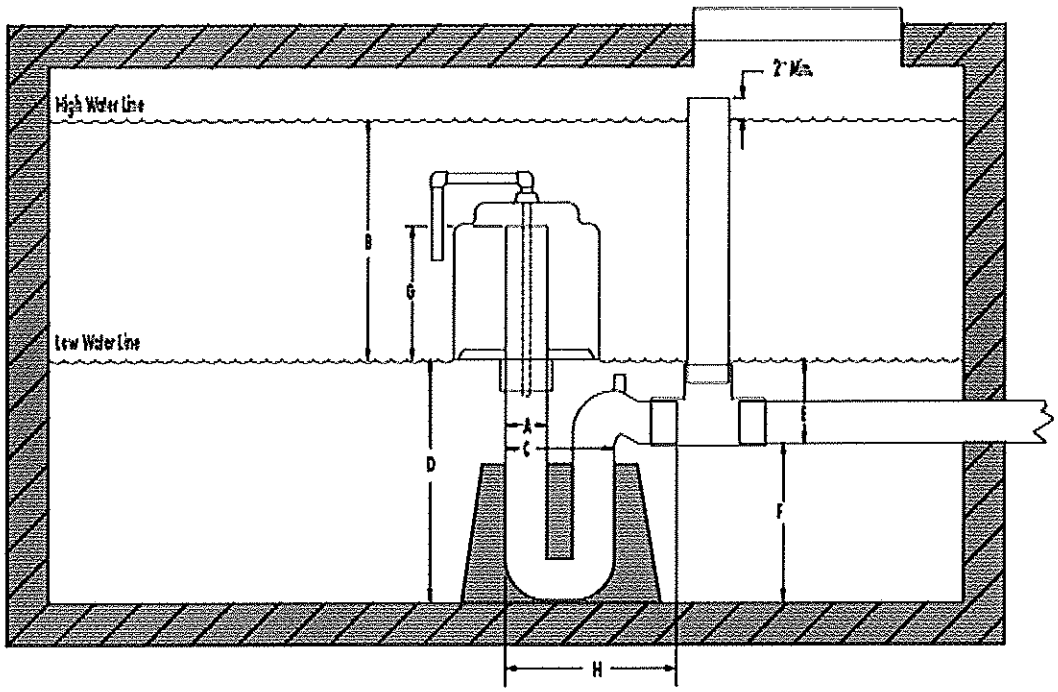
FLUID DYNAMIC SIPHONS INC.
1-800-888-5653
info@siphons.com

Dosing Siphons
Bull Run Valve
Siphon Features
How Siphons Work
Siphon Installation
Effluent Dosing
Contact Us
Home

4" Dosing Siphon with 17" Draw Down

Model	*417*
Diameter (A)	*4"*
Draw Down (B)	*17"*
Application	*Sewage Dosing Siphon*
Price	*Call for Pricing*
Photo	*N/A*
Outlet Size	*4.2"*
Optional Outlet	*4" MNPT*
Width of Trap (C)	*10.5"*
Bottom of Trap to Low Water Line (D)	*22.5"*
Bottom of Discharge to Low Water Line (E)	*7.5"*
Bottom of Trap to Bottom of Discharge (F)	*15"*
Height of Trap Above Low Water Line (G)	*8.3"*
Trap to Discharge (H)	*16.5"*
Average Discharge Rate	*150 GPM*
Flow Rate at Low Water	*100 GPM*

Diagram of Dosing Siphon Specifications



Home | Bell Siphons | Bull Run Valve | Siphon Features | How Siphons Work
Siphon Installation | Effluent Dosing | Contact Us

