

Electrical Safety on Metallic Water Pipes

OVERVIEW

- The Behaviour of Electricity
- The Dangers of Electricity
- Main to Meter electrical protection
- Water Main electrical protection

Behaviour of Electricity

- Electricity will only flow in a closed loop
- Electricity will always travel in the path of least resistance
- Electricity will always try to travel to ground

Dangers of Electricity

- You can't see, hear, smell or taste electricity
- Workers are exposed when they break continuity of the pipe
- This can involve ***main to meter*** or ***water mains***
- Electrical faults can remain hidden for long periods of time



Amounts of Electricity & What it can do to YOU

- A small amount of electricity may give you a ‘tingle’
- Larger amounts of electricity may make the muscles contract involuntarily which you cannot control
- Even more electricity can cause your heart (a muscle) to quiver & not pump properly, or stop completely
- Very large amounts of electricity can also burn you & your internal organs

Electrical Statistics

Between Jan. 1997 & June 2009:

- 75 Electric shocks have been reported from Plumbers.
- 4 of these were fatal

Electric Shock Protocol

In the event of an electric shock

- ▶ Anyone who suffers an electric shock (even a tingle) from a Sydney Water asset **MUST** seek medical attention immediately*
- ▶ All incidents **MUST** be reported

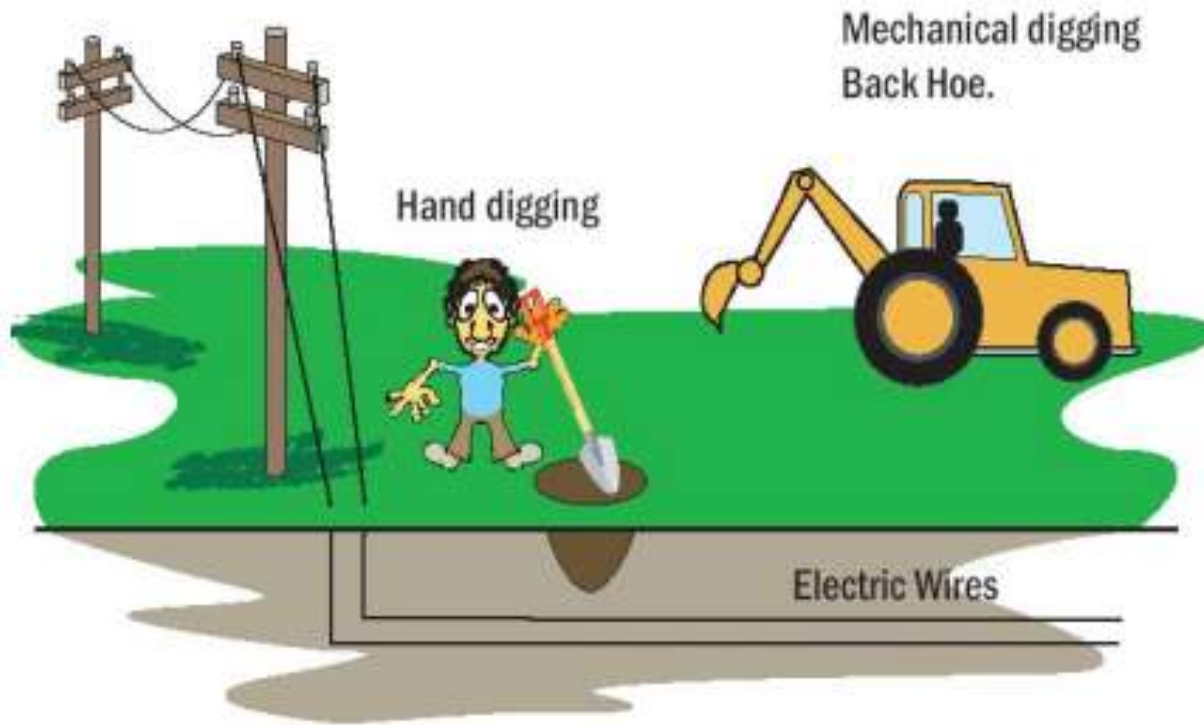
*From HSG 519 Electrical Safety

Contact with O/H

Overhead Power Lines.



