

Tips for Vacuum Testing Septic Tanks

Onsite Wastewater Super Conference of Pennsylvania 2024

Monday February 5th, 2024

Claude Goguen, PE, National Precast Concrete Association

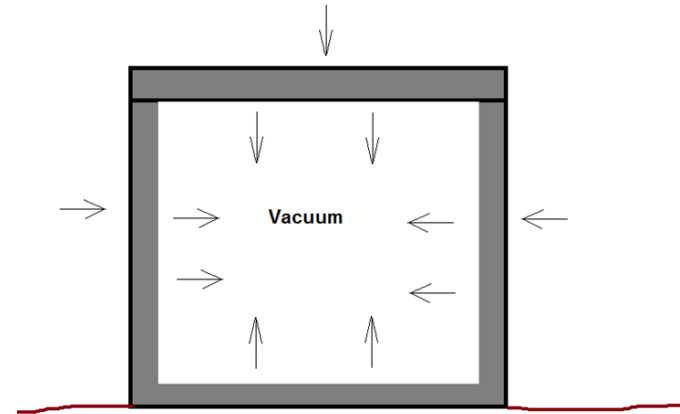


Watertightness Testing

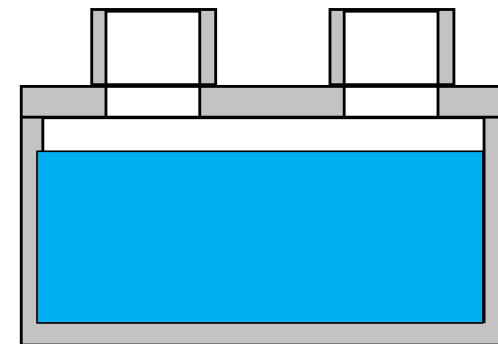


Watertightness Testing

Vacuum testing



Hydrostatic Testing



ASTM Specification References

- ASTM C 1227, Section 9
 - Watertightness in septic tanks
- ASTM C 1613, Section 9
 - Watertightness in gravity grease interceptors
- ASTM C 1719-11
 - Watertightness precast concrete tanks

Watertight Testing – Hydrostatic

Hydrostatic Test per ASTM C 1227

9.2.2 Water-Pressure Testing—Seal the tank, fill with water **to operating level**, and let stand for **24 h**.

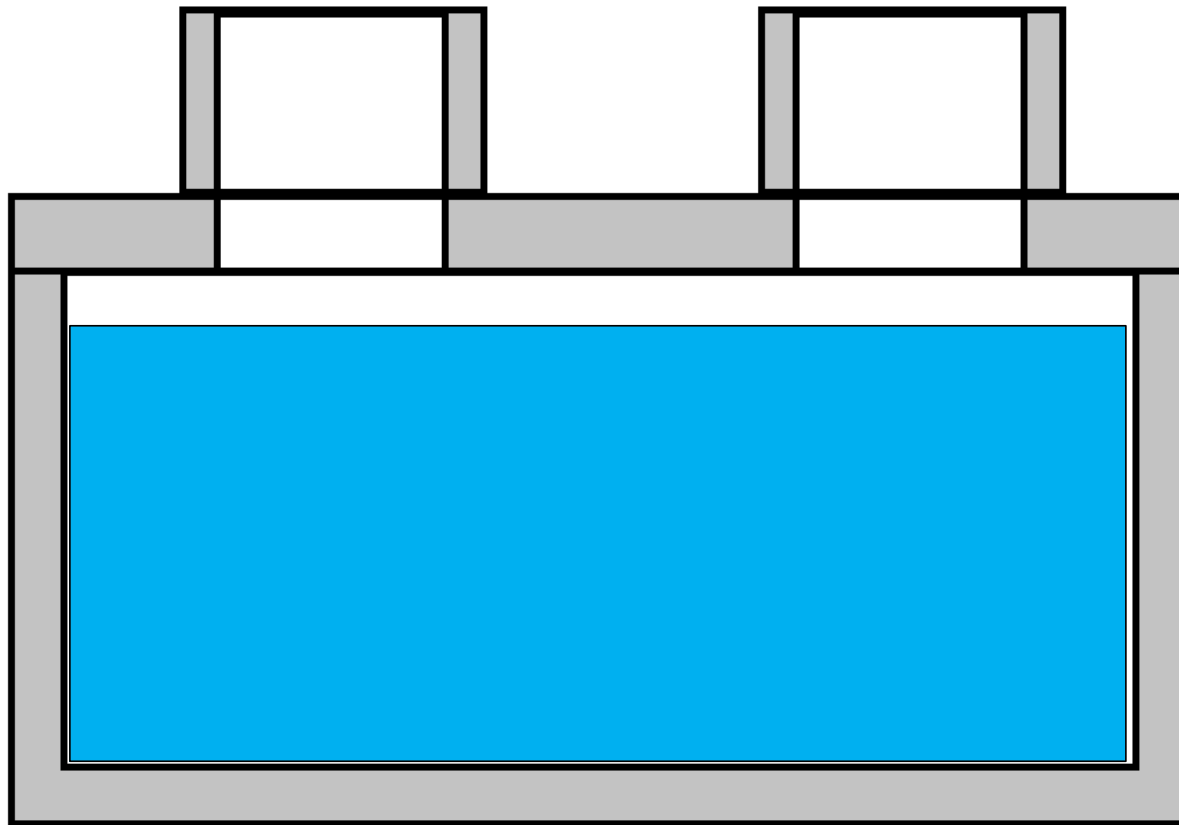
Refill the tank.

The tank is approved if water level is held for **1 h**.