1-800-888-5653
email: info@siphons.com

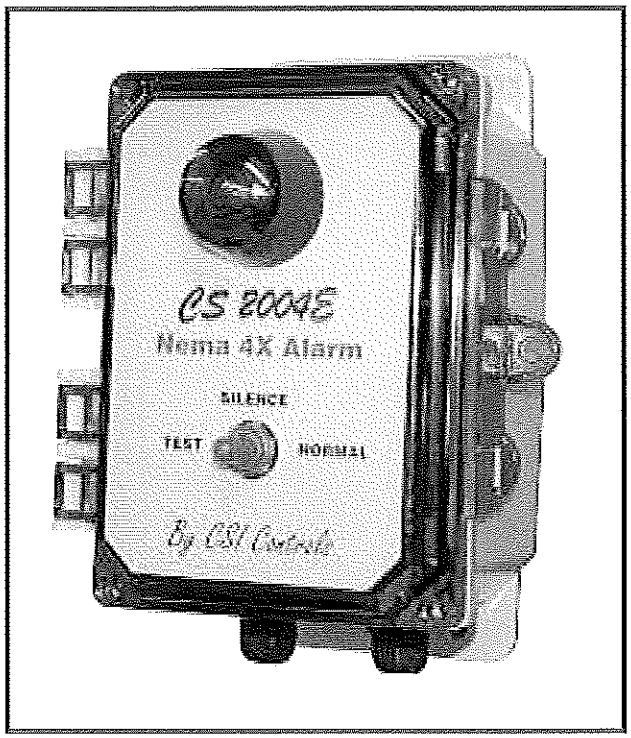
ATTACHMENT C

Alarm System

CS 2004E NEMA 4X Alarm

FEATURES:

- Red Alarm Light
- Includes: 15ft Mini Mercury Float, 6ft Power Cord & 2- 3/8" Seal-Tight Cord Connectors
- Buzzer Audible with External Test / Silence / Normal Toggle Switch
- NEMA 4X Enclosure
- Latching Lockable Cover (No Screws Required)
- External Mounting Feet
- Installs in Minutes
- UL Listed Type 6P Enclosure
- Patents Pending
- One Year Limited Warranty



Applications Include:

Monitoring High Liquid Levels
Monitoring Low Liquid Levels
Sump & Sewage Basins
Septic Tanks & Aeration Systems
Cisterns & Atmospheric Storage Tanks
Chemical Solution Tanks
And Many More...

Specifications

Model	Location Use	Enclosure Type	Enclosure Material	Input Power VAC	Power To Sump	Approx. Ship Weight
CS2004E	Outdoor	4X	Polycarbonate	115	115 VAC	3.4

*Add a "P" suffix to the model number (example CS2004E-P) to add a 2" male adapter to the bottom of the enclosure instead of cord grips so that the unit may be mounted as a pedestal on 2" electrical conduit. ***Pipe not included.***

For more information or to place an order, contact your local distributor or CSI Controls today!

Chandler Systems, Inc., 220 Ohio Street, Ashland, Ohio 44805 • Phone 419-281-5767 • FAX 419-289-2535