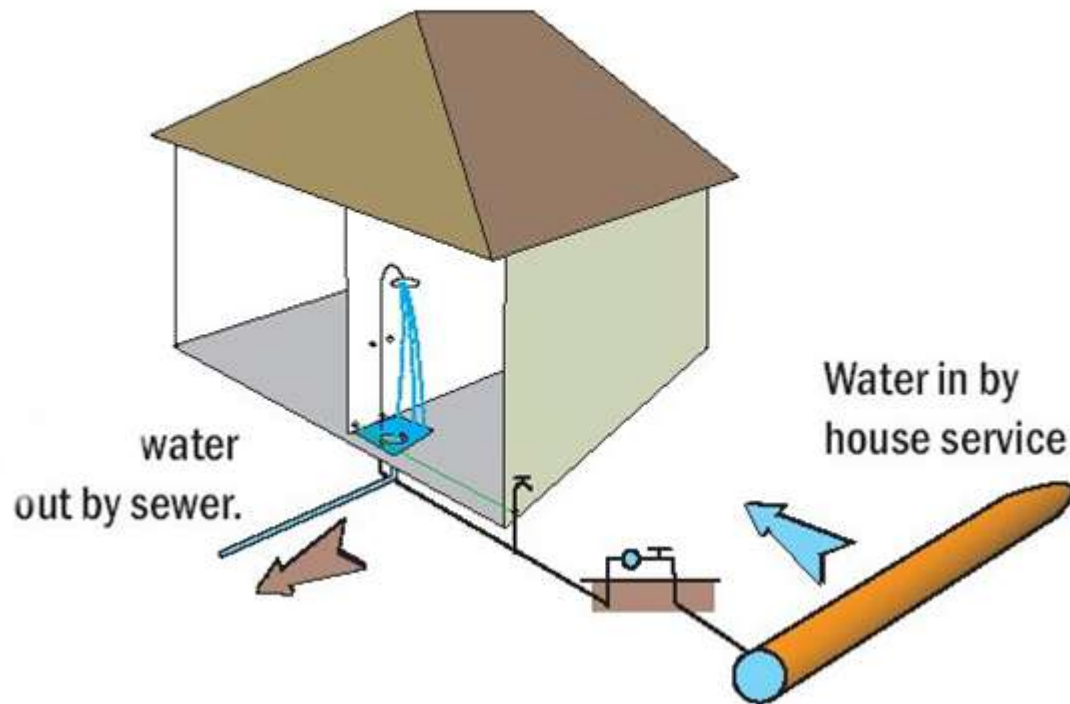
Contact with U/G



Remember - Dial Before You Dig – phone 1100

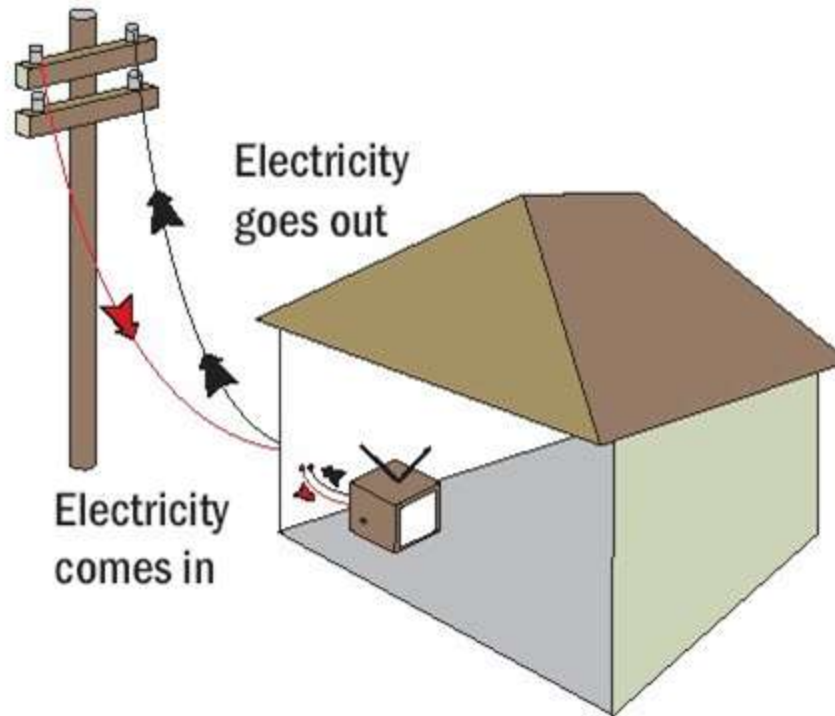
Water Services

How does water come into and go out of a house?