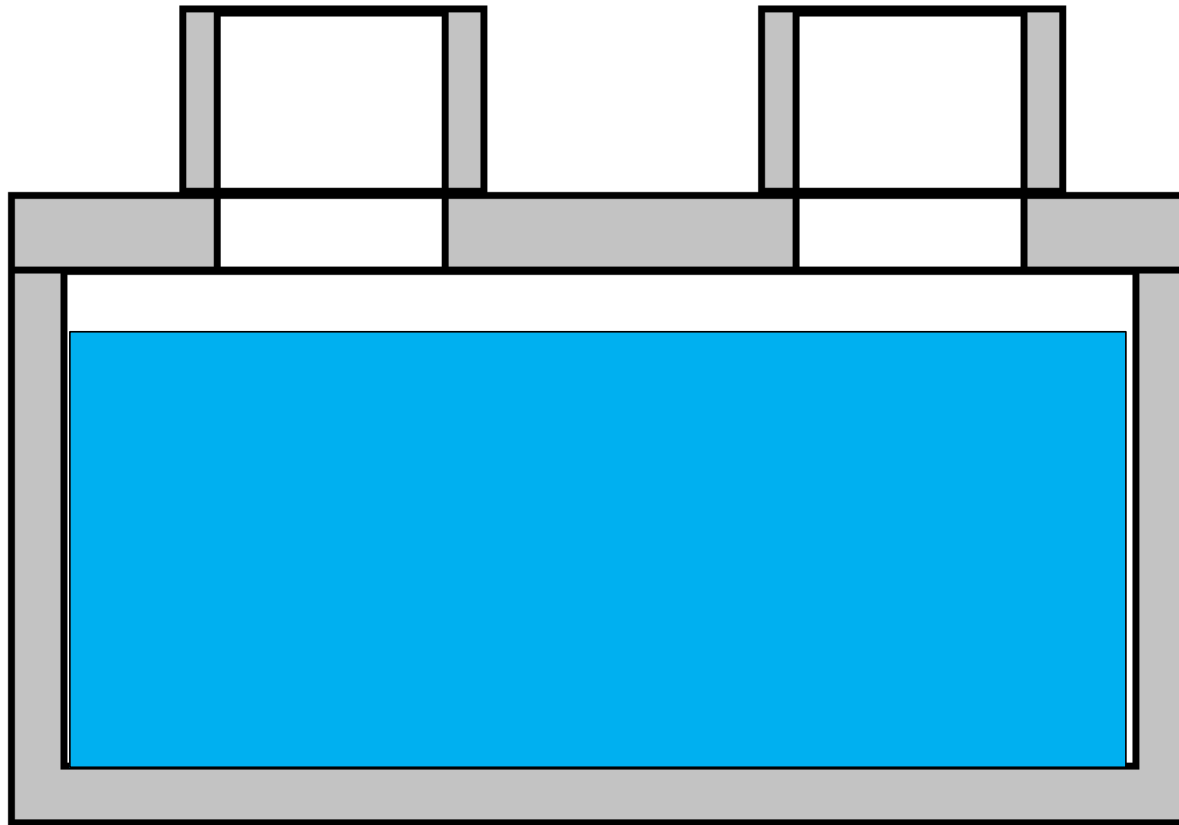
Hydrostatic Cautions

- 1' of water into the riser
 - creates 62 lb/ft² of “lift”
 - this will displace a top seal lid
- Use additional weight when necessary
- **Don't do it if you don't have to!**

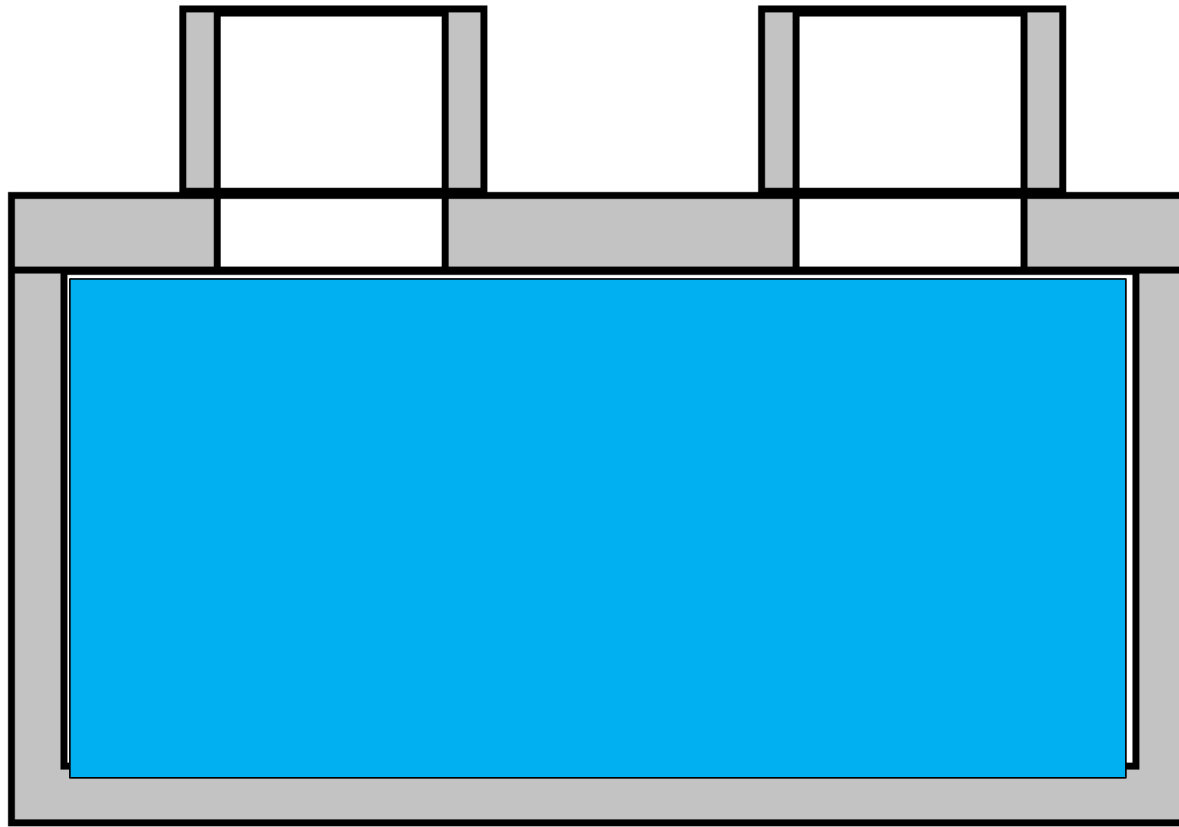
Hydrostatic Tank Testing (Watertightness)



