THE ZABEL ZONE™

AN ONSITE WASTEWATER MAGAZINE

New Zabel Products

ZEUS TURBINATOR™ PUMPS

SmartFilter™ Technology Now available on all filters

Protecting our World's Ground Water

Visit our Website at www.zabel.com or e-mail us at www.zabelzone@aol.com

ZABEL™ environmental technology

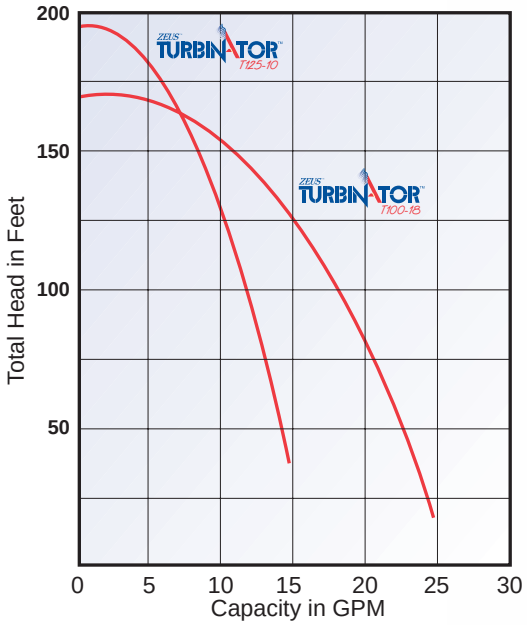
Get Pumped

ZABEL environmental technology™

with Zabel's new...

ZEUS™ TURBINATOR™ PUMPS

Specifically designed for use with all Zeus STEP System packages



MADE IN USA

What's Inside

Editorial Policies

The Zabel Zone™ is published in Fall and Spring editions each year and contains articles of interest to the Onsite Wastewater Community as well as information on Zabel products.

The Onsite Wastewater Community does not exist in a vacuum, but is part of the larger culture. Articles may also appear of a general interest that do not directly involve onsite wastewater issues. Articles by guest authors reflect only their opinions and do not necessarily reflect the opinion of the editor.

Letters to the Editor will be published as space allows with the editor reserving the right to edit the letters for brevity and clarity. If you would like to contribute an article, please contact the editor at : Voice 1-800-221-5742 - Fax 502-267-8801, or - Email ZABELZONE@AOL.COM

The magazine is distributed free of charge and current circulation is approximately 20,000.

EditorsCorner

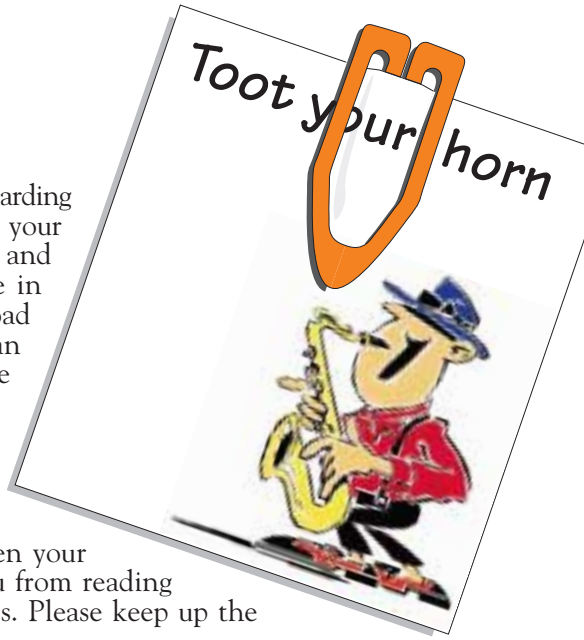
Jan M. Nurse, DMD

Well, readers, this column should be the last written, edited, polished, or whatever prior to The Zabel Zone™ being 'put to bed'. I just love that editor's lingo.

As last time, it has been hectic- a bit more so this time because we have set dates for this and all other issues that follow, and this issue had to come out in a hurry. Anyway, in the future, there is to be a Fall issue, due out the first week in October, and a Spring issue, due out six months later.

I may find myself eating some crow somewhere down the road, but as long as I am editor, I intend to have issues appear on time. That's because your response is a boost to my ego, because I know you appreciate what you learn from each issue and because I have to live with the Big Boss.

So, read on. Write us if you feel so inclined. And enjoy!



Joe,

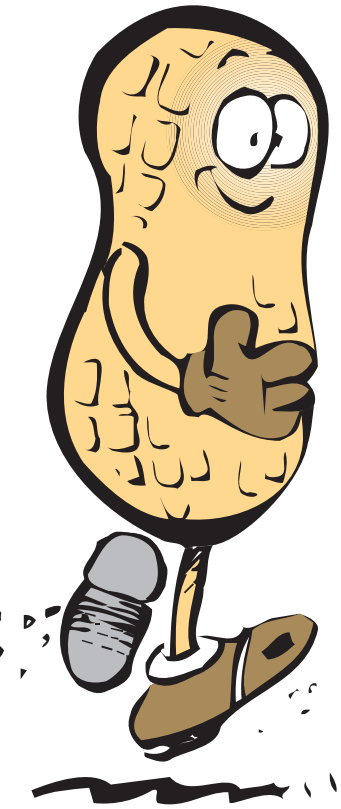
I wanted to drop you a quick note regarding the Zabel Zone™ magazine. I commend your company for producing an informative and thought provoking magazine. It is rare in this day and age of information overload that a company's product literature can make you laugh, inform you and make you think, all on the same page. I actually find it interesting to learn about a subject that most people would rather not think about! One of the things that strikes me most about your company is the camaraderie that seems to exist between your employees. I feel like I know all of you from reading bits and pieces about you in the articles. Please keep up the good work!

I am sending a brief description of one contractor's use of the Zabel™ A300 filters. Ron Zuber replaced a leach field at an existing mobile home park due to the amount of suspended solids that plugged it up. He came to us to retrofit the system with a tank and filters. The system is based on a 10,000 Gallon septic tank which went into a 5'-0" dia. diversion chamber and then into an 8,000 gallon tank before disposal into the leach field. They were getting a lot of suspended solids in the second tank and had to pump out quite frequently. Ron came up with the idea of putting the filters in a tank prior to running into the diversion chamber. His system contains (5) A300 filters discharging into a header pipe and flowing into the diversion chamber. I will keep you up to date on the results of this system.

Todd Clarke Vice President Lakelands Concrete Products, Inc.

Editor's Note: Normally, we hear from many of our readers and print several of their letters. However, in this issue, we felt we would prefer to print just this one as a way of spotlighting it because it sort of says it all. We want the magazine to be informative, be a fun read and, of course, we love hearing another Zabel success story. Thanks, Todd!

Joe Mattingly



Our Peanut League Ball Team

Not to Brag but,
They're Awesome

Our LaRue County Peanut League Dodgers sponsored by Zabel Environmental Technology™ started the 1998 season by playing the Mets in a rematch of last season's Tournament Championship game. The Dodgers came away victorious, giving the Mets their only loss of the regular season. The team finished the regular season with an 8 - 0 record in the American Division and a perfect 13 - 0 record in League play. They also traveled to a neighboring county to participate in the annual Flaherty Community Park Invitational Tournament. Along the tournament trail, they faced three other undefeated teams. They gave the Vine Grove White Sox their 1st and 2nd losses of the season and the Flaherty Cardinals their 1st loss of the season before eventually losing twice to the White Mills Wildcats.

The Dodgers returned home to go undefeated in their own league tournament thus making a record setting third straight appearance in the championship game and coming away with their second straight tournament championship. And yes, just as promised, Coach Theo Terry lost his mustache again.

The Dodgers finished the season with a record of 20 Wins and 2 Losses. They now have a three year record of 38 - 8. Next year, if they go undefeated again in league play and win a third consecutive tournament championship, maybe they will get to shave Coach Terry's head!

While we hope our son, Max, improves his baseball skills through this program, we hope even more that he will develop responsibility, cooperation and self-confidence. Your generosity in itself is teaching him a valuable lesson in life, and we know that the influence of "Coach Buddy" will enhance it even more so. Again, thank you. Sincerely, Steven and Melinda McCubbin

Thank you, Mr. Nurse. Max

This last letter was faxed along with a ball schedule: Dear Mr. Nurse, I am on the Dodgers. Thank you for sponsoring our team and buying our uniforms. Thank you for letting Coach Buddy out of work early so he can be our coach. I hope you can come to a game. Your friend Tori Banks
P.S. I am sending you a ball schedule so you will know when we play

Dear Mr. Nurse, Thank you for buying our uniforms. I thought of a cheer we say at the end of each inning. It's "Dodgers Never Lose!" Maybe you can come watch us play sometime. Here is a picture I drew for you about our baseball team. Theo Terry
(Theo says this picture is of him batting, with a man on 2nd and 3rd bases. The person in the middle is a member of the Indians trying to stop the ball.)

Dear Mr. Nurse, Thank you for the baseball equipment. This year we are playing 1st and 3rd base. We are going to have a fun season. Christian Seymour Shawn Seymour

My name is Chad. I like to play baseball. Thank you for the pants, socks and belt. Chad

Dear Mr. Nurse/ Theo, My family and I want to thank you for sponsoring the Dodgers' Peanut League team in LaRue County. This is quite generous of you, and the children (as well as parents) are most appreciative of the uniforms.

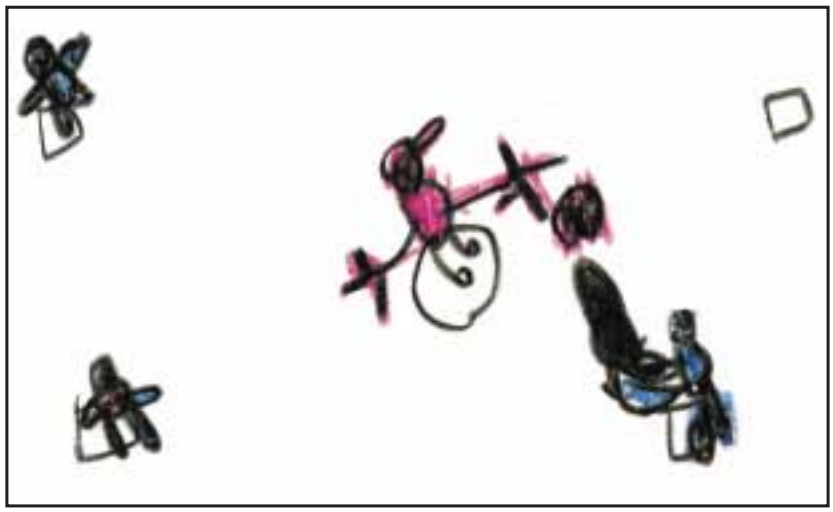
Congratulations Dodgers

Win or Lose, you're #1 with us

Dear Mr. Harry Nurse, Jr., We appreciate your gesture, and we are glad that you are part of our team. Sincerely, Kevin Cruz and Family

The look on our son's face when he opened the bag and saw the baseball uniform was a joy to behold. This is his first year. You made a lot of kids happy. Thank you. Rick and Ginny Marshall, parents of Jonathan

Theo says this picture is of him batting, with a man on 2nd and 3rd bases. The person in the middle is a member of the Indians trying to stop the ball.



Artwork by Theo's son Theo Terry Jr.

NATIONAL ENVIRONMENTAL TRAINING CENTER SERVES AS ONSITE TRAINING CONDUIT

BASIC TRAINING

By Diana Knott

With the ever-growing number of onsite wastewater training centers, it helps to have a national, not-for-profit organization that's in the business of information sharing.

The National Environmental Training Center for Small Communities (NETCSC) at West Virginia University has tracked the development of onsite wastewater training centers around the country and has helped spur dialogue among them.

In a precedent-setting meeting last November, NETCSC and its "sister" organization, the National Small Flows Clearinghouse (NSFC), hosted 22 onsite wastewater training representatives from 15 states. Funded by the U.S. Environment Protection Agency, both NETCSC and NSFC had contributed to these centers' development through technology information, vendor contacts, and technical assistance. The program's manager, Dr. John Mori, stated, "We wanted to further the effort by providing a forum where training center personnel could exchange information about developing and maintaining their programs."

"We know there are several excellent, well-established onsite centers that have the potential to influence the development of the new centers by sharing their formulas for success," he said.

Since that meeting, the numbers of centers have continued to grow and several states- including North Carolina, Texas, Arizona, Alabama, and Wisconsin- have more than one training center. Some have as many as four.

North Carolina's four centers include one in the state capital of Raleigh, which opened this past March. According to the center's director, Dr. Mike Hoover, the 30-acre National Training Center for Land-Based Technology and Watershed Protection is much broader than the other centers.

"Because the resources needed . . . are tremendous for a center of this kind, I don't see other states replicating it in the near future, which is why we hope it will serve the industry on a national basis, " Dr. Hoover said.

In addition to tracking the development of new onsite wastewater training centers and reporting them in the newsletter ***E-train***, NETCSC also has served as a communications conduit among the centers, gathering copies of the centers' training materials, contact lists of their speakers and trainers, and training activity schedules. This information has been stored in NETCSC's databases and also sent to each onsite training center.

According to Dr. Mori, this communication can help prevent centers from reinventing the wheel by offering access to materials and strategies that have already been proven. For example, some centers have acquired "off the shelf" training curricula, such as those offered by the NETCSC, then tailored them to meet their specific needs.

"In this rapidly growing discipline of onsite training, an exchange of this nature offers valuable learning opportunities for all the participants, from the very experienced to the newly-initiated," Dr. Mori said. Overall, onsite wastewater training centers are becoming a vital component of the industry.

"The problems are not local septic tank problems but major environmental issues worthy of respect," said Dr. Paul Trotta, director of the Northern Arizona University training center.

Phil Wright, health director of Utah's Wasatch City-County Health Department agrees. "There was a cry from the private sector for use of new technologies not yet allowed in the state, so there was a need to train and certify regulators, designers, and installers. We think the training center can be pivotal to getting the necessary approval and, ultimately, the use of alternate systems," he said.

NETCSC Training Research Associate, John Hoornbeek, believes that onsite training centers are likely to succeed for three reasons. "First," he said, "economic and development interests are likely to support expanded use of onsite wastewater systems. Second, watershed management approaches are likely to call attention to septage management issues, and finally, state onsite wastewater certification programs may provide the direct regulatory push necessary to provide training centers with ongoing supplies of students."

However, it takes more than just facilities, technologies, instructors, and students to run a successful training center.

"We need to learn more about how to teach and train," said Dave Lenning, director of Washington's Northwest Onsite Wastewater Training Center. "We need to know more about how to develop classes, class materials, and instructor aids. We'll need to develop distance-learning concepts like videos and interactive CDs to assist the learning process, and we need to understand the hands-on principles."

NETCSC can help onsite training centers and others locate educational contacts and materials through its toll-free assistance line at 1-800-624-8301. NETCSC also maintains a web site at *www.netc.wvu.edu*, which includes a "training tips" section, and the program discusses training issues in its free quarterly newsletter, E-train, which is available by request or via the Internet.

On the whole, onsite wastewater training center representatives believe that the centers will provide much of the impetus necessary for increasing approval and adoption of alternative systems and new technologies.

Diana Knott, M.S., is the publications and promotions supervisor for the national environmental services and training programs at West Virginia University. These programs include the National Environmental Training Center for Small Communities, Nation Small Flows Clearinghouse National Onsite Demonstration Projects, and National Drinking Water Clearinghouse.

Also contributing to this article was Diana Duran, MA, former editor of ***E-Train.***

The University of West Alabama Training Center

the Biofilter

Ecoflo®

An Innovative Wastewater Treatment System

If you're looking for a simple, reliable and permanent onsite wastewater treatment system, the Ecoflo® Biofilter is the ideal solution.

This new and improved leach field uses a high-performance peat moss based filter contained in a fiberglass shell.

Suitable for all types of properties, the Ecoflo® Biofilter requires two to three times less space than a conventional system.

The Ecoflo® Biofilter is a *reinvented leach field in a box* which is designed to keep the conventional system's strengths and improve it's weaknesses.

A simple and permanent solution

- Very compact
- Quick installation by an authorized installer
- Great landscaping flexibility
- No electical components
- Superior, long-lasting treatment performance
- Groundwater protection
- Warranty, servicing and after-sales service included
- Adds value to any property

Ecoflo® Biofilter

Conventional system

For further information on the Ecoflo® Biofilter or on any other Premier Tech Environment onsite wastewater treatment products, please contact us:
1 800 6-ECOFLO (1 800 632-6356);

Premier Tech Environnement

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Tel.: (418) 867-8883 Fax.: (418) 867-3896
E-mail: ecoflo@premiertech.com

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KOWA
GOWA

STARTING A STATE ORGANIZATION

By William Gregory

Onsite terminology was still an unknown concept when we started our push for onsite organization in Michigan. NOWRA was just starting - few members; no money - but Harry Nurse had a mission to organize all the different factions in the "septic system business" into an organization with a common direction.

After numerous pitches and attempts to get an organization started, we were able to find a core group. This group consisted of sanitarians, reps and academia types that could start laying the groundwork for a Michigan association.

One of the first tasks was to set forth the purpose of the organization and to enlist the support of as many people involved in the onsite industry as possible.

The Michigan Group (MOWRA) was incorporated as a non-profit organization and we became a constituent organization of the NOWRA Organization. This allowed us to bring in members to the Michigan group and have them join for less money than if they just joined the national.

Our current dues for regular members are $75.00, governmental $50.00 and students are $25.00. All Michigan members are also members of NOWRA.

Here is a checklist for starting a new organization:

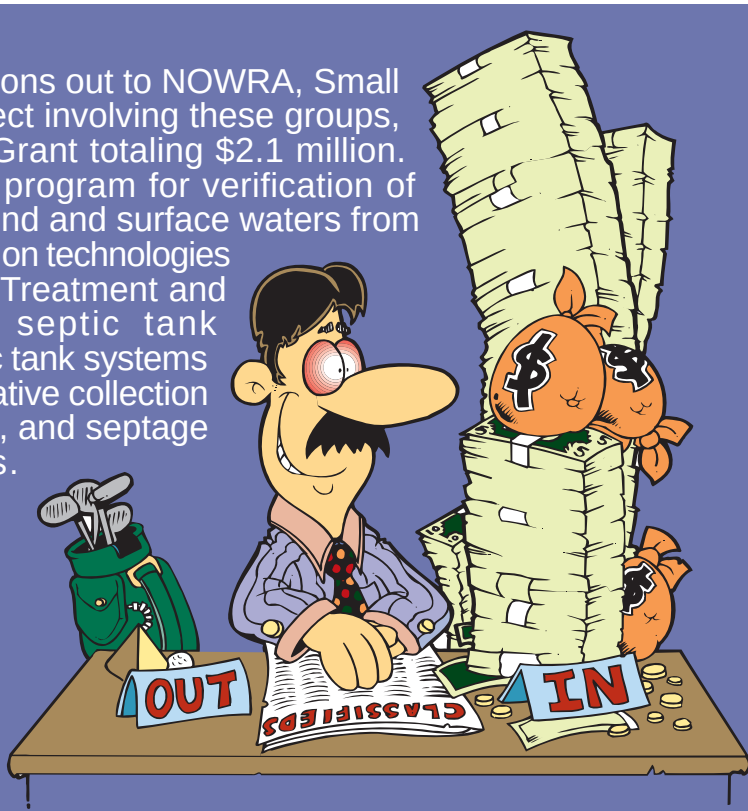
1. Check with NOWRA headquarters and see if there are any members currently listed in your state. NOWRA's number is 1-800-966-2942
2. While attending local and state shows, ask around and see if there are any interested potential members.
3. Get a core group started (6-10 members). Try to get diversity by including engineers, contractors, reps, designers and health department personnel.
4. Elect officers- usually for a minimum of two years to keep continuity and get the organization rolling
5. Set the mission and purpose and write by-laws
6. Set goals and objectives- plan meetings, demonstrations, work sessions and training sessions
7. Make membership meaningful
8. Encourage new members

Don't get discouraged. The onsite market is still in its infancy. We are way ahead of our time and it may take awhile for the industry to catch up with us!

Bill Gregory is the owner of W. G. Sales and is one of Zabel's Marketing Associates

Zabel™ would like to send congratulations out to NOWRA, Small Flows and NSF! In the first joint project involving these groups, they have been awarded a Federal Grant totaling $2.1 million. The grant will be used to develop a program for verification of technologies designed to protect ground and surface waters from contaminants with the initial focus being on technologies related to Decentralized Wastewater Treatment and Conveyance Systems, such as septic tank modifications or add-ons, cluster septic tank systems serving more than one dwelling, alternative collection systems, water conservation systems, and septage treatment and disposal practices.

Congrats!!!



- ✔Reservations
- ✔Scheduling
- ✔Planning
- ✔Organizing
- ✔Travel
- ✔Registration

1998

October

1st-4th, GOWA, Marsha Bates 912-259-0925
3rd-7th, WEFTEC '98, Nanette Tucker 703-684-2443
7th-9th, Missouri Society of Pro. San. Ed. Conf., Grace Steinke 314-843-5053
12th-15th, New Mexico Environmental Health Conf., Tom Duker 505-924-3667
13th-14th, Illinois Environmental Health Association, Paul Chase 630-682-7979 ext. 7396
13th-15th, Utility Technology Expo & Conference, Debbie Waid 913-967-7206
15th-16th, CIPHI, New Brunswick Section, Gary Hunt, 506-453-2830
14th-15th, Northwest Ohio Env. Health Educational Conf., Matt Work 440-967-7359
22nd-25th, NOWRA Conference, Pam Franzen 800-966-2942
25th-28th, Annual Biological Safety Conference, John Stygar 847-949-1517
27th-29th, North Carolina Onsite Wastewater Treatment Conference, Joni Tanner 919-513-1678

November

4th-6th, The Environmental Technology Expo, Debbie Fernandez 770-279-4388
6th-8th, Ontario Sewage Liquid Waste Carriers Assoc. Convention, Jim Aitkin 905-689-5585
15th-18th, American Public Health Association Expo, Lynn Schoen 202-789-5600

December

9th-11th, KOWA Conference & Exhibit, Marietta Ricketts 502-769-0312

1999

February

19th-21st, MCX '99, Brenda Malayeri 800-366-7731
26th-28th, Pumper & Cleaner Environmental Expo, Phil Lane 800-257-7222

July

6th-8th, NEHA Ed. Conf. & Exhibition, Kim Brandow 303-756-9090 ext. 306

At the time of printing those shows highlighted in red will have someone from Zabel giving one or more presentations at some time during the conference.

For the most up to date listing or to submit a Conference or Trade Shows see the conference page in our website.

If you are having a Conference or Expo, and would like the information printed in the next Zabel Zone™ please send your info to us. Or go online to www.***zabel***.com, then click Conference forum, then click the Post button and start typing.

Name of Conference _____

Date(s) of Conference _____

Contact Person _____

Telephone number _____

Send this form to: Zabel™ Environmental Technology, c/o Tom Jenkins-Conferences,10409 Watterson Trail, Louisville, KY 40299

Branching Out

New ZABEL™ Marketing Associate Network Provides Nationwide Service

Now there are two ways to receive ZABEL™ training, service and products - call ZABEL direct or contact one of these great ZABEL Marketing Associates! ZABEL has begun constructing a first class Marketing Associate network to implement our new marketing strategy of selling through the traditional wholesaler/pre-caster as well as direct to the contractor/ installer/pumper. (See Onsite Marketing - Tradition and Opportunity, page 34, Spring '98, available online at http://www.zabel.com)

Onsite systems and issues as well as ZABEL Filters and ZEUS™ systems form the basis for an extensive ZABEL Marketing Associate Training Program. In addition to technical training, ZABEL provides slide presentations and printed training materials for training local regulators and engineers, as well as wholesaler, pre-caster, contractor, installer and pumper customers.

Meet the Zabel Marketing Associates:

Alaska, Idaho, Montana, Northern California, Oregon, and Washington
William A. Matzke Company, Inc
Phone 206/323-4350; Fax 206/325-7644
Now twelve employees strong, Matzke Company was founded in 1954 by William A. Matzke, Jr. to sell and service the wastewater industry from offices located in Portland, Oregon; Boise, Idaho; and Seattle, Washington.

Key personnel include President Michael F. Ingels, Vice President William A Matzke Jr., and Territory Sales Managers Larry Spath - Southern Idaho and Montana; Dan Stucki - eastern Washington and northern Idaho; Andy Gerson - western Washington; and Rick Hickland - northern California. The Matzke Company works closely with environmental organizations and agencies such as the members of Oregon OOSSA, the Oregon DEQ committee, Washington's WOSSA as well as county and state Health Departments throughout the Northwest. They offer only the best in sales and customer service and in the words of Bill Matzke, Jr., "We are proud to handle ZABEL products."

Michigan
W. G. Sales
Phone 517/546-3112; Fax 517/546-9494
Bill Gregory has been active in the onsite industry for over twenty years and is a founding member of (MOWA) Michigan Onsite Wastewater Association, as well as a charter member of (NOWRA) National Onsite Wastewater Recycling Association. He is also active in the Michigan Septic Tank Association, Michigan Environmental Health Association and the national and Michigan Ground Water Associations.