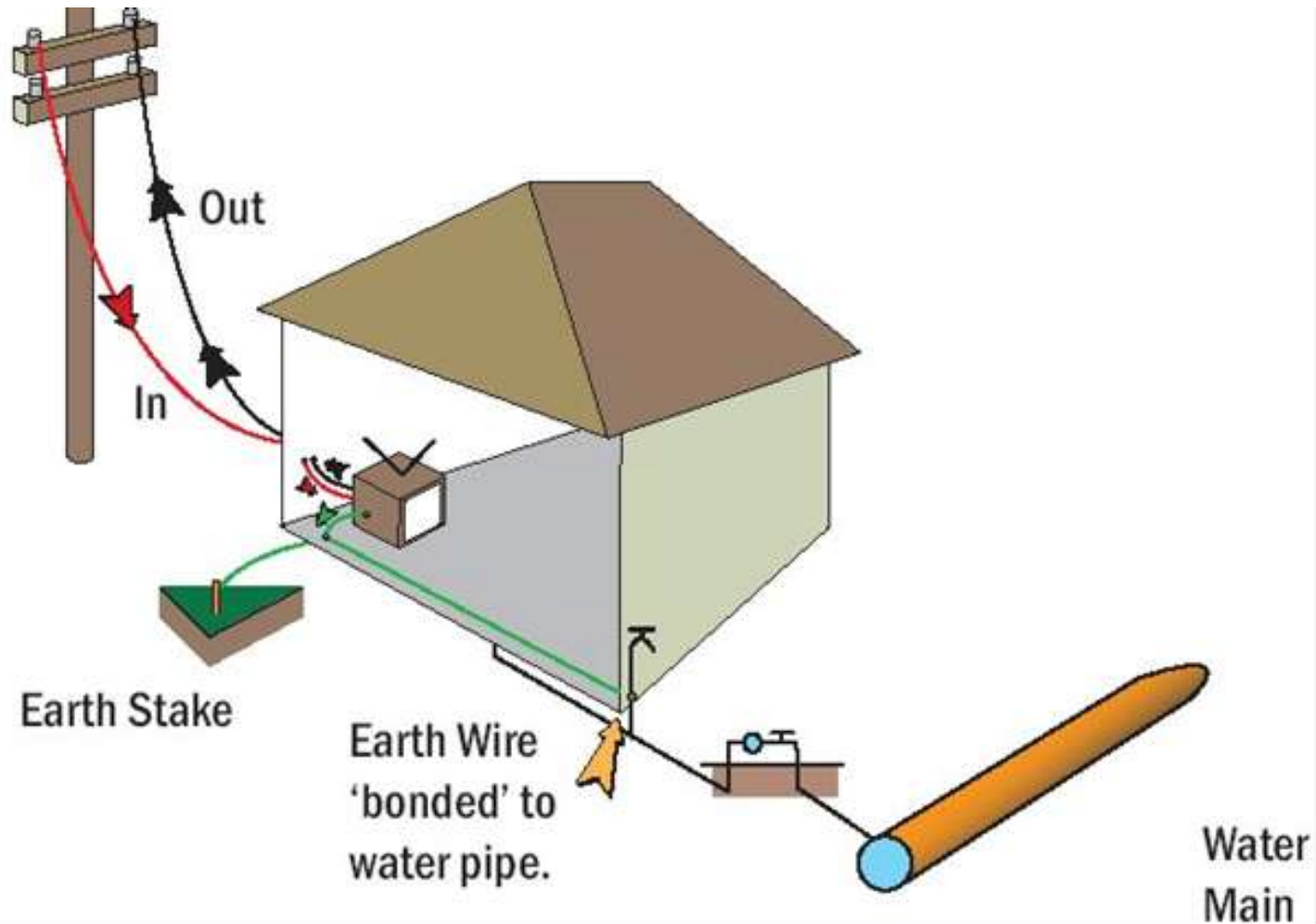


Electricity

How does electricity come into and go out of a house?



Water Services & Electricity – the Link



Main to Meter Process



Mains to Meter Electrical Safety

- ▶ All Main to Meter and Water Main work requires a minimum of **two levels** of control
- ▶ The application of Bridging Conductors around the work area is **mandatory**
- ▶ The wearing of Insulated Electrical Gloves is **mandatory**
- ▶ Using a Plumbers Voltage Monitor is **not a control**

Electrical Safety Equipment



Insulated Electrical Gloves: minimum rating
500v – class 00
Used as per manufacturers Guidelines

Electrical Safety Equipment



Bridging Conductor with insulated screw-type clamps – rated 200Amps continuous

Available from CADIA



Magnetic-Type Bridging Conductor

PVM - Electrical Testing Equipment



Electrical Test procedure to be developed
PVM must be tested & calibrated

PVM's are NOT a control

Mains to Meter Electrical Safety

- *Electrical Testing Process*, utilising a *Plumbers Voltage Monitor*
- The testing process is performed **before** any work commences
- Work ceases **immediately** if voltage is detected
- Constant monitoring for stray voltages

Your Electrical Safety Process **MUST** include:

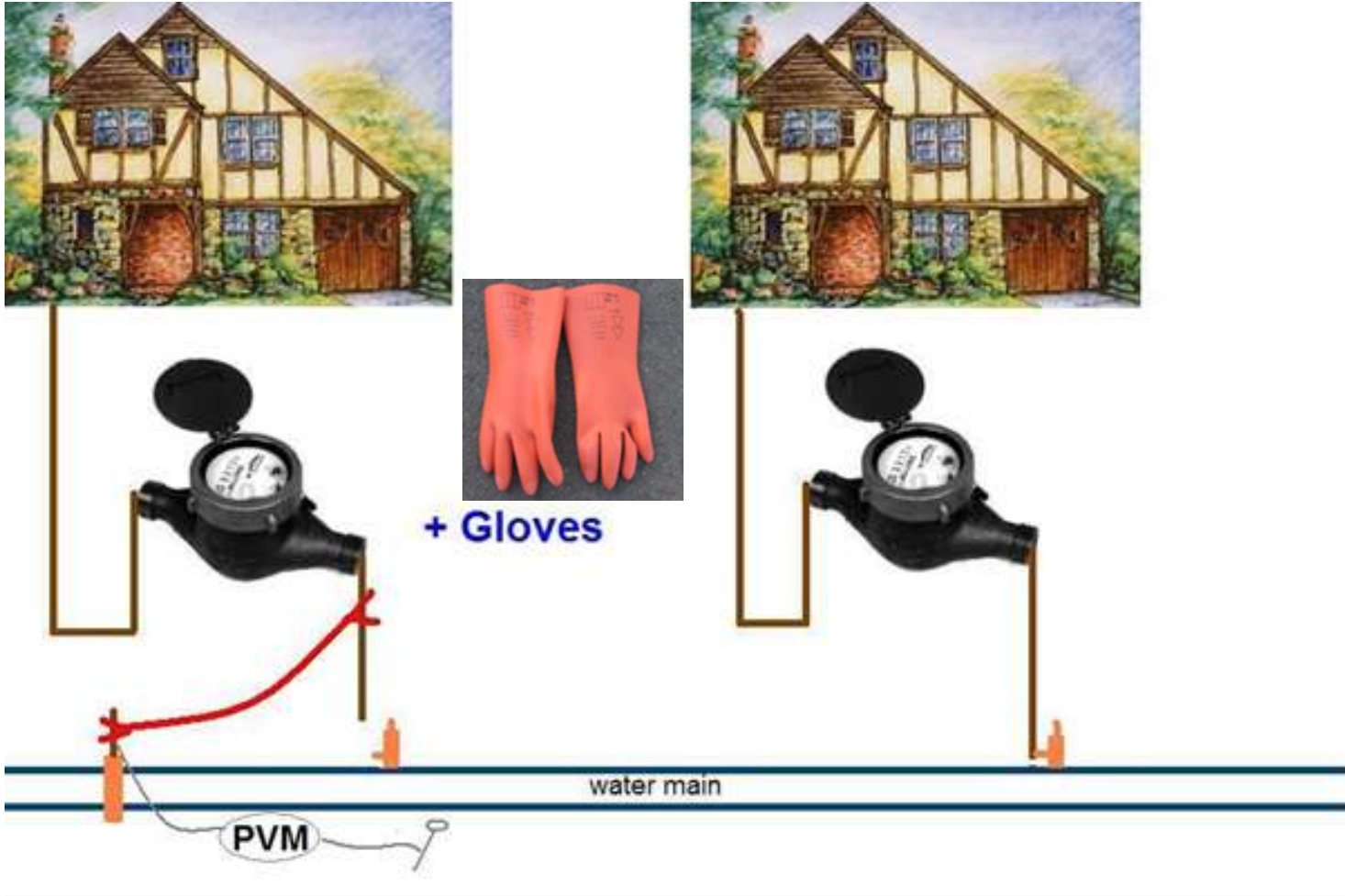
- Check Electrical safety equipment
- Undertake site risk assessment
- Excavate pipe
- ***Test pipework with PVM using testing procedure - Stop work immediately if electricity is detected***
- Clean pipe while wearing insulated electrical gloves (minimum 500v)
- Install bridging saddles/conductive blocks (minimum 200A continuous)
- Attach bridging conductor (minimum 200A continuous)

