

# 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

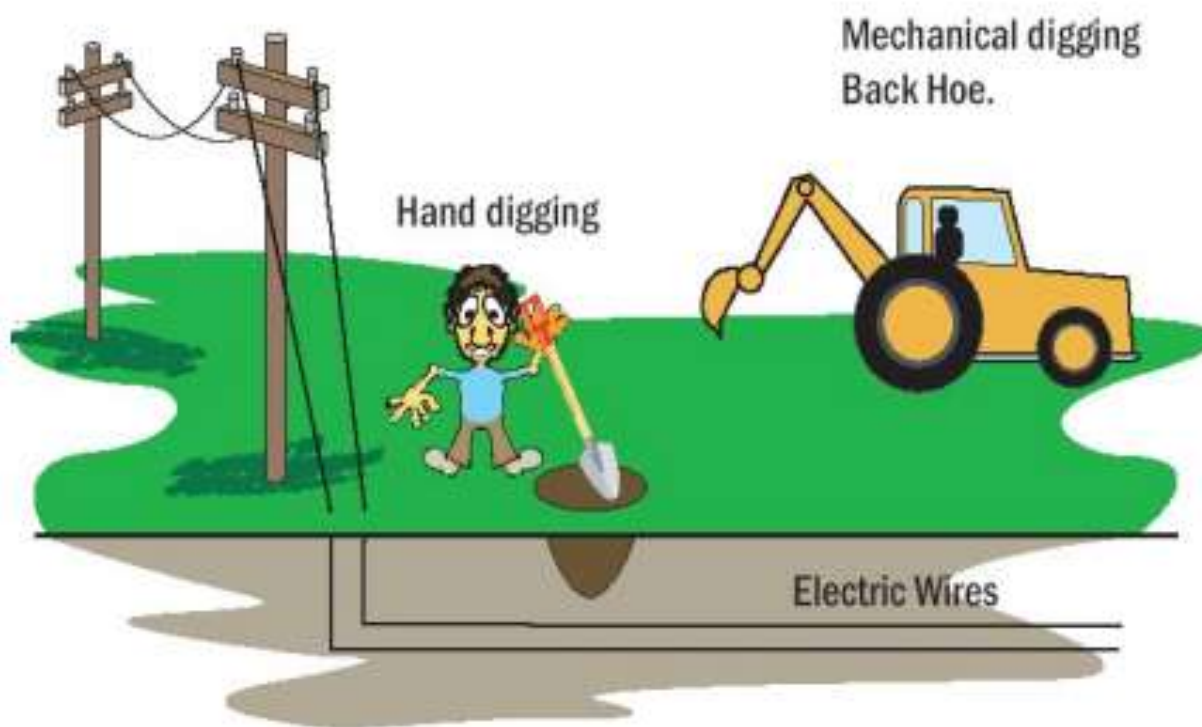
\*From HSG 519 Electrical Safety

Contact with O/H

## Overhead Power Lines.



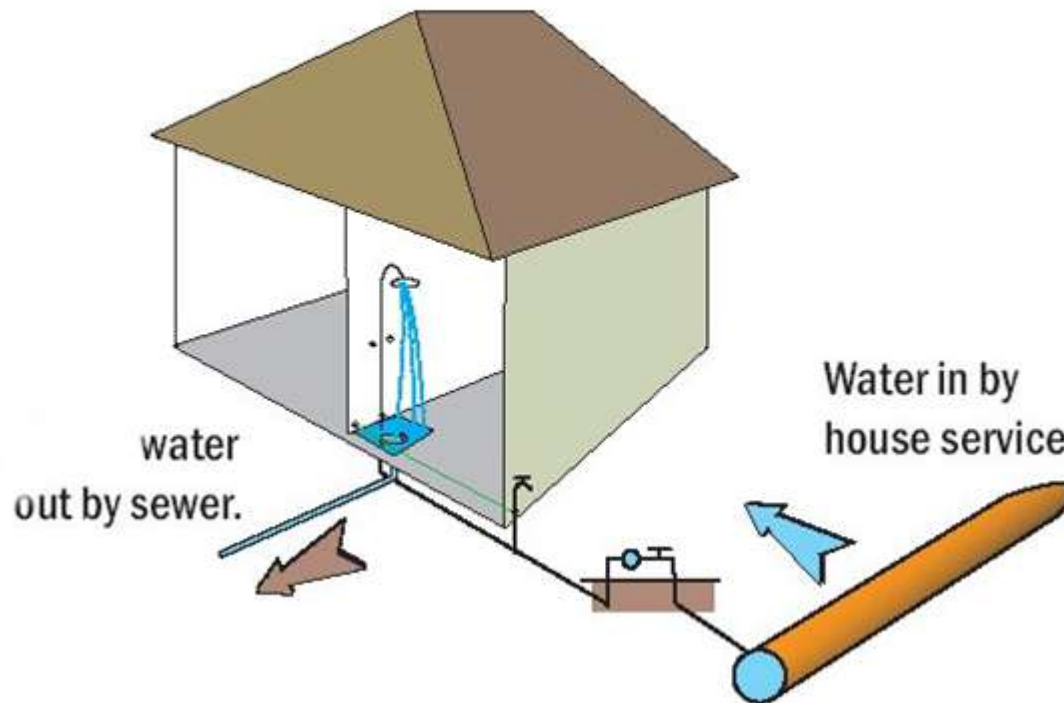
