

Where is the Box? and How Do I Think Outside It?

Troubleshooting in the OWTS Industry

**Southwest Onsite Wastewater Conference
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Content

- **Foundation**
 - **Knowledge**
 - **Principles**
- **Troubleshooting**
 - **OWTS Industry**
- **Thinking Outside the Box**
- **Examples**
- **OWTS Industry in General**



Good Foundation is Important

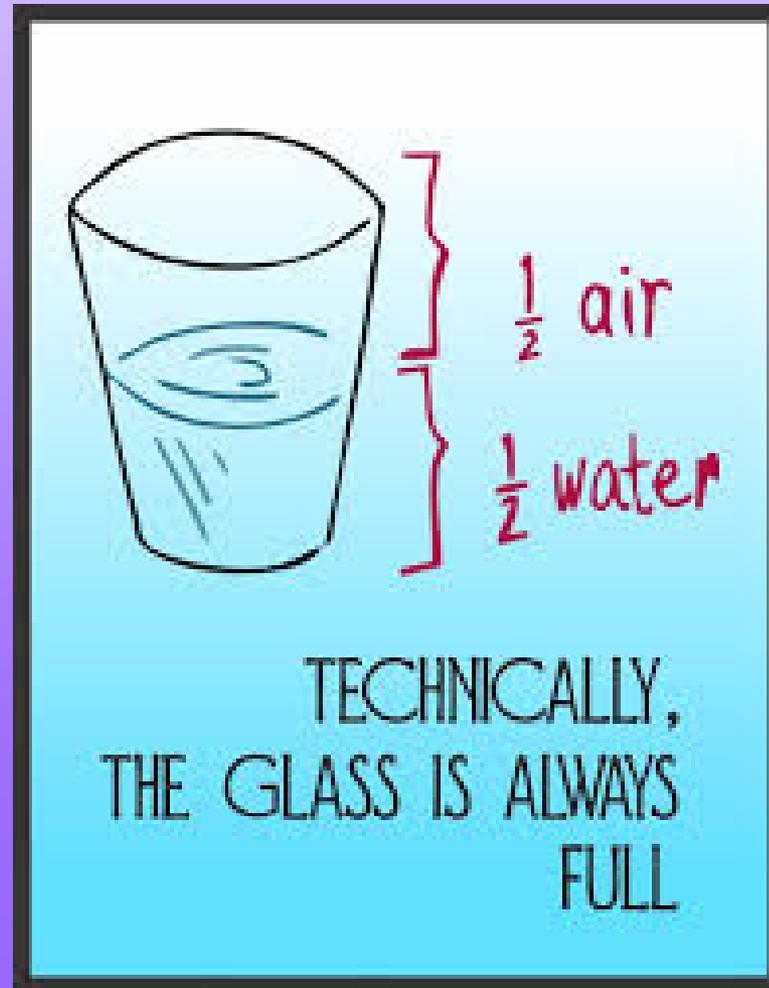


Understanding **Principles** is Critical

- **KISS: Keep it Shallow**
- **KISS: Keep it Natural**
- **KILL: Keep it Level**
- **KIDD: Keep it Dry**
- **KEE: Keep Effluent Even**
- **Tank Location (Distance)**
- **Tank Depth**
- **Air, Air, Air, Air, Air, Air**
- **Etc.....**

What is Thinking Outside the Box?

- **Is The Glass Half-Full? or**
- **Half Empty?**



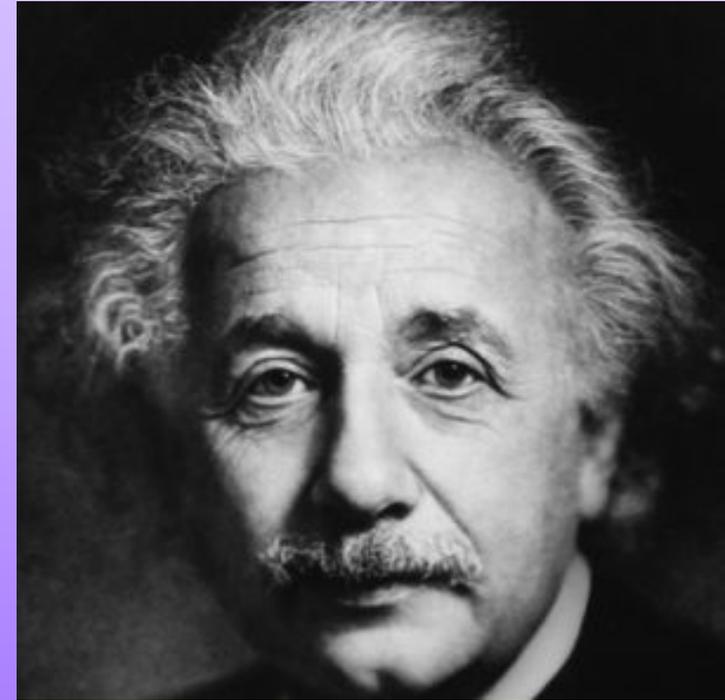
Imagination

is more important than Knowledge

ALBERT EINSTEIN



Dr. Ignaz Semmelweis



Definition:

- **“Works”**
- **Changes with Perspective**
- **Important to Understand Perspective**
- **Designer**
- **Regulator**
- **Installer**
- **O&M Provider**
- **Homeowner**



Do These “Work”?