Water Meter Maintenance

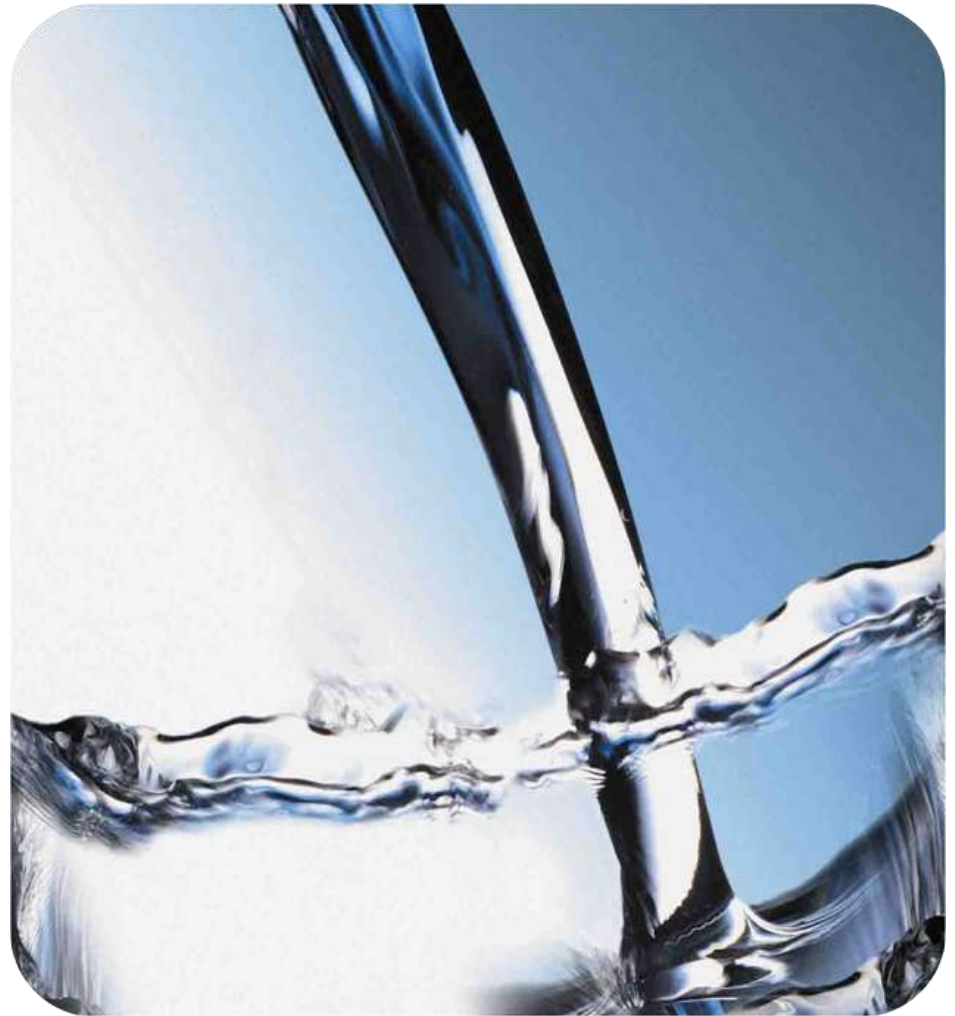


Gloves worn for entire job

Main Tap Maintenance



Water Main Process



Electrical Safety Equipment



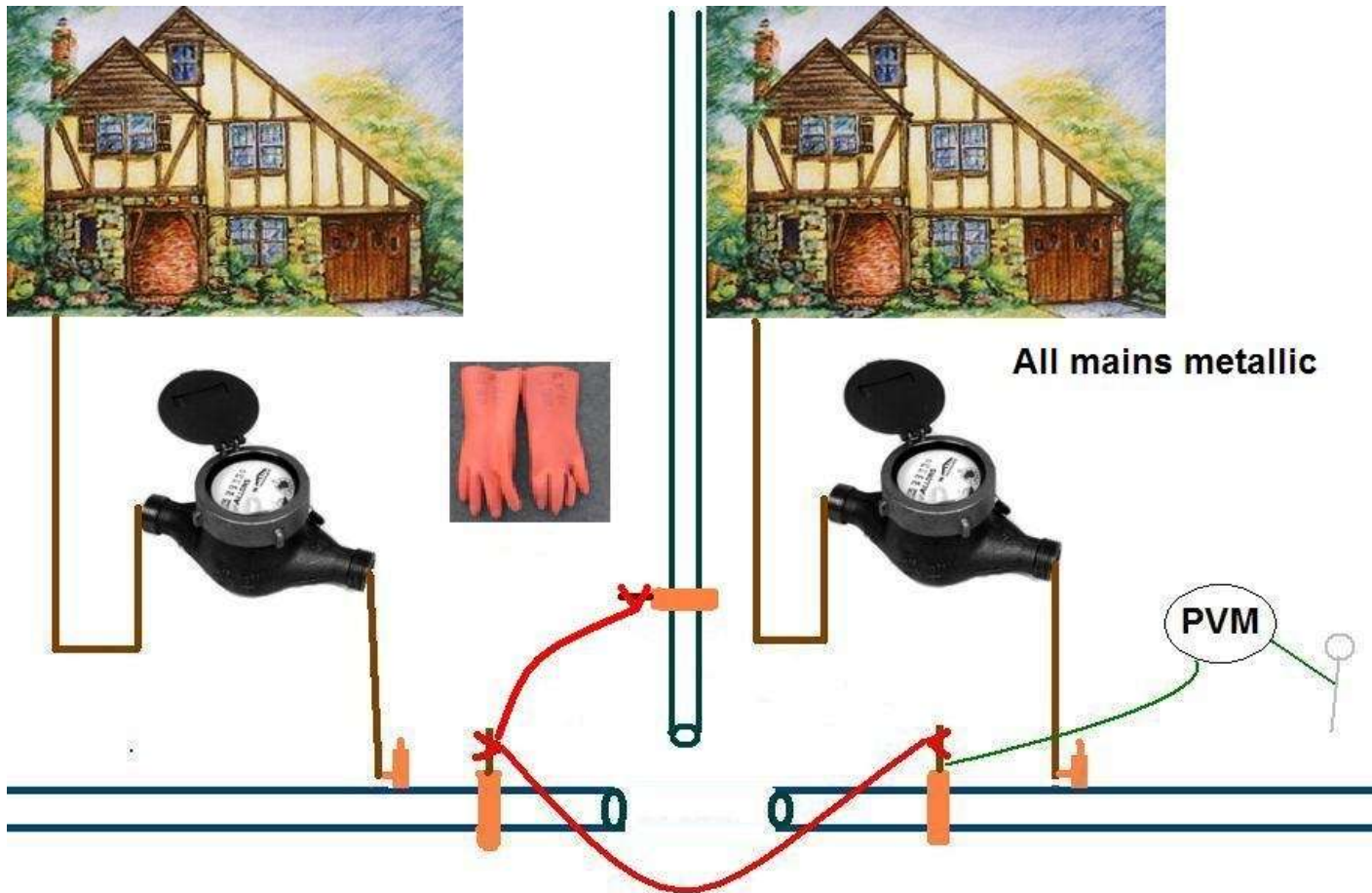