Contact with U/G



**Remember - Dial Before You Dig – phone 1100**

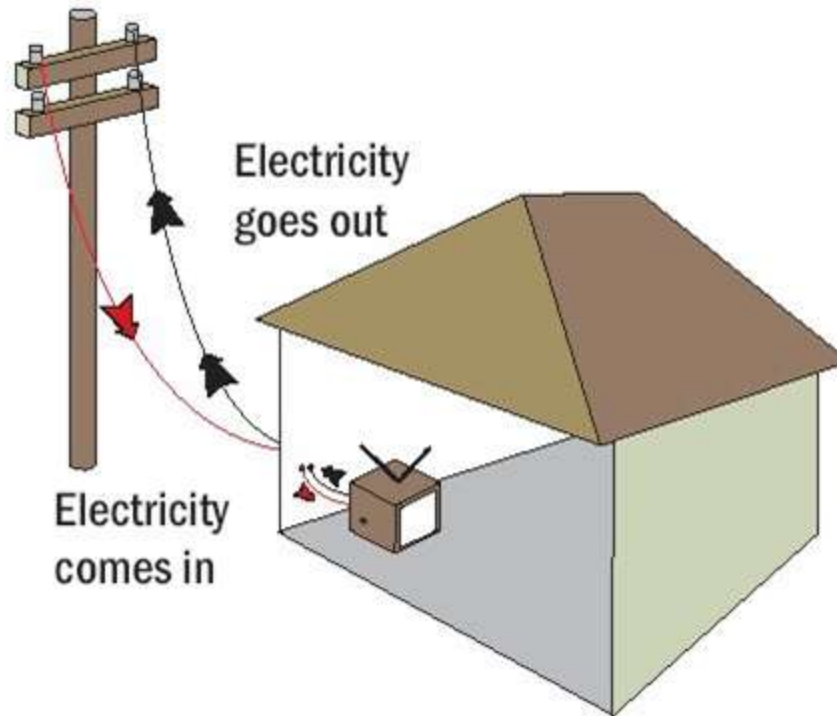
# Water Services

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