- **Perc Hole Markers**
- **Wire Stake w/Flag**
- **Drilled Holes**



**What happens in June
when the grass is 30”
tall?**



WORKS?

- **Labeled Stake Provides Information to Follow-on Techs**

What are the Most Important Tools?

- **Knowledge** of Science Based Principles
- **Observation / Recognition**
- **Science Based Experience**
- **Critical Thinking**
- **Physical Tools Not As Important**

Thought!

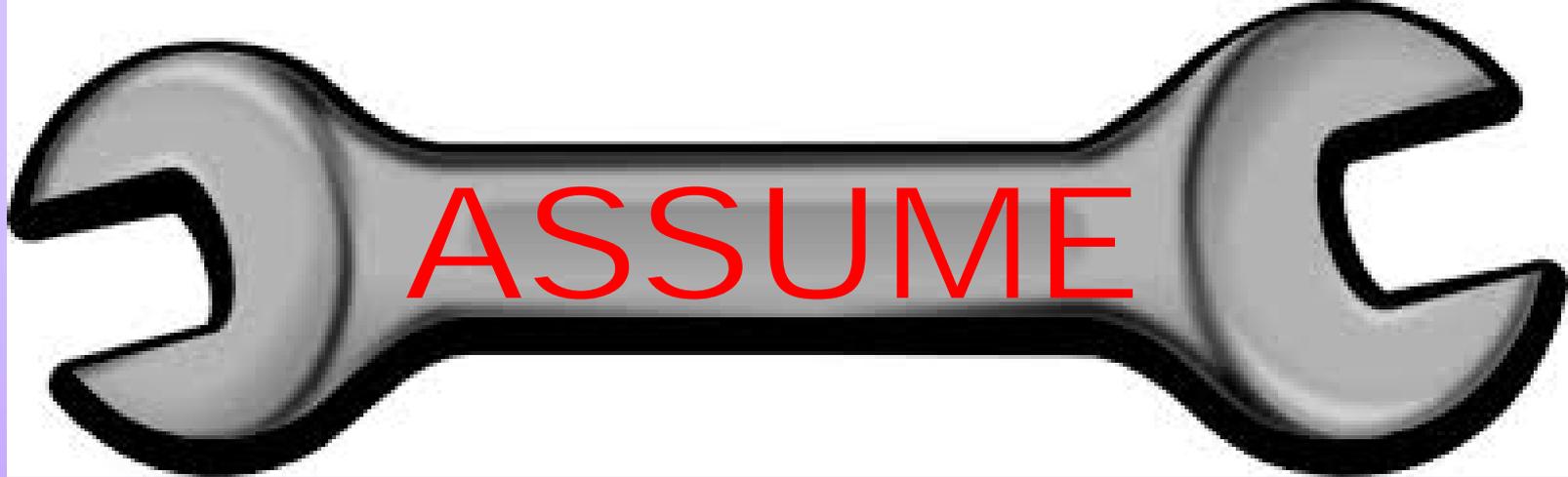
- **Type 1 vs Type 2 Thinking (Daniel Kahneman)**
- **Thought as in Problem Solving**
- **‘CRITICAL THINKING’**
- **Think About It....**
- **How Often in Life Do We Have to Figure Things Out?**
- **How Much of Our Time Do We Do Things “Like We Always Have”?**

OWTS Trickle-Down Effect



HUMAN NATURE





- **That is THE MOST Used Tool We Have**
- **Assume vs Reasoning**

never assume
anything

VERIFY

- This Tool Always Works

~~ASSUME~~

Verify!

CHANGE

- **If Something Isn't Working; CHANGE It!**
- **How Do We Affect Change?**
 - **1. Perceive that Change is Needed**
 - **2. Formulate a Plan for Change**
 - **3. Implement the Plan**
 - **4. Evaluate Effects; Revise as Needed**