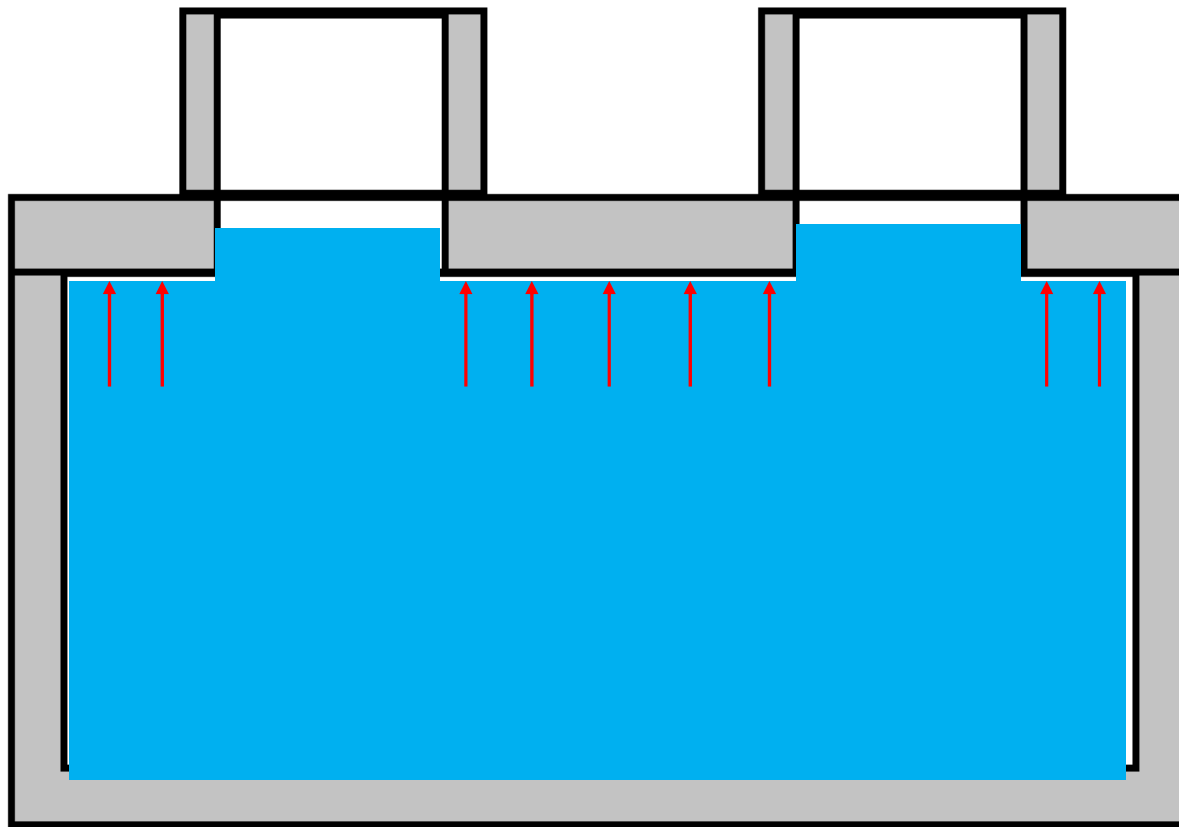
Hydrostatic Tank Testing (Watertightness)



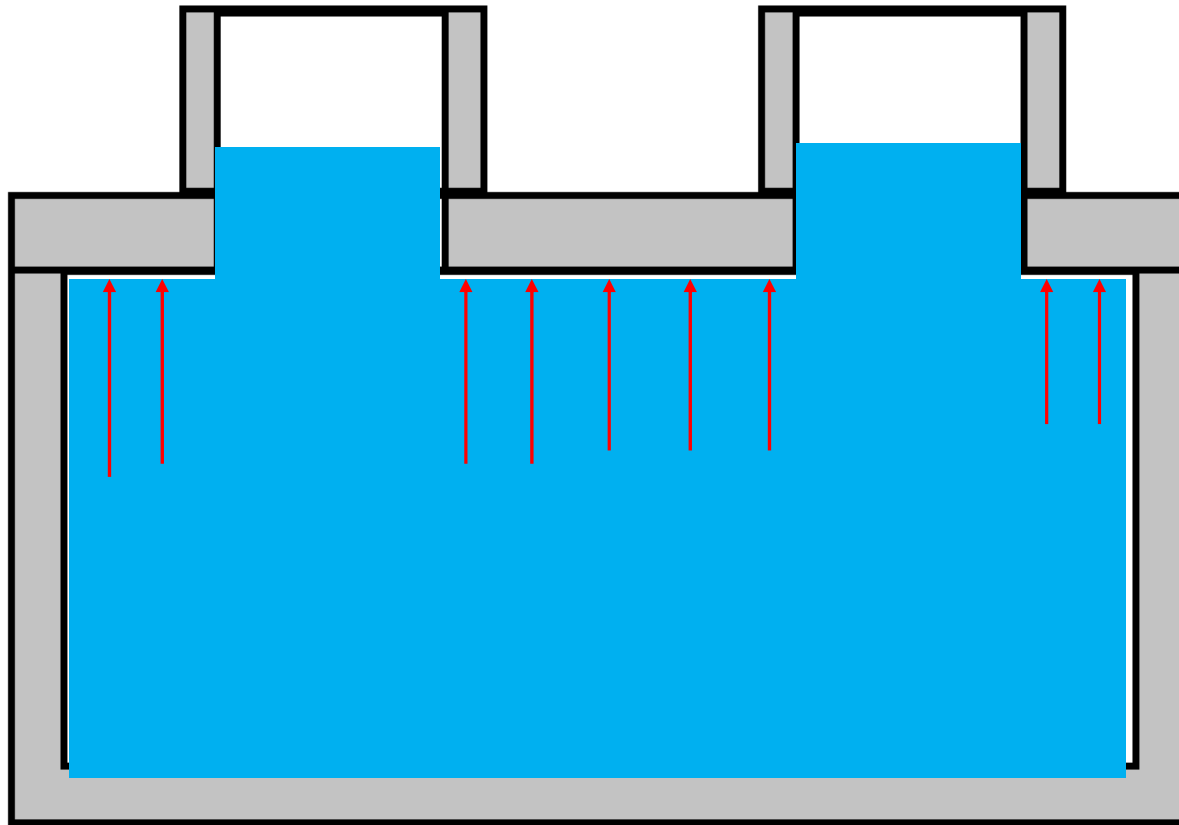
Hydrostatic Tank Testing (Watertightness)