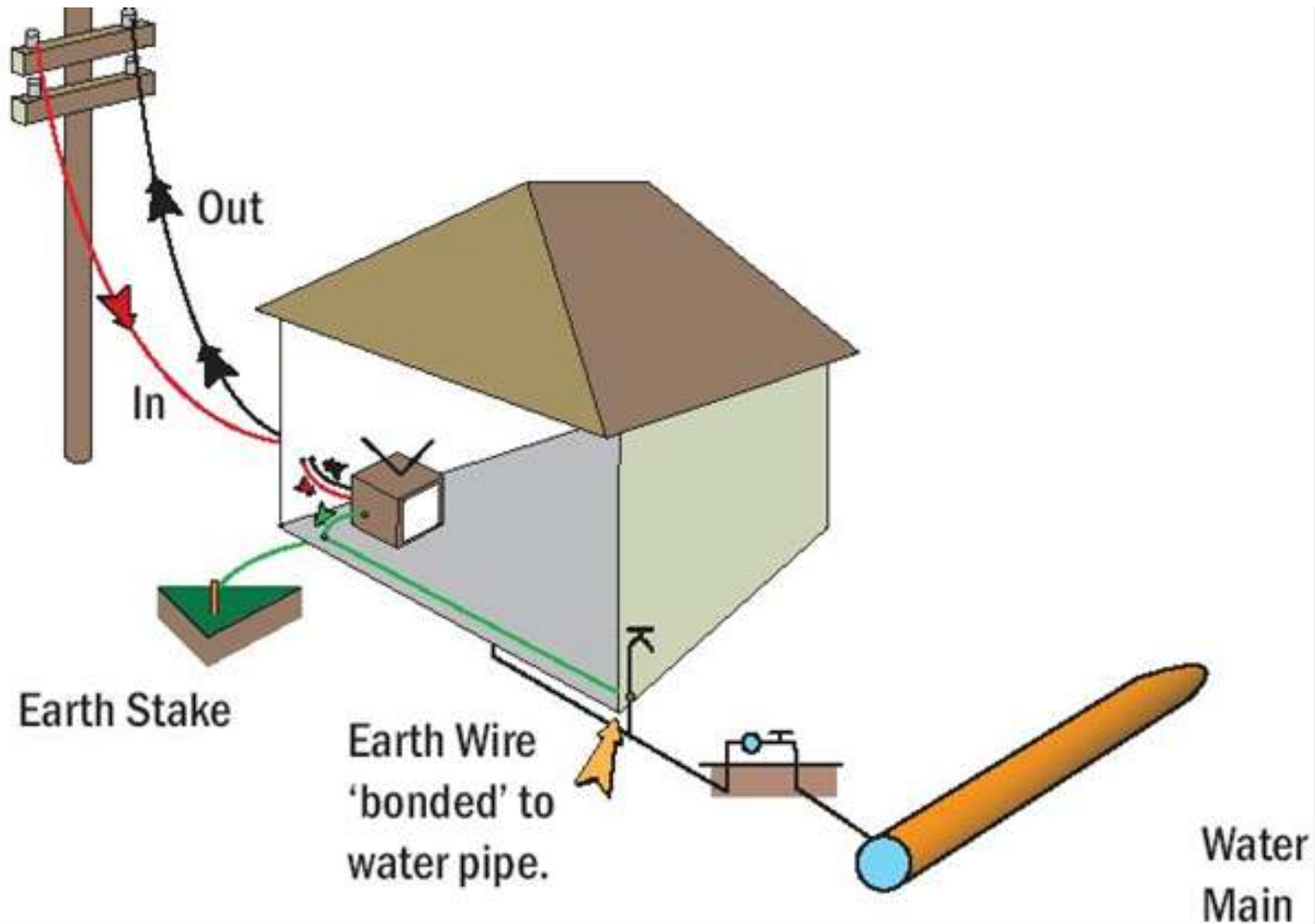


# Electricity

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**

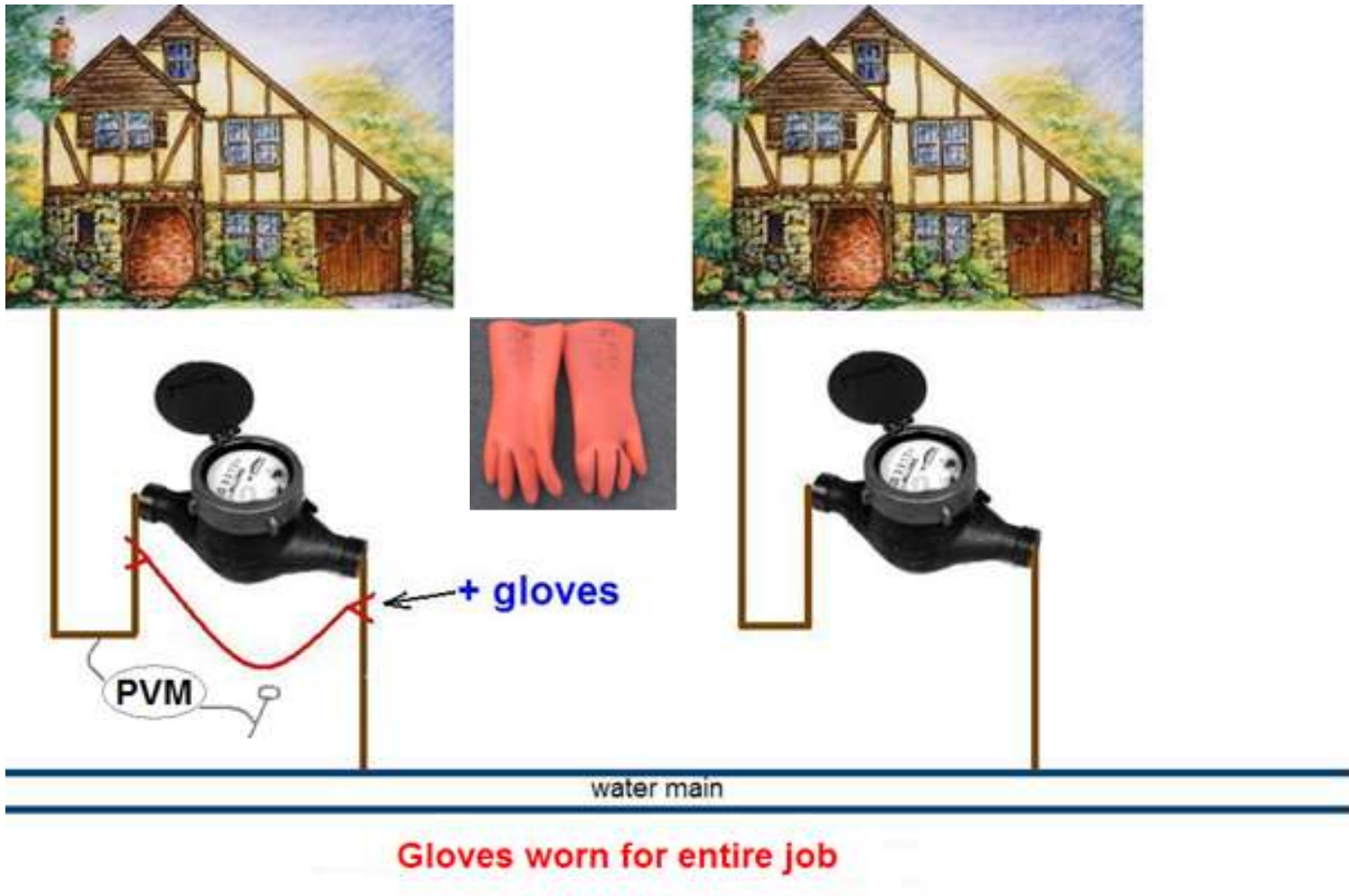
# Mains to Meter Electrical Safety