An advocate of filters for many years, he is one of ZABEL's most successful marketing partners. Bill says, "ZABEL Filters keep solids out of the drain field and in the septic tank where they belong."

Connecticut, Maine, Massachusetts, New Hampshire, Vermont, and Rhode Island
Pendleton Associates, Inc.
Phone 860/646-4411; Fax 860/646-1161
Founded April 1975, it has evolved as a specialist in the sump, sewage, and onsite marketplace. Customers are serviced by four outside salespersons and three inside office and warehouse persons at their 12,000' corporate office and warehouse, located in Manchester, CT.
Proper sizing and engineering applications for unusual conditions are the forte of this company.

Delaware, Maryland, New Jersey and Pennsylvania
Latchaw, Montgomery & Peck, Inc.
Phone 610/647-4640; Fax 800/220-7081, E-mail jvplmp@aol.com.
John Peck leads a trained staff of five outside salespersons and five inside customer service technicians in the selection, installation and service of all ZABEL products. Active in the wastewater treatment field since 1958, they are knowledgeable in the selection of wastewater pumps and controls. The corporate office is located in Malvent, PA, with branch offices in Potomac, MD, York, PA, Easton, PA, and Shamokin, PA.

New York State
Sherwood Specialties, Inc.
Phone 716/546-1211; Fax 716/546-1208
Founded in 1961 to serve primarily the pump and water well industries, in the 70's they added products

in the plumbing, heating and wastewater treatment markets. Led by principals Bruce Campbell and Warren Olson, they cover the state from their Rochester, New York office.

Arizona, Colorado, New Mexico, Utah and Wyoming
Applied Process Equipment, Inc.
Phone 602/998-4097; Fax 602/951-8434
Home office in Scottsdale, Arizona
Applied Process Equipment, founded in 1988, serves the inter- mountain west with sales-engineering representation for environmental and wastewater products of the highest quality. Our primary goal is problem solving rather than the simple sale of a given product. We seek to offer a highly synergistic group of products that represent leading engineering and technology. We are delighted to now represent Zabel Environmental Technology along with our other fine products.

Texas, Oklahoma, Louisiana and Arkansas
MKM Sales, Inc.
Phone 409/866-6702; Fax 409/866-6501
Phone (972) 242-2053; Fax (972) 245-3899
Established in 1980 with offices and warehouse facilities in Beaumont, TX and Carrolton, TX (Dallas area), MKM stocks large quantities of merchandise to complement its manufacturers' inventories and provide quick service to all of its customers.
Mr. Gary Hughes runs the Carrolton, TX, office and travels the north Texas, Oklahoma, and Arkansas regions. Ronnie Moye, Tommy Kent and Shea Kent operate out of the Beaumont, TX, office while servicing customers in south Texas and Louisiana.

Iowa, Missouri and Kansas
The Volrath Sales Group
Phone 888/264-9146; Fax 515/262-3150
Founded by Mike and Justin Volrath, they have been strong supporters of the Iowa Environmental Health Association since 1986 and (NOWRA) National Onsite Wastewater Recycling Association members since 1995. They stay focused and effective by concentrating solely on products that improve the on-site wastewater industry.

Tennessee
The McClain Company
Phone 800/394-9601; Fax 800/428-7623.
Jim and Mike McClain along with Kevin Long and Carl Cooper lead the firm founded by William M. McClain Sr. in 1964. The Nashville sales office is supported by Kathy Scearce and Henry Patton.
"Since the State of Tennessee recently approved effluent filters, we wanted to position the agency with the industry leader," says Jim McClain. "When effluent filters become mandatory, it creates a new onsite maintenance industry for conventional systems."
A founding member of (TOWA) Tennessee Onsite Wastewater Association and members of (NOWRA) National Onsite Wastewater Recycling Association, they work with local and state regulatory agencies, installers, pumpers, engineers, developers and distributors.

North Dakota, South Dakota, Minnesota and Wisconsin
Granse-Burke Alliance
Phone 612/469-2191; Fax 800/328-4599
People oriented and team focused, the Granse-Burke Alliance is headquartered in Lakeville, Minnesota. G. E. Granse and Dave Larson lead this successful onsite marketing organization, specializing in the onsite industry.


Granse-Burke Alliance

Zabel's Travels

One of the stops on the Zabel™ Trade Show tour this year was NEHA show in Las Vegas. Harry, Bill, and Theo attended.

Harry speaking to a crowd of interested folks.

Harry talking about filters

Harry demonstrating our superior Risers & Lids

Oh well... they were in Vegas!

Since he had lady luck in his corner, the office sent him after the 150 million dollar powerball tickets.
It didn't help!

Installing Filters in Difficult Places

There are several techniques for achieving a successful installation in problem situations. Most of these situations can be handled successfully by using the following techniques.

Retrofitting Zabel™ Filters:
Any Zabel™ Filter can be retrofitted to existing onsite wastewater applications. The first method is to uncover the existing tank at the outlet end, remove the access lid and insert an A1800 Cartridge in the existing outlet tee or replace the existing outlet tee with the appropriate Zabel™ Filter. *(Figure 1)*

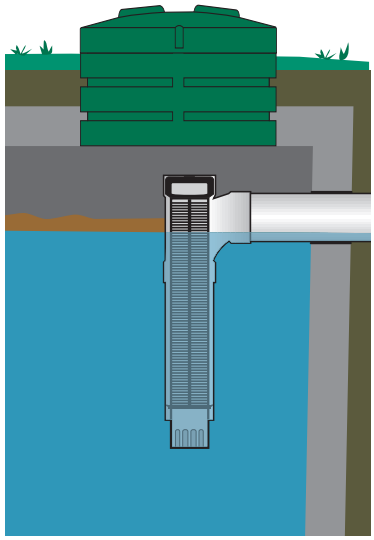


Figure 1

Where this is not practical, a Zabel™ Filter can be retrofitted using a Zeus™ Basin or Container Assembly. The tight line between the septic tank and the disposal field can be cut to allow for the installation of a Basin or Container Assembly. *(Figure 2)* The Zeus™ Basin system allows you to utilize the various risers in the Zeus™ Access system to bring at grade entry to the tank to allow for service of the filter. The Container Assembly includes everything you need - Filter Container, Adjustable Riser, Riser Lid, Lid Screws, Schedule 35 & Schedule 41 Pipe Seals and Sealant.

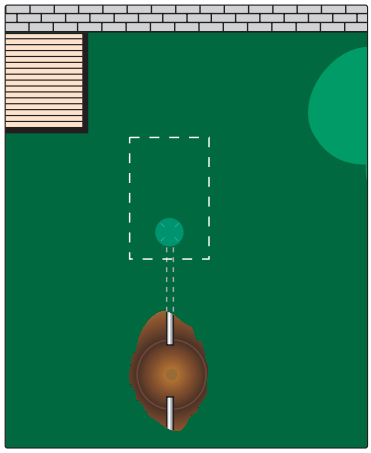


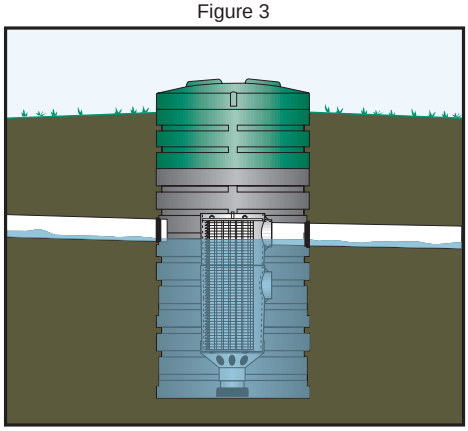
Figure 2

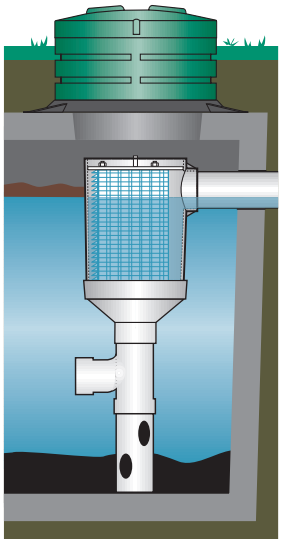
The 38" Basin will also allow you to install an A-100 HIP or A-300 HIP filter outside the septic tank. This is accomplished by using the Zabel™ 4" extension adapter and a section of 4" Sch 40 pipe extended to the bottom of the basin. 1" holes will need to be drilled into the extension adapter to allow solids to slough back into the basin. *(Figure 3)*

Supplementary Support Method for Installing Zabel™ Filters:
Installing two or more Zabel™ Filters in one tank, 18 inches or more from the end of the tank or in high strength waste applications such as restaurants or dog kennels sometimes requires additional support to handle the weight of the filter. Supplementary support can be achieved by following these directions.

Solvent weld the reducer to the bottom of the filter case. Using two pieces of Schedule 40 pipe

Figure 3





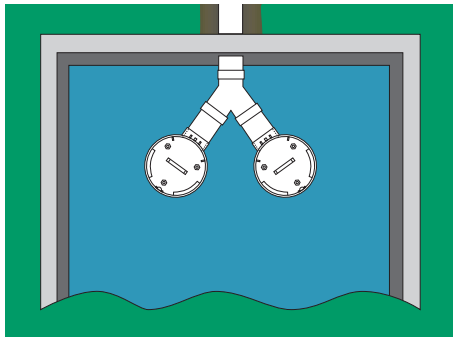


Figure 4

with an inverted Sanitary Tee located at the clear zone level, extend to the bottom of the tank for support. Make sure the pipe exiting the filter and extending through the tank wall is level. Cut four or more two inch holes in the PVC pipe below the Sanitary Tee to prevent sludge build up in the pipe. *(Figure 4)*

When installing an A-100 HIP or A-300 HIP unit in a tank use the Supplementary Support Method outlined previously above as well as a section of 4" Sch 40 PVC pipe extending from the lower filter case outlet to the tank end wall. This gives maximum support to this larger filter unit. *(Figure 5)*

A plumbing flange should be used where Schedule 40 pipe can not be extended through the tank end wall. *(Figure 6)*

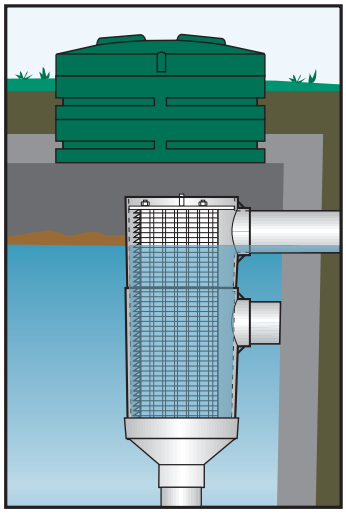


Figure 5

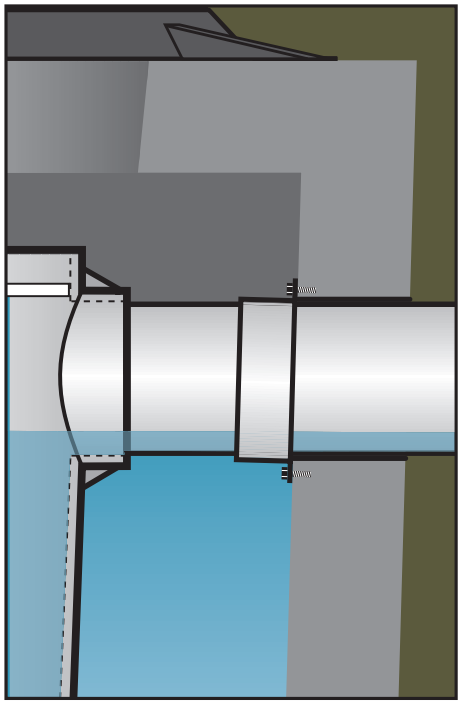


Figure 6

The kids of Mrs. Jodie Reeves' first grade class at S.P. Livingston Elementary School in Jacksonville, FL. Zabel donated shirts for their school's field day. The kids competed in several events with the other classes and were in disbelief when they found out they didn't have to give the shirts back after the field day was over. She says the kids are still wearing them.

Dear Mr. Nurse, Thank you for the T-shirts. We really liked it so much. On play Day we had so much fun. We had the sack race. And the ballon pop. We want to say thanks for the shirt. Have a good day. Your friend, Lena Reese

Dear Mr. Nurse, Thank you for my T-shirt. It make me feel very special. Thanks for your gift. You friend, Larry Rainge

Dear Mr. Nurse, Thank you for the T-shirts. We liked them so much. They were nice. Now we can were them to school. They were cool. Your friend, Roderick Preston

Dear Mr. Nurse, Thank you for the t-shirts. The t-shirts are great. I like them. The shirts are pretty. We love them. You friend, Patrice Buggest

Dear Mr. Nurse, I love the T-shirts! Thanks for the shirts. They were great! I was in the bean bag race and the balloon pop. The shirt was blue and white. We cheered for our class. You are special. Your friend, Renaldo

Dear Mr. Nurse, Thank you for the nice T-shirts. We wore the T-shirts at playday. At playday the shirts said Mrs. Reeves all stars. We won a game with the T-shirts. Your friend, Dwana Rogers

Dear Mr. Nurse, Thank you for the t-shrts. We won the sack game. We did tug of war. We ate in the shirt. The shirt said Mrs. Reeves all stars Your friend, Alexis Jones

Dear Mr. Nurse,, Thank you for the T-shirts. We hopped in the sack to the boys and back. Mrs. Reeves was happy! Your friend, Craig Baker

Dear Mr. Nurse, I like the t-shirts. It was good for you to do that. I like the shirts they look good. We won the sack race. It was great. Your friend, Chris Ewen

Dear Mr. Nurse, Thank you for the T-shirts. They are nice shirts. We had fun on play day. We ran on play day. Thank you for the shirts. Your friend, Antoneisha Wiggins

Dear Mr. Nurse, The t-shirts was great! The t-shirts had stars on them. We had a picnic in the t-shirt. Your friend, Raneisha Gordon

Dear Mr. Nurse, I like the t-shirts. They were nice! I ran in the t-shirts. They said Mrs Reeves All stars. The class and I had fun in the t-shirts. Your friend, Abdul

Dear Mr. Nurse, I thank you for the t-shirts. They said Ms. Reeves all stars. It was blue and white. While I had on the shirt I was in the ballon sit. Your friend, Tamikameartuun

Dear Mr. Nurse, Thank you for the shirts. I am very happy! I am happy for the shirts. The shirts said Ms. Reeves all stars. I like the shirts very much. They are pretty. We are very happy to get the shirts. Your friend, Jahmela Folkes

Dear Mr. Nurse, Thank you for the shirts. Thank you for letting us have the shirts. The shirts said Mrs. Reeves all stars. The shirts were white and blue. Your friend, Anthony Ray

Dear Mr. Nurse, Thank you for the shirt. I played in the balloon sit. I played tug of war. I was yelling my team name. They were blue and white. Your friend, Earnest Gamble

Dear Mr. Nurse, You are a nice man. You are the nicest man on earth. When I went in the sack race people laughed at me. And it gave me good luck. Those were the nicest shirts I ever seen. Your are a nice person. Thank you Mr. Nurse.

THE POWERHOUSE OF McCLEES CONSULTING

By Jan Nurse

If you are a past reader of The Zabel Zone™, you will no doubt recognize the name, Joe McClees. Joe is a lobbyist and business consultant who has contributed articles to past Zabel™ Zone magazines encouraging cooperation between industry and government.

Feeling a two- or three-sentence bio next to his picture is just not adequate, we asked for his permission to turn the tables and make him the subject of an article. He graciously agreed.

Joe McClees is a native of North Carolina and resides in New Bern, but during the legislative year, he divides his time among state capitals and Washington, D.C. When state legislatures adjourn, he works in the U.S. and overseas on business consulting projects.

His wife, the former Susan Henri Johnson, is an attorney. Both are committed Christians who believe their faith should be ever apparent to those around them.

Joe's journey to his career as a lobbyist/consultant began with a degree from Atlantic Christian College (now Barton College) where he received a B.A. in history and political science. From 1976 to 1986, he served in several positions in the North Carolina Department of Natural Resources including Special Assistant Secretary of Natural Resources which gave him the unique opportunity of working with environmental and health related agencies.

In 1986, Joe began McClees Consulting, a firm that offers lobbying and economic consulting services to individual and corporate clients. His background in North Carolina government and industry has enabled him to offer his expertise to a variety of clients, and when the General Assembly is in session in Raleigh or Congress in Washington, D.C., an often heard phrase is, "Joe McClees says . . . "

He is known for his tenacity and forthrightness and as a man who gets the job done right, no matter how long it takes. His clients come to him after seeing him in action or by referral from other clients who found Joe gets results, often when other avenues have failed. He currently acts as the lobbyist for the North Carolina Septic Tank Association where he has overseen the successful efforts at rewriting regulations to promote a positive business environment.

He also represents the North Carolina Portable Toilet Group as well as the Technological Development Authority. In his representation of the latter group, he has successfully lobbied for matching funds and specific legislation for funds for venture capital investment in North Carolina.

Joe says, "A successful trade association operates like a profitable business. Work goes into that business every week. Projections are made, goals are set, and everyone works all year to accomplish those goals. To succeed, you must hire a professional. As with your business, there are no short cuts to success."

Besides his work with McClees Consulting, Joe has found time to pursue his hobby of shooting, and hunting trips have taken him as far as England, Scotland and Africa. He also is the founder of the Fisheries Development Foundation of North Carolina, a non-profit organization that educates underprivileged individuals in job related aquaculture and environmental careers.

If you would like to contact Joe, you may do so at:

McClees Consulting, Inc.
507 Pollock Street
PO Box 1033
New Bern, N.C. 28563
Phone: 252/633-1300
Fax: 252/633-6316

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APPLICATIONS INCLUDE:

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- CISTERN
- IRRIGATION

A stainless steel secondary strainer gives the Red Jacket Utility Pumps added protection against blockage. Even so, the Utility Pumps can handle solids up to 1/16-inch in diameter.

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- **User-friendly design; can be repaired in the field.**
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- **Stainless steel secondary strainer.**
- **Easy to sell with targeted applications.**
- **Specially designed SJWO motor leads handle tough effluent applications.**
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- **Removable stack of impellers makes unit easy to service.**

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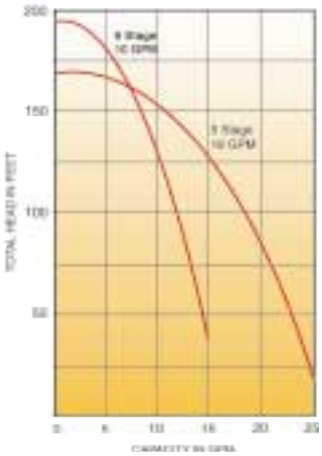
Utility Pump Performance



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RJW-136 11/97

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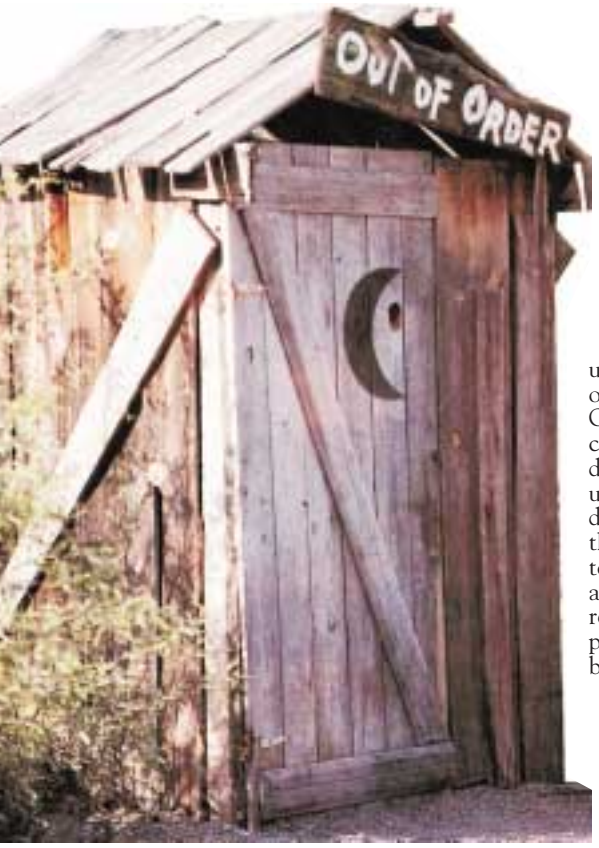


So You ~~Want~~... Need a Septic Tank?

by Albert Royster *Marion County, Florida*

Perhaps you are planning to construct a new residence or any structure with plumbing. How will the anticipated wastewater be properly treated and disposed? Possibly you have considered adding living area to the house realizing the anticipated sewage flow may exceed what your existing system will accept. Will you enlarge the drainfield providing your tank has ample room for storage or add a secondary septic system? This article highlights the obtaining of a septic tank permit, the site evaluation, and the OSTDS installation. It covers what the health department inspector looks for to ensure the project complies with state code. Some tips regarding system maintenance will be addressed.

Applying for the OSTDS Permit

When an application for a construction permit is made to your local building department along with your finished set of house plans, a question to be answered during the permit process is: Will this building be served by sanitary sewer or a septic system? Suddenly you realize your reply will entail either a hookup fee with monthly charges; or construction expenses for a new OSTDS (Onsite Sewage Treatment and Disposal System) unless there is an existing system on site. Prior to purchasing your OSTDS construction permit, be certain you possess a legal description of the property to be utilized. Your local county health department will guide you through the proper permitting processes to ensure compliance with rules and regulations. Regulations require a OSTDS construction permit prior to obtaining your building permit.

The Site Evaluation

You will need to apply for a site evaluation unless one has been previously completed and on file. The site evaluation is normally performed by a health department field specialist. The completed site evaluation will provide the personnel issuing your permit information about the type of soils encountered up to six feet beneath the ground surface. At least two borings will be made at the proposed location of your system. The wastewater application rate is based on the receiving ability to percolate effluent. The application rate determines the minimal amount of drainfield required to properly receive and treat the anticipated wastewater. Soil structures, evidence of a seasonal high water table, vegetative patterns, unobstructed area, and required setbacks to neighboring wells or surface water bodies are important factors that must be interpreted by personnel writing your OSTDS construction permit. It is important to know if you have adequate area to install a septic system prior to construction. Permitting personnel will determine if the amount of land you have is adequate. This prevents you from incurring expenses prematurely and possibly in vain.

Installing the OSTDS

After purchasing your OSTDS permit, a copy must be given to the licensed septic tank contractor hired to install your OSTDS. The septic tank contractor may visit the site prior to offering a bid for the job. After arrangements are made to install your OSTDS, a crew will arrive on site to dig a hole large enough for a septic tank. After the tank is positioned into the hole and set correctly, the distribution box or header pipe is placed. The drainfield is constructed. The yard may appear to be dug up since the soil dug from the drainfield area is normally piled up so it can be backfilled after the system is inspected.

Inspection of the OSTDS Installation

After your licensed contractor has installed your OSTDS, a certified health department field specialist will examine the system before approving to ensure compliance with state code and permit specifications.

In Florida, septic tanks are now required to be multi-chambered and have an approved outlet filter device. The filter is located in the outlet tee; the device that drains the clarified water from the tank into the drainfield. The filter prevents suspended solids from escaping the tank.

Septic tanks must display the size, manufacturer, year made, and the state certification number on the tank legend located on the inlet end of the tank. The tank must be installed level, be structurally sound and watertight.

The inspector will check the distribution box or header pipe to ensure the effluent leaves the junction point equally. The drainfield aggregate material is checked for proper size, depth and quality. Your contractor may elect to install an alternative type of drainfield other than gravel. The inspector will ensure code requirements are met. Drainline slope is measured. The system must not exceed the depth requirement indicated on the

permit. Drainlines must be sealed or capped on the ends or looped together. Drainfields are normally configured into trenches or an absorption bed. The drainfield size must match or exceed the amount indicated on the permit. The top of the drainfield must be lined with a barrier to keep dirt from settling into the drainfield. The location of wells are measured to ensure proper setbacks are met. Property boundaries, building foundations, and water lines must meet certain distances from the septic system. The installer may recommend a root riser be placed on the distribution box if there are trees surrounding the drainfield. By adding some copper sulfate into the riser every six months, roots repel from leaching into the drainfield that would otherwise cause clogging and backups. Storm water or runoff from roofs should not divert towards the drainfield. If so, the fill above the drainfield may erode. Also, the drainfield will remain saturated longer due to ponding. This will hydraulically overload the drainfield in a matter of time. Once the construction is approved by the inspector, the system is covered and rechecked for the proper amount of fill. Mound Systems require additional fill on the sides, top and ends. They must be sloped correctly and stabilized.

System Maintenance

Once your system is approved, remember it requires maintenance. Sludge will build up from the bottom of the tank and will need to be emptied periodically. Have a licensed septic tank company pump your tank every three to five years. When the tank is serviced, be sure to have the outlet filter cleaned. If possible monitor your daily water usage. Using too much water will normally cause the system to fail within the first five years of usage. Large surges of wastewater entering the tank leave less time for settling of suspended solids. You may elect to space the number of wash loads to prevent overloading the OSTDS for short periods. Root clogged drainfields are common and are known as progressive failures. Generally, a root-bound drainfield will perform adequately for a greater period of time than a saturated or overloaded drainfield. Bushes or trees should not be planted on or adjacent to the drainfield.