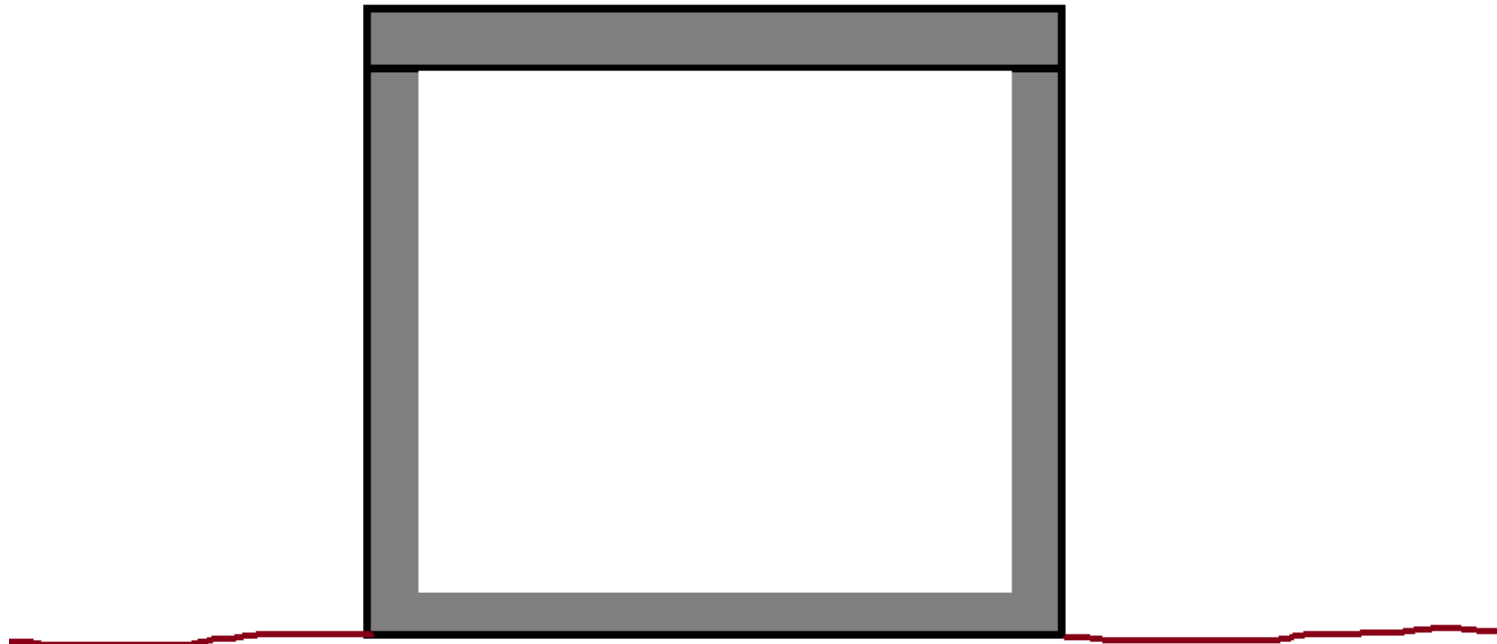
Hydrostatic Tank Testing (Watertightness)