- *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

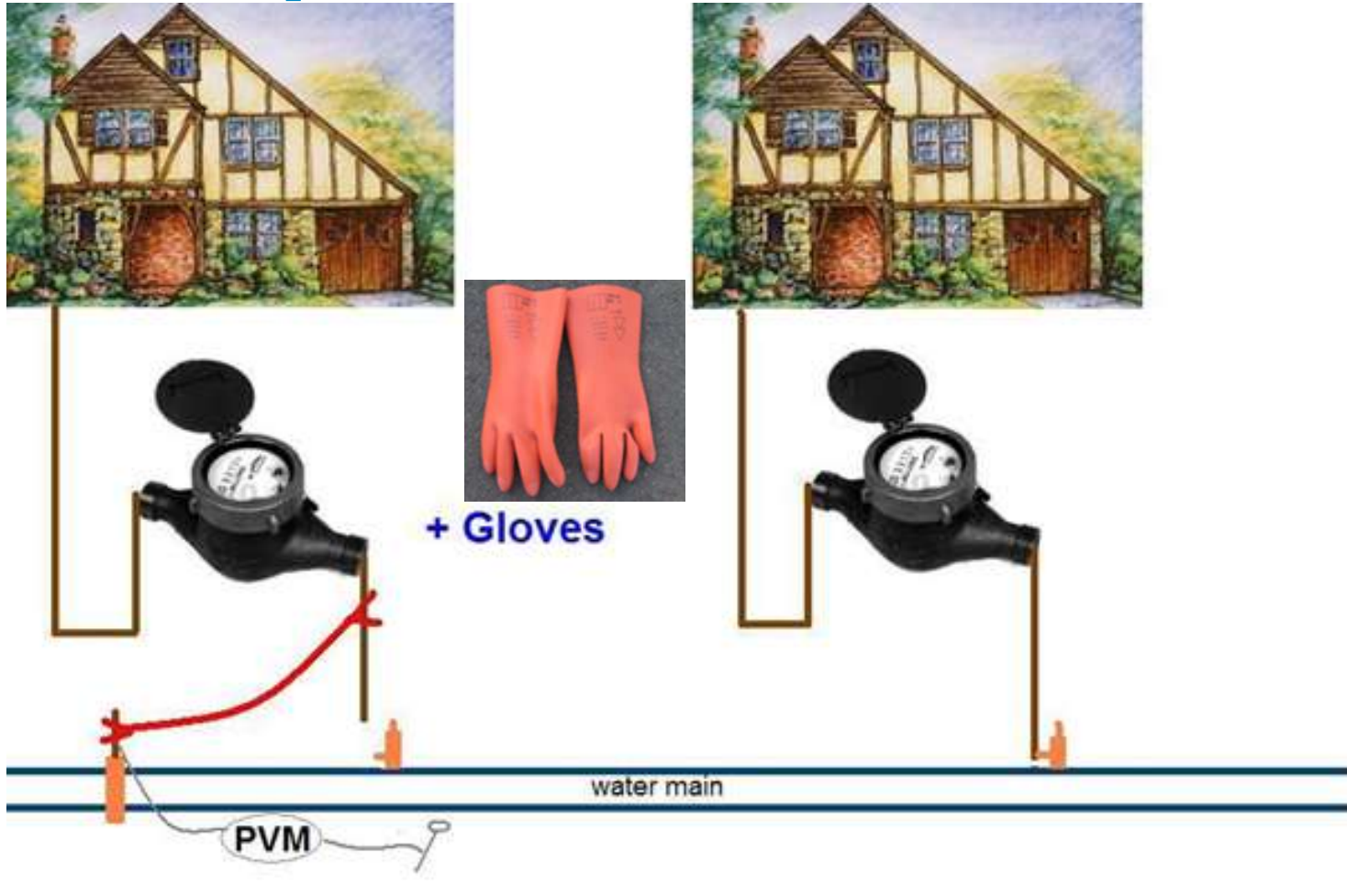
# Your Electrical Safety Process MUST include:

- 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)

