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C-Series Installation Manual

Smart. Simple. Reliable.

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IMPORTANT WARNINGS

Your safety and the safety of others is very important.

Read this manual completely before beginning. It is NOT intended to be a step by step field instruction manual. Prior knowledge of septic system installation and operation is required.

The procedures outlined in this manual must be conducted by Licensed/Registered Septic System Contractors who have been certified by Eliminite (**contact us for class dates and availability**). Only Licensed Installers and Licensed Electricians should install the Eliminite® system. The homeowner should not attempt these procedures. Licensing and Registration requirements will vary; contractors **must** satisfy all laws and regulations pertaining to septic system installation in their jurisdiction.

To reduce the risk of illness, severe injury or death, read and follow all warnings and safety instructions. Failure to comply with warnings and safety instructions may lead to illness, severe injury or death.

These procedures must be conducted in accordance with National Electric Code, all local codes or, in the absence of a local code, all requirements of the government and/or regulatory authority having jurisdiction with a valid permit issued by state or local authority.

Electrical power must be turned off and locked out before opening any part of the system. Only a Licensed Electrician should wire and energize electrical components.

Never begin any excavation without first contacting the local underground utility locating service and having all utilities located and identified.

Open tanks represent a serious hazard that could result in severe injury or death. Never leave an open tank unattended. **All hatches, accesses, lids and manways must be sealed and secured at all times to keep unauthorized persons from deliberately or inadvertently entering or falling into any tank.**

Open trenches, holes, pits, etc. represent a serious hazard that could result in severe injury or death.

Contact with wastewater can cause illness, infections and parasitic infestations. Biological organisms that can cause severe illness and death may thrive in the wastewater environment.

Never enter any tank—drowning is a significant hazard. Wastewater systems may contain potentially explosive or asphyxiating gases.

Maintenance Providers, Installers and Contractors must comply with all applicable OSHA regulations.

Keep all body parts from under the unit especially when lifting. Use equipment currently sized for the weight being lifted.

Do not use system for any purpose other than its intended use.

Always prevent debris, dirt, gravel, sand and foreign materials from entering the Eliminite®, septic tank, pipes or pump chamber. Failure to keep debris out of the system may lead to malfunction.

Septic System Contractor or Owner must have a valid permit issued by the Local or State Health Department prior to beginning installation.

Eliminite® components are extremely flammable. DO NOT use open flames, torches, welding units etc. in, around or near unit.

Read and obey all warnings included with specific components including pump, control panel, PVC Solvent, and PVC Cement.

Pumps and Floats must be installed such that pumps remain submerged at all times.

INTRODUCTION

The Eliminite® system is delivered as a complete, pre-manufactured package which includes the Eliminite® unit, recirculation pump, control panel, Lung® and MetaRocks®. Installing the Eliminite® as a septic system component should not significantly increase overall installation time. This installation guide is intended for residential applications only. Please contact your Authorized Eliminite® Distributor for special instructions on multi-unit residential and commercial systems.

Because you, the licensed installer, play such an integral role in the success of the Eliminite® system, Authorized Eliminite® distributors, engineers and experienced customer service representatives are available to assist you throughout the installation process.

PLEASE NOTE: As environmentally aware manufacturers and innovators, we continually strive to improve and refine our systems to better meet our clients' needs. Consequently, some descriptions, diagrams and photographs may not precisely match your delivered product. Most refinements will result in enhanced performance or simpler installation, but please contact us immediately if you have questions relating to any discrepancy you observe between your system and the systems we've depicted and described in your manual.

SYSTEM OVERVIEW

SECTION A: Process & component description

TREATMENT PROCESS: Wastewater from the home drains into the building sewer and enters the septic tank. Inside the septic tank solids settle to the bottom and fats, oils and grease (FOG) float to the top. As the solids settle and FOG floats, a third, middle layer develops, referred to as clarified effluent. The clarified effluent drains to the Eliminite C series tank. When the liquid level in the pump chamber rises enough to lift the Eliminite® low level cutout float switch, the timer in the control panel is activated. The low level cutout float is a safety feature that prevents the Eliminite® pump from running when there is not enough liquid in the tank. The Eliminite® pump is turned on and off by the timer in the control panel according to factory settings. When the Eliminite® pump is turned on by the control panel, liquid is pumped from the bottom of the C-series tank and sprayed over the MetaRocks® media contained in the Eliminite tank. At the same time, a portion of the liquid is returned back to the septic tank and fresh air is pulled into the system by the patented Lung® air entrainment device.

Inside the Eliminite®, clarified effluent trickles over the MetaRocks® where the first step in the treatment process takes place. Microorganisms naturally present in the wastewater attach to the surface of the MetaRocks®. As wastewater trickles over these microorganisms it will be utilized as a food source. The result of this "bioremediation" activity is a reduction in the concentration of undesirable components in the wastewater. The second step in the treatment process occurs after the wastewater has trickled through the Eliminite® and is returned to the septic tank. Inside the septic tank, the liquid exiting the Eliminite® unit is introduced to a different set of microorganisms with the ability to remove constituents that could not be removed by the first step alone. This cycle repeats and establishes a circulation between the septic tank, pump chamber, MetaRock® media, and back to the septic tank. As more wastewater from the house is discharged to the septic tank and the liquid level in the system rises, treated effluent is sent to the drainfield. Microorganisms naturally present in the soil complete the treatment process.

METAROCKS®: MetaRocks® unique physical characteristics make them an ideal medium for growing and maintaining microorganisms. With long term effective porosity of over 50% and ample long term surface area, MetaRocks® are a huge improvement over other types of tricking filter media.



View Inside Eliminite showing MetaRocks and spray nozzle

FIGURE 1

Natural, sand-coated surface provides ideal environment for biofilm growth.



MetaRocks close up view

FIGURE 2

Large open pores allow free movement of air and greatly reduce clogging potential.

LUNG: Operated by the same pump that delivers wastewater to the Eliminite®, the Lung provides fresh air to the Eliminite®. The Lung is driven by the pressure of flowing liquid. Each time the effluent pump is activated, air drawn into the distribution pipe from the previous cycle is discharged directly into the Eliminite®. When the pump is turned off by the control panel, the distribution pipe drains by gravity back to the pump chamber and fresh air is pulled into the distribution pipe. This sequence repeats each time the Eliminite® receives wastewater. The Eliminite® C-series Lung® has the added benefit of a venturi component which draws fresh air into the system while the Eliminite pump is running in addition to the process described above.

FLOAT SWITCH: The float switch is an electrical switch operated by a float in a tank or reservoir that typically controls the operation of another electrical component such as a pump or timer. As part of the Eliminite® system, float switches serve three purposes:

1. Disable the Eliminite® pump if the liquid level in the pump chamber is too low.
2. Control operation of drainfield/discharge pumps.
3. Activate high level alarm if the liquid level in the pump chamber is too high.

Component Description (cntd.)

CONTROL PANEL: Each Eliminite® system includes a Dual Pump Control Panel to operate the Eliminite® pump and the drainfield pump. The panel is equipped with a Siemens Logo Controller that is configured to manage the Eliminite® pump run cycles and to track elapsed run time and number of starts for both pumps. The controller will also activate a visual and an audible alarm in the event of a system malfunction. An automatic telephone dialer or a wireless alarm notification is available as a control panel option, but is not required on basic Eliminite® models. A current sensing module in the panel triggers an alarm if the Eliminite® pump malfunctions.

ELIMINITE® PUMP: A Hydromatic OSP 50 is the standard pump supplied with each Eliminite®.

DRAINFIELD PUMP: A drainfield pump is also required for pressure dosed systems. The drainfield pump IS NOT included in the standard C-Series package due to the widely varying requirements of this pump. Contact your design engineer, Eliminite distributor, or Eliminite, Inc. for assistance in sizing and obtaining the proper drainfield pump

SECTION B: Preparing for the installation

Please read this installation guide completely and follow it carefully. The guide is designed to save you time and effort and help ensure your safety and the optimum performance of the Eliminite®.

This manual is directed at skilled, Eliminite® Certified, licensed and experienced septic system contractors and is not a “how-to” manual for first time or novice installers. If you are not an Eliminite® Certified installer, you are not authorized to install an Eliminite® system.

Drainfield installation, connections, components and operation will not be addressed in detail in this manual. This manual focuses on installation of the Eliminite® system only. For information on other septic system components, contact your local health department or Eliminite® distributor. Some state laws require that advanced systems such as the Eliminite be covered under a maintenance contract. The contractor is required to discuss maintenance with the owner and completed documents to the maintenance provider.