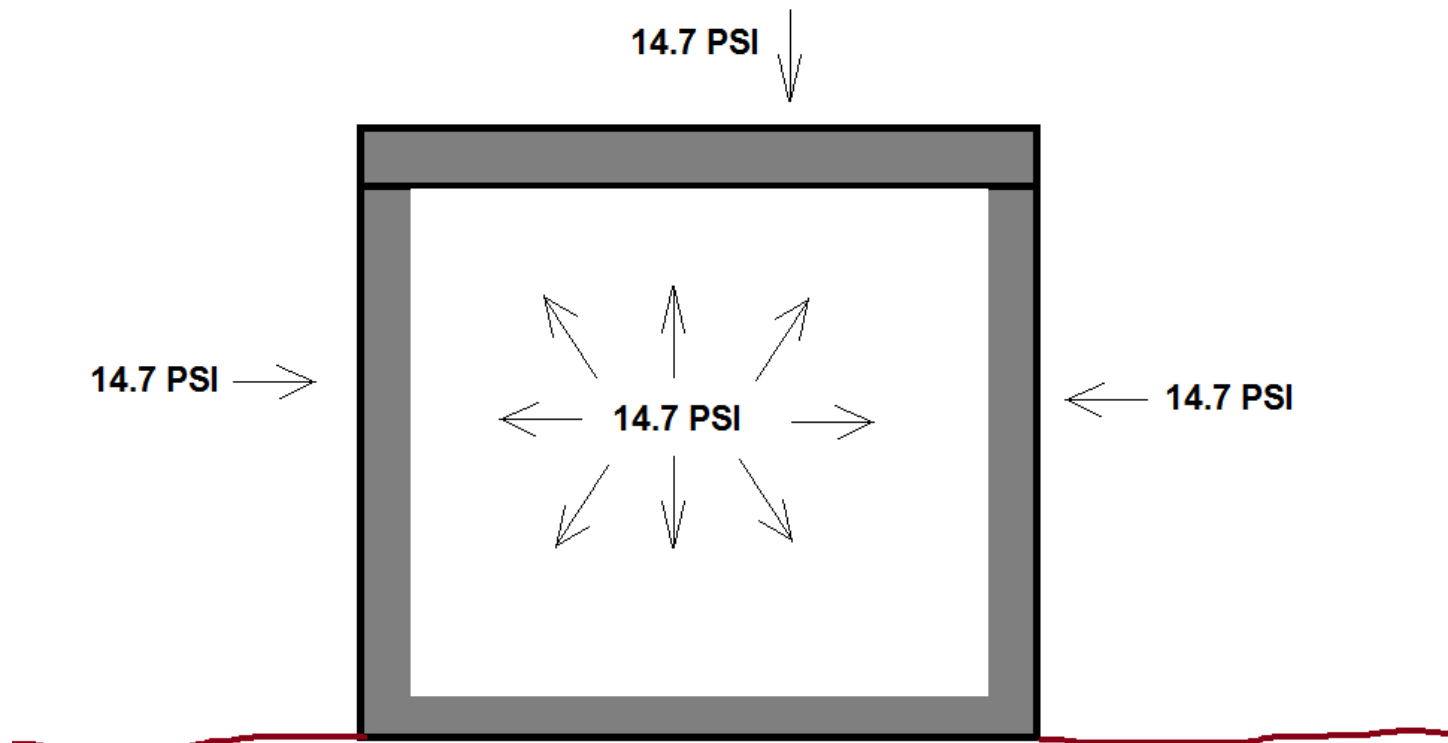
Hydrostatic Tank Testing (Watertightness)