www.chandlersystemsinc.com csi@zoominternet.net

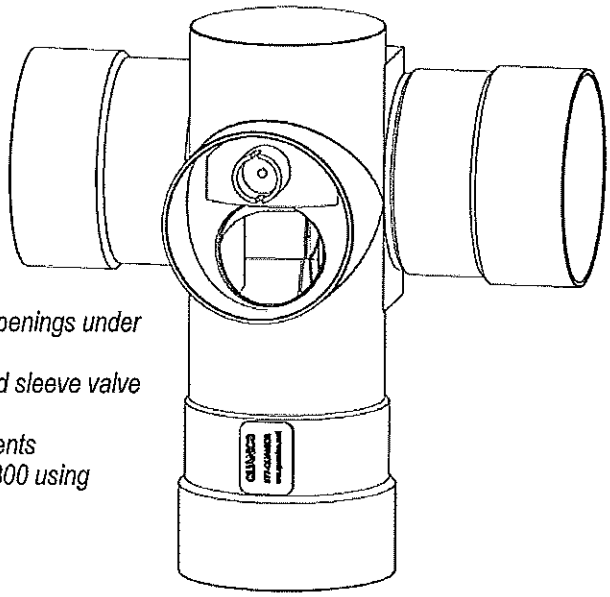
ATTACHMENT D

Splitter Tee

TechData

Flow Divider/Director

GDS-ZS300, GDS-ZS300D

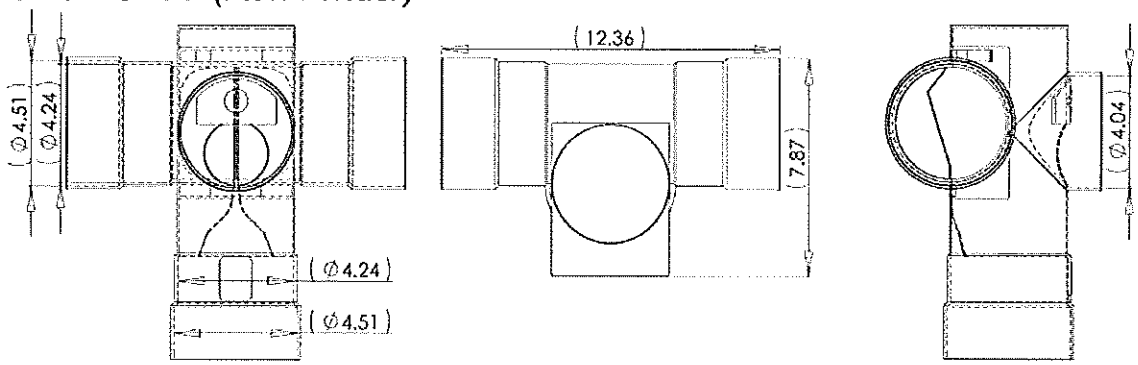


Features

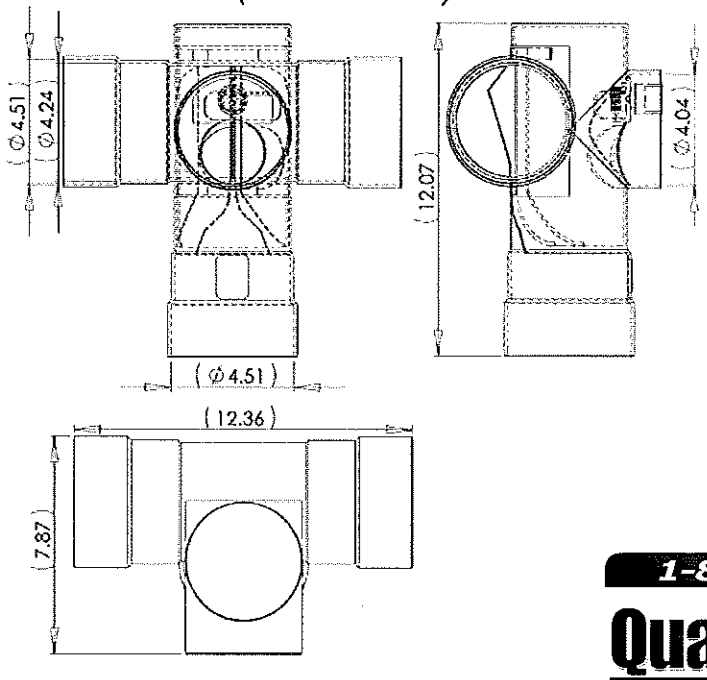
- GDS-Z300 utilizes a central weir to divide effluent evenly between two openings under gravity flow conditions
- GDS-Z300D may be used to alternate between two fields with a patented sleeve valve
- Patented design allows attachment to either 4" SDR 35 or SCH 40 pipe
- Monitoring hub may be extended to grade for easy viewing and adjustments
- Laboratory test results conducted by Dr. Bob Rubin Ed.D on the GDS-Z300 using 1000 ml samples at 3 gpm:

Position	Right Port Distribution	Left Port Distribution
Level	50.03%	49.97%
1/16" Tilt	50.2%	49.8%
1/8" Tilt	51.3%	48.7%

GDS-ZS300 (Flow Divider)



GDS-ZS300D (Flow Director)



Materials:
Injection molded PVC plastic

Warranty for Defects in Material and Workmanship
- *1 Year*

AutoCad dwg files at ***www.quanics.net***

Pricing page 13