After your system is properly built, inspected and approved, maintenance and care are essential to prolong the life of your system.

Albert J. Royster is an environmental specialist for Marion County Health Dept. in Ocala, FL. He is the septage coordinator of the county in charge of permitting pumpers and septic tank manufacturing facilities. Albert inspects onsite sewage treatment and disposal systems and performs soil profiles. He is a member of the Florida Septic Tank Association and received the FSTA award for Heath Department Inspector to the year in 1997.

"Rebel Humor"

A man walked into a bar decked out in a Florida Gator hat, tee shirt and other paraphernalia. He saw two men sitting on bar stools, one wearing a hat with a large FSU on the front, the other with a UT cap.

To the man with the FSU hat he said, "What does that stand for?"

"Florida Stomped Us," the man replied.

When asked about his cap, the UT man replied, "Us Too."

Assuring Septic System Maintenance Management with Wastewater Filters

By Harry L. Nurse Jr.

Do wastewater filters solve all the maintenance management problems of conventional onsite systems?

The Spring 1996 edition of Pipeline magazine, published by National Small Flows Clearinghouse, focused on the need for management programs for onsite systems. It reported that state regulators have more confidence in centralized treatment systems than onsite systems because "they have centralized management and oversight and centralized operation and maintenance". Most industry professionals agree there are three keys to managing properly operating onsite systems. These are design, installation and maintenance.

A proper design usually encompasses environmental factors such as a site evaluation - including climatic, topographical and soil conditions, type of use - residential, commercial or industrial, nature and strength of waste, and hydraulic loading of the system.

There are onsite technologic alternatives to properly design a system for most sites. There is also enough systems design know how to determine when an onsite system should not be used. More and more states are putting management programs in place that require designers to pass specific courses and take continuing education seminars to be certified to practice onsite wastewater systems design. This is not to say that there is complete agreement about this process and it is true many areas of the country lag behind the learning curve required to provide adequate design management. However, that is a program problem that can be solved through proper state and county codes. Good design information is available.

Just as management of the design process is the foundation on which a successful onsite system rests, a competent installation is also necessary to a properly operating system. Good installation is also dependent on training and monitoring installers to assure that the system has been constructed as it has been designed.

Whether it is an advanced design requiring the installation and setting of complex mechanical components or a conventional septic tank and drainfield, the system will not provide the designed treatment unless a knowledgeable installer carefully follows the intended design. Again, many states are beginning to require training and certification of installers.

The third leg of this management puzzle is maintenance. It is by far the most difficult of the three to execute. Like designers and installers, service personnel can and should be required to be certified in the skills necessary to monitor and maintain a variety of systems. Some states have already headed down this road with more to soon follow.

The decision to service a system, that is to determine if and when it should be serviced, is usually left to the homeowner. This is the only part of the onsite program dependent on the knowledge and performance of a non-professional. This dependence on the homeowner for service of onsite systems is the greatest contributor to the reluctance of governmental jurisdictions to view economical onsite systems as an attractive alternative to expensive centralized sewer systems.

The industry's failure to provide an adequate approach for the maintenance of the most basic conventional systems has also contributed to the reluctance of states to embrace the more sophisticated onsite technologies. Aerobic treatment units are a case in point. The primary restriction on the acceptance of aerobic treatment units has been the problem of assuring long term maintenance of the system beyond the two years required under NSF Standard 40 certification. Aerobic manufacturers are reluctant to voluntarily increase their required service commitment of two years. They feel it puts them at a cost disadvantage with conventional and other onsite technologies which in most states do not have any enforceable service component.

If periodic monitoring and maintenance is needed for aerobic systems, it is certainly a need for all onsite systems whether it is the more complicated recirculating sand filter or simple conventional systems that usually only require periodic inspection and removal of septage. Although servicing of conventional systems is very straightforward and some would say down right simple, it is also critical in avoiding system failure.

This concern for maintenance management of conventional systems is voiced in seminar after seminar with repeated calls for educating the homeowner about the needs of the system. Simply writing code that says a conventional system should be inspected and serviced every three to five years is not likely to result in the homeowner, who probably doesn't even know the code exists, having the system serviced. Most homeowners have many priorities in their lives other than pumping their septic tank.

When does the homeowner have the system serviced? In seminar after seminar I have conducted, regulators and industry agree, "They have it serviced when it backs up."

Managing the homeowner is the key to managing maintenance! Now, how do we manage the homeowner?

Homeowners actually do three things that compound the problem of system performance and interfere with system maintenance management. First, they put things in the tank that don't belong. Second, they hydraulically overload the system. And third, as we said previously they perform system maintenance only when the system backs up.

Depending on the homeowner to act either takes direct regulatory enforcement, which states have been reluctant to do, or depends on homeowner education - an impossibly expensive undertaking that is unlikely to dramatically change homeowner attitudes.

The answer is to manage system maintenance by requiring wastewater filters in all systems utilizing septic tanks as part of the design. Requiring wastewater filters on the outlet of septic tanks manages the homeowner!

If the homeowner discards inappropriate material in the tank, the filter keeps it in the tank. Sanitary products, hair and cigarette butts will also be contained in the tank. If bleach or some other caustic material is discarded, the filter will not remove the offending agent. However, it will protect the field from the excess solids until the tank recovers. If grease is put in the tank, the filter will keep most of the grease out of the field.

If the homeowner overloads the hydraulic flow, not allowing the normal 24 hour retention time, the filter protects the field from solids carryover exacerbated by the flow.

Finally, if the homeowner has maintenance performed only when the system backs up, the filter will protect the field and slow the system down which assures system maintenance before there is a system failure.

Does this mean the system works fine one day and plugs the next causing a messy problem for the homeowner? No! All Zabel filters are designed with a bypass when the body of the filter plugs.

Does the bypass allow unfiltered material to leave the tank? No! The material rises over the outside of the filter, approximately four inches above the outlet invert, causing a gentle slowing of the waste system. The effluent exits through the normal outlet after it has been filtered through the clean reserve portion of the filter.

During the period the system has slowed, the homeowner has ample opportunity and warning to have the system serviced.

Do wastewater filters solve all the maintenance management problems of onsite systems? No. It is in systems utilizing conventional septic tanks and filtered pump vaults that most benefit from this process.

Wastewater filters do not solve problems of poor siting or poor design. They cannot correct problems caused by poor installation. When the system has been correctly designed and installed, however, the filter is the only passive system that will assure system maintenance prior to an expensive and catastrophic failure caused by overloading of suspended solids.

It will take states time to put in place the programs and training necessary to provide adequate monitoring and management of onsite wastewater system design and installation as well as systems maintenance. However, by simply requiring an inexpensive wastewater filter in every septic tank, conventional onsite systems will no longer be dependent on the homeowner's education or interest in the system's maintenance.

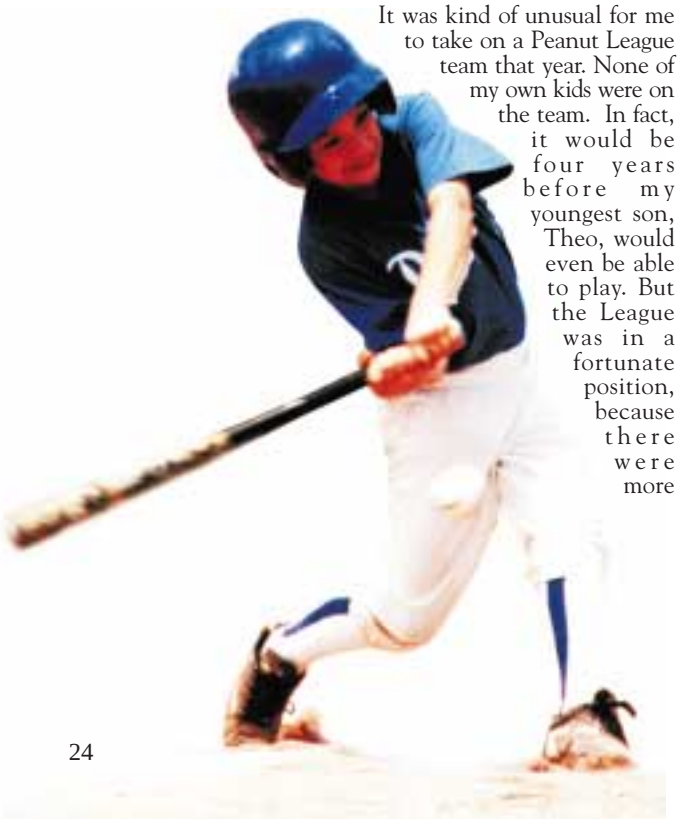
At a lower cost per system than any other design, installation or maintenance management program, requiring a wastewater filter in every septic tank will manage the homeowner assuring septic system maintenance in a timely manner. With conventional system maintenance assured, perhaps state regulators would be more likely to see onsite systems as an attractive and low cost alternative to expensive centralized systems.

Zabel™ Enters "The Big Show"...
Introducing the ZEUS™ STEP System Packages

By Theo Terry

All rookies dream of being a Major League ball player in the "Big Show." Just as Zabel has become a Major League player in the Onsite Wastewater Industry.

Four years ago, I decided to take on the challenge of coaching an expansion Peanut League baseball team of 6 to 8 year old boys and girls. I'd already spent some time being an assistant coach for my son Andrew's Peanut League team, but when he moved up to the next level, all the coaching positions were filled. Something had happened during that last spring, however, of Andrew's Peanut League. Being at the ballpark again reawakened the bug that infected me all through my own youth. Baseball, springtime and small-town America. I had to be a part of it.



It was kind of unusual for me to take on a Peanut League team that year. None of my own kids were on the team. In fact, it would be four years before my youngest son, Theo, would even be able to play. But the League was in a fortunate position, because there were more players than could fit on the existing teams; hence, the need for expansion.

Being the new kid on the block, so to speak, left me in a position of having to prove my coaching abilities. Being an expansion team also left me lots of players to draft, and I walked up and down the gym during tryouts eyeing those kids like a major league scout. Early on, it became apparent that my way of thinking in building a team didn't "jive" with a lot of the other coaches. While they were working hard to build teams of 8-year-olds who were strong offensively, I was trying to look for talent in 6- 7- and 8-year olds. And, I'll admit, I looked at their parents, too, trying to remember who had played ball themselves as kids, because I figured they'd be the ones who would work with their kids away from the ballpark. They'd have the bug, too.

At the end of the first season, it looked like my fellow coaches were right. We didn't win one single game. But lots of games were close, and I could see the potential down the road. I never gave up on those kids, and their parents didn't, either.

See, this is how I look at it. There will always be big kids, even in Peanut League, who are good hitters. But it's being strong defensively, knowing the game and staying on top of the action that wins games. Give me smart kids, and I'll make them good ball players.

Baseball is important to me. In fact, when I was interviewing for this job, I told Harry that I coached a Peanut League team, and was concerned about taking on a new job that would necessitate me dropping this springtime obligation. I guess it's a good thing Harry and I agree that family and community commitments do matter. (Zabel has since become a part of this project, as you can see in past and present issues of The Zabel Zone™.)

Now, four years later, the Dodgers have been to the

championship game three times, winning the past two years, and going undefeated for the 1998 season. And, as good as our team was this year, we've got 10 players coming back next year, and I swear we've got another good shot at that championship trophy. Now, I'm one of those coaches hanging around the ballpark all spring, living off hot dogs and Gatorade, scouting other teams and re-hashing each game play-by-play. God, I love this game!

I never make decisions for my coaching strategies strictly by the book, at least not the way "it's always been done." While I still see other coaches loading up for that one strong season, I'd rather work toward a team that consistently stays at the top. Then the players will learn the game, have a good time doing it, and be able to remain competitive. Instead of writing the books, I guess I'd rather be the team they write the book about.

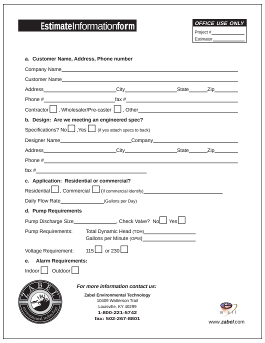
Recently, I've been thinking about all the advice I got (and still get!) from my fellow coaches about baseball. Since I've been working for Zabel, I've gotten (and still get!) a lot of advice about marketing and the onsite wastewater industry. However, the same philosophy that guides me on the baseball field carries over to our attitude at Zabel. As I've said many times before, we have a motto at Zabel stating, "Manufacturers should respond to the needs of the industry rather than industry responding to the needs of the manufacturer."

In keeping with this tradition, Zabel is providing a new service to its customers. We are proud to quote entire STEP System Packages which can be drop-shipped to the customer's place of business, or, if preferred, directly to the job site.

Many people in the industry have suggested a company can't sell directly to contractors. "You have to go through engineering or design firms; these systems are just too complicated for installers and contractors."

Clearly, we at Zabel disagree. Sure, there are alternative treatment systems, cluster systems, and entire community STEP systems that require engineered plans.

However, there are a whole group of STEP systems that are not used exclusively for engineered systems. Over 90% of all onsite systems are still of the conventional type; however, a small percentage of these require some type of alternative plan. This small percentage may need to use a STEP system to overcome an elevation difference between the pretreatment unit and the discharge point. Installers and contractors have a great deal of expertise in dealing with these systems; we are only providing them the assistance and convenience in assembling an applicable, efficient and economical unit for their particular need.



EstimateInformationform

OFFICE USE ONLY
Project #____
Estimator____

a. Customer Name, Address, Phone number
Company Name____
Customer Name____
Address____ City____ State____ Zip____
Phone #____ fax #____
Contractor ☐ , Wholesaler/Pre-caster ☐ , Other____

b. Design: Are we meeting an engineered spec?
Specifications? No ☐ ,Yes ☐ (if yes attach specs to back)
Designer Name____ Company____
Address____ City____ State____ Zip____
Phone #____
fax #____

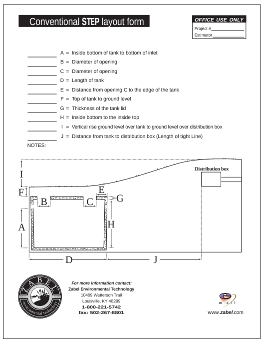
c. Application: Residential or commercial?
Residential ☐ , Commercial ☐ (if commercial identify)____
Daily Flow Rate____(Gallons per Day)

d. Pump Requirements
Pump Discharge Size____, Check Valve? No ☐ Yes ☐
Pump Requirements: Total Dynamic Head (TDH)____
Gallons per Minute (GPM)____
Voltage Requirement: 115 ☐ or 230 ☐

e. Alarm Requirements:
Indoor ☐ Outdoor ☐

For more information contact us:
Zabel Environmental Technology
10409 Watterson Trail
Louisville, KY 40299
1-800-221-5742
fax: 502-267-8801
www.zabel.com

What Zabel does is service both ends of the pipeline. Installers may get a quote on an engineered plan by completing an Estimate Information Form (available from Zabel), then mailing, faxing or sending it by e-mail to Kevin Greene, along with a copy of the specs you are bidding against. Kevin will review this information, and, if he has any questions, will give either you or the designer a call to clarify. He will then provide you with a written copy of a quote that is good for 60 days. If you want the package, simply sign the quote letter, return it to Kevin, and he will package your STEP System and drop-ship it to the destination of your choice.



Conventional STEP layout form

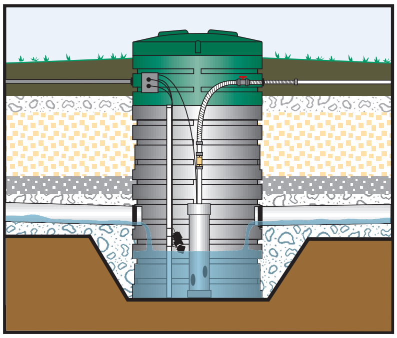
OFFICE USE ONLY
Project #____
Estimator____

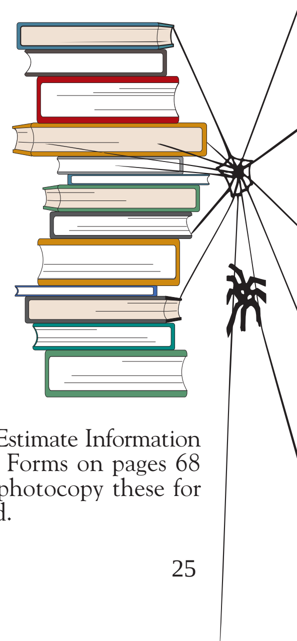
____ A = Inside bottom of tank to bottom of inlet
____ B = Diameter of opening
____ C = Diameter of opening
____ D = Length of tank
____ E = Distance from opening C to the edge of the tank
____ F = Top of tank to ground level
____ G = Thickness of the tank lid
____ H = Inside bottom to the inside top
____ I = Vertical rise ground level over tank to ground level over distribution box
____ J = Distance from tank to distribution box (Length of tight Line)
NOTES:

For more information contact:
Zabel Environmental Technology
10409 Watterson Trail
Louisville, KY 40299
1-800-221-5742
fax: 502-267-8801
www.zabel.com

Kevin will also assist installers or contractors not working directly from an engineered plan in selecting the appropriate components to assemble the STEP system package. Again, simply complete the Estimate Information Form mentioned earlier, and additionally, the Conventional STEP Layout Form (also available from Zabel). Kevin will be able to take the information from this form and determine the specific components for your particular application. Our commitment is to work with installers or contractors, to get them the best possible system at the best price.

With the introduction of these package systems, Zabel is entering a whole new ballgame. Not only are we providing quality individual components, but now the buyer has a source for STEP System packages as well. Zabel is able to pass along the package savings to the customer, with discounts as much as 1/3 off the cost of assembling individual components. An added dividend is the customer has one company to turn to for warranty issues, instead of two, three or more. Just another bonus the customer gets when choosing to do business with a winning team.





Editors Note: You can find copies of the Estimate Information Form and Conventional STEP Layout Forms on pages 68 and 69 of this magazine. Feel free to photocopy these for use the next time you have a job to bid.

FORMS ON PAGE 68

The ADVENTURES Of Zabel™ Man

Visit ZABEL'S UPDATED WEB SITE

Have you visited Zabel's™ web site? Were you even aware that one existed?

If you have visited it in the past, but not recently, you will want to "hit" us again. We have recently been updated and think you will like the changes.

If you have never seen our web page, let me tell you what's available there.

Conference Schedule

Interested in upcoming conferences? There is the Conference Forum, overseen by Sherry Bradley, where you can obtain information on upcoming events, or post your conference.

Our Onsite Forum, moderated by Don Alexander, lets you get online and discuss issues of interest with people from all over. Put your two cents in!

Regulators Mix it up

Have you misplaced one of your past Zabel Zone™ magazines and want to re-read an article? Well, shame on you, but there's hope. You can find any article from any past issue and download it from our web site.

Our products are also listed here. Each product sheet includes a picture of that product, as well as its application, performance specs, materials used in manufacturing, service method and warranty. And, a price list is included for your convenience.

Last, but not least, just for a little flavor and fun, you will find a Southern History section. Does it have anything to do with wastewater treatment? No, but that's part of the fun.

Southern History

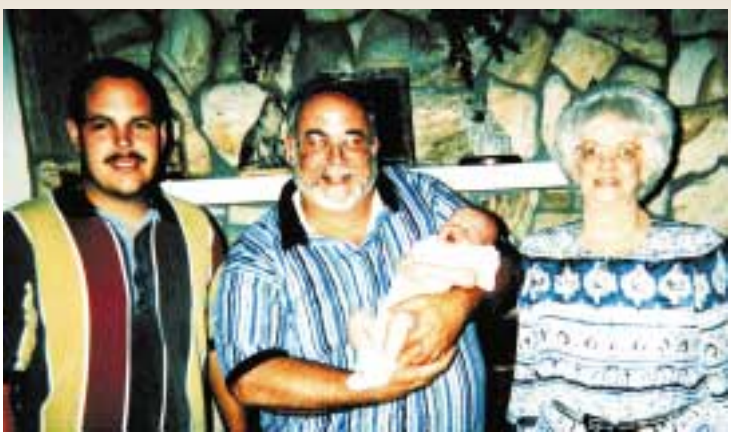
Hope to "see" y'all there real soon!

*The address for the Zabel website is www.zabel.com

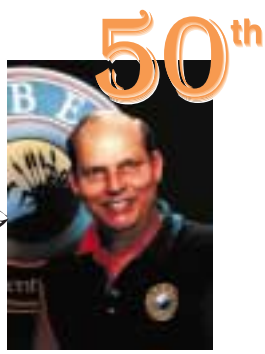
www.zabel.com

Zabel's New Addition
4 Generations

From left, Robert Nurse ***(Father)***, Larry Nurse ***(Grandfather)*** and Helen Nurse ***(Great Grandmother)*** with Jared Robert Nurse. Born on August 9th, 1998. 8lbs, 14 oz. and 21.5 inches long. Amy Nurse (Mom) is doing great.



Congradulations to Zabel's Bill Rawlins who turns 50 on October 3rd



BLACK BELT TRAINING CENTER

By Bill Rawlins

The Alabama Onsite Wastewater Training Center, located at the University of West Alabama in Livingston, Alabama, is the newest of the training centers popping up all over the country. The purpose of this center is to provide training in the use of alternative systems, when and where traditional systems will not work. The people working in the onsite industry who are trained include installers, contractors, and public health workers. In addition, the general public may benefit from attending the training center.

Lesley Garner at left, white shirt and blue billed hat

The place where the center is located is known as the Black Belt of west Alabama. There are a large percentage of conventional system failures in this area because the soil does not perc adequately. Improperly treated effluent may enter the surface water system, polluting streams and water supplies. The Alabama Department of Environmental Management (ADEM) studies have indicated the Black Belt region has the highest rate of onsite system failures in the state of Alabama.

The center's director, Lesley Garner, says the center is needed to provide year round classes in technological advancements to all onsite workers and local citizens. The training provides hands-on education to make learning easier and more meaningful. The Alabama Department of Public Health (ADPH) requested the center to serve as a demonstration site for all new onsite technology.

The plan is to install five different alternative systems. They are a sand filter, a peat system, constructed wetlands, a low-pressure distribution system and a drip emitter system. Each system will be in duplicate so that one can be functioning with sewage and the other using fresh water. All of the systems were donated or provided at low cost to the center. There have been several workdays held where volunteers have installed the systems.

Along with many other companies, Zabel™ is an active participant in this project. We challenge others to get involved because we believe the environment is everyone's responsibility and there are opportunities to protect our water resources. For further information, contact Lesley Garner at (205) 652-3803.

By Theo Terry

Zabel™ Gets Pumped Up!

ZEUS™ TURBINATOR™

Right before my wife and I got married, we had the prerequisite meeting with the minister. In that discussion somewhere were a few points about the sanctity and responsibilities of marriage, but mostly I remember discussing some recent repairs and modifications of the septic system at the church. My wife said she should have realized what she was getting into when most of our prenuptial discussion centered around the disposal of. . . well, you know.

Now, almost eight years later, my wife probably has heard more about effluent systems and onsite wastewater disposal than she ever thought was possible. But as anyone who knows me realizes, one of the ways I work through anything is to talk about it (and talk, and talk). In fact, after one particularly informative session, Robin commented, "I've never seen anyone get so pumped up about . . . well, you know."

I thought about that conversation when we at Zabel™ began to develop the ZEUS™ Septic Tank Effluent Pump (STEP) Systems. Because, with pun fully intended, we are pumped up about the ZEUS TURBINATOR™, a new series of submersible effluent pumps designed specifically for the onsite wastewater market.

The TURBINATOR™ is the perfect fit for the ZEUS™ STEP System. When used with any of the four filtered pump vault (FPV) models currently available from Zabel, the homeowner gets triple protection for his treatment system. The FPV provides 1/16" level of filtration by way of dual removable side panels. The TURBINATOR then additionally provides two levels of protection. First, is the primary strainer, which is easily removed for cleaning, which adds to the life of the pump as well as the treatment system. The stainless steel secondary strainer provides the final level of protection.

Another feature of the TURBINATOR is the specially-designed motor leads-10-foot oil and water resistant cable with connectors installed on wire ends.