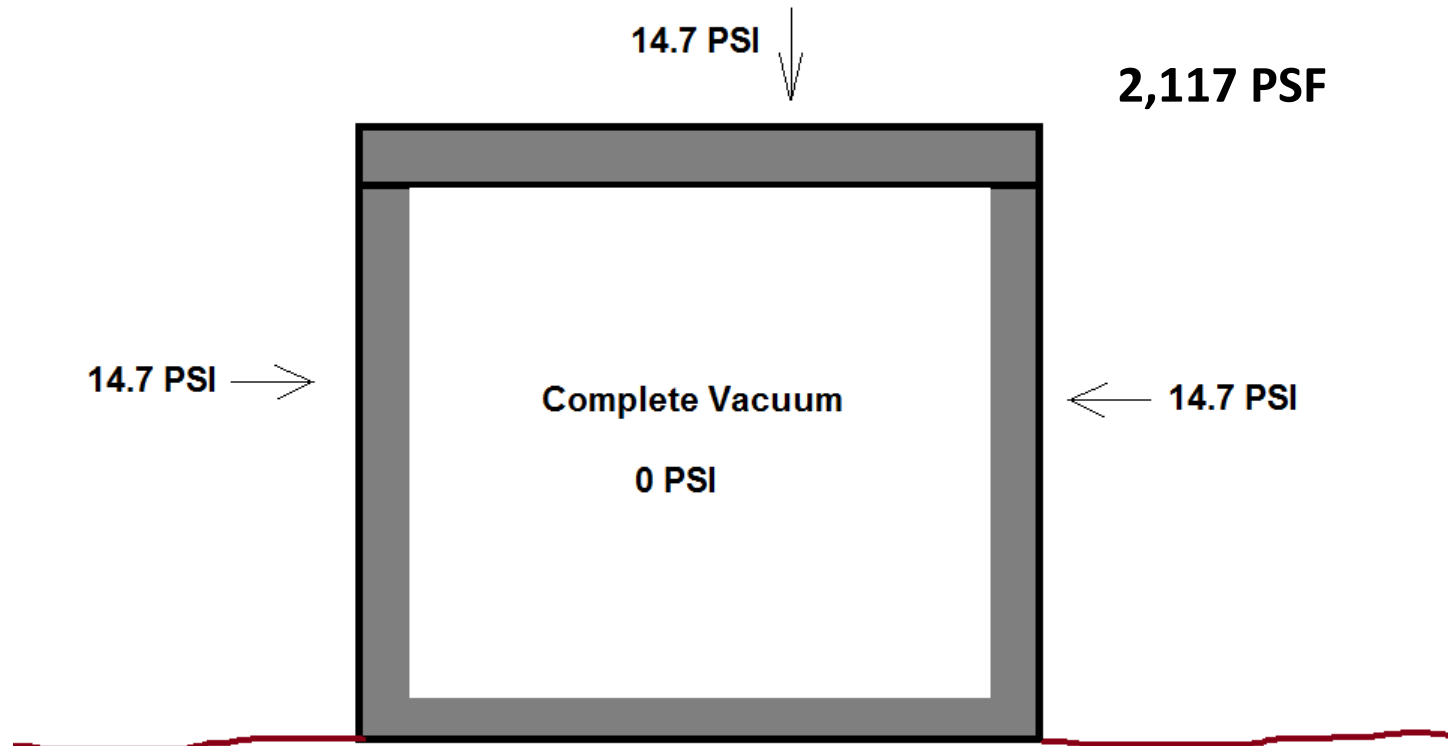
Vacuum Testing



Vacuum Testing



Vacuum Testing

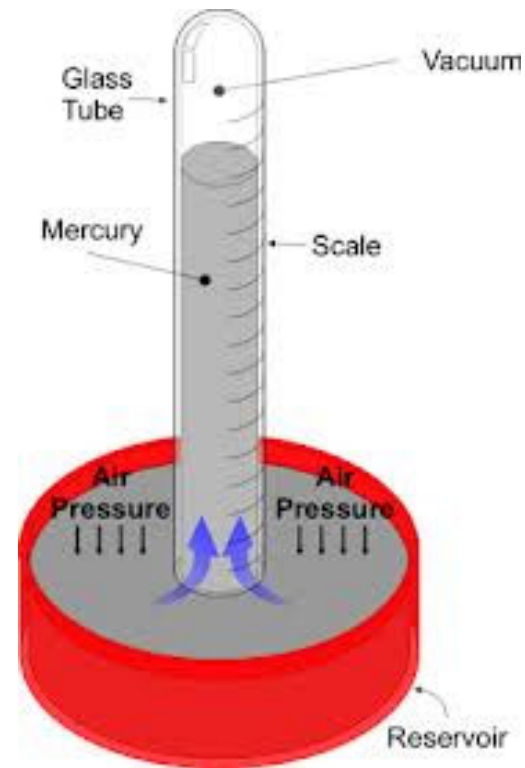


Vacuum Testing - Inches of Mercury

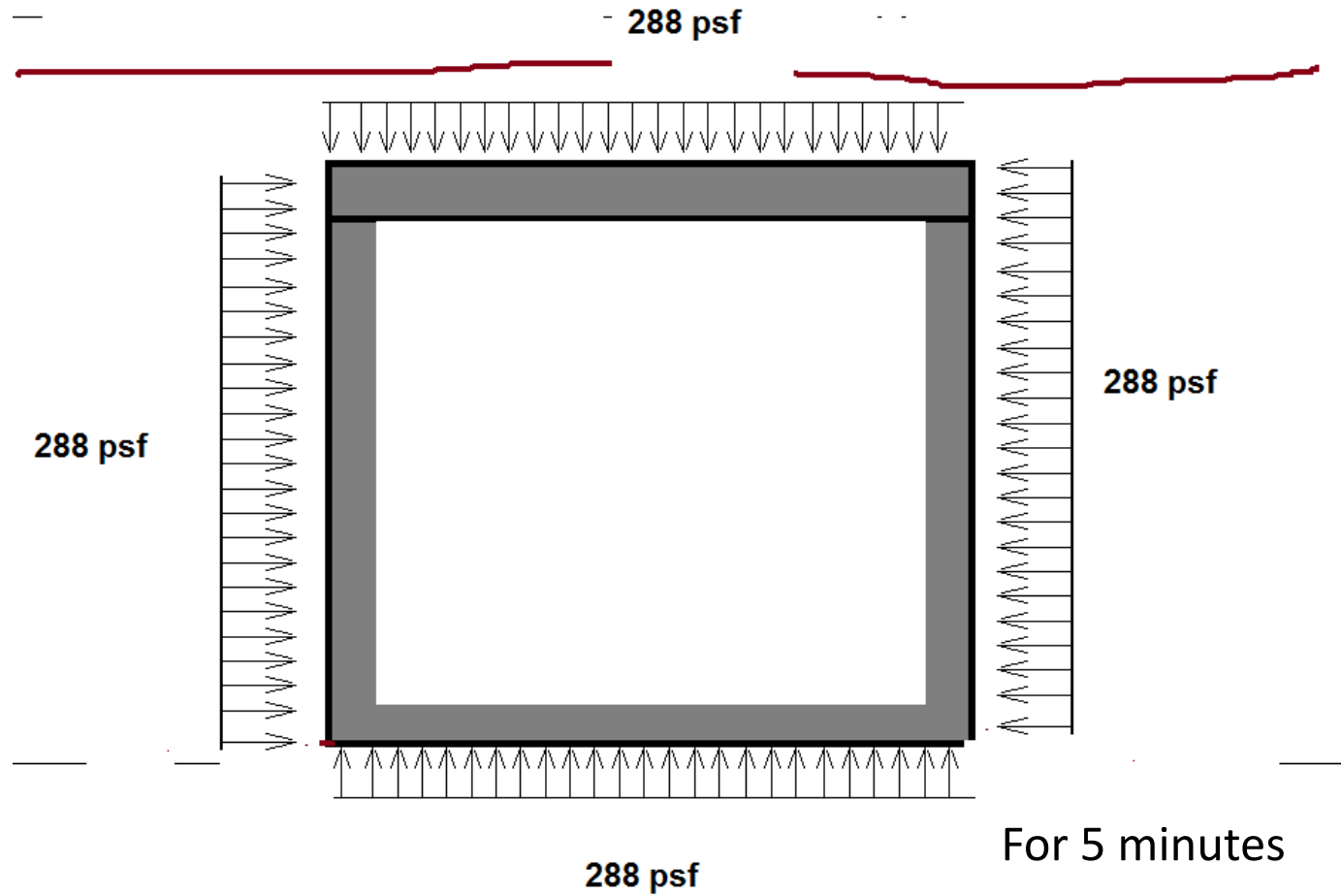
1 inch Hg = 0.4913 PSI

1 psi pressure = 2.03" in Hg

Approx 2"