Before you begin, take inventory of your system components. You should have the following:

- Eliminite® with MetaRocks®
- Hydromatic OSPSO effluent pump
- Control Panel
- Air pump (optional)
- Lung (installed inside the Eliminite®)
- Float switches (number of float switches varies depending on the type of system being installed; there are four float switches for most applications)
- Three sets of multi-part forms
- A valid permit from your local health department to install an Eliminite® system

Thoroughly inspect the Eliminite® for damage. Report any damage immediately to your Authorized Eliminite® Distributor. Make sure you have the model and serial numbers available for reference. Also, any discrepancies, or product defects, should be noted on both the driver's bill of lading and the packing list. Compare the serial number on the unit with the serial number on this manual; they should match. If they do not match call your distributor before installing the Eliminite®.

Determine if your permit has predefined locations for the Eliminite®, septic tank, pump chamber and drainfield. If these components do have predefined locations, install the components in those locations and according to those instructions. Otherwise, select a location complying with the regulations in effect in your jurisdiction.

Keep in mind that the lids for the septic tank, pump chamber and Eliminite® must be installed at finished grade and fully accessible without a shovel. The system should NEVER be installed under a driveway or other structure. Please note that a common error for inexperienced installers is to bury the lids for the septic tank, pump chamber and Eliminite®--**this voids the system warranty and will be a major obstacle to system maintenance.**

Create a simple schematic sketch detailing the locations of the Eliminite® unit, septic tank, control panel and drainfield before beginning the installation. Include distances from identifiable surface features. **This schematic sketch is an important step in the installation process and may be used as the basis for your as-built drawing.**

The 4" inlet to the Eliminite® C-Series tank must be slightly lower than the outlet from septic tank to allow for gravity flow of liquid from the septic tank to the Eliminite®. **Failure to plan for and achieve proper drainage from the unit will result in system malfunction.**

Plan installation of the system for a period during which dry weather conditions are expected.

Special considerations are necessary if installing an Eliminite® in an area of high groundwater. Contact your distributor to discuss options. Semi-custom Eliminite® models are available which, depending on the depth to groundwater, may better suit your site.

C SERIES INSTALLATION PROCEDURE

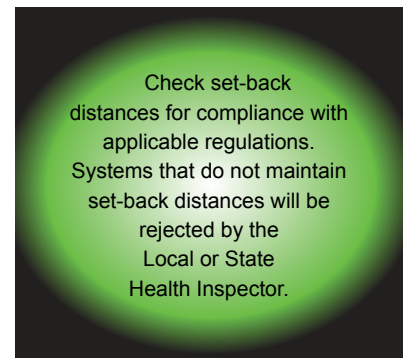
SECTION C: Key component locations and site excavation

Step C.1: Determine the locations for the septic tank, pump chamber, drainfield and Eliminite® using the schematic you created in Section B as a guide. Keep in mind that the system's lids must be accessible without digging. No part of the system should be installed under a driveway or structure. Lay out system piping, taking care to avoid conflicts and damage to underground utilities. Make certain utility locations are recently and clearly located and marked.

Step C.2: Determine a location for the control panel. Find or build a suitable location for the control panel. Do not install it on or near a location where people will be disturbed by the sound of the motor contractors engaging. Make sure the audible and visual alarms will not be obscured from plain view of the occupants or maintenance personnel.

Step C.3: Mount the control panel in the location determined in Step C.2 using the screws provided. The control panel requires two separate circuits from the main service panel. One is for the pump(s) circuit and the other supplies power to the alarm circuit. If two separate circuits are not supplied to the panel the possibility of failure is increased and **warranty may be voided.**

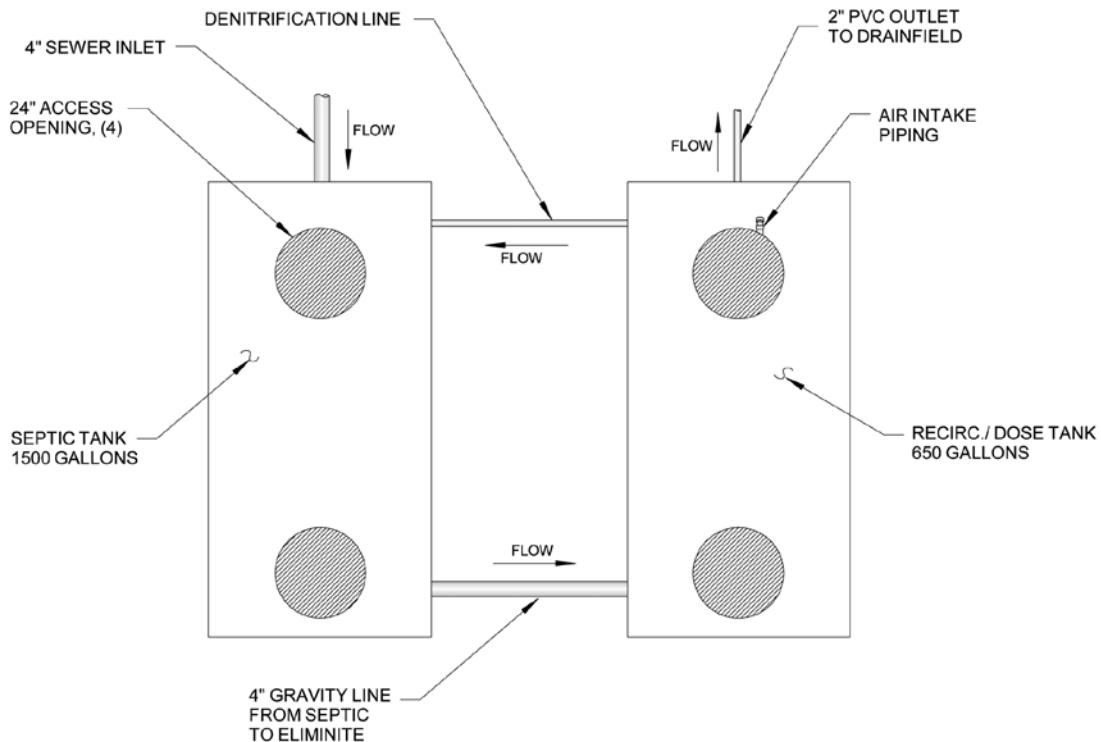
Step C.4: Excavate to the proper dimensions for all of the components of the system. Separate the topsoil from the subsoil and maintain in separate piles. Make sure that the bottom of each excavation is free of debris, especially rocks and other sharp objects. If the bottom of the excavation is uneven, lay a bed of sand, pea gravel or clean soil and compact the material to create an even, smooth surface with a firm and stable foundation. If components settle, system failure may occur. Verify that the excavation site for the Eliminite® is approximately 24 inches wider and 24 inches longer than the footprint of the Eliminite® on all sides and excavate to the required depth. Verify tank elevations to ensure that the invert out of the septic tank is above the invert of the Eliminite® inlet so liquid will flow freely from the septic tank into the Eliminite® tank.