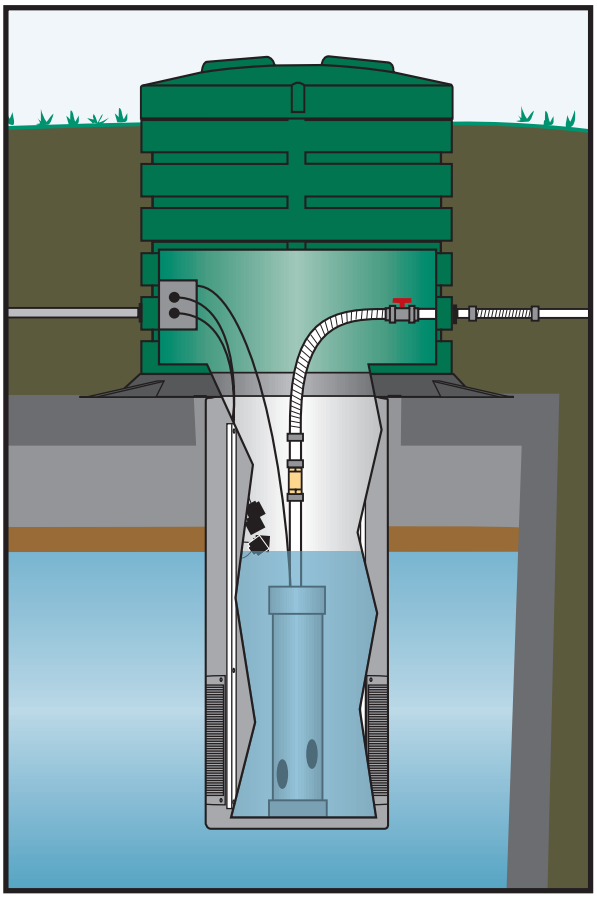
The TURBINATOR holds with the ZEUS philosophy that products should be designed for ease of service. It is yet another example of Zabel's intent of designing a product directly for onsite wastewater application, rather than taking an existing product off the shelf and trying to make it applicable for effluent use.

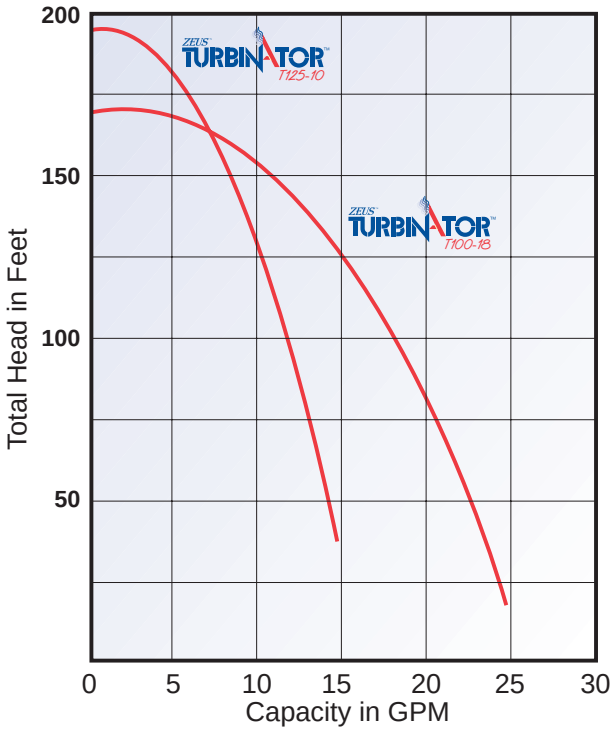
Initially, the TURBINATOR will be available in two models, with additional models to follow once testing is complete. Currently available are the T125-10 and T100-18. Model T125-10 has an optimum performance of 10 gpm at a Total Dynamic Head (TDH) of 125 feet. For higher flow applications, the Model T100-18 has an optimum performance of 18 gpm at a TDH of 100 feet. Both the T125-10 and T100-18 Model TURBINATOR Pumps come equipped with a 1/2 HP, 115-volt, NEMA standard motor.

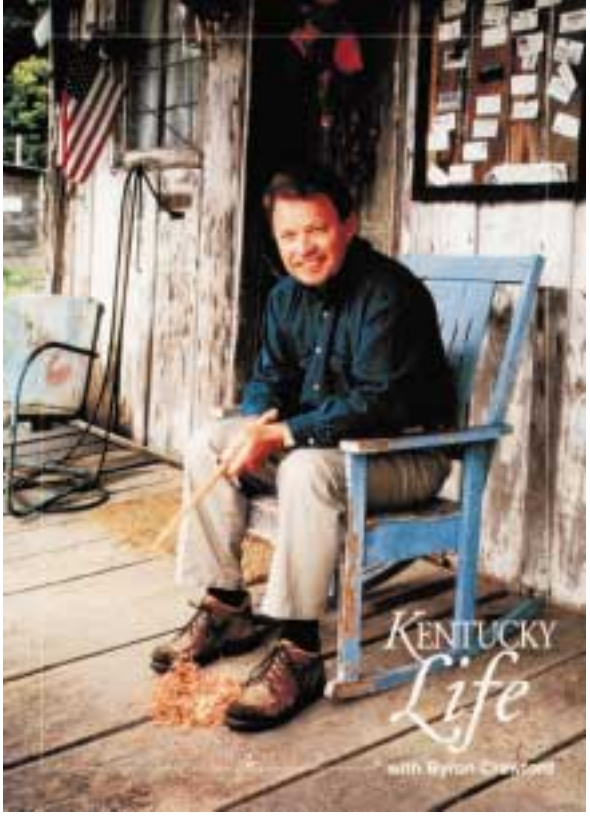
Now it's official. Zabel really has become "pumped up" with the addition of the TURBINATOR to our line of STEP Systems Components. So the next time you are bidding a job that calls for a pump, give Kevin Greene, Zabel's Technical Support Manager a call. He'll be happy to quote a complete STEP System package for you, made up entirely of quality ZEUS components. And you'll get "pumped up" by the savings a package provides, both in dollars and the convenience of having one company's warranty covering the products.

Which leads me to another story...

Editor's Note: See related article on ZEUS STEP System Packages on page 24-25 in this issue.







LIFE'S REAL TREASURES SELDOM MEASURED IN DOLLARS, CENTS

Line Fork, KY.- The porch of Cecil Cornett's small cabin, deep in the mountains of Letcher County, is a good place to spend hours listening and learning.

Cornett's stories are seasoned with seldom-heard, old mountain words and phrases that mark his cultural heritage and his place in time.

"I wouldn't delight in a school," he said of his boyhood. "It seemed like I had my mind on something else all the time and just couldn't hardly learn a thing."

But Cecil Cornett has learned plenty in his 82 years on the banks of Wolfpen Branch.

He learned his mother's love of flowers and her ways of gardening, and his father's way with horses and tools. He learned that a good name was worth more than wealth on Line Fork. He learned to cut timber in the log woods, and to make rocking chairs, straight-backed chairs and tables from tree limbs that he cuts long Wolfpen Branch.

He has learned to enjoy the small things around him that are beautiful, and to accept, without bitterness, those things that he cannot change.

"I get awful lonesome sometimes, just studying about my people all dead and gone," he said. "I've got a radio that I listen at a lot. They'll sing them pretty songs and it gets me pretty lonesome sometimes. I study now, and wish I would've married. My mother wanted me to marry, but I never did."

He was in love once, years ago, with a pretty woman whose words and laughter linger in his memory.

"I liked her better than anything, and she did me, too," he said. "I would have married her if she would have had me, but she got killed in a car wreck. Her name was Ellie Jane Turner. That's the only woman I ever did love. I never did like another one good enough to marry."

He treasures a short-handled cutting scythe that Ellie Jane hung on the front of his four-room cabin many years ago, after they had been working in the yard. The scythe, along with a small, weathered bag of his mother's garden seeds, a rusty four-pound lard bucket that once served as his father's lunch pail and a dipper made from a gourd are among Cornett's most prized possessions. His father and mother hung the bag of seeds, the pail and the dipper on the wall of the back porch well over 50 years ago, and the objects have never been moved.

Cornett's mother died in 1948, but Cecil cared for his father until his death many years later at age 96. Cecil has outlived three brothers and two sisters.

Although he remembers traveling to some town in Indiana with his family years ago, and he was once hospitalized in Lexington, he has never seen Louisville or Cincinnati or very many of the towns around Kentucky.

Nearly all of his life has been spent on the 144-acre farm that his family carved out of the woods around the cabin. "I know every crook and turn of it," he said. "I can't climb these hills and I ain't able to work now, but I make a garden and cook for myself and try to keep the yard mowed."

He still tends a pink, fragrant patch of sweet william, which his mother planted in the yard 60 or 70 years ago, and which he moved to a spot beside the cabin after her death.

About seven years ago, while barefoot in his kitchen, Cornett was "nibbed" on the foot by a small copperhead snake, but he was treated for the bite and suffered no serious effects.

"They made a moving picture here a while back," he said. " 'Fire Down Below' is what they called it. They floored my porch; took everything out- foundation, sills and everything- and refloored it, and never charged me a penny. Some of them said that the man that did it was a brother to that man with the ponytail (actor Steven Segal). They paid me $2,100."

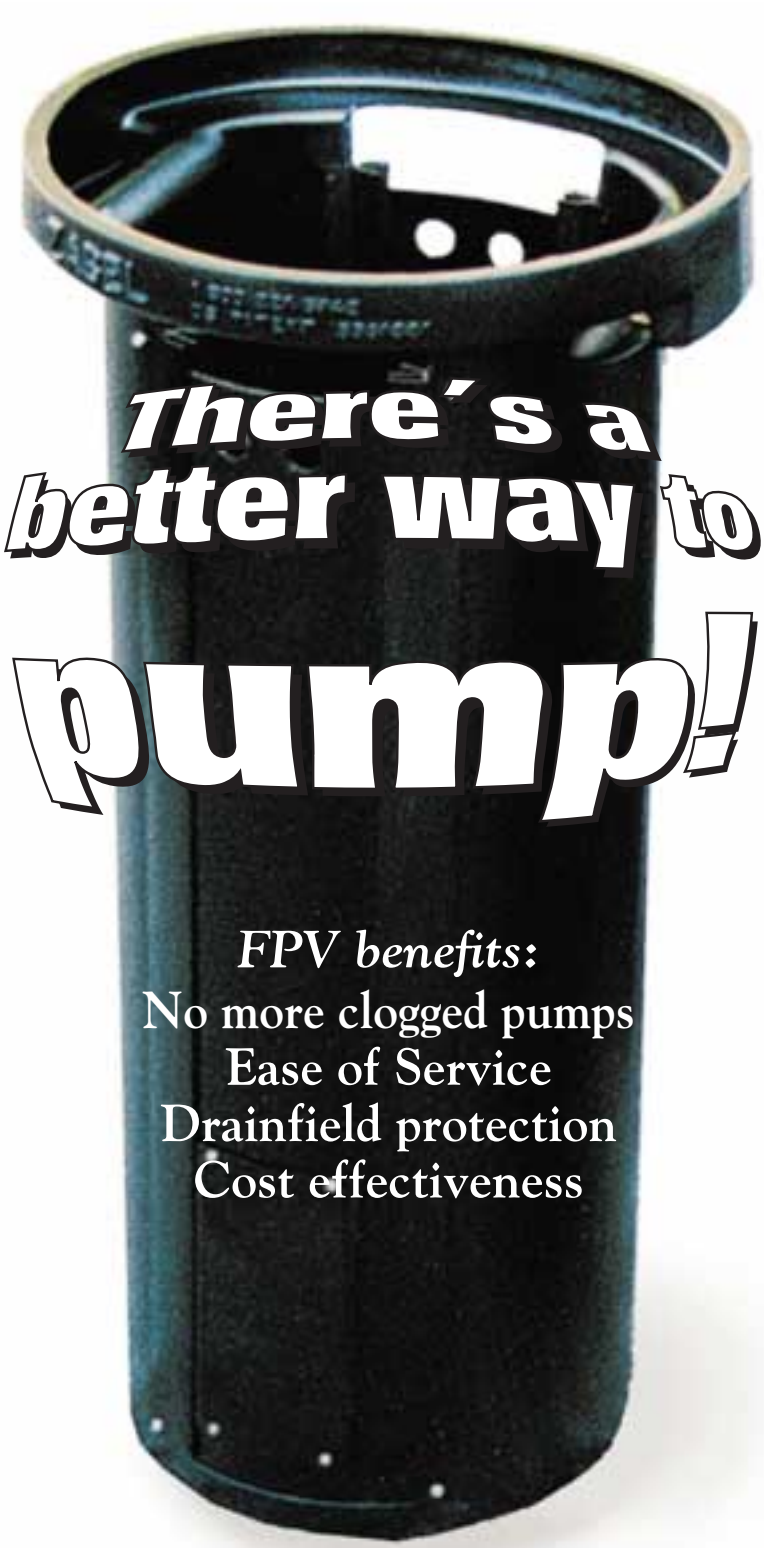
He would not trade his little cabin on Wolfpen Branch in Letcher County for a mansion elsewhere, Cecil Cornett told me as we said goodbye. Everything that meant something to him was there.

"Don't forget me," he said.

I promised that I wouldn't.

Byron Crawford is a resident of Shelbyville, KY. He is the Kentucky Columnist for the Courier Journal and the Cincinnati Enquirer. He is also the host of the Emmy Award winning "Kentucky Life Series", a weekly magazine seen on KET. He has written two books, Kentucky Stories and Crawford's Journal.

Editor's Note: Byron Crawford will be the luncheon speaker at this years NOWRA Conference.



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FPV benefits:

No more clogged pumps
Ease of Service
Drainfield protection
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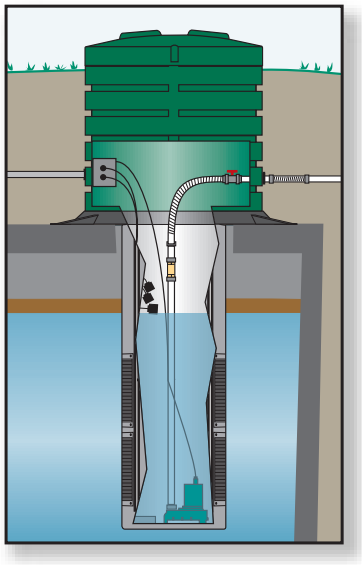


Zabel™ now quoting complete STEP System packages

ZABEL environmental technology™

PRICES ON PAGE 74

Call for a **free** ZABEL ZONE *An Onsite Wastewater Magazine* **1-800-221-5742** • Website http://www.***zabel***.com

The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,580,453, 5,582,716, 5,591,331, 5,593,584, 5,683,577, Des. 386.
Canadian: 2,135,937; New Zealand: 264824; Other Patents Pending

By Harry L. Nurse Jr.

Rebel's Corner

Have you ever watched the hard charging stock cars of NASCAR or the swift open wheel speed machines of CART and said to yourself, "I could do that?" Just a matter of having the courage to put your foot on the floor and the place to do it, right?

While attending the Mississippi Onsite Wastewater Conference in Biloxi this past April, I received two surprises- a birthday cake from my friends in the association there and a card from my wife saying, "For your birthday, you are going to the Skip Barber Racing School in Sebring, FL."

Jeff Gordon is a graduate of the Skip Barber School. So is Michael Andretti and about a third of the field that starts the Indianapolis 500. It was always a dream of mine and I was as excited as a kid with a new toy.

Two days later, I checked into the Holiday Inn for a good night's sleep before starting this adventure. Sleep? You've got to be kidding! The instructions clearly warned, 'Starting time is seven-thirty. Don't be late!' I was so excited, I was there by seven. So were the other twenty drivers.

April in Florida means humid, 85-degree days and 65-degree nights. By the time I had met my classmates and instructors and awkwardly donned the mandatory bright red fire-resistant racing suit and helmet for the first time, I was already sweating. I told myself it was only the weather.

After the first hour of instruction- how to start the car, how to stop the car, the importance of 'both feet in if you spin' and how not to get killed while having a good time- I went down to the track to check out my car for my first ride. My Barber-designed Formula Dodge was bright red and bullet-shaped. Low to the track with a steering wheel the size of a small plate, it looked like it was doing a hundred sitting still.

And then we got in the cars. And I do mean in. Shoehorned into a reclining plastic shell and held firmly in place with a five point harness that protects you 'in case' and helps hold you stable through sharp turns at high speed, I waited the order to start engines. Everything felt awkward - the sloped angle of the seat, the pull of the safety harness, the strange clothes, the helmet, the position of the accelerator, brake and clutch pedals.

The instructor circled his hand tightly above his head giving the start up signal. Turning the starter switch the engine came to life for the first time. As instructed, I pressed the accelerator to warm the engine and heard the throaty rumble, rumble, pop-pop sound of the exhaust. It was the beginning of an adrenaline rush greater than I had ever experienced before.

I followed the Dodge Neon pace car out of the pits to the backside of the track where a slalom course was set up. Each car raced in turn through the course of six cones. On the third practice pass, second gear, throttle to the floor, I accelerated through the first and second cones, lifted off the accelerator, jammed the brakes hard and cut hard to the left sending the car completely around and backwards at 50 mph.

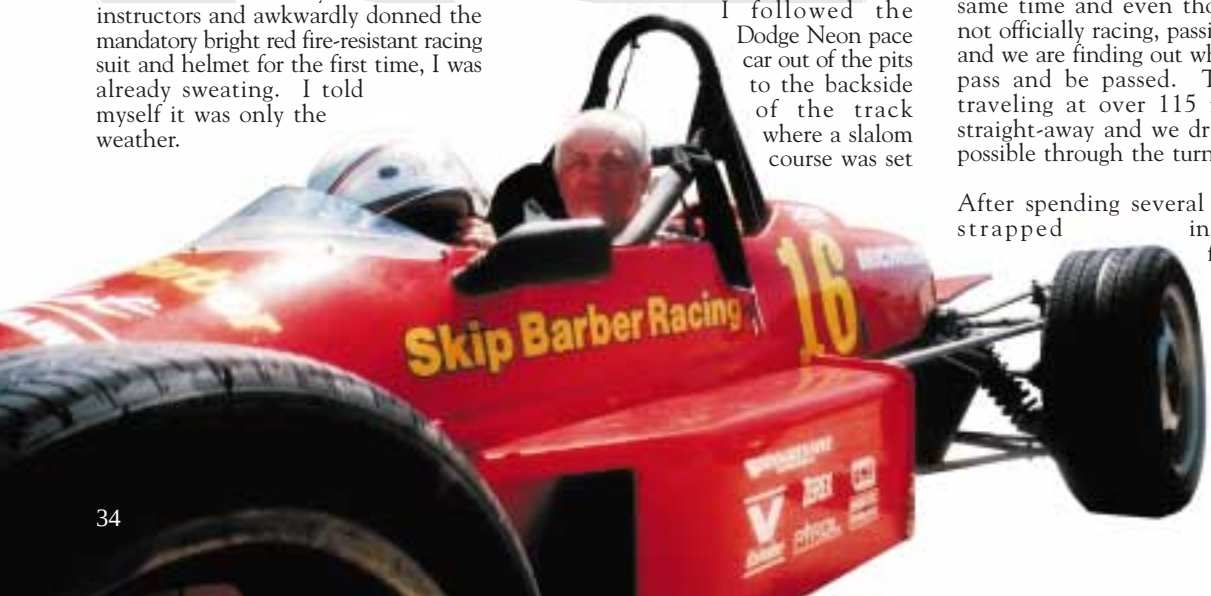
Another hour of instruction - how to find and drive the line, avoid the early apex unless you want to spin, enter corners slow so you can go faster out, and stop in a straight line.

Back in the car for the braking exercises. As I waited my turn in line, I watched the cars ahead accelerate one at a time for fifty yards and then lock up their brakes sending them into an uncontrolled skid. My turn.

I accelerated as quickly as possible and after a dozen passes learned to 'make the tires chirp'. Bringing the car to a stop quickly enough to make the tires chirp, but not hitting the brakes hard enough to lock them up gives you both control and stops the car in the shortest possible distance. A happy tire is a chirping tire.

On the third and final day, the practice laps are now ten laps without stopping. All the cars are on the track at the same time and even though you are not officially racing, passing is allowed and we are finding out what it's like to pass and be passed. The cars are traveling at over 115 mph on the straight-away and we drive as fast as possible through the turns.

After spending several hours a day strapped inside, the car feels like an extension of your body. Being in the car is normal; being out of the car feels strange.



And the instructors tell you a fib. Getting ready to go for the 'last ride', I am told the course is over. No more driving. The last ride has already happened. They do this so you will not try to drive beyond your limits on what you expect to be your last time in the car. It seems more cars are lost or damaged on the 'last ride', than during the rest of the course so they have learned to eliminate it.

I wanted to cry. All that adrenaline pumping and no place to go.

Well not exactly. Barber runs over 60 races a year in an amateur series that school graduates can drive in to satisfy their need for speed. So I'm thinking about it. And I have been looking at a stock car that's for sale. Of course it would have to have a Rebel Flag on the hood. And I've been thinking how great it would be to offer our ZabelZone™ advertisers an additional ad on the ZABEL™ web site and perhaps, just perhaps, I should throw in a nice bright logo on the new ZABEL racecar.

And if that doesn't work, there's always the one day of instruction and 30-lap driving experience in a Winston style stock car I'm signing up for at the Charlotte Speedway.

And there is always my next birthday wish and a loving wife who makes my dreams come true. You know Jan, I have always dreamed of owning a racecar.

Gentlemen, start your engines!

THE UNSCIENTIFIC METHOD

Or a Tongue-in-Cheek Look at How to Keep Research and Development Costs Under Control

By Donald Alexander

In the last issue of the Zabel Zone Magazine, this column was devoted to how the scientific method is used to examine and discover how things work. This is especially important in the onsite industry because there is still much that is unclear about how even a simple septic system functions. This was abundantly clear at the NOWRA Technical Practices meeting in Texas last fall. There was precious little agreement among the experts assembled concerning how a septic system worked.

Beginning with an hypothesis and then establishing a method for examining that hypothesis, through data collection and analysis, and conclusions, the scientific method seeks to reveal, reject, or confirm what we think might be true. Properly executed, the methodology is repeatable and unbiased. Unfortunately, there is another method that masquerades as scientific but isn't. Instead of moving inexorably toward shedding light on our understanding, this method wanders aimlessly, favoring neither a better nor diminished understanding of our world. I call this the unscientific method.

The unscientific method is nearly the reverse of the scientific method. Whereas the scientific method begins with an educated guess, called the hypothesis, and works through a logical and repeatable process to reach a conclusion, the unscientific method eliminates these problematic elements of science. The unscientific method begins with the conclusion, which immediately eliminates two of the most serious problems associated with the scientific method: expense and uncertainty. When you begin with the conclusion, the outcome is hardly in doubt. After all, who really wants to spend money on research when it may not prove what you want?

The scientific method requires a rigorous methodology, carefully designed to test an explicit hypothesis. This methodology must be able to withstand the scrutiny of other scientists; a process called peer review. The unscientific method rarely gives more than lip service to such frivolous and expensive concepts as an impartial evaluation methodology. An abundance of good science already exists, accepted by the scientific community at large, and the unscientific method not only realizes this, it capitalizes on it. It permits unlimited borrowing of research and encourages the reinterpretation of results to arrive at exactly the predetermined conclusion. Why spend good money, and usually lots of it, when so much well-done science is just waiting to be re-interpreted?

This borrowing of research by 'unscientists' is not to be confused with the apparent borrowing of ideas that regularly occurs in science. In science, earlier research is used to develop or clarify an hypothesis, or educated guess. A new or modified methodology is developed and new information is gleaned from the work. This type of borrowing builds new knowledge on the foundation of what is known. This is quite a different proposition from the work of 'unscience' where the conclusion comes first, no methodology is expanded or revised, no data are collected, and nothing new is learned.

Let's explore how this process of unscience works. A product developer seeks to market a new product, component, or idea. After executing a design, instead of rigorous testing to verify performance, the product goes to market and a sales team develops an approach they believe will be effective. Invariably, a product claim is made that the new method is better than the old method. Some claims, like a product being lighter or easier to use, are either obvious or so subjective as to be meaningless. Other claims are more like Harry Nurse's "foo-foo dust." No one knows if foo-foo dust really exists (not even Harry), and since science only examines what is known to exist, foo-foo dust can't be disproved. Simply because no one has seen it or measured its effects doesn't mean it doesn't exist. Depending upon whether you believe foo-foo dust is good or bad, the new product will have either more or less of it and that will become the basis for the product claim. With the scientific method, an educated guess (the hypothesis) would be formulated and tested before claims were made. With the unscientific method, the reality of foo-foo dust would be assumed and offered as the factual basis for how the product works.

One might think the unscientific method would be an obvious sham but such is not the case. Articles and papers of all kinds, whether based on science or opinion are used (and quite possibly abused) to support product claims. The initial appearance is generally credible but

on closer examination, a number of questions appear. Invariably, those who rely on the unscientific method will review published reports and cite many in support of their product. If you read the material cited, conclusions will often be made in the reinterpretation of the original work that go beyond the data and are not supported by the data. Another clue that the unscientific method is at work is that unscientists when confronted with reports that contradict their conclusion tend to be critical of the study, attempting to find fault with the methods or the data analysis. This level of criticism does not extend to work that favors their conclusion.

There are other keys to look for when you suspect the unscientific method may be at work. First, I ask for the basis of the product claims. If no new data was collected and analyzed, a red flag goes up in my mind. Another clue is examining the principle on which a product works and determining if it is a widely accepted process. Some processes such as gravity, soil infiltration, treatment in an unsaturated soil zone, aerobic treatment, and so forth, are well documented and can be relied upon. Not all new processes are invalid by any means, but processes which are not well proved and documented should be tested and documented before being accepted. Processes, which rely on poorly defined principles, or contradict other proven and well-documented principles, should be considered suspect or discounted entirely.