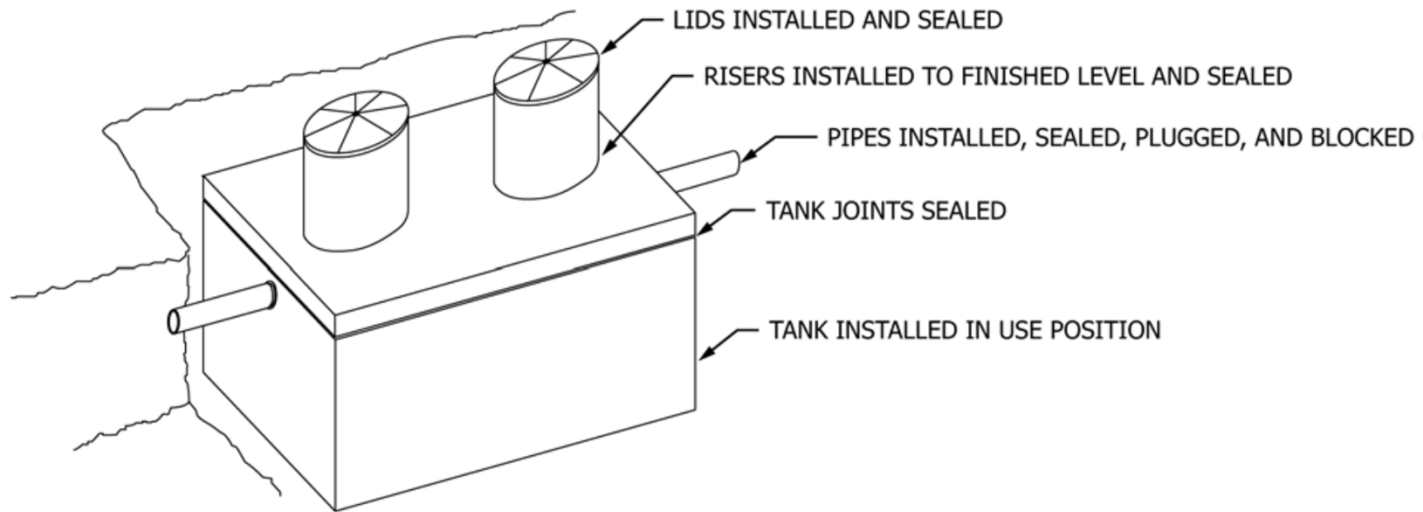
Watertightness (C1227)



ASTM Vacuum testing

- 4" of Hg = 288 psf
- Hold for 5 minutes
- Local jurisdiction may refer to an older version of C1227.
 - C1227-05 : 4" - 90% for 2 minutes
- C1613 – allows ½" drop

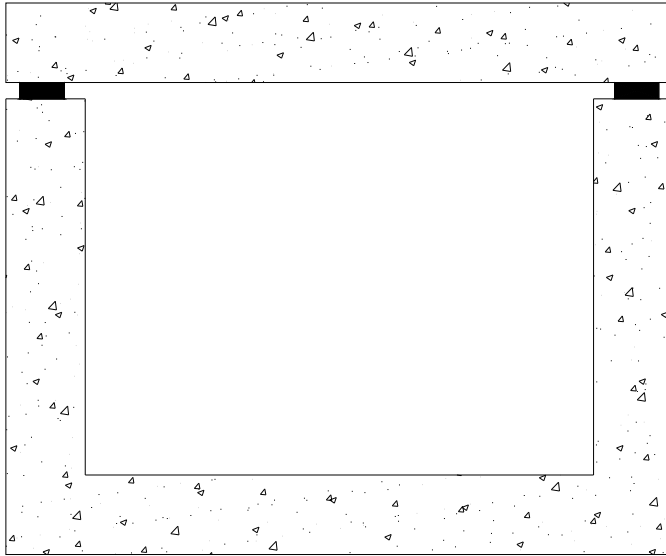
From ASTM C1719



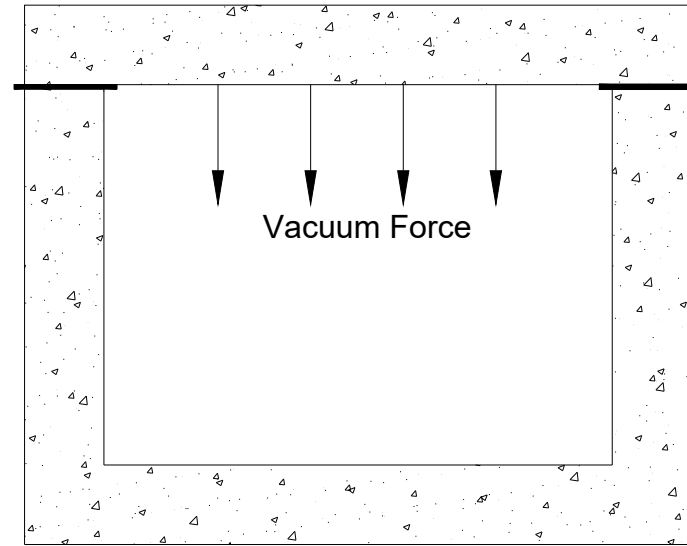
Another purpose...

- Because it improves the seal!

Before Vacuum



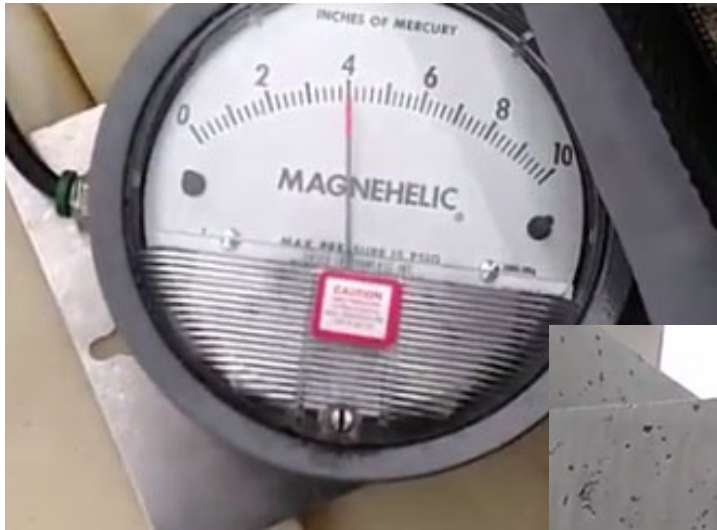
After Vacuum



Can you vacuum test after backfill?