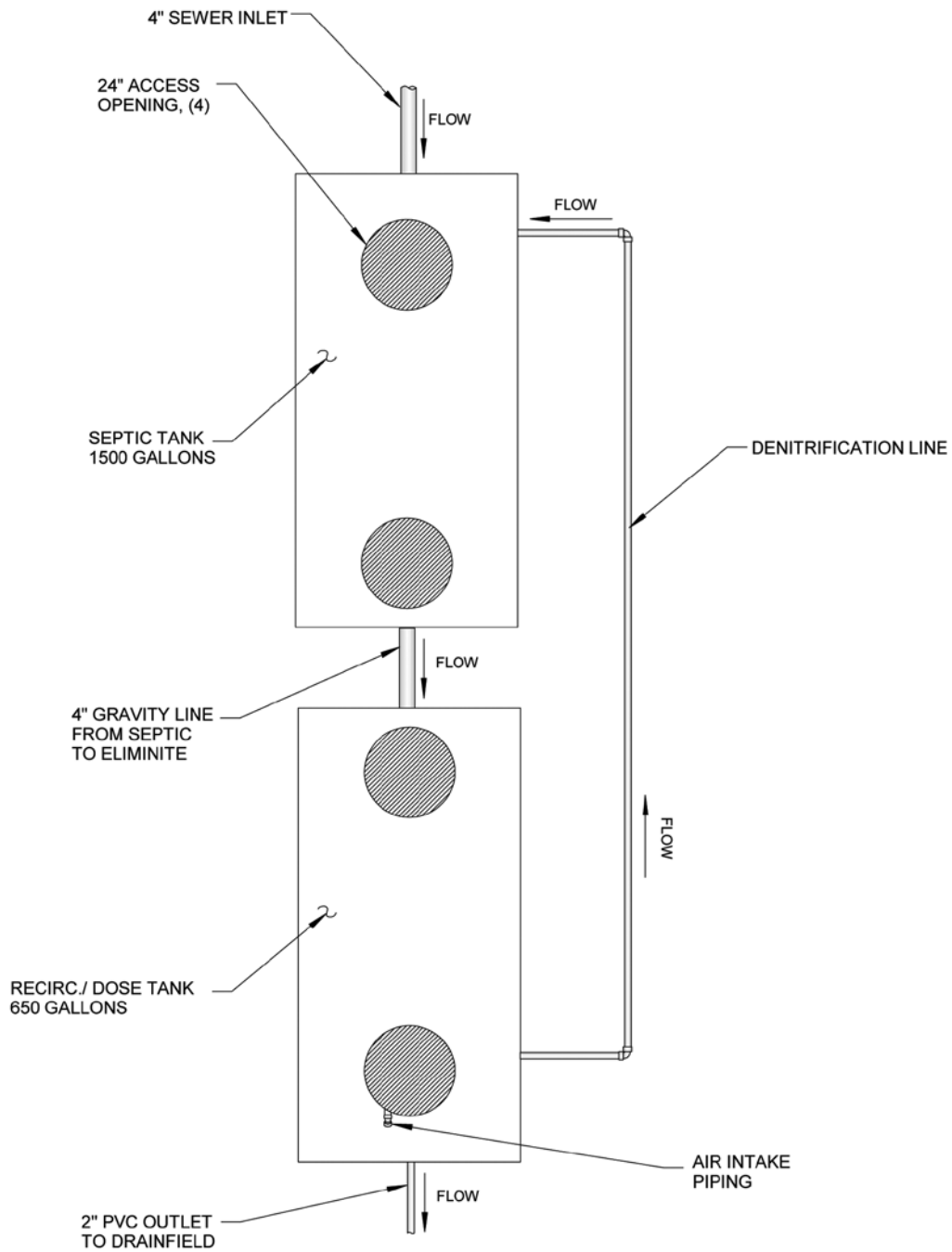
SECTION D: Unload, set and connect Eliminite® and septic tanks

Step D.1: The Eliminite® C-Series tank and septic tank should arrive from the concrete precastor/distributor on a truck capable of setting both tanks in the excavation. If the tanks are not placed in the excavation by the delivery truck, a crane or excavator will be required to set the tanks. The Eliminite tank and septic tank can be placed side-by-side or end-to-end depending on the site and owner preference. Make sure the excavation is of the proper length, width, and depth to accommodate both tanks in their final locations. Both tanks must be properly bedded to prevent damage to the tank and settling. Follow all applicable regulations and recommendations from the tank manufacturer.

Step D.2: Make the connection between the septic tank and the building sewer. Make the connection from the 4" septic tank outlet to the 4" Eliminite® inlet. Install the 1" filtrate return line from the 1" union on the Lung® to the inlet end of the septic tank. Make certain that the 1" line will drain after each dose to prevent freezing, either to the septic tank or back to the Eliminite® tank. Refer to Appendix A for proper procedures for solvent/cement welding PVC pipe.



Side by side Option



End to End Option

SECTION E: Attach float switches, connect pump discharge and pump chamber wiring

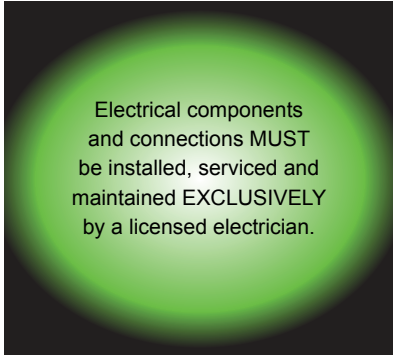
Step E.1: Attach the floats to the float support bracket in the manner shown in the drawings. Elevations for the floats should be established by the system designer/engineer. Confirm that the Eliminite® low-level cutout needs to be above the floor of the pump chamber when the floats are installed. This ensures the Eliminite® pump remains submerged at all times. If 17" is insufficient to accomplish this you must contact your distributor for instructions.

Step E.2: Install the drainfield pump (if required) in the pump chamber. Connect discharge piping.

Step E.3: If splicing is necessary it must be completed within a waterproof/vapor-proof junction box. Connect all wiring in the junction box within the chamber.

Step E.4: Run electrical conduit from the junction box to the control panel. Solvent/cement weld all conduit joints. Run electrical conduit from the flow switch port on the Eliminite® and connect it to the conduit that runs to the control panel. A suitable, permanent vapor barrier must be installed inside all conduit to keep corrosive gasses from traveling through the conduit and coming in contact with electrical components and connections. Direct bury wire may be used in lieu of conduit if allowed by local codes.

Step E.5: Install necessary wiring for the pumps to the control panel from each of their respective locations. Label wires using the labeling conventions shown in the drawings. Refer to pump manufacturer's electrical specifications to determine correct wire sizes. Voltage drops at the pump should not be more than 2% of the pumps rated voltage. Use larger gauge wires for distances over 100 feet to prevent voltage drop.



Electrical components and connections **MUST** be installed, serviced and maintained **EXCLUSIVELY** by a licensed electrician.

SECTION F: Install Eliminite® air inlet piping

Step F.1: Install a riser on the pump chamber access opening. Solvent/Cement weld the air inlet check valve assembly into the 1 1/2" union on the Lung® in the desired direction and extend the 1 1/2" piping from the air inlet check valve through the riser..

Step F.2: Fresh air must be drawn into the system via the 1 1/2" piping through the riser with each cycle of the Eliminite® dose pump. Bed the end of the pipe in at least 5 cubic feet of gravel lined with Mirafi 140N filter fabric or equivalent, and/or extend the pipe into a plastic valve box or sprinkler box extending to the surface. If the tanks are backfilled with washed rock or gravel, the pipe may be plumbed so that it terminates in the gravel backfill. Make sure that the pipe inlet cannot be clogged by dirt, standing water, or ice as this will cause the system to malfunction. The check valve on the air inlet piping is marked with "This Side Up". Make certain that the check valve in the correct position.

SECTION G: Backfill

Step G.1: Be sure all piping is correctly bedded before beginning final backfill. Improperly bedded pipe may settle and break, resulting in a complete system failure.

Step G.2: Backfill the excavations using subsoil first, taking care that large rocks do not damage components. Do not compact the soil. Note: Rather than compacting the soil around the tanks, which reduces the soil's usefulness as an insulator, mound the excavations so that the soil consolidates naturally. (This note does not apply to the pipe bedding or tank foundations.) Pipes and tanks must be supported from the bottom up so they are not damaged by settling.

EXCAVATION PARAMETERS

Follow OSHA regulations for tank excavations. Collapse of excavation walls could result in death or serious injury.

GENERAL

The installing contractor must take all precautions necessary to protect employees working in or near a tank excavation. These precautions should include but are not limited to the following: Locate and protect any utility installations near the excavation before opening the excavation. Secure the walls of the excavation. Prevent exposure of employees to hazardous fumes from the excavation. Protect employees from hazards associated with water accumulation in the excavation. Erect barricades, etc, to prevent unauthorized vehicle or pedestrian traffic. Inspect, a minimum of once a day, the excavation and surrounding area. For additional information on excavation, trenching and shoring safety practices, consult the following OSHA standards: Part 1926, Subpart M (Fall Protection), 500-503; and Part 1926, Subpart P (Excavations), 650-652.

SECTION H:

Complete control panel connections and drainfield

Step H.1: Connect the labeled wires to the terminal blocks in the panel as shown in the drawings and included with the control panel.

Step H.2: Before testing can be conducted it will be necessary to complete the remaining septic system installation. Once the entire system has been built, plumbed and wired, proceed to Section I

SECTION I: System start-up

Step I.1: Remove the Eliminite® pump chamber cover. Add clean water to the pump chamber until the water level is above the low-level cutout float when it is in its elevated position.

Step I.2: Switch breakers at the main service panel supplying the control panel 'ON'.

Step I.3: The control panel is energized, be careful not to touch electrical components. Turn the breakers on the left side of the control panel 'ON'.

Generally this error arises when the electrician or installer fails to label component wires properly and makes incorrect connections to control panel terminals. Improper wiring has the possibility of damaging the control panel. It can also cause the entire septic system to cease operation and backup into the household. Any improper wiring or improvisation to the wiring diagram (even if it works) will void the system warranty. If damage occurs to any component of the system or household, which is caused by incorrect wiring, the contractor and/or licensed electrician will be held responsible for all costs and repairs.