The last clue to verifying the unscientific method is to watch what happens when unscience meets science that isn't readily dismissed. When science disproves a claim of the unscientific marketer, the marketer will usually pass it off as typical scientific conflict to be expected. As unfavorable data increases, the most common response seems to be to revise the explanation of how the product works, revising the mode of operation with neither methodology nor data, and then continue to make identical product performance claims.

Sound familiar? Of course it does. This type of marketing occurs routinely in the onsite industry. In some ways it affects us all but in many ways the regulatory community is affected the most because it falls to us to respond with some sort of product approval or denial. Without a credible body of data to support claims, it is premature to seek regulatory approval. Moreover, states that grant approvals based on claims which are scientifically unsubstantiated are not serving anyone's long-term interests. This is not to say that the product claims may not be true, or may not be proven eventually, but until a product is tested, no one knows for sure how it will perform.

So why use the unscientific method? I don't know for certain but I have an educated guess. It seems to me that product credibility is more important to sales than actual performance. The unscientific method seems to create product credibility faster and cheaper than the scientific method. This is especially true among the scientifically naive and unsuspecting. When regulators are unsuspecting or naive, this credibility translates into a product approval, profit, and new marketing claims based on these approvals. This credibility becomes a sales pitch for the unscientists as they move across state lines. The inference given, often explicitly, is that the states that have granted approvals are wiser, more open to innovation, and generally more forward thinking. The wisdom and accuracy of such logic is lost on me. Increasingly, the unsuspecting are legislators and legislative bodies. Once duped into a dubious approval the results are the same: increased credibility, product approval and profit.

So, what is the real problem with the unscientific method? One could argue if there's no harm, there's no foul. As a regulator I see three problems. First and foremost in my mind is that the unscientific method is dishonest. Through its use, unsuspecting homeowners receive systems that are not proven in terms of treatment and dispersal. Second, it places an unnecessary risk on our environment. Without proper testing it is impossible to know if these systems are better or worse for the environment, especially our ground and surface waters, than other systems currently in use. Third, it sells the business of onsite technology and development short when untested products are brought to market. What we do is important in terms of public health and long term water quality impacts. As an industry we owe it to ourselves to be scientifically responsible and avoid promoting the unscientific method.

"First and foremost in my mind is that the unscientific method is dishonest"

HOW DOES AN NSF STANDARD COME TO BE?

By Tom Bruursema

Product standards in the United States is an age old concept, and one which NSF pioneered in the area of alternative, onsite residential wastewater treatment systems more than thirty years ago. NSF became involved with wastewater at the request of the regulatory community, as a means to provide for uniform, comparable performance test data on newly introduced, innovative products. Since that time, three unique standards have evolved to meet the needs of the regulatory officials, and of the greater stakeholder, the community.

Standards Process

The NSF standards development process uses the internationally recognized and accepted process of consensus building. The term "consensus" means those representatives of directly and materially affected interest categories have reached a substantial agreement. Further, consensus requires that all views and objections be considered, and that an effort be made toward their resolution.

Representatives from three primary interest groups, of equal numbers, work together as members of the Joint Committee on Wastewater Technology to determine the language and content of the standards. These three groups include the product manufacturers, regulatory officials, and users of the products. Each sector is represented by approximately 12 experts in the onsite industry. NSF's role is facilitation of the process, bringing thoughts and ideas to the Joint Committee for discussion and debate, leading to the development of new and revised standards.

Membership on the Joint Committee is by invitation and selection based upon the needs of the Committee for balanced participation and representative expertise. The Joint Committee on Wastewater Technology serves as the core group for the development of all standards in the onsite, residential treatment area. Members are not rotated based upon the changing of the standard or subject discussions. Instead, other individuals may be asked to participate, through Task Groups, to assist the Committee in the event that certain issues are outside the expertise of the Committee. To assure continuity and orderly development/maintenance of standards, each Joint Committee member is requested to serve a minimum three-year term.

Once a standard has been drafted through the Joint Committee, a formal balloting process takes place. Each member has one vote only, with four options including affirmative, affirmative with comment, negative with reason(s), and abstain with reason(s). Acceptance by a majority of the members is required, including an affirmative ballot of at least two-thirds of those meeting the ballot deadline, excluding abstentions. With a majority vote, the draft standard can be recommended for adoption.

Prompt consideration is given to all expressed views and objections received by the members. A concerted effort is made to resolve all expressed objections, with each objector being advised of the disposition of the objection. Any objections which require substantive changes to the standard in order to resolve, along with unresolved objections, are reported back to the Committee members. All members are then given the opportunity to respond and reaffirm or change their vote.

Once the Joint Committee on Wastewater Technology has recommended the final document for adoption, it is passed on to the NSF Council of Public Health Consultants (CPHC) for review. The CPHC membership is composed of representatives from regulatory agencies, academic institutions, and other national and international leaders in the public health and environmental fields. The Council contains approximately 45 members, as elected by their own membership. Unlike the Joint Committee, the CPHC is a single representative body for all of the NSF programs, rather than for wastewater alone, and it has no industry representation.

The role of the CPHC is to provide advice and guidance to NSF in the design and carrying out of its current and future programs. As a result, the Council reviews and ballots all new and revised standards prior to presenting them to the NSF Board of Directors for final adoption.

Once adopted, standards undergo a periodic review at intervals not to exceed five years. These reviews allow for a cover to cover assessment of content and opportunity for change. Such changes at five-year intervals are common, resulting from advancements in product technology and demands from the regulatory community and

marketplace for higher performance criteria. The same process as that described above for new standards is used for revision. The Joint Committee provides the core review and change, followed by the CPHC, leading to adoption by the Board of Directors.

American National Standards Institute

Upon completion of the first working draft by the Joint Committee, a corresponding and parallel process begins through the American National Standards Institute (ANSI). ANSI is a private organization providing for the oversight and accreditation of organizations, which offer, as services, standards writing and conformity assessment programs. NSF has been a member of ANSI since the 1980's, and has been accredited as both a national consensus standards writer and product certifier for all of its current programs, including wastewater treatment.

The process through ANSI begins with public comment whereby the NSF draft is made available to any and all interested parties. Comments are fed back into the NSF Joint Committee process for review. Once the standard has achieved approval by both the Joint Committee and CPHC, and adopted by the NSF Board of Directors, it is then presented to the ANSI Board for adoption as an American National Standard. If accepted, the standard can then bear both the NSF and ANSI designations.

Conclusion

NSF's standards development process has formed the foundation upon which North America has come to seek advice, in the case of decision regarding selection of proper, innovative treatment, technologies, and performance recognition. NSF has further supported these needs by offering the most recognized, relied upon certification program for wastewater treatment devices. Recognizing the growing need for such standards and credible testing and certification, NSF is committed to offering improved and expanded services to the stakeholder community. The future of the alternative, onsite treatment industry will be dependent upon a proven record of performance. NSF standards and certification are the paths leading to greater acceptance, recognition and value to the industry and their customers.

From left, Doug Ebelherr, Don Alexander, Harry Nurse, Steve Berkowitz, and George Earle at the Joint Wastewater committee meeting at NSF.

Bryan Dayton leading the discussion and debate in regards to the new NSF Standard 46 for effluent filters

TEST REPORTS

Zabel™ Filter Test Reports

Most university, government and independent testing laboratories report TSS and BOD as an average of the data points taken before and after filtration. Zabel has also developed a new device for taking a control sample as well as a filtered sample at the same time in order to directly compare and report the results as an average percentage of reduction. Both methods are based on a technique for comparing filtered and non-filtered effluent from the same septic source.

Reporting TSS from a filtered source without comparing an unfiltered sample from the same source tells nothing about the actual contribution the filter made to the performance of the system. For example, you can report an average TSS of 30ppm, but without knowing what the TSS was before the filter was installed you cant tell whether the filter performed well or not.

Because of the way others have reported their filter's "performance", Zabel has always reported our filters performance including the benefit of the septic tank itself. If the tank removed 31% of the TSS and Zabel's filter improved this by 68%, the total system - tank and filter - were removing 98% of the total solids.

Consistent with university, government and independent testing laboratories we will continue to report the filtered versus unfiltered effluent from the same site as a percentage of improvement, but we will only report the actual improvement achieved by the filter ignoring the performance of the tank. We recommend our competitors do the same so it will be easier for the industry to compare results.

Keep this in mind when you compare the following test results with our competitors or with our previous reporting method.

Data Point Averages	TSS **Before**	TSS **After**	% Reduced	BOD_5 **Before**	BOD_5 **After**	% Reduced
Zabel A100						
TN Tech University	95.7	45.8	52.1	131.3	89.3	31.9
Kentucky Testing Laboratory	93.2	31.0	66.7			
Zabel A300						
Wastewater Services[1]	6530	113	98.3	2130	780	63.4
Zabel A1800						
DNREC, Div. of Water Resources	190.5	68.0	64.3			
Zabel Proprietary Test Program	131.6	56.6	56.9			

1. The grease & oils for this installation were: Before - 1764 After - 2.2 % Reduced - 99.8

In addition to the data shown above, Zabel received a report on five restaurants monitored by the Merrillville Conservancy District. This report was done by ranges and is shown below.

Zabel A300	**Range mg/l Without Filter**	**Range mg/l With Filter**	**% Reduction**	
			Low End	**High End**
Kentucky Fried Chicken	120 to 6500	50 to 110	53.3	98.3
New Moon Chinese	76 to 1300	34 to 120	55.3	90.8
Cisco's Mexican	96 to 1040	19 to 110	80.2	89.4
Gary Country Club	130 to 706	22 to 94	83.1	86.7
Patio Restaurant	70 to 800	50 to 120	28.6	85.0

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- Functional on conventional septic tanks or more advanced secondary treatment systems.

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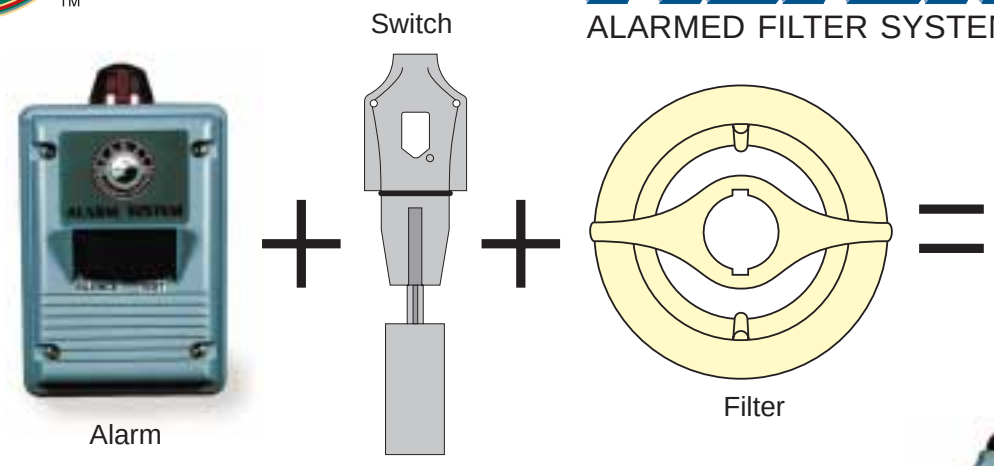
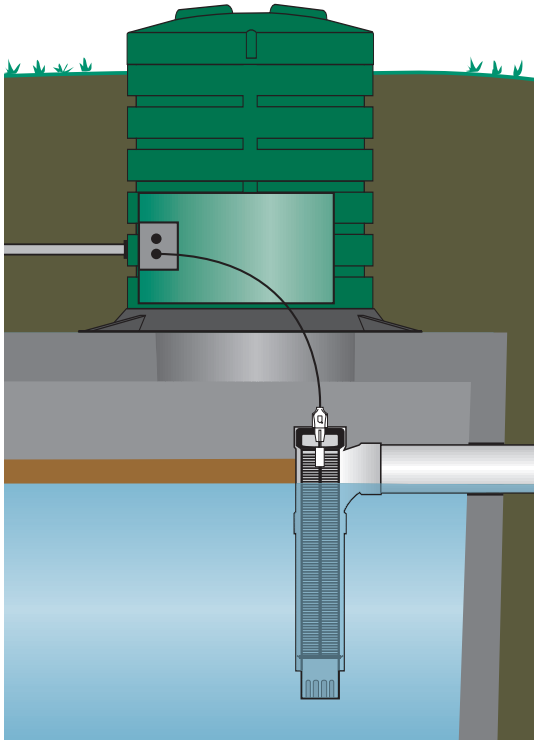
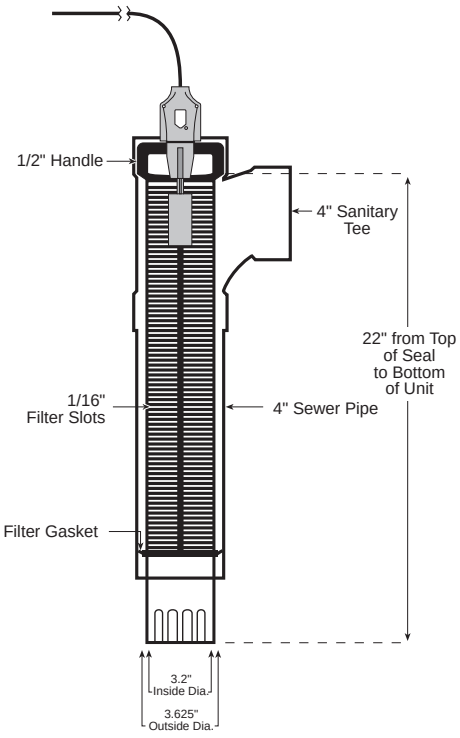
NEW!

SMART FILTER™

ALARMED FILTER SYSTEM







Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:

U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584, U.S. Des. 386,241,349067, 4605501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 264824, Other Patents Pending

Zabel's™ New Residential High Performance Filter is designed to provide extra protection for homes with garbage disposals and still sloughs the solids back into the tank.

A recent Zabel™ survey showed that 43% of homes on conventional onsite systems have a garbage disposal. Like most regulators, Zabel™ recommends homes on septic systems should not have garbage grinders - a condition that is prohibited by some codes and discouraged by regulators everywhere - but people do it anyway! Zabel's™ New Residential High Performance Filter has an exclusive two-stage filtration (1/2 inch & 1/16 inch) system designed to prevent large solids and fine garbage grinder floatables from getting inside the filter cartridge while maintaining Zabel's™ patented system for sloughing filtered solids back into the tank.

The **SmartFilter™** is designed to improve the long-term performance of most onsite septic systems including those in homes using a garbage disposal and those in locations with poor soils. The system consists of an A1800-HIP-SF effluent filter, vertical float switch, and alarm panel.

The A1800-HIP effluent filter is designed to fit in a standard four inch outlet sanitary T pipe. This filter prevents unwanted solids from leaving the tank, entering the drainfield, and causing premature failure of the effluent treatment system. Over time, the filter collects solids which gradually restrict the flow of effluent to the drainfield.

The vertical float switch monitors the blockage of the filter and sends a signal to the alarm panel when the filter is approximately 90% full, or mature.

The alarm sounds and the red beacon illuminates prompting the homeowner to contact their installer or pumper for routine servicing.

During this routine service call, the installer or pumper should:

1. Clean the switch and filter. To avoid potential health hazards, the filter debris must be sprayed directly back into the septic tank and not onto the homeowner's lawn.
2. Determine if pumping is necessary by checking the depth of sludge in the tank.
3. Pump the tank if necessary.

PRICES ON PAGE 71

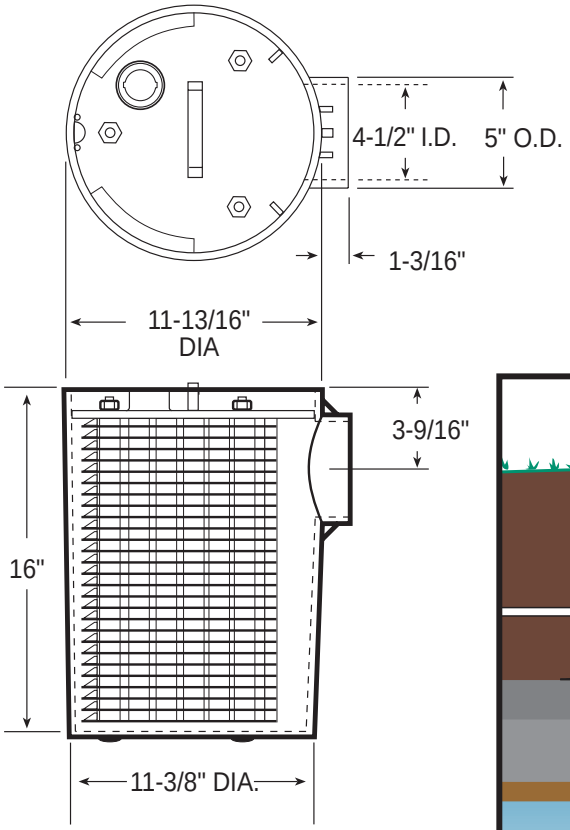
FEATURES

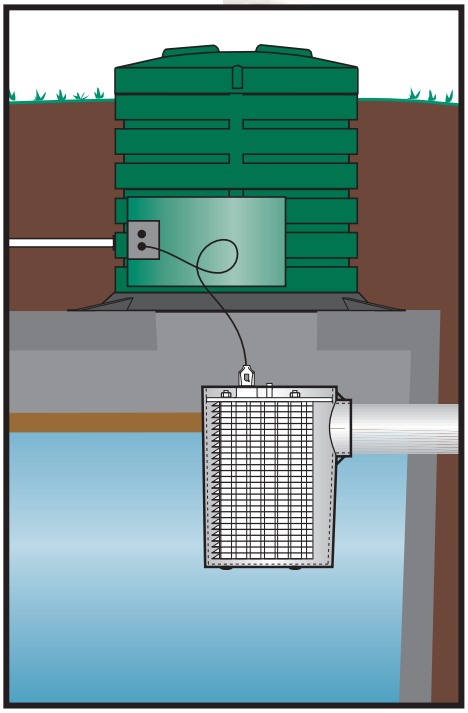
- Alarm panel features manual alarm test switch and horn silence switch
- Alarm horn sounds at 82 decibels at 10 feet (3 meters)
- Direct interface of control switch and Zabel A1800-HIP effluent filter insures proper placement of switch.
- Two-year limited warranty

NEW!

SMART FILTER™

ALARMED FILTER SYSTEM





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NEW!

SMART FILTER™

ALARMED FILTER SYSTEM

Zabel's™ **Commercial & Industrial Filters** have been redesigned so that they can now accept the SmartFilter™ switch.

Managers of Commercial/Industrial facilities have responsibilities for countless issues during their normal daily routine, one of which is the proper operation of their onsite wastewater treatment system. This usually is not a high priority, thus leading to costly problems from system failures or fines for exceeding discharge standards.

The SmartFilter is designed to provide the manager of a Commercial/Industrial facility an early warning that their septic tank or grease interceptor needs a service call. The vertical float switch monitors the blockage of the filter and sends a signal to the alarm panel when the filter is approximately 90% full or "mature".

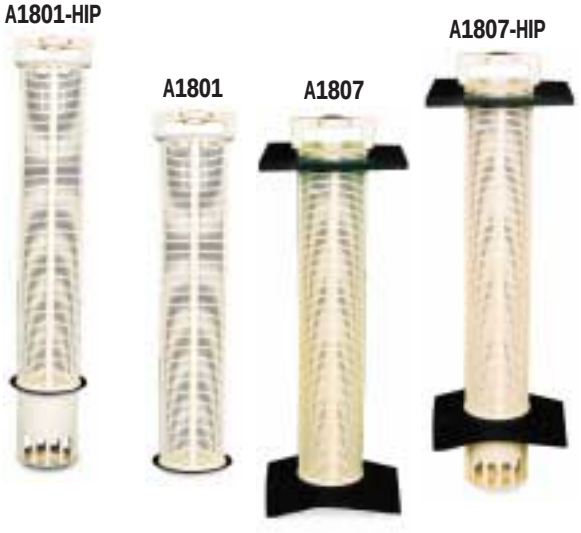
The alarm sounds and the red beacon illuminates, prompting the manager to contact their service company.

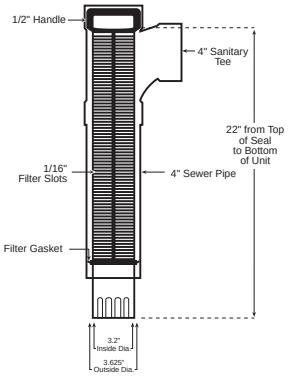
During this routine service call, the serviceman should:
1. Clean the switch and filter. To avoid potential health hazards, the filtered debris must be sprayed directly back into the septic tank or grease interceptor.
2. Determine if pumping the tank is necessary by checking the depth of sludge or grease in the tank.
3. Pump the tank, if necessary

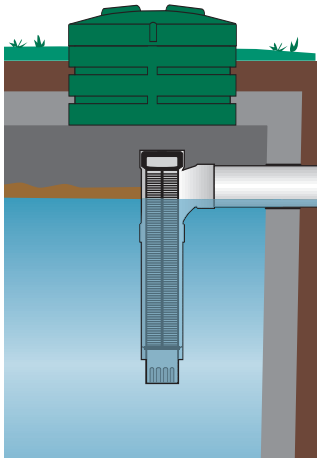
FEATURES
- Alarm panel features manual alarm test switch and horn silence switch
- Alarm horn sounds at 82 decibels at 10 feet (3 meters)
- Direct interface of control switch and Zabel A100/A100 HIP and A300/A300 HIP effluent filters insures proper placement of switch.
- Two-year limited warranty

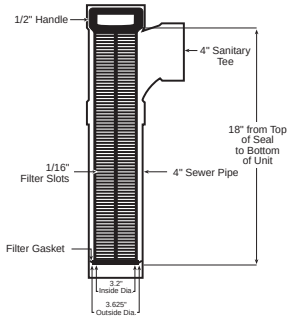
PRICES ON PAGE 72

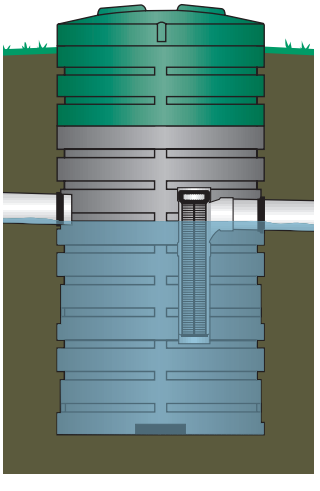
A1800s

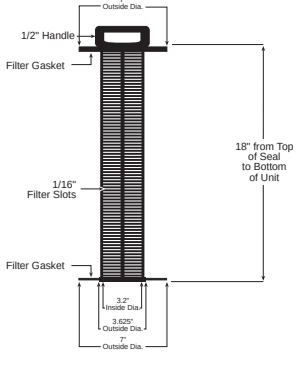


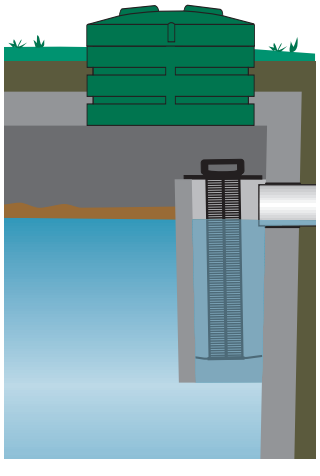












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Zabel™ A1800 Series Residential Wastewater Effluent Filter Product Specification

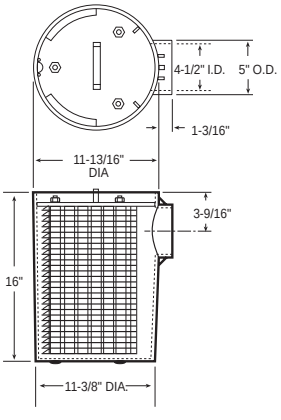
1. Product Name: Zabel™ The A1800 Residential Wastewater Filters, U.S. Patent Nos.: 5,382,357; 5,482,621; Canadian Patent No: 2,135,937; Other patents pending.
2. Model Numbers: A1800; A1800-HIP, A1800-HIP-SF, A1801, A1801-HIP, A1801-HIP-SF, A1807, A1807-HIP
3. Application: Single family homes no more than four bedrooms. **Zabel's™ New Residential High Performance Filter** is designed to provide extra protection for homes with garbage disposals and still sloughs the solids back into the tank.
4. Performance Specification
   4.1. All A1800 Models: Maximum daily flow - 800 gpd.
   4.2. Multiple Filters may be installed in manifolds to handle larger flows.
   4.3. TSS: Average reduction in TSS within 6 months of installation - 40 percent in typical residential wastewater.
5. Materials: All materials are non-corrosive PVC
6. New System Installation: Center the top of the 4-inch Filter Case under an outlet access opening at least 8 inches in diameter. Securely fasten the bell coupling of the case by a PVC solvent weld connection to the 4-inch PVC pipe extending through the outlet wall of the tank. The pipe extending through the end wall may be any schedule four-inch pipe. Location of the PVC outlet pipe in the tank end wall shall conform to local code. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. For septic tanks with cast in place concrete baffles use the A1807 model. Insert bottom of filter through thick gasket and slide to top of filter cartridge. Install filter cartridge with top gasket **only** into tank baffle, to ensure gasket lies flat without hanging over the edge of baffle. **Do not trim** gasket unless it overhangs edge of baffle. Remove filter cartridge and install thin gasket into the groove at the bottom of the cartridge. Reinsert the cartridge into the concrete baffle to complete installation. A riser to grade over the Outlet Access Opening is recommended.
7. Existing System Installation: The filter cartridge, Model A1801 may be installed in any existing 4" outlet Tee and pipe. The filter may be installed in an existing tank if an adequate outlet access opening already exists and the filter can be installed without damaging the existing tank. If a 4-inch PVC outlet pipe does not extend into the tank, the filter can be installed utilizing a plumbing flange. For septic tanks with cast in place concrete baffles use the A1807 model. Insert bottom of filter through thick gasket and slide to top of filter cartridge. Install filter cartridge with top gasket **only** into tank baffle, to ensure gasket lies flat without hanging over the edge of baffle. **Do not trim** gasket unless it overhangs edge of baffle. Remove filter cartridge and install thin gasket into the groove at the bottom of the cartridge. Reinsert the cartridge into the concrete baffle to complete installation. If the existing tank cannot be used, the filter can be installed in existing systems using a Zabel Container Assembly Model CA100 or Zeus™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36" T-Handle is available if required to reach filters more than 12 inches below grade. Tap the cartridge on the inside of the inspection port or hose off the cartridge into the tank if needed and reinsert into the case. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system
10. Service Frequency: The filter should be cleaned when the septic tank is normally inspected and pumped as required by local regulation. The A1800's are designed to slough most normal solids off the inside of the vertical walls and back into the tank when the effluent flow is in a resting state. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system
11. Warranty: The A1800's are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel's™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.
12. Dimensions:

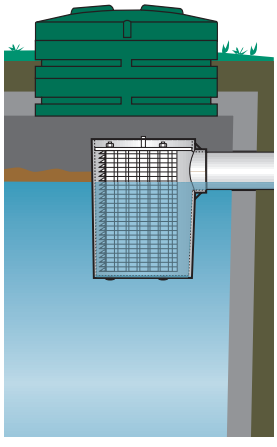
	Diameter	Cartridge Height	Filtration	Total Filter Surface	Lineal Feet of Weir
A1800	4"	18"	1/16"	158.4 in^2	61
A1800-HIP	4"	22"	1/2"-1/16"	*158.4 in^2	*61
A1807	4"	18"	1/16"	158.4 in^2	61

*Calculations are for the 1/16" area only.