Water Main Electrical Safety



+ Gloves

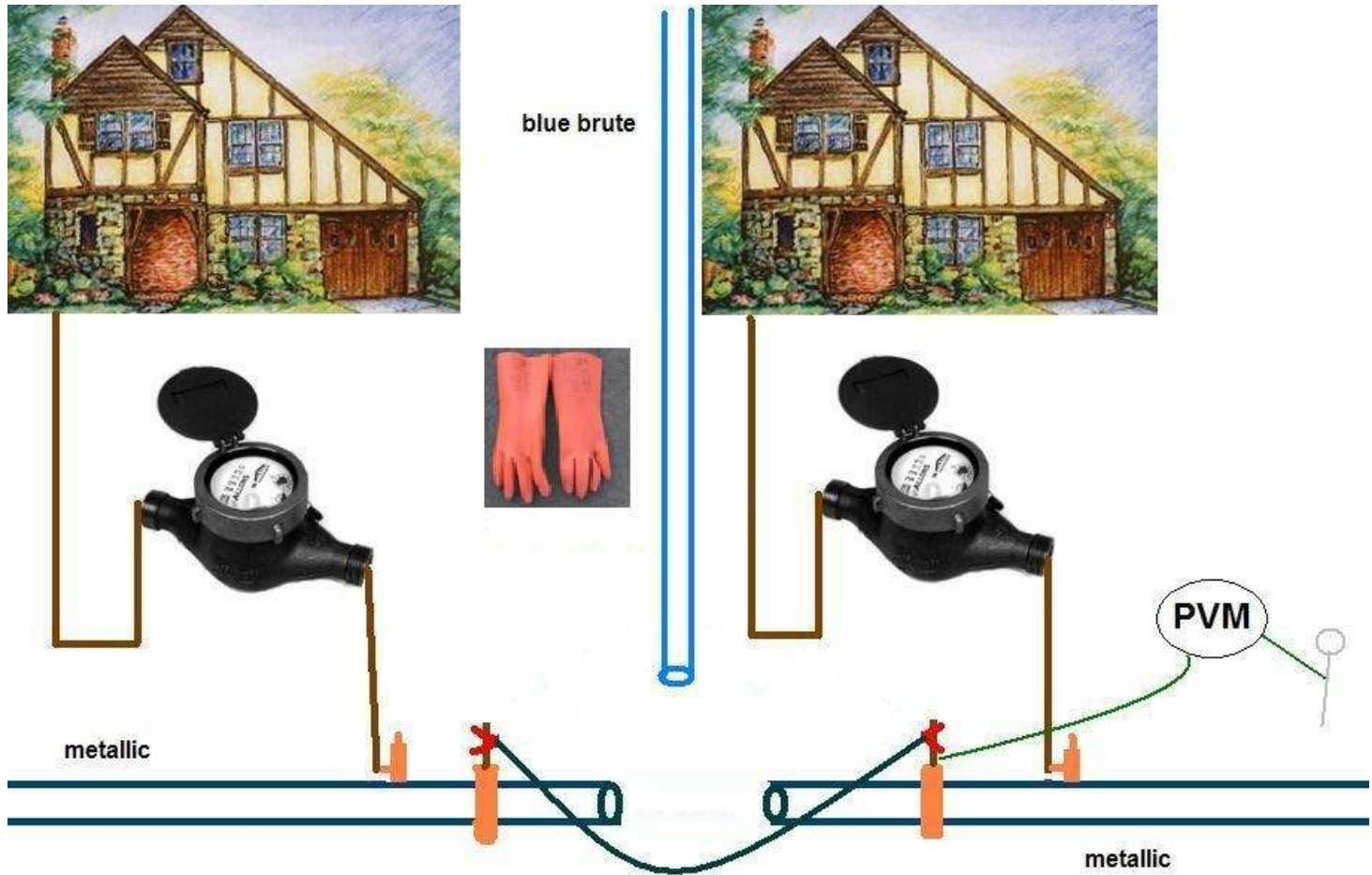


Water Main Electrical Safety #2



Note: Bridging Conductors are one level of control even when two conductors are used. Gloves **MUST** be worn for entire job