Step I.4: Switch the Eliminite® pump (i.e. pump 1) toggle to 'HAND'. The Eliminite® pump should start and begin pumping water. Listen for the sound of water flowing. If you do not hear water moving through the system, check the breakers and switches. If, after checking, water is not being pumped in the unit, refer to the [Troubleshooting Section](#). Allow the pump to run for approximately one minute. Do not let the Eliminite® pump run dry. Switch the Eliminite® toggle 'OFF' and turn control panel breakers 'OFF'.

Step I.5: Switch breakers located on the left side of the panel 'ON'. Switch the Eliminite® pump toggle to 'AUTO'.

Step I.6: The controller starts the timer in the “pump off” position. Take note of the time. 12 minutes should elapse after the toggle is set to 'AUTO' before the Eliminite® pump is turned on by the control panel. Once the Eliminite® pump starts, note the time again and verify a one minute run time. Allow the cycle to continue. While waiting for the Eliminite® pump to run again complete Steps I.8 and I.9.

Step I.7: Lift the high level alarm float and verify that the high level alarm is activated.

Step I.8: All floats need to be lifted concurrently from the bottom up. You have to hold up the Low level cutout float AND the Off float before the On float will activate.



WARNING: ELECTROCUTION HAZARD
DO NOT lift floats with your hands or with anything that conducts electricity.
Use a non-conducting pole.

Step I.9: When 12 minutes have elapsed and the Eliminite® pump starts, check for vigorous spray emitting from the spray nozzles.

Step I.10: Visually confirm flow into the septic tank from the Eliminite® drain 1” recirculation line..

Step I.11: Push the low level cutout float down as far as it will go. Confirm that the Eliminite® pump shuts down.

Step I.12: The purpose of this step is to measure and record the time it take for the drainfield pump to deliver one dose volume (one cycle between the 'ON' and 'OFF' floats) to the drainfield. With the Eliminite® toggle 'OFF' and the drainfield pump toggle set to 'AUTO', begin filling the pump chamber with clean water. When the liquid level rises to the point that the 'ON' float is triggered and the drainfield pump starts, begin timing to the nearest second and remove the water source from the tank. Record how long the pump runs from the time it started to when it triggers the 'OFF' float and stops. This information will be used by the maintenance provider to assess the long term operation of the system.

SECTION J: Prepare “As-Built” drawing

Step J.1: On the 3-part form provided, hand sketch an “As-Built” of the system in relation to nearby structures. The drawing must show tank and pipe locations, electrical conduit, drainfield or connection to off-site discharge. The “As-Built” does not have to be computer generated but must identify and dimension the components of the system and make it easy to locate them in the future. A sample “as-built” is provided in Appendix B (press firmly on 3-part form and use ball point pen).

Step J.2: Fill in the checklist form completely. Where there is a request for information, do not leave it blank. The unit serial number is engraved on a tag affixed to the unit on the lip under the cover.

Step J.3: The White original copy should be mailed back to Eliminite—P.O. Box 359 Belgrade, MT 59714—in the pre-paid, self-addressed stamped envelope provided. The Yellow copy must be returned to the owner of system. **Failure to do so may result in delay or lapse in required monitoring, and the system warranty may be voided.** The Pink copy is for the installer’s records and must be retained for future reference.

SECTION K: Final steps

Step K.1: Place cover on Eliminite®.

Step K.2: Tightly seal and secure cover.

Step K.3: Fill septic tank to point of overflow into pump chamber with clean water.

Step K.4: If the liquid level in the pump chamber is above the Eliminite® pump low level cutout float, run the drainfield pump until the low level cutout is triggered. This will stop the Eliminite® pump from running until the system is used. If the liquid level in the pump chamber is below the low level cutout proceed to the next step. Inspect the entire septic system for leaks. Confirm that bedding requirements are met and verify that the overall general installation is correct and that the system functions properly.

Step K.5: Switch all breakers ‘ON’ and all toggles to ‘AUTO’. Close covers and secure control panel door. Finish final backfill, grading and site cleanup.

FINAL CHECKLIST

Complete the checklist on the 3-part form by circling Yes or No.

1. Is the unit damaged in any way? Yes _____ No _____
2. Is the electrical service on? Yes _____ No _____
3. Is the wiring properly labeled? Yes _____ No _____
4. Do the pumps and the alarm have separate circuits from the main breaker panel? Yes _____ No _____
5. Is the water supply available? Yes _____ No _____
6. Do the floats operate properly? Yes _____ No _____
7. Do the pumps operate properly? Yes _____ No _____
8. Is all piping sloped to drain? Yes _____ No _____
9. Are all components properly bedded and back filled? Yes _____ No _____
10. Is the Pump 1 toggle switch turned to 'Auto'? Yes _____ No _____
11. Is the Pump 2 toggle switch turned to 'Auto'? Yes _____ No _____
12. Is the system cycle of 1 minute on, 12 minutes off, functioning properly? Yes _____ No _____
13. Is the vapor barrier installed in the conduit as required? Yes _____ No _____
14. Are float elevations from the bottom of the tank recorded? Yes _____ No _____
15. Do the Eliminite spray nozzles emit a vigorous spray? Yes _____ No _____
16. Is the time elapsed between 'On' and 'Off' on the drainfield pump recorded? Yes _____ No _____
17. Are the counters reset to '0'? Yes _____ No _____
18. Are all lids, accesses and manways closed, secured and fully accessible? Yes _____ No _____
19. Is the septic tank filled to outlet with clean water? Yes _____ No _____
20. Is the system information completed? Yes _____ No _____
21. Is the maintenance agreement completed? Yes _____ No _____
22. Is the Eliminite unit, septic tank and pump chamber insulated with approved sub-grade insulation? Yes _____ No _____
23. Is the Maintenance Agreement completed and delivered to Certified Maintenance Provider as required by Local/State Regulations and system manufacturer? Yes _____ No _____
24. Did you discuss the Maintenance Agreement with the system owner? Yes _____ No _____

IMPORTANT REQUIRED INFORMATION

Owners Information

Name: _____

Street: _____

City: _____

State: _____

Zip code: _____

Telephone: _____

Fax: _____

Cell: _____

System Data

Eliminite® serial number: _____

Permit number: _____

Date of installation: _____

System Installer Information

Name: _____

Company: _____

Street: _____

City: _____

State: _____

Zip code: _____

Telephone: _____

Fax: _____

Cell: _____

Installation Address

Subdivision name: _____

Lot number: _____

Street: _____

City: _____

State: _____

Zip code: _____

Eliminite® serial number: _____

Permit number: _____

Date of installation: _____

Electrician Information

Name: _____

Company: _____

Street: _____

City: _____

State: _____

Zip code: _____

Telephone: _____

Fax: _____

Cell: _____

APPENDICES

Appendix A: Preparation of pipe surfaces and cement process for plastic pipe

Appendix B: Sample “As-Built” drawing

Appendix C: Materials and specifications

Appendix D: Bedding and backfill requirements

Appendix A– Preparation of pipe surfaces and cement process for plastic pipe

Joining plastic casing is a relatively simple process, but the integrity of the joint will be a function of the thoroughness of the joining techniques.

The materials and tools required include: (AWWA, 1981)

1. A fine-toothed saw.
2. A miter box.
3. A small knife, file, or beveling tool.
4. Fine-grained, abrasive paper.
5. Clean, dry cloth or paper towel.
6. Cleaner and/or primer capable of imparting color.
7. The proper solvent cement.
8. A natural bristle brush approximately half the diameter of the casing being joined or a specially designed applicator which may be included in the solvent cement container.

Preparation of the pipe surfaces and the actual cementing process should be accomplished as listed below (AWWA, 1981). Because solvents are highly flammable and their vapors may present a health hazard in enclosed areas, solvent cements should be used with care; avoid contact with eyes and skin and long-term breathing of vapors.

Step 1. Cut casing using a fine-toothed saw and a miter box to avoid rough or uneven cuts.

Step 2. Smooth the cut end with a knife, file, or sandpaper. Remove all burrs and cuttings.

Step 3. Clean the contact surfaces of the pipe end and socket with a clean, dry cotton cloth or paper towel. Grease must be removed with a cleaner recommended by the solvent cement manufacturer. Roughening the contact surfaces with abrasive paper aids in the development of a better bond.

Step 4. Check the fit of the sections to be cemented. A good “dry fit” should show the spigot end entering the socket to about one-half to two-thirds of its depth. Some manufacturers supply casing with marks to designate proper fit. Incorrectly dimensioned pipe, bell, or coupling shall not be used.