PRICES ON PAGE 71

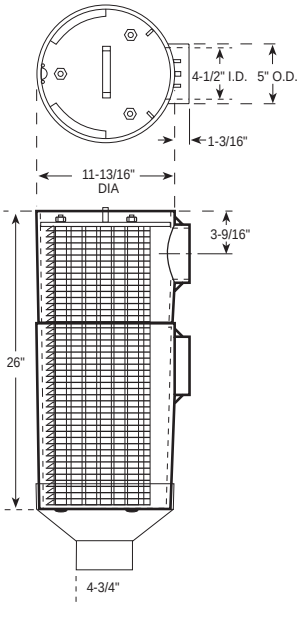
A100s

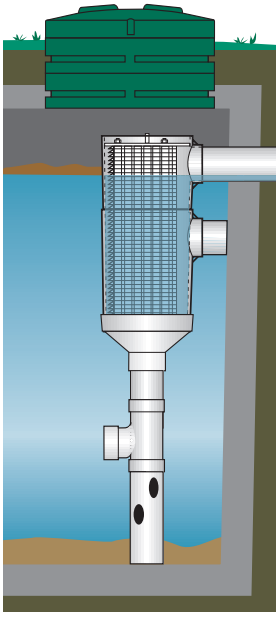




A100

A100-HIP





Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

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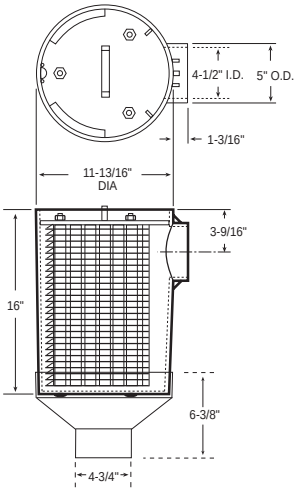
Zabel™ A100 Series
Commercial & Residential Effluent Filter
Product Specification

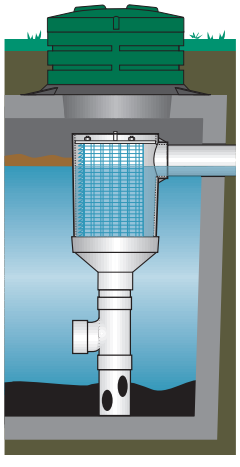
1. Product Name: Zabel™ A100 Commercial & Residential Effluent Filter, U.S. Patent: 4,710,295
2. Model Numbers: A100 Case & Cartridge; A101 Cartridge Only; A100-HIP Case & Cartridge; A101-HIP Cartridge Only
3. Applications: Apartments, trailer parks, schools, churches, shopping centers, and offices; Septic dump stations and community treatment plants; Single and Multi-family homes
4. Performance Specification
   - 4.1. Model A100: 3,000 gpd
   - 4.2. Model A100-HIP: 4,500 gpd
   - 4.3. Multiple filters may be installed in manifolds to handle larger flows. Use a Zabel Flow Control Plate Model FC100 to set the effluent flow to predetermined limits.
   - 4.4. TSS: Reductions in TSS within six months of installation - 50 to 90 percent. The higher the pre-filtered TSS the greater the percentage of reduction.
   - 4.5. $BOD_{5:}$ Reduction in BOD_5 within six months of installation - 20 to 45 percent is dependent on the make-up of the wastewater.
5. Materials: All materials are non-corrosive. Case & Lid - PVC; Filter discs - Polystyrene; Rods - Polyethylene; Nuts - Nylon. A100-HIP rods and nuts are stainless steel.
6. New System Installation: Center the top of the 12 inch Filter Case under an outlet access opening at least 16 inches in diameter. PVC solvent weld the bell coupling to the 4 inch Schedule 40 PVC exit pipe of the tank as required by local code. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. If required to meet depth requirements, install a Zabel™ Extension Reducer and 4-inch Schedule 40 pipe to the bottom of the filter case. A riser to grade is recommended. High performance double stack (Model A100-HIP) filters and multiple filters installed in manifolds will require additional support and access.
7. Existing System Installation: The filter may be installed in an existing septic tank if an outlet access opening already exists and the filter can be installed without damaging the existing tank. If a 4-inch Schedule 40 PVC pipe does not extend into the tank, the filter can be installed utilizing a plumbing flange. If the existing septic tank cannot be used, the filter can be installed using a Zabel™ Container Assembly Model CA100 or Zeus™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36” T-Handle is available if required to reach filters more than 12 inches below grade. Hose off the cartridge into the tank and reinsert into the case. If required, the filter may be disassembled for further cleaning.
10. Service Frequency: The filter requires cleaning when the septic tank is normally inspected and pumped as required by local regulation. The A100s are designed to slough most normal solids off the inside of the vertical disc dam walls and back into the tank when the effluent flow is in a resting state. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system.
11. Warranty: The A100s are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel’s™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.
12. Dimensions:

Model	Diameter	Height	Filtration	Settling Area	Total Filter Surface	Lineal Feet of Weir
A100	12”	16”	1/16”	596.16 in^2	1,857.6 in^2	198
A100-HIP	12”	26”	1/16”	1,018.08 in^2	2,908.8 in^2	297

PRICES ON PAGE 60

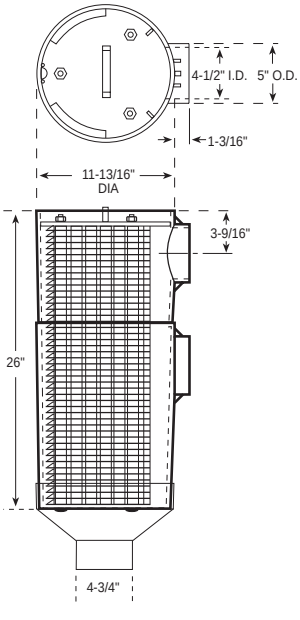
A300s

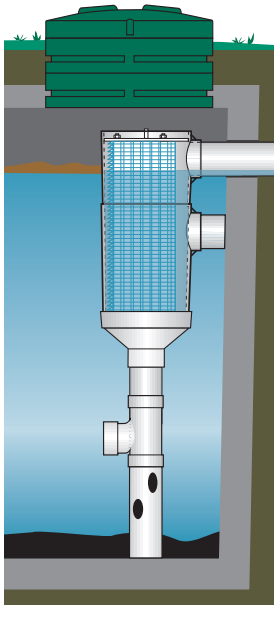




A300

A300-HIP





A300-ADA

Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584,
U.S. Des. 386,241,349067, 4605501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 264824,
Other Patents Pending

Zabel™ A300 Series High Strength Industrial & Commercial Effluent Filter Product Specification

1. Product Name: Zabel™ A300 Industrial & Commercial Wastewater Filter, U.S. Patent: 4,710,295
2. Model Numbers: A300 Case & Cartridge & Reducer; A301 Cartridge Only; A300-HIP Case & Cartridge & Reducer; A301-HIP Cartridge Only
3. Applications: Grease: restaurants; Hair: dog kennels, beauty shops, zoo facilities; Lint: Laundromats; Food processing: wineries, bakeries; Animal wastes: poultry, hog & cattle farms; Apartments, trailer parks, schools, churches, shopping centers, and offices; Septic dump stations and community treatment plants; Single and Multi-family homes
4. Performance Specification
   - 4.1. Model A300: Maximum daily flow - 3,000 gpd
   - 4.2. Model A300-HIP: Maximum daily flow - 4,500 gpd
   - 4.3. Multiple Filters may be installed in manifolds to handle larger flows than those shown above. A Zabel™ Flow Control Plate Model FC100 is available to set the effluent flow of a single filter to pre-determined limits.
   - 4.4. TSS: Reductions in TSS within six months of installation - 50 to 90 percent. The higher the unfiltered TSS, the greater the percentage of reduction.
   - 4.5. BOD_5: Reduction in BOD_5 within six months of installation - 20 to 45 percent is dependent on the make up of the wastewater.
5. Materials: All materials are non-corrosive. Case & Lid - PVC; Filter discs - Polystyrene; Rods - Polyethylene; Nuts - Nylon. A300-HIP rods and nuts-stainless steel.
6. New System Installation: Center the top of the 12 inch Filter Case under an outlet access opening at least 16 inches in diameter. PVC solvent weld the bell coupling to the 4 inch Schedule 40 PVC pipe of the tank as required by local code. Add 4 inch Schedule 40 pipe to the bottom of the reducer as needed. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. A riser to grade is recommended for all commercial and industrial installations. All filters installed in grease interceptor tanks **will require** additional support.
7. Existing System Installation: The filter may be installed in an existing tank if an outlet access opening already exists and the filter can be installed without damaging the existing tank. The filter can also be installed utilizing a plumbing flange. If the existing tank cannot be used, the filter can be installed in existing systems using a Zabel™ Container Assembly Model CA100 or ZEUS™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36" T-Handle is available if required to reach filters below grade. The filter may be cleaned with a steam wand, chemical degreaser or disassembled for further cleaning.
10. Service Frequency: The A300s are designed to be installed in high strength waste applications. Each application will have to be monitored to determine proper service cycles. See article on "Restaurant Applications for Zabel™ Filters" for recommended guidelines in the Spring/Summer 97' issue.
11. Warranty: The A300s are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel's™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.

10. Dimensions:

	Diameter	Height	Filtration	Settling Area	Total Filter Surface	Total Flow Area
A300	12"	18"	1/32"	624.69 in^2	1,857.6 in^2	206
A300-HIP	12"	28"	1/32"	1,067.04 in^2	2,908.8 in^2	312

PRICES ON PAGE 60

A100/A300

Zabel™ Filter Installation

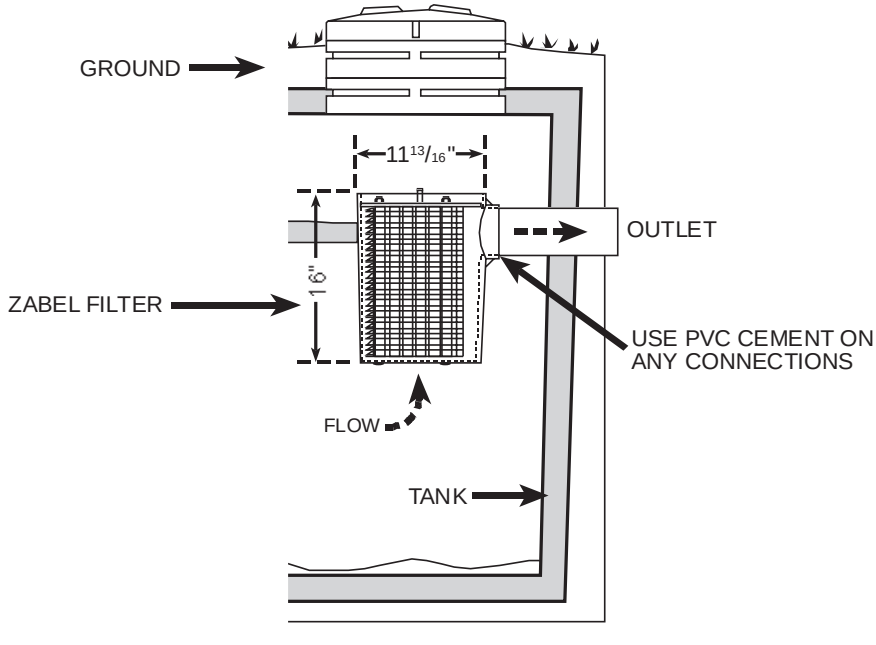
The Model A100/A300 Zabel Filter for commercial/industrial septic tanks is installed in place of the standard outlet tee.

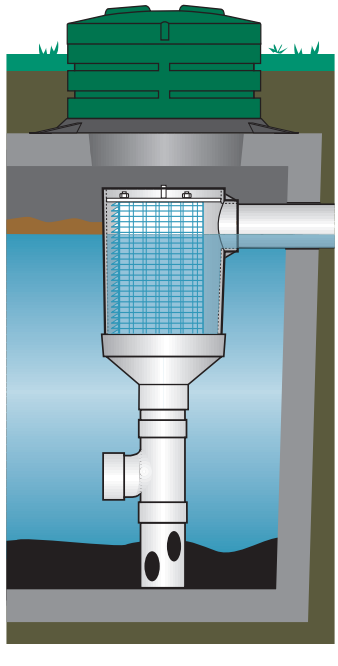
Securely fasten the bell coupling on the side of the filter case by a solvent weld connection to the Schedule 40 PVC plastic pipe which extends through the outlet opening of the septic tank. The Schedule 40 PVC pipe extending through the outlet opening of the tank should be at least 12" or more beyond the tank before being connected by an adaptor to the remainder of the system. This will suspend the filter inside the septic tank by the bell housing on the side of the filter case.

The top of the tank must have an opening 12" in diameter or larger to allow easy removal of the disc dam cartridge for cleaning. If the tank opening over the filter is the only access to the tank for pumping, it should be large enough in diameter to allow the tank to be pumped prior to removing the cartridge for cleaning.

Supplementary Support Method for Installing Zabel Filters:
Installing two or more Zabel Filters in one tank, 18 inches or more from the end of the tank or in high strength waste applications such as restaurants or dog kennels sometimes requires additional support to handle the weight of the filter. Supplementary support can be achieved by following these directions.

Solvent weld the reducer to the bottom of the filter case. Using two pieces of Schedule 40 pipe with an inverted Sanitary Tee located at the clear zone level, extend to the bottom of the tank for support. Make sure the pipe exiting the filter and extending through the tank wall is level. Cut four or more two inch holes in the PVC pipe below the Sanitary Tee to prevent sludge build up in the pipe.





A100/A300

Maintenance

The interval for servicing septic tanks is set by state and local code. Throughout the United States there is a wide divergence of opinion on what this interval ought to be, but most regulatory agencies suggest two to five years. The filter does not increase the frequency of servicing for the tank.

To service the filter, remove the tank cover located over the filter. Pump the tank prior to removing the disc dam cartridge for cleaning to prevent any solids from escaping to the field when the cartridge is removed.

Pull sharply on the lid handle and the disc dam cartridge will slide out of the case. In order to prevent contamination of the ground with septage, turn the cartridge sideways and lay it back in the opening. Now rinse off the cartridge with a garden hose or a fresh water tank hose from the truck, being careful to rinse all septage material back into the tank. It is not necessary that the filter be cleaned "spotless". The biomass growing on the filter aides in the pretreatment process and should be left on the discs.

On rare occasion then it will be necessary to dismantle the cartridge. If required, remove the nuts on the three bolts at the top of the lid and the cartridge can be easily disassembled for cleaning. After the cartridge is cleaned, and reassembled if necessary, place it back in the filter case. Be sure it is all the way in the case until it snaps into place. Replace the septic tank cover.

Easy to maintain • Ecologically Sound

• The filter is virtually self cleaning. The continued action of the anaerobic organisms on the filter discs causes lodged particles to disintegrate and fall to the bottom of the tank.

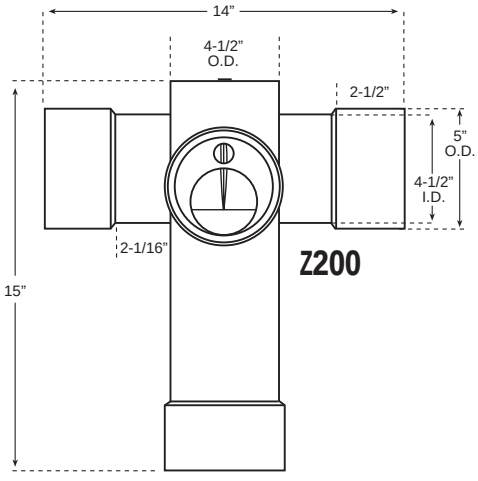
• The filter only requires servicing at the normal inspection and pumping intervals required of a standard septic installation.

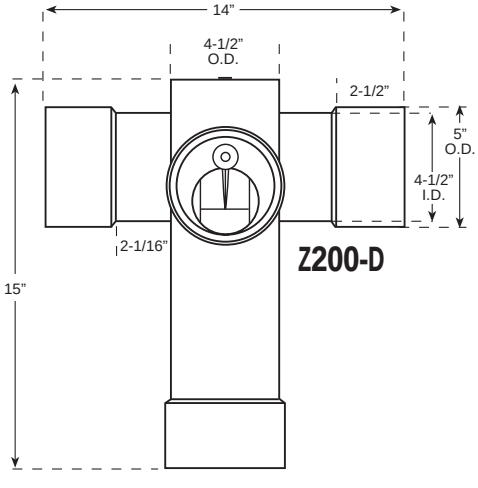
• The filter cartridge is safely hosed off back into the tank by a qualified septic tank pumper.

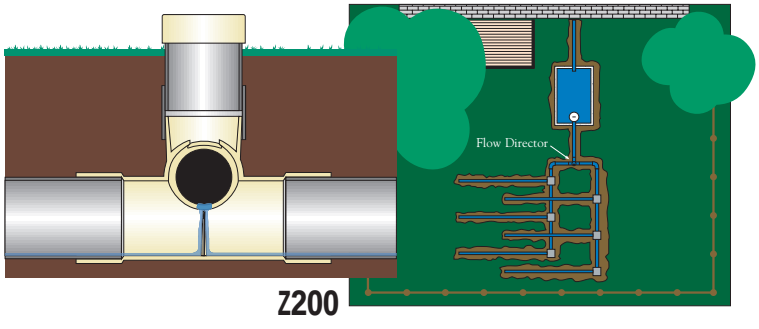
ZABEL environmental technology™

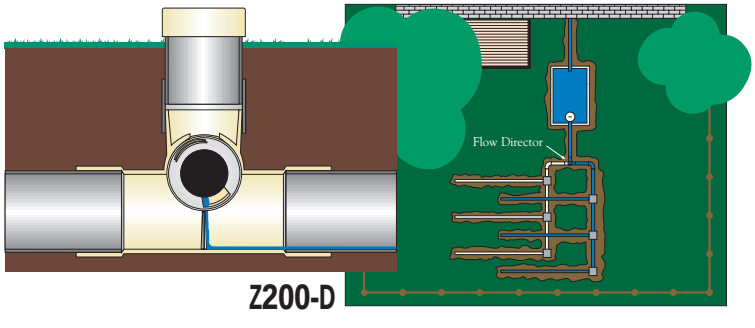
ZEUS™
ZABEL ENGINEERED UNIFIED SYSTEM

DISTRIBUTION SYSTEM









The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584, U.S. Des. 386,241,349067, 4605501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 264824, Other Patents Pending

Flow Divider - Flow Director
ZEUS™ Z200 - Z200D Series
Product Specification

1. Product Name: Zabel™ Flow Divider, Zabel™ Flow Director, US Patent Nos.: 4,605,501; 5,098,568 D309,007
2. Model Numbers: Divider Model Z200, Director Model Z200D
3. Application
   3.1. Divider Model Z200: Replaces old-fashioned distribution boxes and pipe manifolds.
   3.2. Director Model Z200D: Replaces expensive old-fashioned Y-valves.
4. Performance Specification
   Flow Pattern: Laboratory test results conducted by Dr. Bob Rubin Ed.D. on the Flow Divider using 1000 ml samples @ 3 gpm:

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

5. Materials: All material is non-corrosive Rigid Vinyl PVC
6. Installation: Weld the inlet side of the unit with PVC glue to the Schedule 40 pipe at the outlet end of the septic tank.
7. Service: A professional onsite service company should perform all onsite system service. Flow Divider: The Flow Divider does not require service, but may be used to view the effluent stream when the system is normally inspected.
   Flow Director: The Flow Director does not require service, but may be used to view the effluent stream when the system is normally inspected. If the flow needs to be adjusted between two lines or fields, turn the gear device in the top of the unit to direct the sleeve valve in the proper direction. Direction of effluent flow can be confirmed by visual inspection.
8. Warranty: The Z220 and Z200D are warranted to be free from defects in material and workmanship for two years from the date of original installation. Zabel's liability is limited to repair or replacement of the part.

PRICES ON PAGE 62

Flow Divider Exclusive Features and Benefits

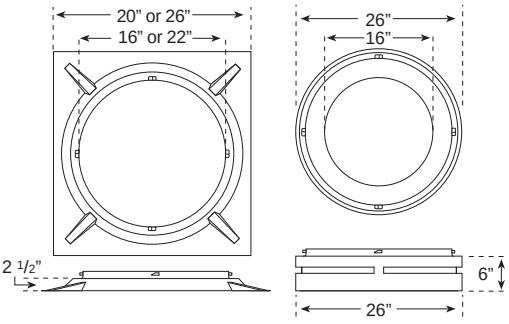
- Distributes effluent leaving the septic tank by means of a patented central weir design that insures flow is evenly divided even if the Flow Divider is not level.
- Distributes flow better than any distribution box or manifold.
- May be placed in manifold for even distribution of multiple lines.
- Allows effluent monitoring from grade level.

Flow Director Exclusive Features and Benefits

- The Flow Director is a Flow Divider with a patented sleeve valve installed to allow adjustment of the effluent flow between a primary and secondary field or between two or more lines.
- Replaces old fashioned WYE-Valves
- Allows effluent monitoring from grade level.
- The effluent will gravity back flow from the primary to secondary field if the homeowner fails to change the flow direction at the proper time reducing the probability of an effluent breakout.

ZABEL ENGINEERED UNIFIED SYSTEM

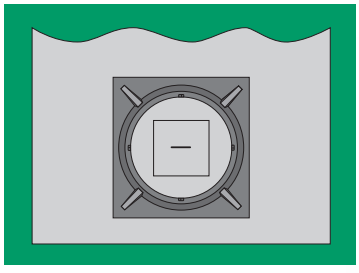
ZEUS™ ACCESS SYSTEMS

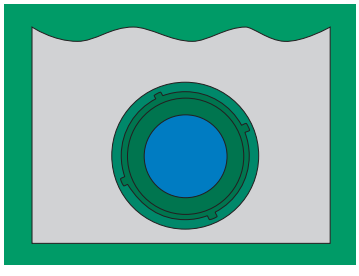


RB-TA-T-20x2
RB-TA-T-26x2

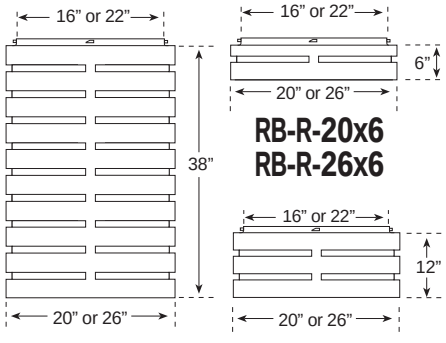
RB-TA-F-26x6

TOP VIEW





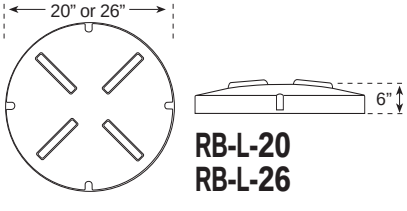
Patent Pending



RB-R-20x6
RB-R-26x6

RB-R-20x38
RB-R-26x38

RB-R-20x12
RB-R-26x12



RB-L-20
RB-L-26

The ZEUS™ Access System includes six interchangeable parts: two septic tank adaptors, three risers and a lid. The patent pending interlocking system makes these Zabel™ products are resistant to unauthorized entry and provides protection from ground water infiltration.