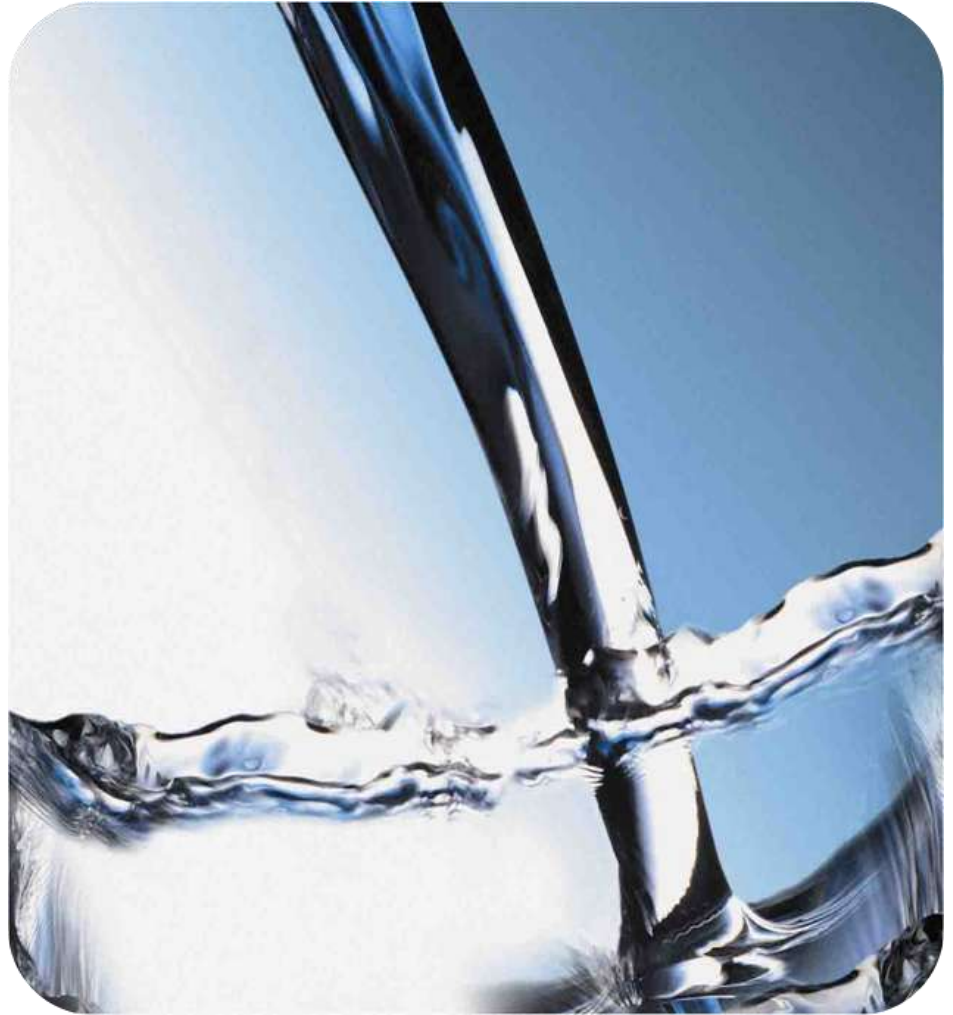
# Water Meter Maintenance



# Main Tap Maintenance