Step 5. If the casing is made of PVC, apply a primer to the inside surfaces of the socket. The primer may require more time to soften the belled end casing sockets than is necessary to prepare the sockets of a molded coupling.

Step 6. Primer shall be applied to the outside of the PVC casing (spigot) end to prepare it for joining. All surfaces to be cemented shall be coated with the primer.

Step 7. Apply a thin coat of solvent cement to the interior surface of the socket. The use of too much solvent could weaken the casing wall.

Step 8. Apply a uniform coat of solvent cement to the outside surface of the spigot end of the casing.

Step 9. Insert the spigot end of the casing section forcefully into the socket to the entire depth of the socket while both the inside socket surface and outside surface of the casing are completely coated with wet cement.

Step 10. Twist casing 1/8 to 1/4 turn then hold the socket and casing sections together for at least 15 to 20 seconds or until an initial set takes place.

Step 11. Wipe the excess cement from the socket. A properly cemented joint should show a bead of solvent cement around the entire circumference of the casing where it meets the socket.

Step 12. To insure a strong bond, a joint should remain undisturbed until an initial set is reached (TABLE 1).

TABLE 1. Solvent cementing of belled end casing. Approximate initial set times*

*Development of full operating strength requires curing periods about ten times longer than shown by this table.

Temperature	Pipe Diameter 1"-3" Set Time in Minutes	Pipe Diameter 4"-6" Set Time in Minutes
15° F to 40° F	7.5	15
5° F to 15° F	30	60
-20° F to 5° F	90	180

Appendix C: Materials and specifications

Eliminite® tank	Precast concrete tank with at least 3" thick walls reinforced with steel. Concrete must have a water/cement ratio of less than 0.45, a 28 day compressive strength of at least 4000 PSI, and must be made with sulfate-resistant cement with a tricalcium aluminate content of less than 8 percent.
Eliminite® pressure piping	PVC Schedule 40.
Eliminite® drain piping	PVC ASTM 3034 SDR 35.
MetaRocks®	Proprietary Lightweight engineered medium for growing microorganisms.
Standard Eliminite® pump	Hydromatic OSP 50, submersible effluent pump, voltage specified by user.
Control panel	Proprietary dual panel with Siemens LOGO! Control Center, UL Listed.

Appendix D– Bedding and Backfill Requirements

BACKFILL MATERIAL:

Eliminite tanks must be installed using either pea gravel or crushed stone as bedding and backfill material. If damage is detected, do not attempt repairs. Contact Eliminite, Inc. immediately. Telephone and fax numbers are found on the front cover of this manual. Using other than approved bedding and backfill materials without prior written authorization from Eliminite, Inc. will void the tank warranty. Use of unapproved backfill material may cause tank failure, or damage the tank or surrounding property.

Backfill material must meet the following specifications: The material is washed, free-flowing, and free of ice, snow and debris. When using pea gravel, the material is to be a mix of rounded particles, sizes between 1/8 inch and 3/4inch. The pea gravel must conform to the specifications of ASTM C-33, paragraph 9.1, sizes 6, 67 or 7. When using crushed stone, the material is to be a mix of angular particles, sizes between 1/8 inch and 1/2 inch. The crushed stone must conform to the specifications of ASTM C-33, paragraph 9.1, sizes 7 or 8. No more than 5% (by weight) of the material may pass through a #8 sieve. It is recommended that the materials supplier certifies that the material conforms to ASTM C-33 and any other applicable specifications. If material which meets these specifications is not available, contact technical support at Eliminite, Inc. for information on alternate materials and the process for approval.

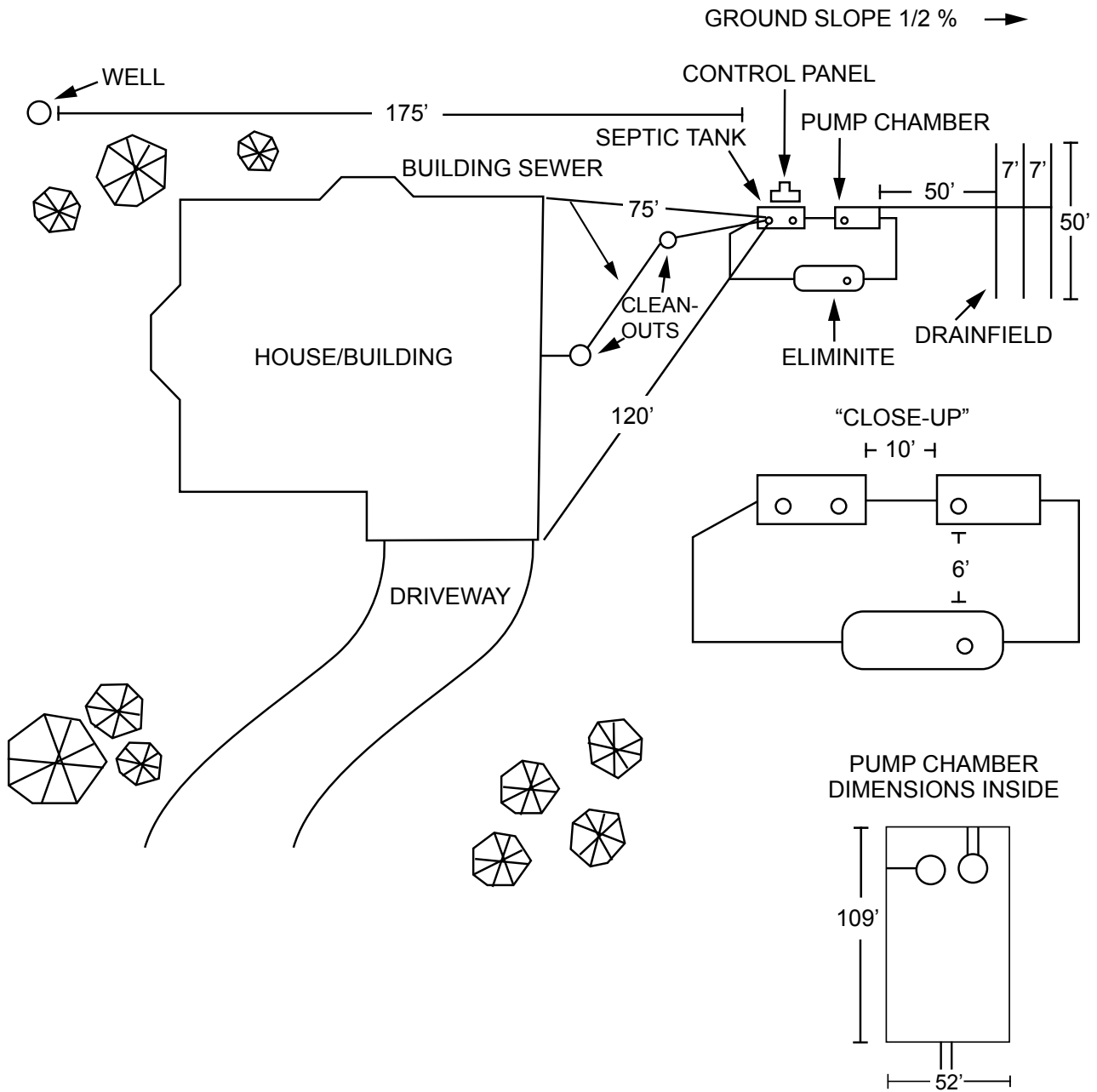
EXCAVATION PARAMETERS:

Follow OSHA regulations for tank excavations. Collapse of excavation walls could result in death or serious injury.