What is Troubleshooting

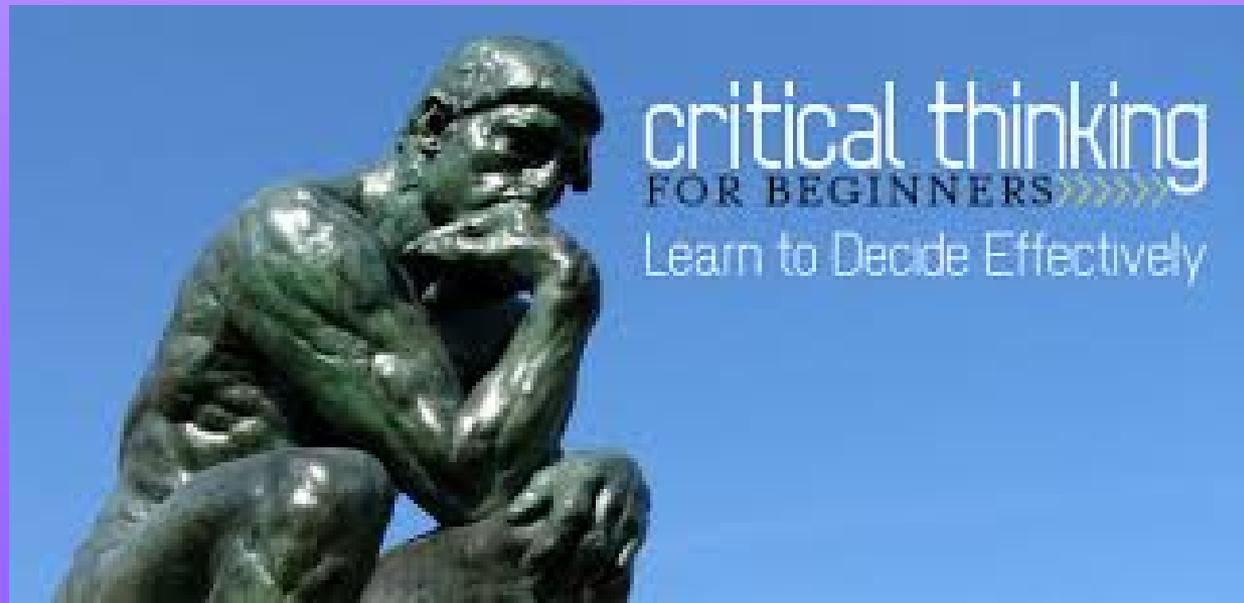
Troubleshooting is a form of problem solving, often applied to repair failed products or processes. It is a logical, systematic search for the source of a problem so that it can be solved, and so the product or process can be made operational again.

From Wikipedia

- **Reasoning to Determine the Source of a Problem & Create a Solution that Works**
- **THIS IS NOT LIMITED TO A SYSTEM!!**

Troubleshooting

- **Ability to Troubleshoot**
- **Directly Related to Ability to Think Critically, and**
- **Our Foundation of Knowledge/Principles**



Troubleshooting

- **If Our Ability to Troubleshoot is a Net**
- **Then Our Knowledge is the Size of the Mesh**
- **More Knowledge; Smaller Mesh**
- **Less Information Slips Through**

Troubleshooting

- **Who Performs Troubleshooting Tasks?**
- **Everyone in the Industry!**
- **Where Does Troubleshooting Take Place?**
- **Anywhere!**

Cooperate to Avoid Problems

- **Difficult Design/Installation Problem?**
- **Tough Constraints?**
- **Regulations Not Helpful?**
- **Before Designing a Solution**
- **Consult With Regulators**

Engineers.....

- **OWTS Industry Assumes that Being an Engineer comes with OWTS Knowledge**
- **Without OWTS Knowledge, Engineers are in the Same Boat as Anyone Else**

The Value of Knowledge

- **Science-based Knowledge Has Positive Value**
- **Bad Knowledge is also Valuable (as long as we know it is wrong)**

OWTS Industry is a Non-Professional Industry

- **Don't Believe That? You're the Majority**
- **What is "Professionalism"**
 - **Education, Experience, Testing, Certification, Continuing Ed, Conduct**
- **Why Non-Professional?**
- **Standardized Training**

EXAMPLES

MITCHELL INSPECTION

- **Time of Sale Use Permit Inspection 2013**
- **Alarm Problems in Less Than 1-Year**
- **2nd Inspection Called For & Completed**
- **3rd Inspection to Confirm**

1

The Site



2



1



The Inspection



10.04.2014 10.19

2

3

1



The Inspection



10.04.2014 10:11

3

MULLEN INSPECTION

- **Time of Sale Use Permit**
- **Inspection- December 2009**
- **Original Installation- 1979**
- **No “On-Lot” Access to STA**

MULLEN INSPECTION



NOLAN INSPECTION

- **2013 Time of Sale Use Permit Inspection**
- **House Constructed in 1976= 37-Years Old**
- **Asked by Buyer to Verify OWTS Findings**
- **Two Previous Inspections Conducted**
- **1= Home Inspector= 48” Ponding (5/10)**
- **2= Certified OWTS Inspector= 18” Ponding
(5/13)**

Inspection Tools

A Stick is a Stick is a Stick...



2



80" Ponding Measured...

LOUDEN OWTS INSPECTION

- **New 4-Bedroom Home**
- **2 Occupants; Woman & Her Sister**
- **Pressure Dosed Trench STA**
- **House Occupied for 4-Months**

SYSTEM



SYSTEM



Finding the Problem



The Reason It Was “Working”



SUMMARY

- **Good Troubleshooting= Knowledge + Experience + Imagination**
- **Quick & Easy Won't Always Work**
- **No Substitute for:**
 - **Good Observation AND Recognition**
 - **Knowledge**
 - **Reasoning**
 - **Imagination**
 - **Sound, Science Based OWTS Principles**

SUMMARY

- **To Become a Professional Industry We MUST Require Standardized Training, Testing, Certification & Continuing Ed of ALL Practitioners**
- **Regulators**
- **Engineers/Designers**
- **Installers**
- **O&M Providers**
- **Pumpers**

Questions?

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