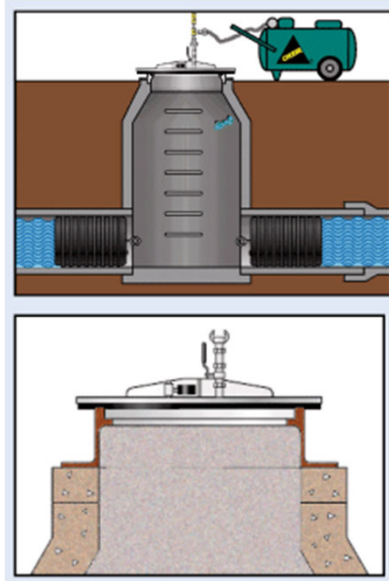
- **Not advised!!!,**
- Possible, but you must be very careful
- Take existing ground/hydro loads and subtract from design load
- That's your vacuum

Watertight Testing: In-Plant



Vacuum Test Equipment

- Cherne



www.cherneind.com

Vacuum Test Equipment

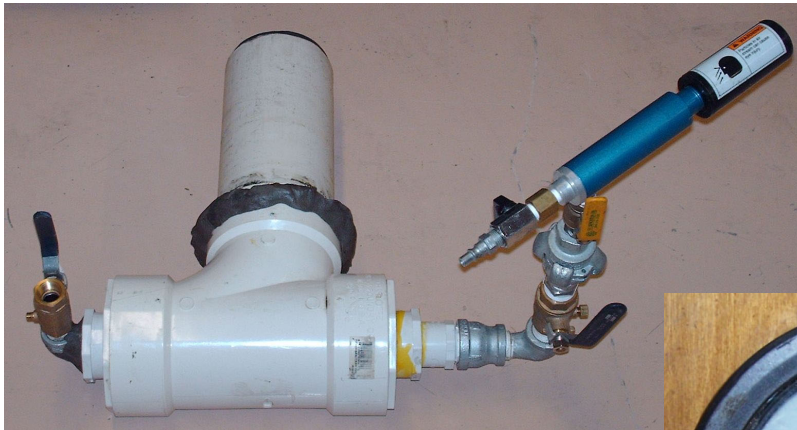
- Plug It



www.plugitproducts.com

Vacuum Testing Equipment

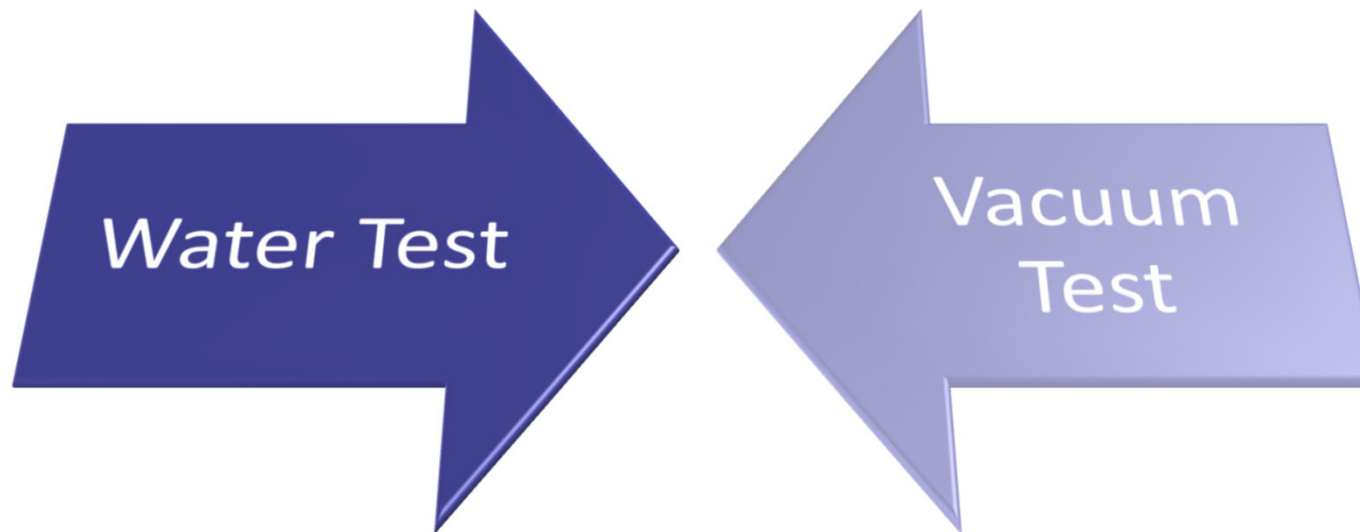
- Home made



Venturi Vacuum Tester



Water Test vs. Vacuum Test



Summary



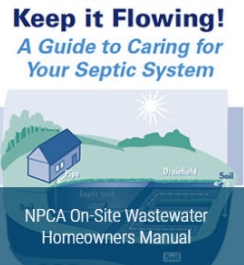




- Proper design is essential for tank functionality and durability
- Concrete strong in compression
- Reinforcing strong in tension
- Reinforced concrete has significantly higher capacities
- Anticipate all loading scenarios in design
- Use NPCA as a resource!!!

Best Practices Manual



Additional Information & Resources

PRECAST.ORG

 <p>BEST PRACTICES MANUAL</p> <p>On-Site Wastewater Tank Best Practices Manual</p>	 <p>PRECAST CONCRETE ON-SITE WASTEWATER TANKS</p> <p>GUARDING THE GROUNDWATER</p> <p>On-Site Wastewater Tank Brochure</p>	<p>Precast Concrete Septic Tanks</p> <p>Rock Solid Tanks, Rock Solid Treatment</p> <p>On-Site Wastewater Tank Presentation</p>	 <p>Keep it Flowing! <i>A Guide to Caring for Your Septic System</i></p> <p>NPCA On-Site Wastewater Homeowners Manual</p>	 <p>On-Site Wastewater Optional Ballot</p>
 <p>The Precast Advantage</p> <p>On-Site Wastewater Installer Ad Campaign</p>	 <p>On-Site Wastewater Tank Standards</p>	 <p>Search Septic Tank Products</p>		



Precast ... The Concrete Solution

Questions?

- If you have any questions about this presentation or anything about precast concrete onsite wastewater structures, please contact:

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THANK YOU!



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