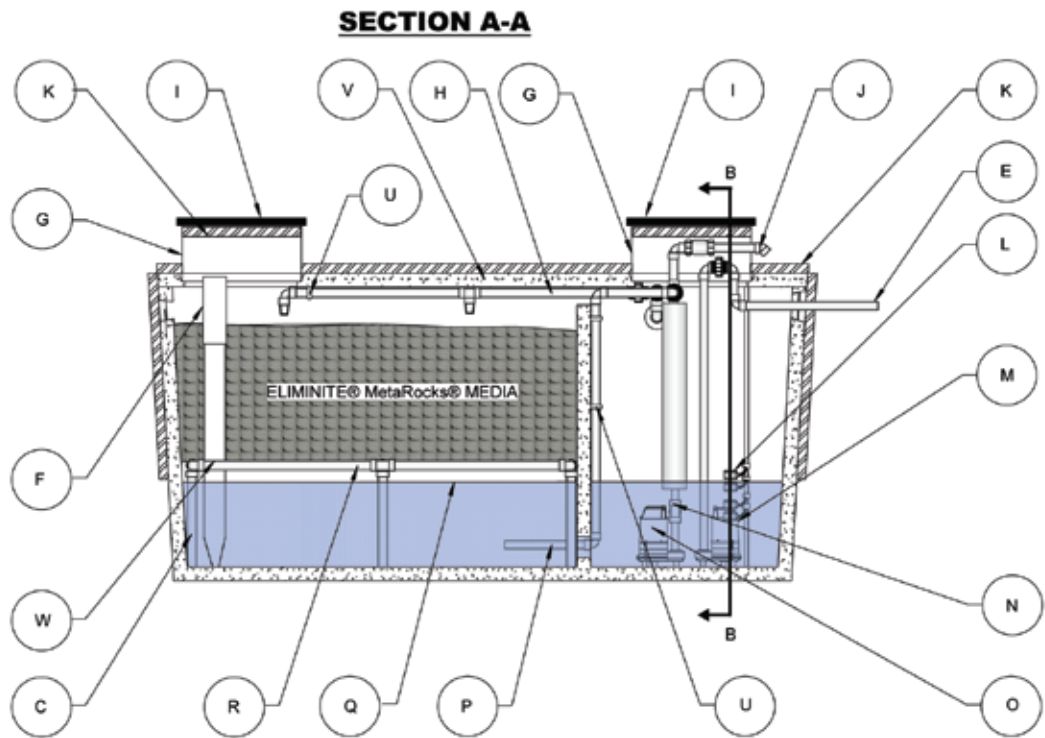
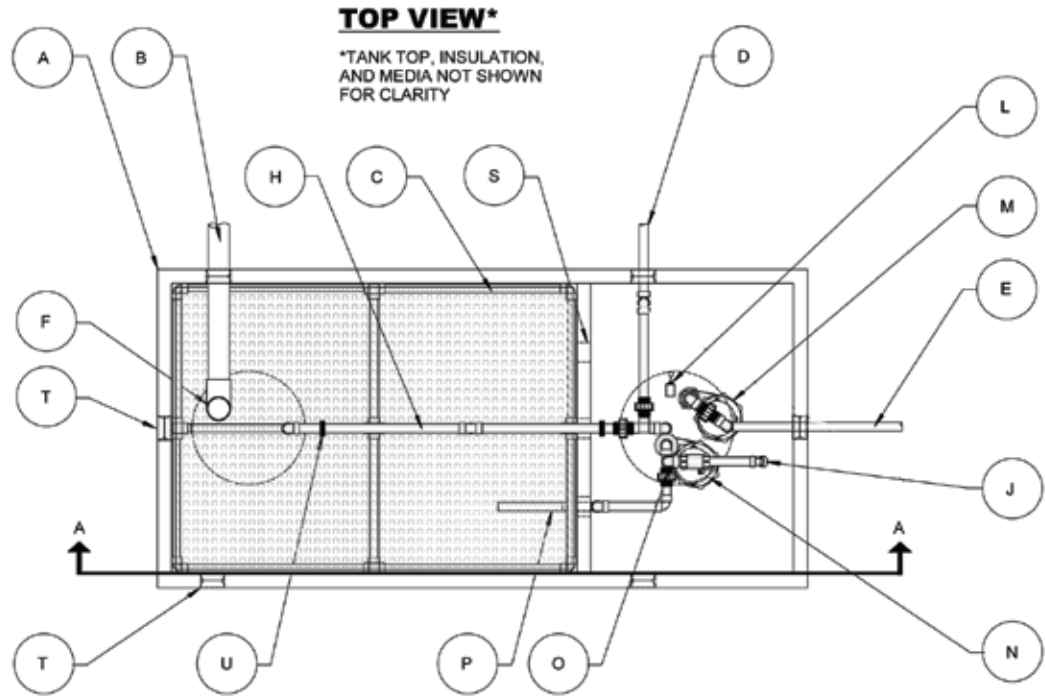
GENERAL:

The installing contractor must take all precautions necessary to protect employees working in or near a tank excavation. These precautions should include but are not limited to the following: Locate and protect any utility installations near the excavation before opening the excavation. Secure the walls of the excavation. Prevent exposure of employees to hazardous fumes from the excavation. Protect employees from hazards associated with water accumulation in the excavation. Erect barricades, etc., to prevent unauthorized vehicle or pedestrian traffic. Inspect, a minimum of once a day, the excavation and surrounding area. For additional information on excavation, trenching and shoring safety practices, consult the following OSHA standards: Part 1926, Subpart M (Fall Protection), 500-503; and Part 1926, Subpart P (Excavations), 650-652.

SAMPLE: As built drawing

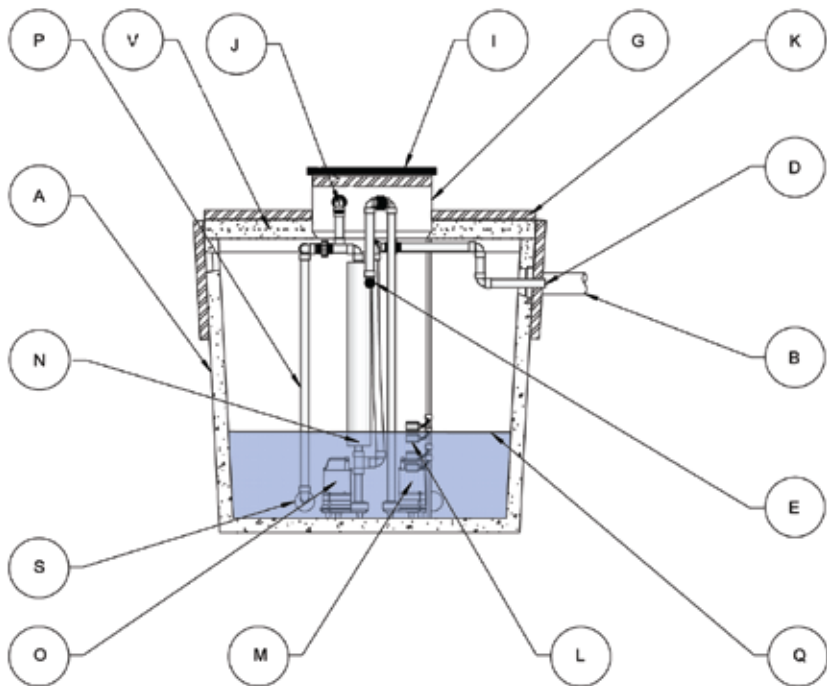


ELIMINITE® C-SERIES OVERVIEW

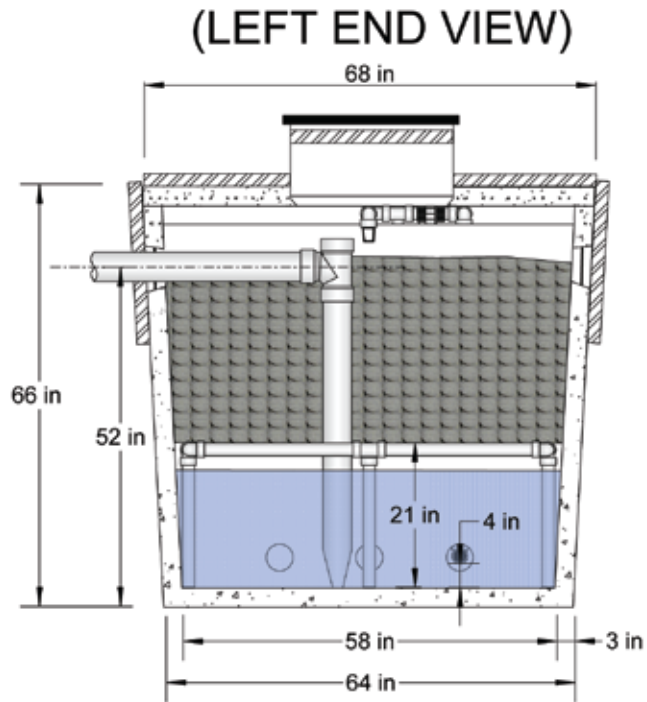


A	TWO-COMPARTMENT CONCRETE TREATMENT TANK
B	4" SCH 40 PVC INLET FROM SEPTIC TANK
C	MEDIA SUPPORT FRAME AND GRID
D	1" SCH 40 PVC DENITRIFICATION RETURN LINE TO SEPTIC TANK
E	2" SCH 40 PVC OUTLET TO DRAINFIELD
F	4" SCH 40 PVC SANITARY TEE
G	24" DIAMETER, 12" TALL PVC RISER, (2)
H	1 1/2" SCH 40 PVC SPRAY BAR ASSEMBLY
I	24" DIAMETER BOLT-DOWN RISER LID, (2)
J	LUNG® AIR INLET PIPING
K	2" THICK SUBGRADE INSULATION BOARD
L	DRAINFIELD PUMP CONTROL FLOAT SWITCH ASSEMBLY
M	DRAINFIELD PUMP (MODEL VARIES)
N	ELIMINITE® DOSE PUMP - HYDROMATIC OSP50
O	ELIMINITE® LUNG® PROPRIETARY AIR ENTRAINMENT ASSEMBLY
P	1 1/2" SCH 40 PVC LUNG® AIR INJECTION PIPE, SECURED TO BAFFLE WALL
Q	RECIRCULATION TANK LIQUID LEVEL
R	PVC MEDIA SUPPORT FRAME
S	4" DIAMETER BAFFLE WALL PORT, (3)
T	POLYLOK TANK SEAL OR EQUIVALENT, (6)
U	1 1/2" PIPE CLAMP, (4)
V	CONCRETE TANK TOP
W	GEOGRID PENETRATION FOR INLET FROM SEPTIC TANK