The ZEUS™ Access System is designed to fit other ZEUS™ Systems such as: Filtered Pump Vaults, Pump and Discharge Systems, and Alarm and Control Systems to make complete STEP system packages. Look for the ZEUS™ trademark to ensure quality.

Call for a **free** ZABEL ZONE™ *An Onsite Wastewater Magazine* **1-800-221-5742** • Website http://www.***zabel***.com

ZEUS™ Access Systems Product Specification

1. Product Name: ZEUS™ 20” or 26” Risers and Lids

2. Model Number:RB-TA-T-20x2, RB-TA-F-20x6, RB-R-20x6, RB-R-20x12, RB-R-20x38, RB-L-20, RB-TA-T-26x2, RB-TA-F-26x6, RB-R-26x6, RB-R-26x12, RB-R-26x38, RB-L-26

3. Applications: Appropriate for use in all access to septic tanks, dosing chambers and the ZEUS™ basin system.

4. Materials: All materials are non corrosive high density polyethylene.

5. New System Installation: Cast either the 20" tank adapter form, Model # RB-TA-F-20x6 or the 26" tank adapter form, Model # RB-TA-F-26x6 into the concrete septic tank lid. To retrofit to existing tanks use 20" tank adapter top, Model #RB-TA-T-20x2 or the 26" tank adapter top, Model #RB-TA-T-20x2. First clean the concrete lid of any soil and debris around edge the of the inlet and outlet access opening. Apply double mastic to the bottom edge of the tank adapter top. Center the tank adapter top over the inlet and outlet access openings and walk down to seal the adapter to the top of concrete lid. Place a bead of sealant around the top inside edge of the tank adapter top and lower an appropriately sized riser into place. Turn the riser clockwise until it locks into place. Repeat this step as necessary until you reach the desired height for the access system. Zabel Recommendation: Any configuration of risers should not exceed 48" in height. Place the lid onto the last riser and turn clockwise until it locks into place. Secure in place with tamper resistant screws. Do not place any sealant onto the uppermost riser as this will inhibit access to the system for routine maintenance.

6. Warranty: The ZEUS™ access system are warranted to be free from defects in material and workmanship for two years from the date of original installation. Zabel’s™ liability is limited to replacement of the ZEUS™ access system only and in no event shall Zabel™ be liable for any consequential damages of any kind.

PRICES ON PAGE 61

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ZEUS™
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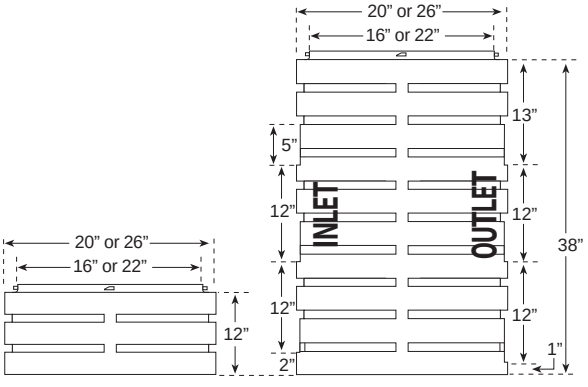
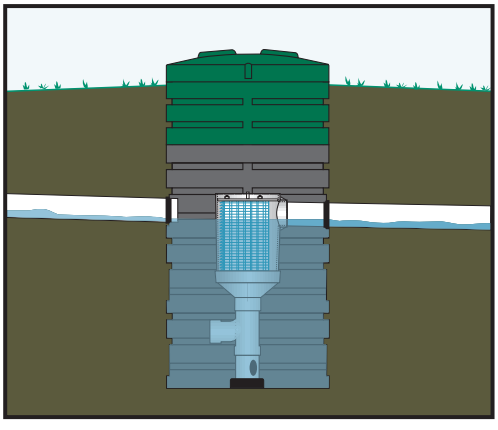
BASIN SYSTEMS



RB-B-20x12
RB-B-26x12

RB-B-20x38
RB-B-26x38



Basin Assembly Systems

RB-BAS-26x38

Basin System includes 26" Basin, Lid and 4 Grommets
*grommets come in 4" size, one set for Sch 40 pipe and one set for SDR 35 pipe.
other size grommets are available

RB-BAS-20x38

Basin System includes 20" Basin, Lid and 2 Grommets
*grommets come in 4" size, one set for Sch 40 pipe and one set for SDR 35 pipe.
other size grommets are available

The ZEUS™ Basin System is composed of a 38" basin, lid, and two 4" grommets. These basins are designed to work with the ZEUS Access System to make products that are resistant to unauthorized entry and provides protection from ground water infiltration.
The ZEUS Basin System is designed to fit other Zabel™ products such as: Effluent filters, Interlocking Filtered Pump Vaults, Pump and Discharge Systems to make complete ZEUS packages.
Look for the ZEUS trademark to ensure quality.

ZEUS™ Basin Systems Product Specification

1. Product Name: ZEUS™ 20” or 26” Basins

2. Model Number: RB-B-20x12, RB-B-20x38, RB-B-26x12, RB-B-26x38, RB-BAS-20x38, RB-BAS-26x30

3. Applications: Appropriate for use with all Zabel™ filters, as a distribution box, water level control box for constructed wetlands and in the case of the RB-B-26x38 may be used to house the interlocking Filtered Pump Vault model number FPV-I36-2. May also be used to house a pump and discharge system for various applications, such as use within a recirculating sand filter.

4. Materials: All materials are non corrosive high density polyethylene.

5. Installation in new or existing systems: The Basin Assembly System includes everything you need to install the unit — Basin, lid, lid screws, 2-4”grommets. The basins are designed to be custom fitted by the installer utilizing any one of the three pre-determined inlets or outlets on the 38” basins and the appropriate sized pipe grommets. The installer can customize the 12” basin as the need arises. The Zeus Access System can then be utilized to provide a grade access to these systems.
   Zabel Recommendation: Any configuration of risers used should not exceed 48” in height.

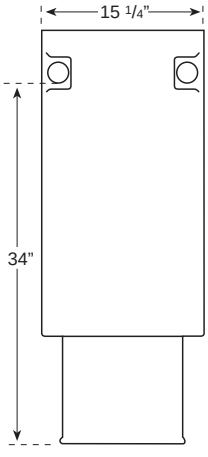
6. Warranty: The ZEUS™ Basin system are warranted to be free from defects in material and workmanship for two years from the date of original installation. Zabel’s™ liability is limited to replacement of the ZEUS™ access system only and in no event shall Zabel™ be liable for any consequential damages of any kind.

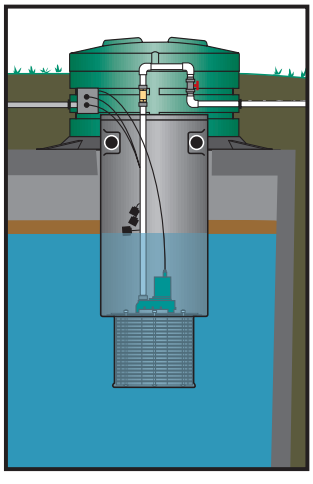
PRICES ON PAGE 61

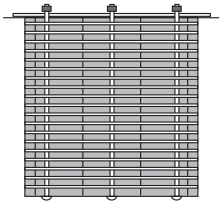
MADE IN USA

ZEUS™
ZABEL ENGINEERED UNIFIED SYSTEM

FILTERED PUMP VAULTS

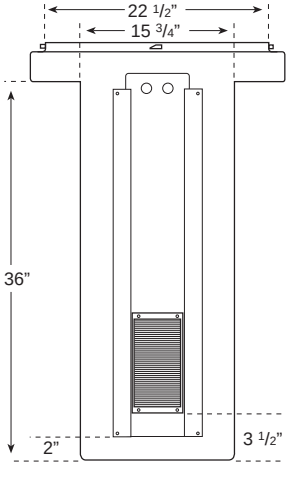


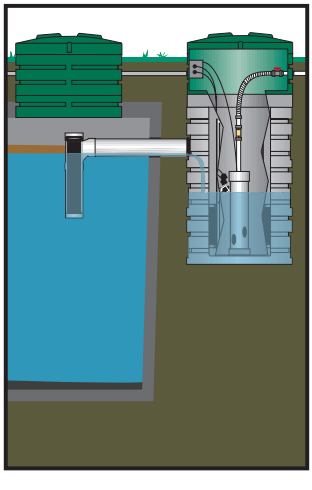




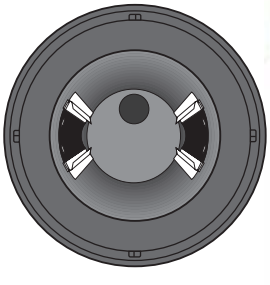
Top view

FPV-H-34-A101





Top view



FPV-I-36-2

The ZEUS™ Filtered Pump Vault System includes seven pump vaults of two basic styles: Hanging style and Interlocked. The Hanging style pump vaults come in two filter designs: A100 and A1800 style slotted plates. The Interlocked FPV comes only with the A1800 style slotted plates. These parts are designed to fit those from the ZEUS™ Riser & Basin System, Discharge System and Alarm & Control System to make complete STEP System Packages.

Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:
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U.S. Des. 386,241,349067, 4605501,5098568,
Des. 309007 Canadian: 2,135,937 New Zealand: 264824

MADE IN USA

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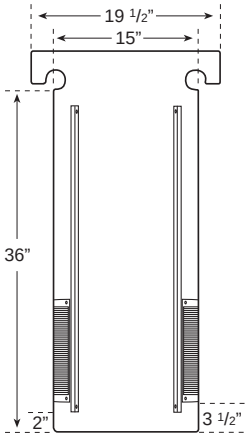
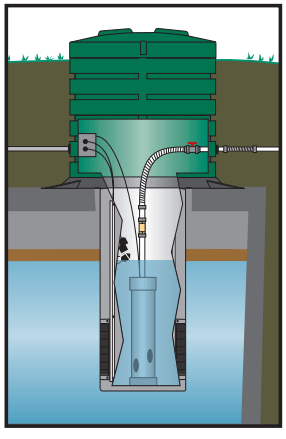
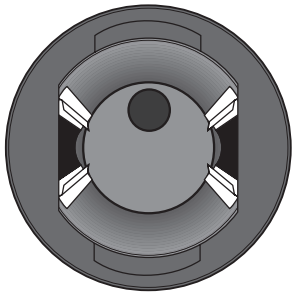
FILTERED PUMP VAULTS

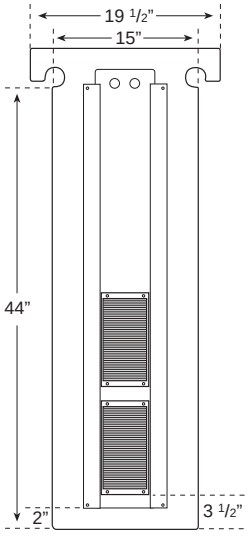


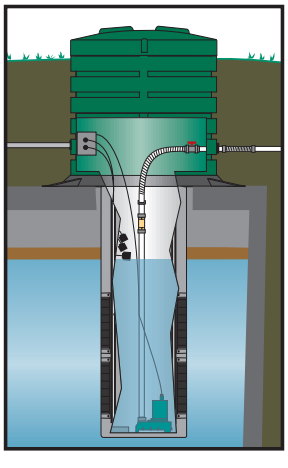


Top view

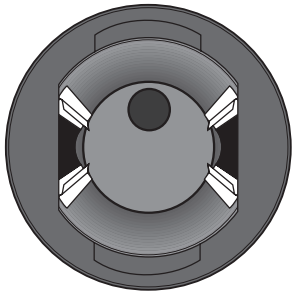


FPV-H-36-2
FPV-H-36-4





Top view



FPV-H-44-2
FPV-H-44-4

PRICES ON PAGE 62

The ZEUS™ Filtered Pump Vault System includes seven pump vaults of two basic styles: Hanging style and Interlocked. The Hanging style pump vaults come in two filter designs: A100 and A1800 style slotted plates. The Interlocked FPV comes only with the A1800 style slotted plates. These parts are designed to fit those from the ZEUS™ Riser & Basin System, Discharge System and Alarm & Control System to make complete STEP System Packages.

Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:

U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584,
U.S. Des. 386,241,349067, 4605501,5098568,
Des. 309007 Canadian: 2,135,937 New Zealand: 264824

ZEUS™ Filtered Pump Vaults Product Specification

1. Product Name: Zabel™ Filtered Pump Vaults, Hanging or Interlocking styles
2. Model Number: FPV-H34-A101, FPV-H36-2, FPV-H36-4, FPV-H44-2, FPV-H44-4, FPV-I36-2
3. Applications: Appropriate for use in all STEP systems with submersible effluent pumps, sewage pumps and high head turbine pumps.
4. Performance Specification: All flows for the FPV-H34-A101 were determined to be laminar at rates up to 34 gpm. All flows for FPV-H36-2, FPV-H36-4, FPV-H44-2, FPV-H44-4, FPV-I36-2 were determined to be laminar at rates up to 90 g.p.m. It was concluded that the pumps tested with the FPV as a system did "not generate enough turbulence to materially disturb the solids in the septic tank system."

FPV Septic Tank Turbulance Test Results: FPV-H36-2, FPV-H36-4, FPV-H44-2, FPV-H44-4, FPV-I36-2				
Flow Rate @	**0" Theoretical**	**1" From Filter**	**6" From Filter**	**12" From Filter**
5 gpm	0.042 fps	< 0.02 fps	< 0.01 fps	< 0.01 fps
15 gpm	0.128 fps	< 0.06 fps	< 0.03 fps	< 0.01 fps
30 gpm	0.255 fps	< 0.08 fps	< 0.04 fps	< 0.02 fps
40 gpm	0.34 fps	< 0.09 fps	< 0.05 fps	< 0.02 fps
80 gpm	0.68 fps	< 0.20 fps	< 0.06 fps	< 0.02 fps
FPV Septic Tank Turbulance Test Results: FPV-H34-A101				
Flow Rate @	**0" Theoretical**	**1" From Filter**	**6" From Filter**	**12" From Filter**
8 gpm	0.122 fps	< 0.02 fps	< 0.01 fps	< 0.01 fps
34 gpm	0.520 fps	< 0.05 fps	< 0.03 fps	< 0.02 fps

5. Certified Pumps: The following pumps have been tested by Zabel™ and have been certified for use with the following Filtered Pump Vaults: FPV-H36-2, FPV-H36-4, FPV-H44-2, FPV-H44-4, FPV-I36-2.
   - 5.1. [1] HYDROMATIC Pump Models: SP50, SW/VS33, SHEF33, SHEF25, OSP33, SPD100H, SHEF50, SKHD150, SP40, SHEF100 and SPD50H. High Head Turbine Pump Models HE8-51, HE12-51, HE20-51.
   - 5.2. [2] F.E. MYERS Pump Models: SSM33, ME3H, ME3F, ME40, ME50, ME75, ME100, ME150, P51, P102, MW50, and High Head Turbine Pump Models 2NFL51-8E, 2NFL52-8E, 2NFL72-8E, 2NFL102-8E, 2NFL51-12E, 2NFL52-12E, 2NFL72-12E, 2NFL102-12E, 2NFL51-20E, 2NFL52-20E, 2NFL72-20E, 2NFL102-20E, 2NFL152-20E, J1025BE, J1525BE, J1035BE and J1535BE.
   - 5.3. Red Jacket Pump Models: Utility 518, Utility 610
   - 5.4. Zabel's Pump Models: Zeus™ Turminator™ T125-10, T100-18.
6. Materials: All materials are non-corrosive. For the FPV-H34-A101 the pump vault tank-high density polyethylene, case, lid & nuts-rigid vinyl PVC, Filter discs-high impact polystyrene, rods-high density polyethylene. For the FPV-H36-2, FPV-H36-4, FPV-H44-2, FPV-H44-4, FPV-I36-2 the pump vault, filter panel, trim strips, and maintenance plate - linear low density polyethylene (LLDPE); Filter plate - polypropylene
7. Installation in new or existing systems: For the hanging FPV's center 15-inch filtered pump vault in the septic tank outlet access opening of at least 16 inches in diameter. Thread 1-1/2" schedule 40 pipe through the handles to bridge the access opening in the tank. If 6" adapter has been cast into the lid simply lower the FPV through the opening and allow the pump vault to rest on the adapter. For the FPV I-36 it is a matter of simply lowering the pump vault into the 38" basin and turning to the right to lock into place.
8. Service method: A professional onsite service company shall perform all onsite system service. Pump the tank to the lowest level practical. For the FPV-H34-A101 disconnect the discharge assembly from the pump, remove the pump and floats. Remove the Filter cartridge and rinse with clean water. Return the cleaned Filter cartridge to the bottom of the pump vault. For the FPV-H36-2, FPV-H36-4, FPV-H44-2, FPV-H44-4, FPV-I36-2 Insert the maintenance plate behind the filter panel to be cleaned all the way to the bottom of the tank. Remove the filter panel and rinse the filter plate with clean water. Return the cleaned Filter Panel and repeat until all panels have been cleaned. Visually inspect the pump and float switches. After servicing return pump and a float to original positions and remove the maintenance plate. They normally will not require adjustment unless there is a malfunction.
9. Warranty: The Filtered Pump Vaults are warranted to be free from defects in material and workmanship for two years from the date of original installation. When the Filtered Pump Vaults are originally installed with a certified pump, the warranty period is ten years from the date of installation. Zabel's™ liability is limited to repair or replacement of the Filtered Pump Vault only and in no event shall Zabel™ be liable for any consequential damages of any kind. Manufacturers warrant their respective pumps and controls.

[1] Dr. S. Lingireddy and Dr. S. Yost., Assistant Professor of Civil Engineering at the University of Kentucky, Department of Civil Engineering, *Evaluation of Zabel™ FPV100 Pump Vault and Hydromatic Pumps: A Study of Septic Tank Turbulence* Lexington, KY, June 10, 1996 and

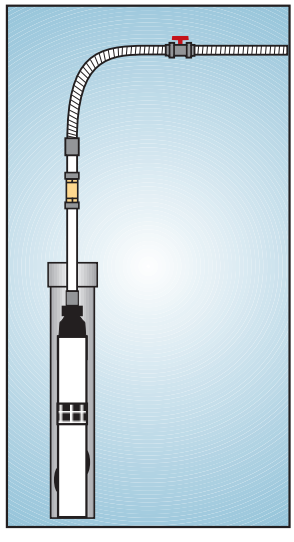
[2] *Evaluation of Zabel™ FPV100 Pump Vault and Myers Pumps: A Study of Septic Tank Turbulence* Lexington, KY, September 3, 1996.

MADE IN USA

ZEUS™
ZABEL ENGINEERED UNIFIED SYSTEM

DISCHARGE SYSTEMS

DS-TD-1.25
DS-TD-2.0

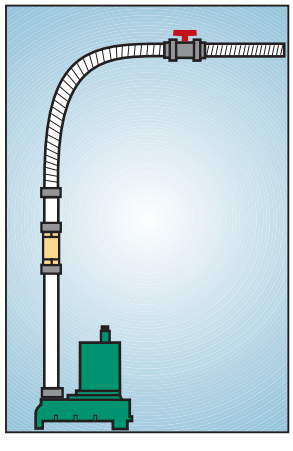


GROMMETS

DS-GT-4.0
DS-GT-3.0
DS-GT-2.0
DS-GT-1.5
DS-GT-1.25

*Pump sold seperately or as part of a ZEUS STEP System package

DS-ED-1.5



CHECK VALVES

DS-CV-2.0 **DS-CV-1.5** **DS-CV-1.25**

*Pump sold as part of a ZEUS STEP System package

MADE IN USA

Alarms, Controls & Accessories

AC-A-O-SF

Versatile, indoor or outdoor liquid level alarm system.

LR54245 LISTED 288X

- Enclosure meets Type 3R water-tight standards
- Manual horn silence switch, and manual alarm test switch
- Alarm horn sounds at 82 decibels at 10 feet (3 meters)
- Complete package includes standard VRS control switch with 10 feet (3 meters) of cable indoor/outdoor alarm panel.
- Two-year limited warranty

AC-A-I

Easy-to-Install liquid level alarm system for indoor use.

LR54245 LISTED 288X

- NEMA 1 enclosure rated for indoor use
- Red warning light, green “power on” light, alarm test switch, and horn silence switch
- Alarm horn sounds at 88 decibels at 10 feet (3 meters)
- Can be used with any UL Listed switching mechanism rated to include 1 amp, 12 VAC load
- Alarm system (when installed on separate circuit) operates even if the pump circuit fails
- Complete package includes standard Sensor Float® control switch with 15 feet (4.57 meters) of cable and pipe clamp for mounting, and UL authorized, waterproof splice kit
- Switching mechanism operates on low voltage and is isolated from the power line to reduce the possiblility of shock
- Two-year limited warranty

AC-A-O

Versatile, indoor or outdoor liquid level alarm system.

LR54245 LISTED 288X

- Enclosure meets Type 3R water-tight standards
- Automatic alarm re-set, horn silence switch, and alarm test switch
- Alarm horn sounds at 82 decibels at 10 feet (3 meters)
- Alarm system (when installed on separate circuit) operates even if the pump circuit fails
- Complete package includes standard Sensor Float® control switch with 15 feet (4.57 meters) of cable and pipe clamp for mounting
- Two-year limited warranty

JUNCTION BOX

Junction Box w/3 or 5 connectors.

- Veratile, reinforced, PVC enclosure provides weatherproof protection for electrical connections
- Tested to NEMA 4X standards
- Durable housing is resistant to moisture, flame and ultraviolet rays
- Hinged cover can be locked to provide a secure and tamper proof box
- RCC8 cable connectors provide strain relief and a liquid tight seal

MADE IN USA

Alarms, Controls & Accessories

AC-CP-S-S

Single-phase, simplex pump switch control.

- Entire control system (panel and switches) is UL Labeled to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Package includes 2 float switches one for on/off, and one for alarm
- Complete, step-by-step installation instructions included
- Two-year limited warranty

AC-CP-S-C

Single-phase, simplex motor contactor control.

- Entire control system (panel and switches) is UL Labeled to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Package includes 3 float switches two for on/off, and one for alarm
- Complete, step-by-step installation instructions included
- Two-year limited warranty

AC-CP-S-C-T

Single-phase, simplex timed dosing pump control.

- Entire control system (panel and switches) is UL Labeled to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Package includes 3 float switches (low level cut out, redundant off, high water alarm)
- Repeat cycle timer for sizing pumped effluent doses and frequency of operation
- Complete, step-by-step installation instructions included
- Two-year limited warranty

AC-CP-D-C

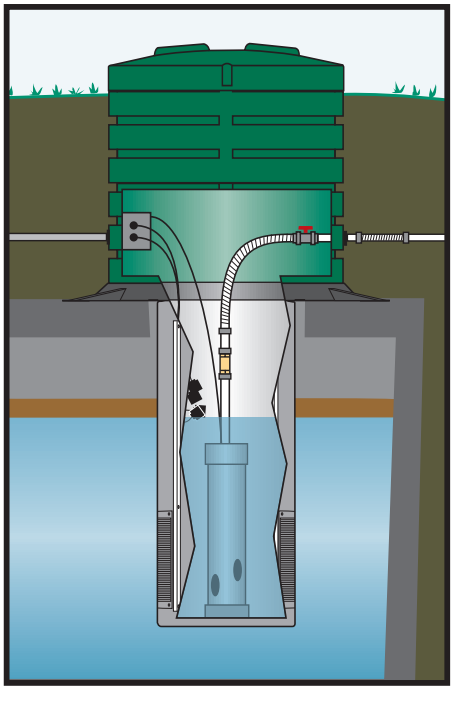
Single-phase, duplex alternating pump control with override.