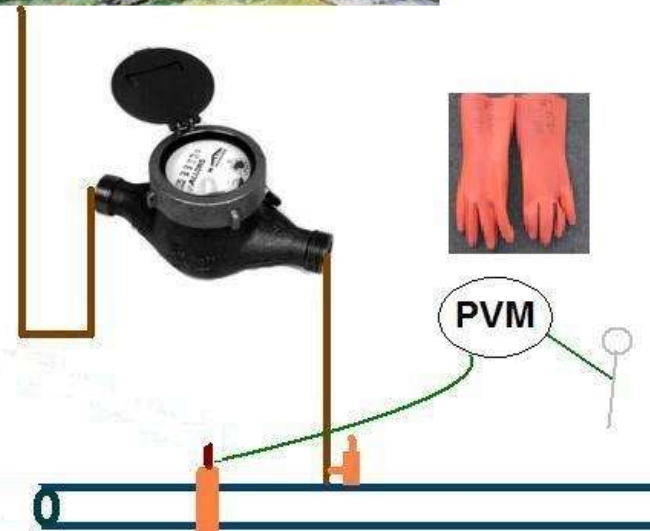
Water Main Electrical Safety #3



Water Main Electrical Safety #4



blue brute



metallic

Summary

- Conduct a ***Risk Assessment***
- Inspect/Clean Equipment
- Test for Electricity using PVM
- Clean Pipe-work
- Attach Bridging Conductor/s
- Isolate Water Supply
- Carry-out Repairs
- Re-instate Water Supply
- Remove Bridging Conductors



Questions?