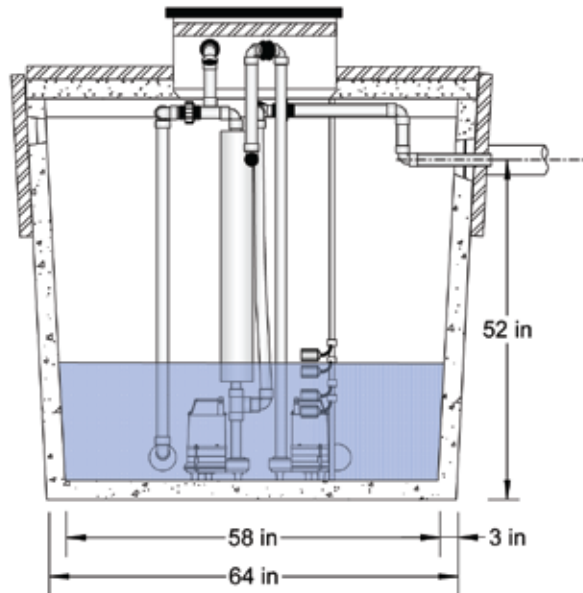
SECTION B-B



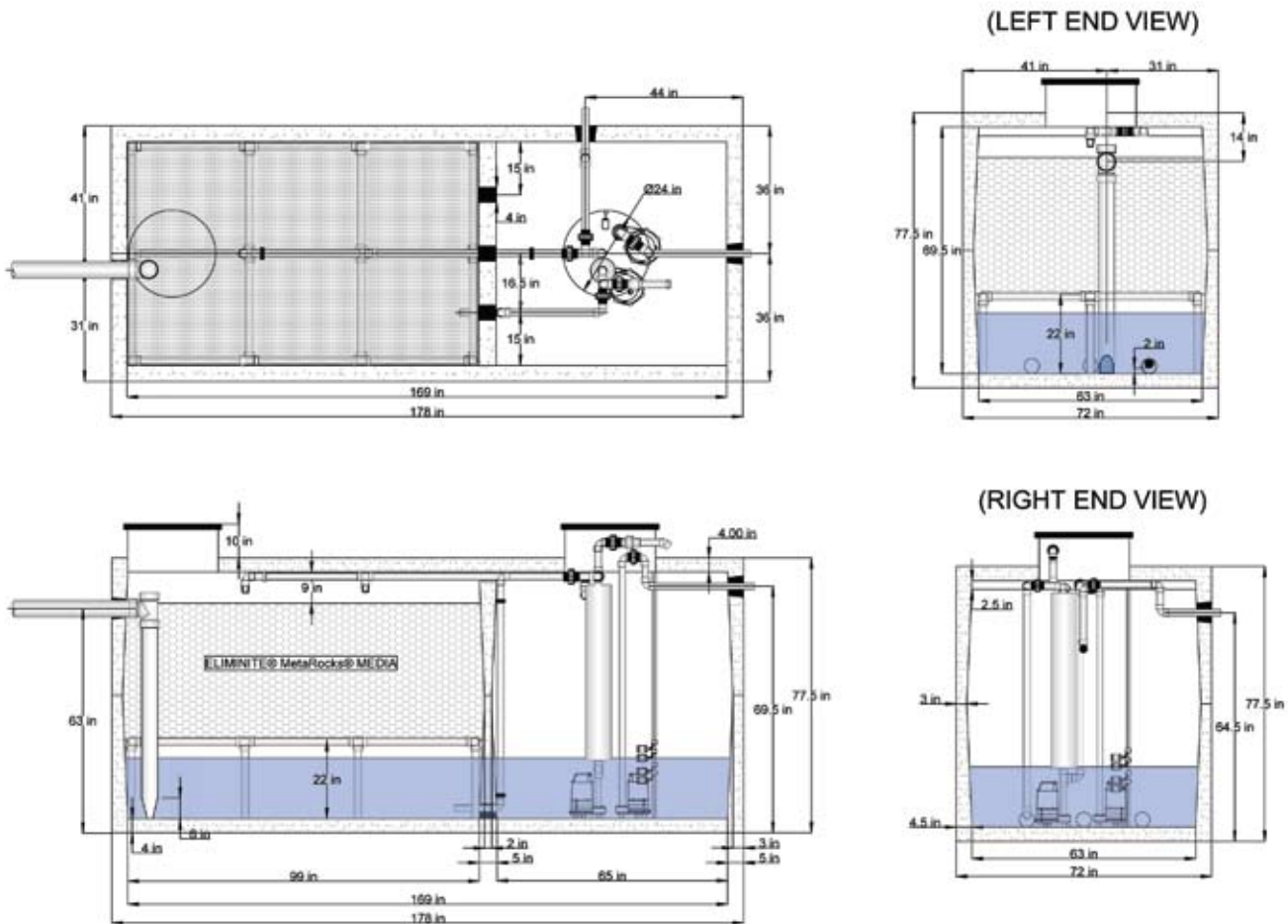
Eliminite Model 120C Dimensions



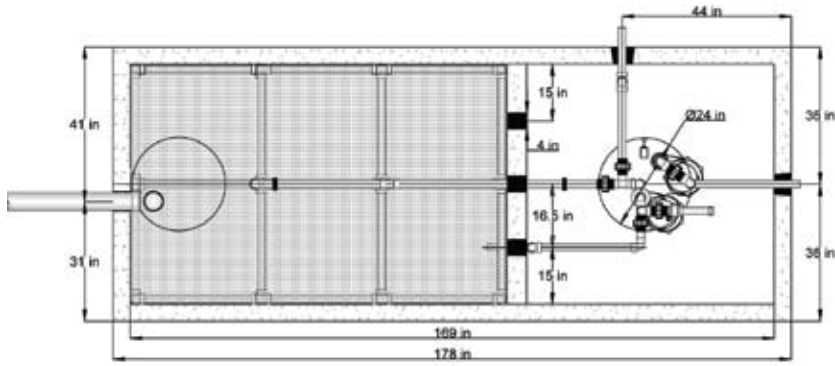
(RIGHT END VIEW)



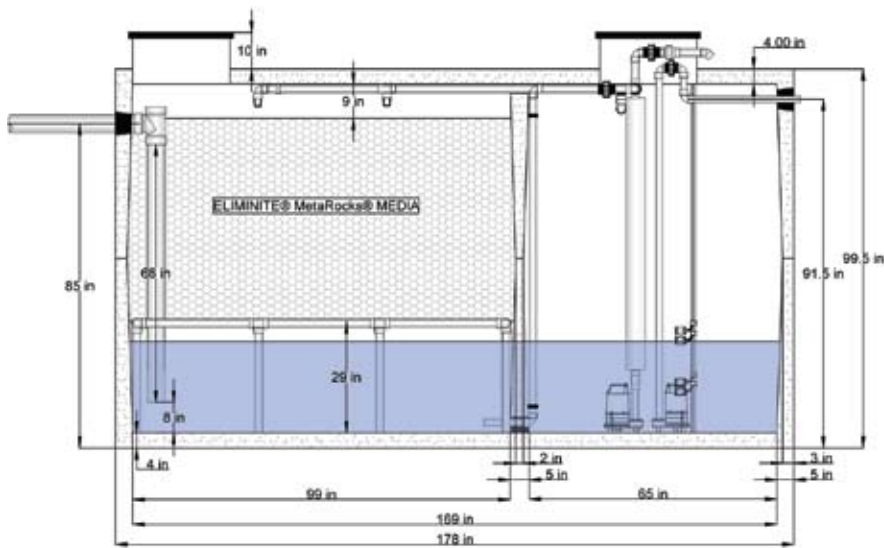
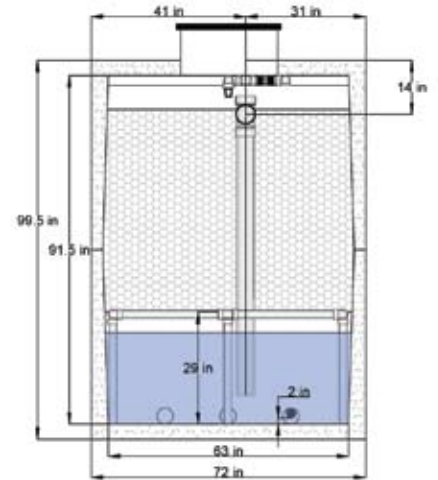
Eliminite Model 220C Dimensions