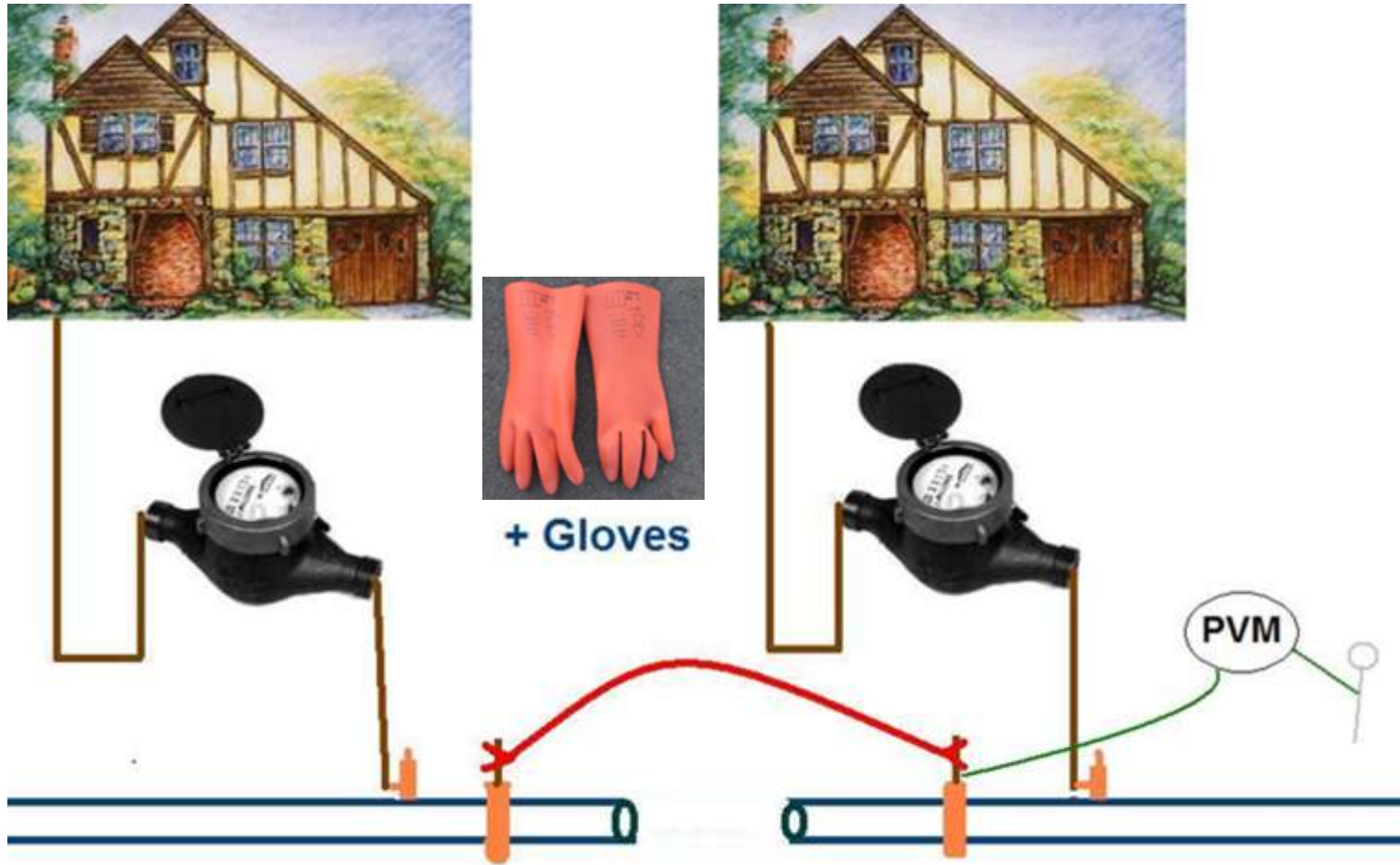
# Water Main Process



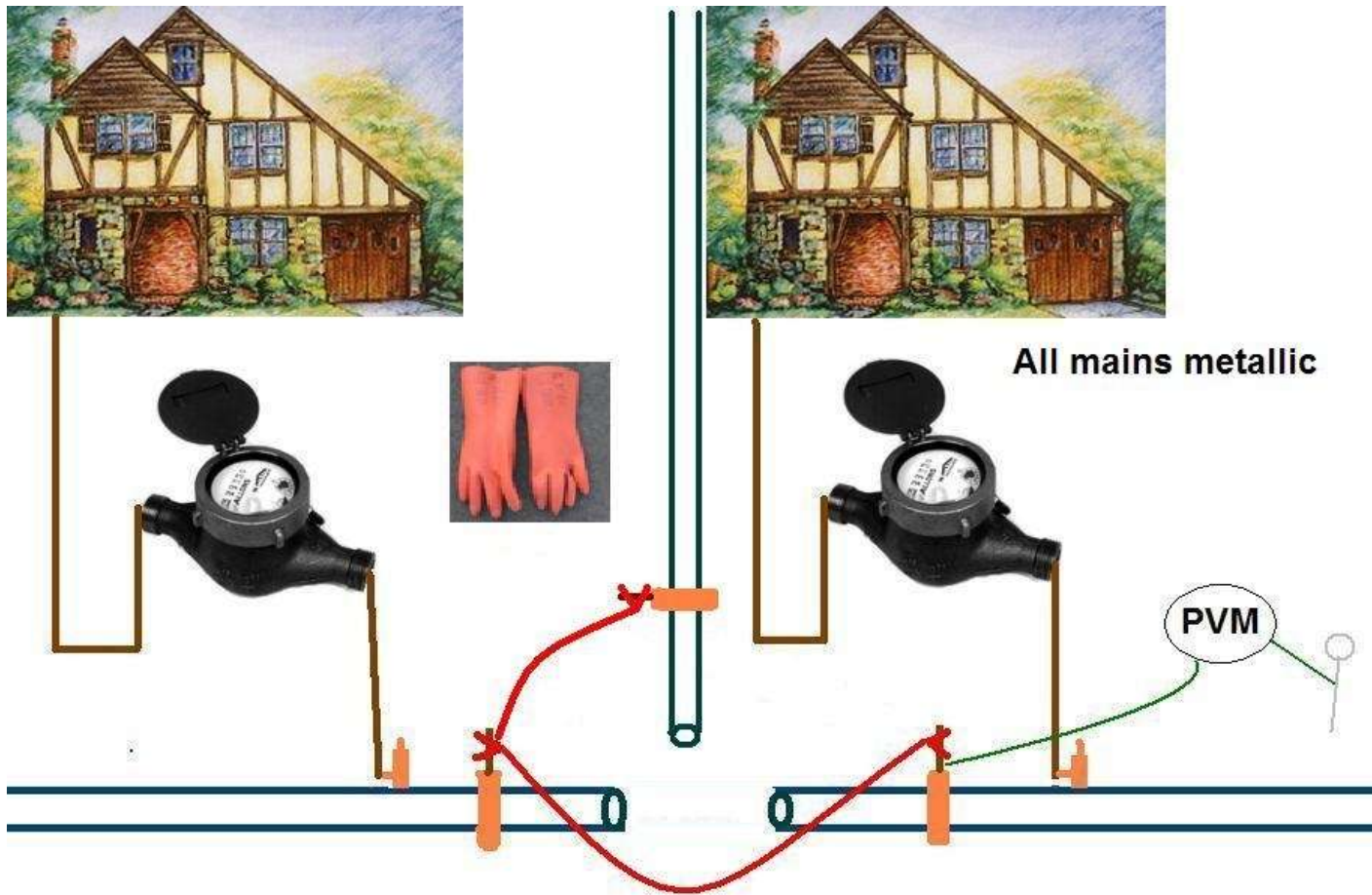