- Entire control system (panel and switches) is UL Labeled to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Package includes 3 float switches two for on/off, and one for lag/alarm
- Alternately controls two pumps with lag pump backup
- Complete, step-by-step installation instructions included
- Two-year limited warranty

MADE IN USA

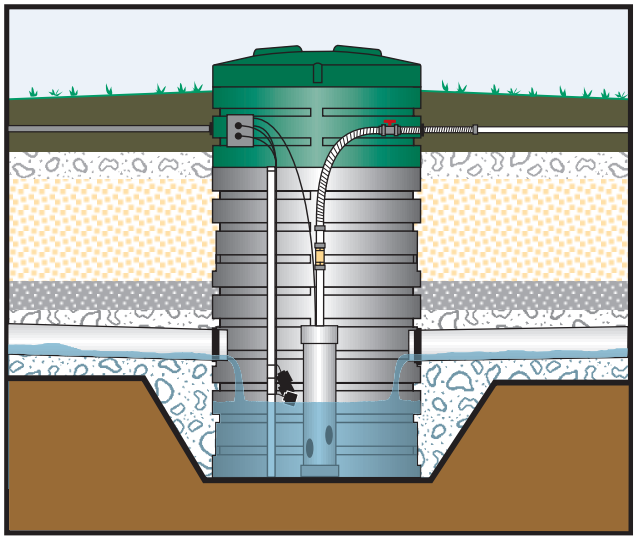
ZEUS™
ZABEL ENGINEERED UNIFIED SYSTEM

PUMPS



ZEUS™ TURBINATOR™ T125-10

T125-10



ZEUS™ TURBINATOR™ T100-18

T100-18

MADE IN USA

ZEUS™

ZABEL ENGINEERED UNIFIED SYSTEM

PUMPS

The ZEUS Turbinator™ Submersible Pump is specifically designed to handle effluent applications.

The Turbinator™ is the newest addition to the ZEUS STEP System family. Customers have the option of buying individual components from Zabel™ and putting together their own STEP System or they can choose to have Zabel quote a complete system package (see related article on page 24-25 of this magazine) and ship the entire package to them.

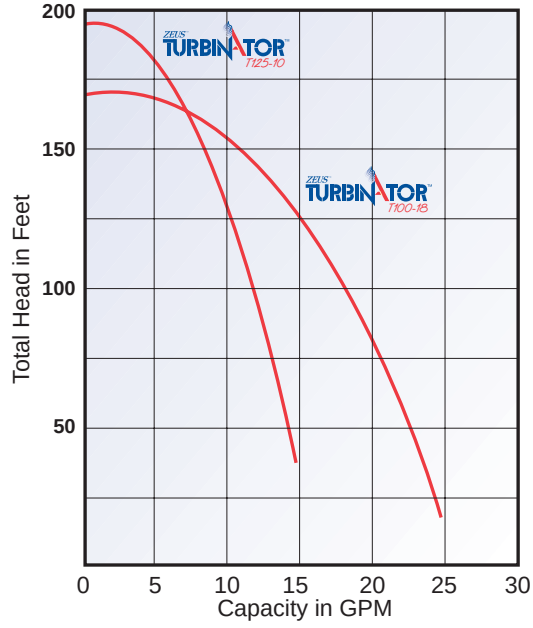
Two models are currently available: T125-10 and T100-18.

Both the T125-10 and T100-18 model Turbinator™ Pumps come equipped with a 1/2 HP, 115-volt, NEMA-standard motor that is CSA-approved. A stainless steel secondary strainer gives the ZEUS Turbinator™ Pumps added protection against blockage. So, the Turbinator™ Pumps can handle solids up to 1/16-inch in diameter.

The Model T100-18 Turbinator™ has an optimum performance of 18 gpm with the Model T125-10 having an optimum performance of 10 gpm.

FEATURES

- Cleanable, removable primary strainer adds to pump life
- Stainless steel secondary strainer
- Specially designed SJWO motor leads handle tough effluent applications
- 120-inch cable ideal for demanding applications
- Tested to a simulated depth of 575 feet
- Two-year limited warranty



EstimateInformationform

OFFICE USE ONLY

Project #_____

Estimator_____

a. Customer Name, Address, Phone number

Company Name_____

Customer Name_____

Address_____City_____State_____Zip_____

Phone #_____fax #_____

Contractor ☐ , Wholesaler/Pre-caster ☐ , Other_____

b. Design: Are we meeting an engineered spec?

Specifications? No ☐ ,Yes ☐ (if yes attach specs to back)

Designer Name_____Company_____

Address_____City_____State_____Zip_____

Phone #_____fax #_____

c. Application: Residential or commercial?

Residential ☐ , Commercial ☐ (if commercial identify)_____

Daily Flow Rate_____(Gallons per Day)

d. Pump Requirements

Pump Discharge Size_____, Check Valve? No ☐ Yes ☐

Pump Requirements: Total Dynamic Head (TDH)_____

Gallons per Minute (GPM)_____

Voltage Requirement: 115 ☐ or 230 ☐

e. Alarm Requirements:

Indoor ☐ Outdoor ☐

For more information contact:

Zabel Environmental Technology

10409 Watterson Trail

Louisville, KY 40299

1-800-221-5742

fax: 502-267-8801

mail

zabelzone@aol.com

Conventional **STEP** layout form

OFFICE USE ONLY

Project #_____

Estimator_____

_____ A = Inside bottom of tank to bottom of inlet

_____ B = Diameter of opening

_____ C = Diameter of opening

_____ D = Length of tank

_____ E = Distance from opening C to the edge of the tank

_____ F = Top of tank to ground level

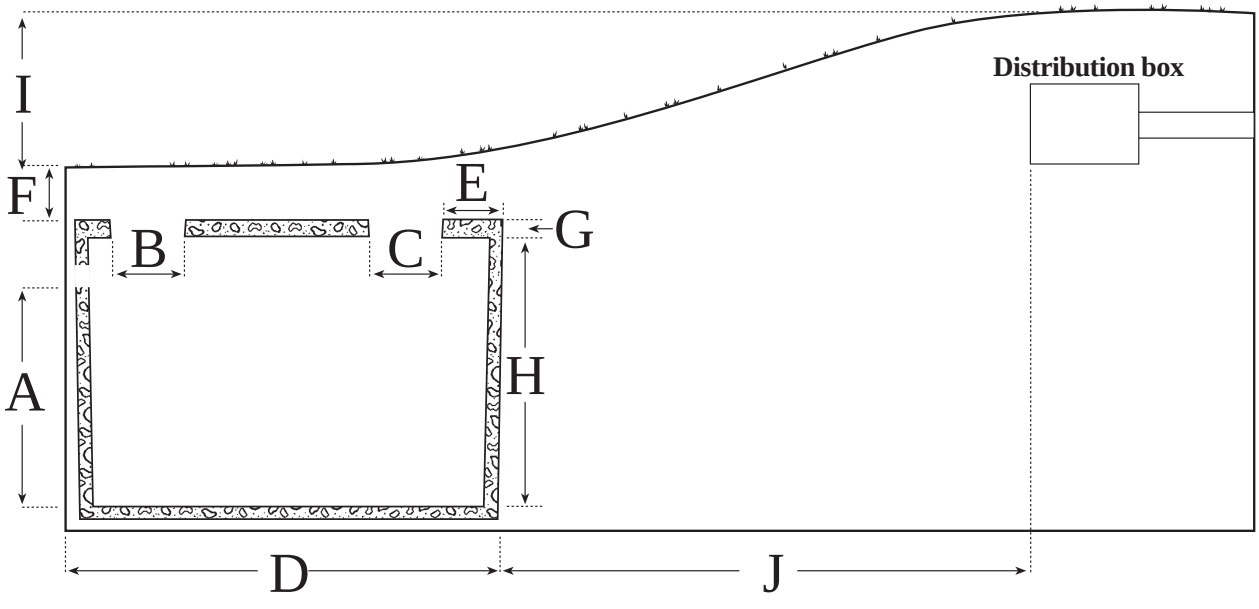
_____ G = Thickness of the tank lid

_____ H = Inside bottom to the inside top

_____ I = Vertical rise ground level over tank to ground level over distribution box

_____ J = Distance from tank to distribution box (Length of discharge pipe)

NOTES:



For more information contact:

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10409 Watterson Trail

Louisville, KY 40299

1-800-221-5742

fax: 502-267-8801

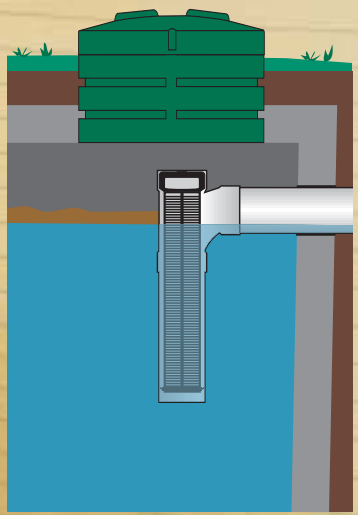
m a i l

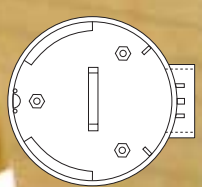
zabelzone@aol.com

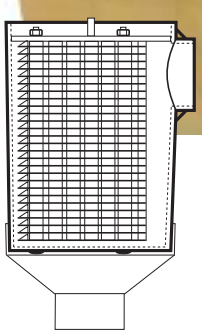
Don't Cut Corners

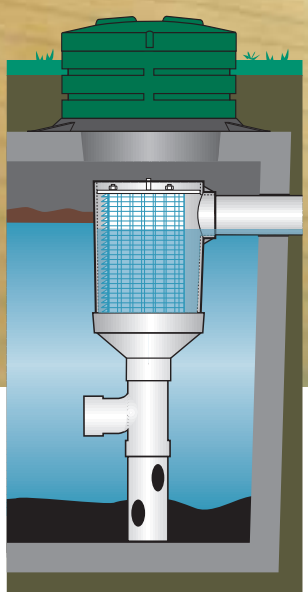
Use Zabel Products to ensure Quality and Performance!

Effluent Filters increase the efficiency of the septic tank, they further protect the treatment and disposal system from excessive solids during peak flow conditions. And most importantly they give homeowmers a passive warning that its time to service their systems. So look for the Zabel™ brand and protect your investment as well as the environment with a low cost high performance effluent filter.









ZABEL environmental technology TM

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Canadian: 2,135,937; New Zealand: 264824; Other Patents Pending

Call for a **free** ZABEL ZONE™ *An Onsite Wastewater Magazine* **1-800-221-5742** • Website http://www.***zabel***.com

PRICE LIST

Price List

MADE IN USA

CALL TOLL FREE
1-800-221-5742

A1801-HIP-SF

A1801-HIP

A1801

A1807

A1807-HIP

ZABEL™

WASTEWATER FILTERS & ACCESSORIES

PART NO	RESIDENTIAL FILTERS	LIST	ONE +	10+	30+	50+
	A1800 Case & Cartridge					
A1800	Standard Filter	49.95	43.00	35.00	34.00	33.00
A1800-HIP	High Performance Filter	55.95	49.00	41.00	40.00	39.00
A1800-HIP-SF	HIP SmartFilter™	155.95	149.00	141.00	140.00	139.00
	A1801 Cartridges					
A1801	Standard Cartridge	39.95	33.00	25.00	24.00	23.00
A1801-HIP	High Performance Cartridge	45.95	39.00	31.00	30.00	29.00
A1801-HIP-SF	HIP SmartFilter™ Cartridge	145.95	139.00	131.00	130.00	129.00
	A1807 Concrete Baffle Cartridges					
A1807	Standard Cartridge	49.95	43.00	35.00	34.00	33.00
A1807-HIP	High Performance Cartridge	55.95	49.00	41.00	40.00	39.00

	COMMERCIAL FILTERS					
PART NO	**A100 Case & Cartridges**	**LIST**	**ONE +**	**10+**	**30+**	**50+**
A100	Standard Filter	169.95	133.00	108.00	102.00	98.00
A100-SF	SmartFilter™	269.95	233.00	208.00	202.00	198.00
A100-HIP	High Performance Filter	244.95	198.00	197.00	196.00	195.00
A100-HIP-SF	HIP SmartFilter™	344.95	298.00	297.00	296.00	295.00
	A101 Cartridges					
A101	Standard Cartridge	134.95	98.00	73.00	67.00	63.00
A101-SF	SmartFilter™ Cartridge	234.95	198.00	173.00	167.00	163.00
A101-HIP	High Performance Cartridge	194.95	133.00	132.00	131.00	130.00
A101-HIP-SF	HIP SmartFilter™ Cartridge	294.95	233.00	232.00	231.00	230.00
	HIGH STRENGTH FILTERS					
PART NO	**A300 Case & Cartridges**	**LIST**	**ONE +**	**10+**	**30+**	**50+**
A300	Standard Filter	199.95	163.00	138.00	132.00	128.00
A300-SF	SmartFilter™	299.95	263.00	238.00	232.00	228.00
A300-HIP	High Performance Filter	269.95	223.00	222.00	221.00	220.00
A300-HIP-SF	HIP SmartFilter™	379.95	333.00	332.00	331.00	330.00
	A301 Cartridges					
A301	Standard Cartridge	149.95	113.00	88.00	82.00	78.00
A301-SF	SmartFilter™ Cartridge	249.95	213.00	188.00	182.00	178.00
A301-HIP	High Performance Cartridge	204.95	158.00	157.00	156.00	155.00
A301-HIP-SF	HIP SmartFilter™ Cartridge	304.95	258.00	257.00	256.00	255.00


A100/A300-ADA


FC100


TH100


SEAL

PART NO	**ACCESSORIES**	**LIST**	**ONE +**	**10+**	**30+**	**50+**
A100/A300ADA	Extension Adapter	29.95	19.00	18.00	17.00	16.00
FC100	Flow Control/Maintenance Plate	9.95	9.00	8.00	7.00	6.00
TH100	Filter Service Extractor (T Handle)	34.95	32.00	30.00	28.00	26.00
SEAL	Filter Tamper Seal	2.95	2.00	1.90	1.80	1.70

ZEUS™

ZABEL™ ENGINEERED UNIFIED SYSTEM

JUNCTION BOX

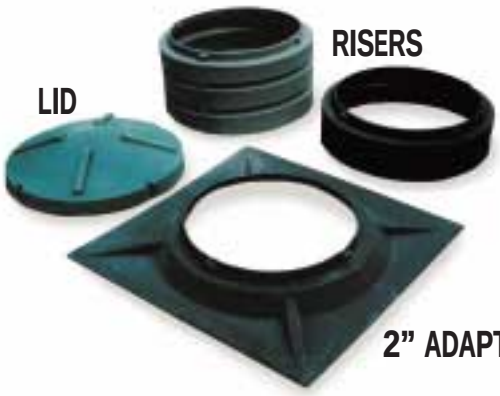
INDOOR ALARMS

OUTDOOR ALARMS

CONTROL PANELS

PART NO	ALARM & CONTROL SYSTEM	LIST	ONE +	10+	30+	50+
AC-JSB-3	Junction/Splice Box w/3 Connectors	36.95	32.00	31.00	30.00	29.00
AC-JSB-5	Junction/Splice Box w/5 Connectors	36.95	35.00	34.00	33.00	32.00
AC-A-O-SF	Alarm - Outdoor-SmartFilter™	136.95	106.00	104.00	102.00	100.00
AC-A-I	Alarm - Indoor	116.00	86.00	84.00	82.00	80.00
AC-A-O	Alarm - Outdoor	146.95	116.00	114.00	112.00	110.00
AC-ACB-O	Alarm w/ Control Block - Outdoor	186.95				
AC-CP-S-S	Control Panel-Simplex-Switch	459.95				
AC-CP-S-C	Control Panel-Simplex-Contactor	492.95				
AC-CP-S-C-T	Control Panel-Simplex-Timed	585.95				
AC-CP-D-C	Control Panel-Duplex-Contactor	764.95				

ZEUS™ Alarm & Control System
May only be purchased
with ZEUS™ packages.



LID

RISERS

2" ADAPTER

BASIN

NEW

26" CONTAINER ASSEMBLEY

20" CONTAINER ASSEMBLEY

PART NO	RISER & BASIN SYSTEM	LIST	ONE +	10+	30+	50+
RB-L-20	20" Lid	48.95	39.00	38.00	37.00	36.00
RB-TA-T-20x2	20" Tank Adapter - Top 2"	45.95	36.00	35.00	34.00	33.00
RB-TA-F-20x6	20" Tank Adapter - Form 6"	35.95	26.00	25.00	24.00	23.00
RB-R-20x6	20" Riser x 6"	35.95	26.00	25.00	24.00	23.00
RB-R-20x12	20" Riser x 12"	45.95	36.00	35.00	34.00	33.00
RB-R-20x38	20" Riser x 38"	85.95	76.00	75.00	74.00	73.00
RB-B-20x12	20" Basin x 12"	45.95	36.00	35.00	34.00	33.00
RB-B-20x38	20" Basin x 38"	85.95	76.00	75.00	74.00	73.00
RB-BAS-20x38	20" Container Assembly	119.95	100.00	99.00	98.00	97.00
RB-L-26	26" Lid	52.95	43.00	42.00	41.00	40.00
RB-TA-T-26x2	26" Tank Adabter - Top 2"	49.95	40.00	39.00	38.00	37.00
RB-TA-F-26x6	26" Tank Adapter - Form 6"	39.95	30.00	29.00	28.00	27.00
RB-R-26x6	26" Riser x 6"	39.95	30.00	29.00	28.00	27.00
RB-R-26x12	26" Riser x 12"	49.95	40.00	39.00	38.00	37.00
RB-R-26x38	26" Riser x 38"	89.95	80.00	79.00	78.00	77.00
RB-B-26x12	26" Basin x 12"	49.95	40.00	39.00	38.00	37.00
RB-B-26x38	26" Basin x 38"	89.95	80.00	79.00	78.00	77.00
RB-BAS-26x38	26" Container Assembly	139.95	130.00	129.00	128.00	127.00

HANGING PUMP VAULT

INTERLOCKING PUMP VAULT

HANGING PUMP VAULT

NEW

ZEUS TURBINATOR

TURBINE DISCHARGE

NEW

EFFLUENT DISCHARGE

GROMMETS

CHECK VALVES

1.25” 1.5” 2.0”

PART NO	FILTERED PUMP VAULT SYSTEM	LIST	ONE +	10+	30+	50+
FPV-H34-A101	Hanging 34" W/A101 Filter	139.95	129.00	118.00	117.00	116.00
FPV-H36-2	Hanging 36" W/2 Filter Plates	189.95	179.00	175.00	174.00	173.00
FPV-H36-4	Hanging 36" w/4 Filter Plates	199.95	189.00	185.00	184.00	183.00
FPV-H44-2	Hanging 44" w/2 Filter Plates	209.95	199.00	195.00	194.00	193.00
FPV-H44-4	Hanging 44" w/4 Filter Plates	219.95	209.00	205.00	204.00	203.00
FPV-I36-2	Interlocked 36" w/2 Filter Plates	189.95	179.00	168.00	167.00	166.00
PART NO	**PUMP SYSTEM**	**LIST**	**ONE +**	**10+**	**30+**	**50+**
PS-T-125-10	Turbinator 125TDH-10GPM	579.95	379.00	374.00	369.00	364.00
PS-T-100-18	Turbinator 100TDH-18GPM	569.95	369.00	364.00	359.00	354.00
PART NO	**DISCHARGE SYSTEM**	**LIST**	**ONE +**	**10+**	**30+**	**50+**
DS-TD-1.25	*Turbine Discharge1.25"	85.95	78.00	76.00	74.00	72.00
DS-ED-1.5	*Effluent Discharge1.5"	95.95	88.00	86.00	84.00	82.00
DS-TD-2.0	*Turbine Discharge2.0"	149.95	142.00	140.00	138.00	136.00
DS-CV-1.25	Check Valve1.25"	36.95	32.00	31.00	30.00	29.00
DS-CV-1.5	Check Valve1.5"	38.95	34.00	33.00	32.00	31.00
DS-CV-2.0	Check Valve2.0"	48.95	44.00	43.00	42.00	41.00
DS-ASV-1.25	Anti-Siphon Valve1.25"	36.95	32.00	31.00	30.00	29.00
DS-ASV-1.5	Anti-Siphon Valve1.5"	38.95	34.00	33.00	32.00	31.00
DS-ASV-2.0	Anti-Siphon Valve2.0"	50.95	46.00	45.00	44.00	43.00
DS-GT-1.25	1.25" Grommet	3.95	2.80	2.60	2.40	2.20
DS-GT-1.50	1.50" Grommet	3.95	2.80	2.60	2.40	2.20
DS-GT-2.0	2.0" Grommet	3.95	2.80	2.60	2.40	2.20
DS-GT-3.0	3.0" Grommet	4.95	3.50	3.30	3.10	2.80
DS-GT-4.0	4.0" Grommet	4.95	3.50	3.30	3.10	2.80

FLOW DIVIDER

FLOW DIRECTOR

PART NO	DISTRIBUTION SYSTEM	LIST	ONE +	6+	12+	36+
Z200	Flow Divider	32.95	29.00	28.00	27.00	26.00
Z200D	Flow Director	37.95	34.00	33.00	32.00	31.00

*includes true union ball valve & flexible connector-check or anti-siphon valve extra

Zabel **Marketing** Materials

Logo Clothing

Hats
Camo or corduroy
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gray, yellow, khaki, hunter
green 28.99

Pocket Tee shirts
9.99

Crystal Springs Golf Shirts -
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Quality embroidering makes these clothing items stand out in the crowd.

Hats and Golf Shirts include the Zabel name on one sleeve of shirts and back of hats.

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Effective July 1, 1997

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1% 10 days; Net 30 days. No discounts on COD, MC or Visa. There will be a $25.00 fee for returned checks.

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No returns without prior approval. Product may be returned within 30 days of purchase order date for full refund if returned in unopened box. A 20% restocking fee will be charged if boxes opened & re-sealed or return is made after 30 but within 90 days of purchase. Returns after 90 days will be on a case by case basis. All freight will be charged to the customer's account.

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F.O.B. our warehouse.

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1.5% late fee charged each month or portion thereof for the unpaid balance. Timely payments are very important and this late fee will be charged to all accounts that are paid late.

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Freight claims for damaged or missing shipments are the responsibility of the customer. Shipping claims are to be filed by the customer with the delivering carrier and any losses incurred are at the customer's expense. If you receive a shipment in damaged condition you should retain all packing material for carrier's examination, immediately advise the carrier by phone and in writing, and advise our office immediately so we may assist you with your claim.

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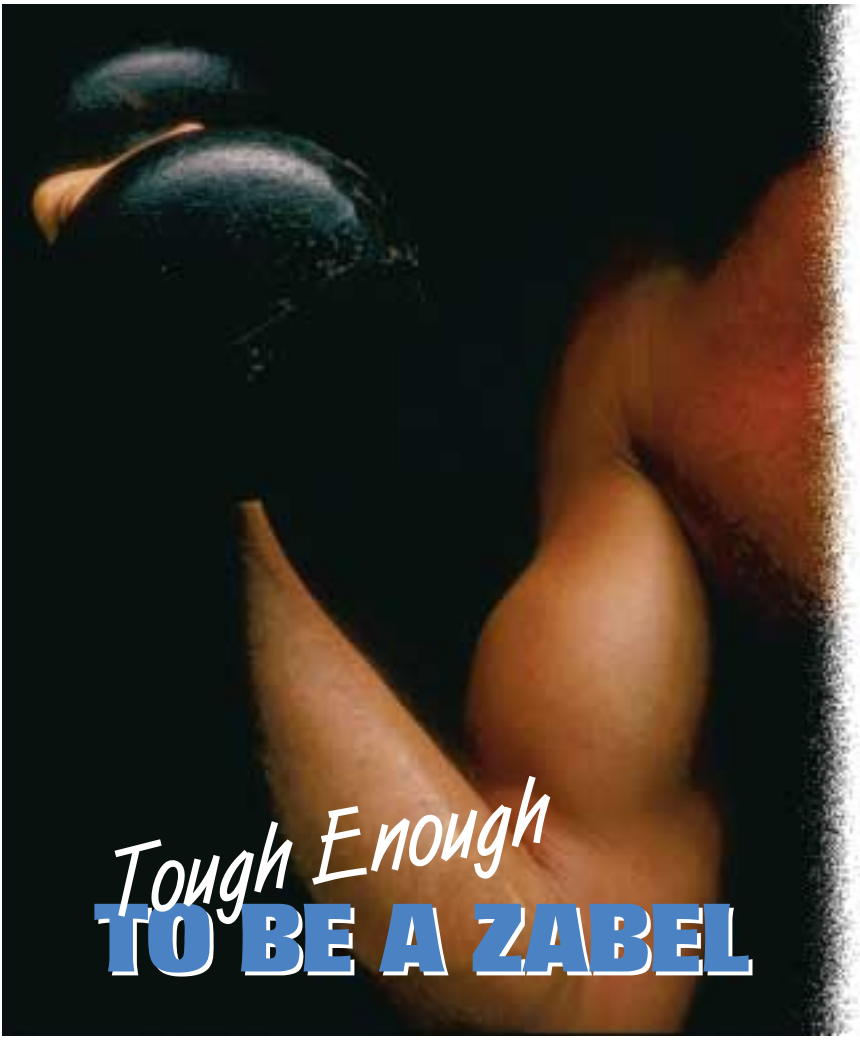
ZEUS™ Access System

ZABEL ENGINEERED UNIFIED SYSTEM



Patent Pending

MADE IN USA

The *ZEUS*™ Access System includes six interchangeable parts: two septic tank adaptors, three risers and a lid. The patent pending interlocking system makes this Zabel product resistant to unauthorized entry and provides protection from ground water infiltration.

The *ZEUS*™ Access System is designed to fit other *ZEUS*™ Systems such as: Filtered Pump Vaults, Pump and Discharge Systems, and Alarm and Control Systems to make complete STEP system packages.

Look for the *ZEUS*™ trademark to ensure quality.

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