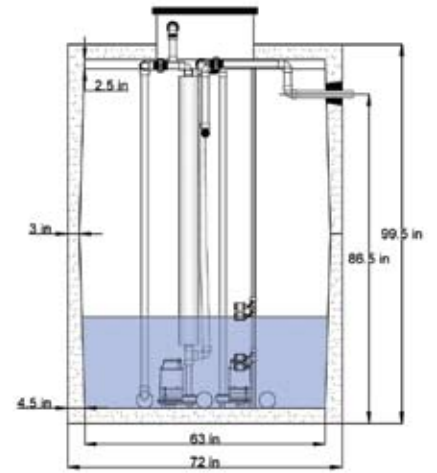
Eliminite Model 320C Dimensions



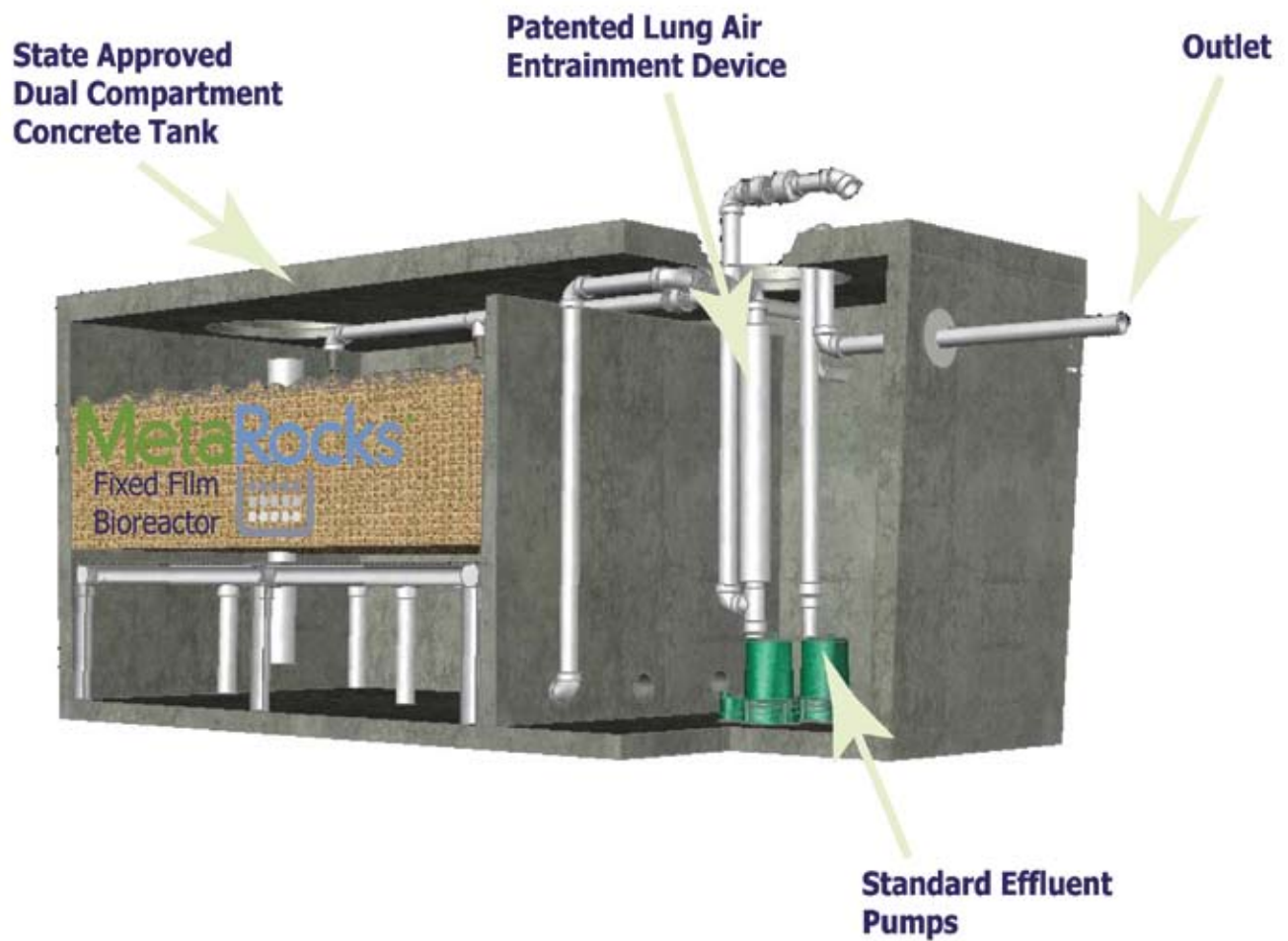
(LEFT END VIEW)



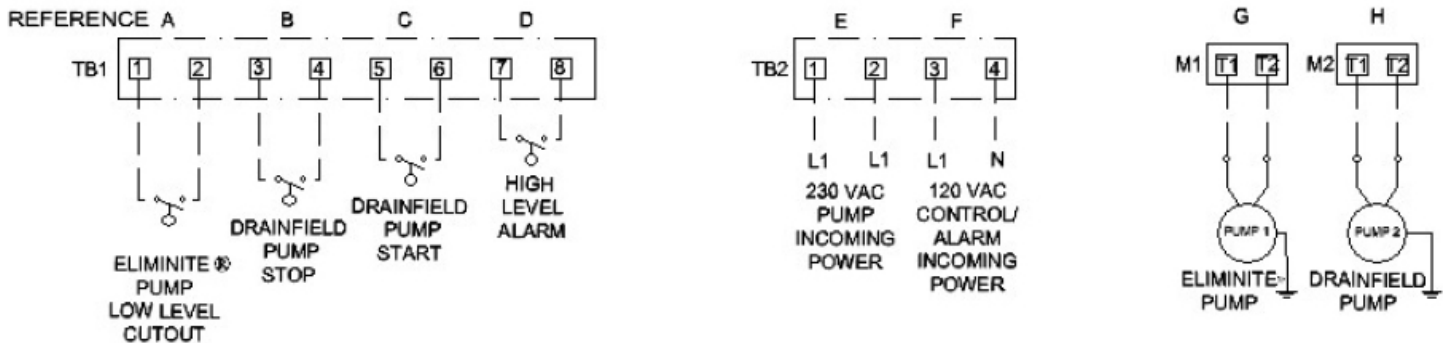
(RIGHT END VIEW)



SAMPLE: Eliminite C-series cut-away view



Duplex Control Panel Standard Series



COMPONENT/FUNCTION	TYPE	LOCATION	CONTROL PANAL CONNECTION	REF
HIGH LELEL ALARM	FLOAT	PUMP CHAMBER	TB1 7 & 8	D
DRAINFIELD PUMP START	FLOAT	PUMP CHAMBER	TB1 5 & 6	C
DRAINFIELD PUMP STOP	FLOAT	PUMP CHAMBER	TB1 3 & 4	B
ELIMINITE®PUMP LOW LEVEL CUTOUT	FLOAT	PUMP CHAMBER	TB1 1 & 2	A
ELIMINITE®PUMP	OSP 50 PUMP	PUMP CHAMBER	M1 T1 & T2	G
DRAINFIELD PUMP	VARIES	PUMP CHAMBER	M2 T1 & T2	H
230V INCOMING	PUMP CIRCUIT		TB2 1 & 2	E
120V INCOMING CIRCUIT ALARM	CIRCUIT ALARM		TB2 3 &4	F



1. (TB1) TERMINAL BLOCK
2. (TB2) TERMINAL BLOCK, INCOMING POWER
3. M1 & M2 PUMP MOTOR CONTRACTORS
4. SIEMENS LOGIC CONTROLLER.TIMER
5. PUMP CURRENT SENSOR
6. CIRCUIT BREAKERS



Eliminite®



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