# Electrical Safety Equipment



# Water Main Electrical Safety

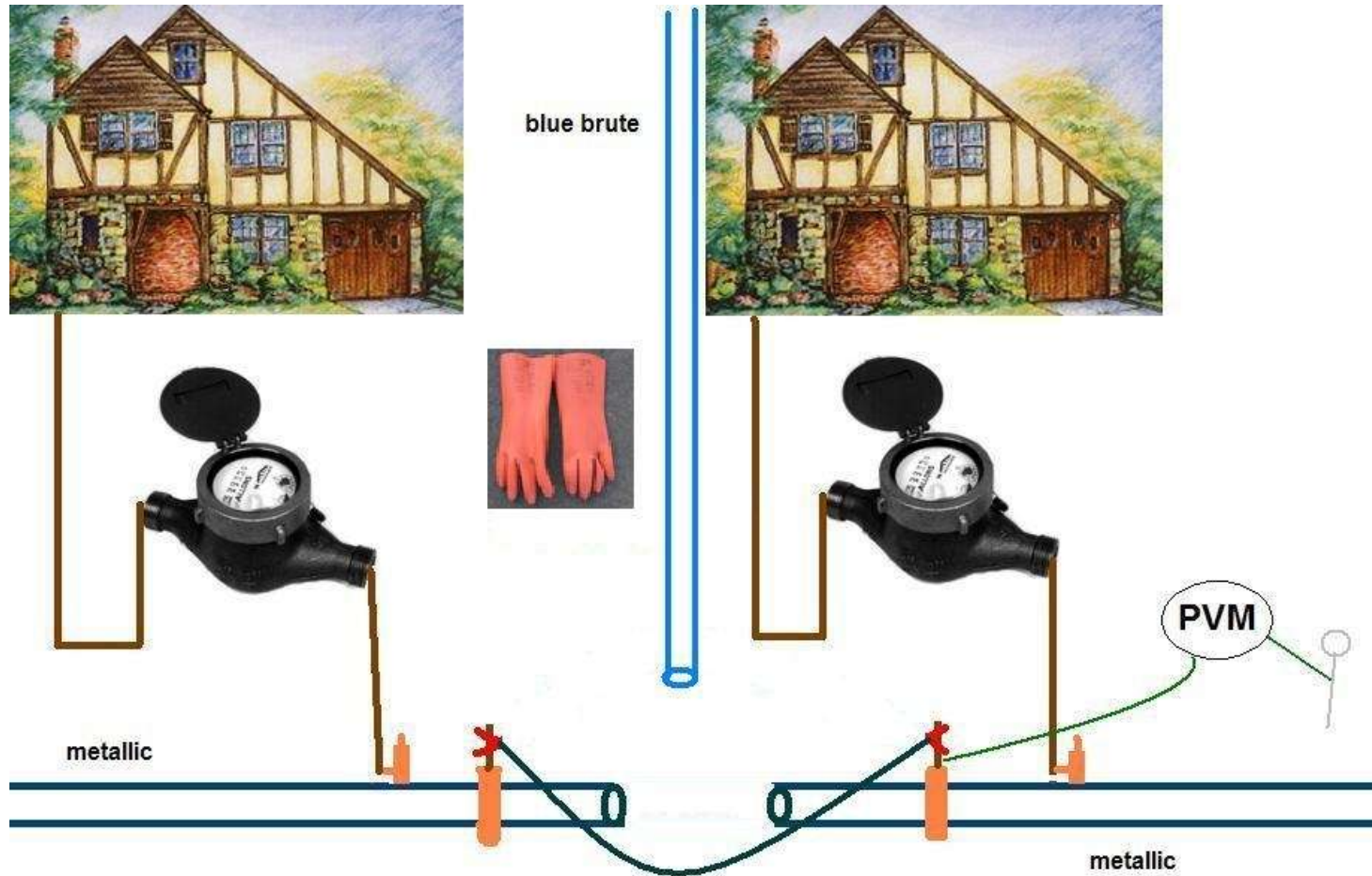


# Water Main Electrical Safety #2



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

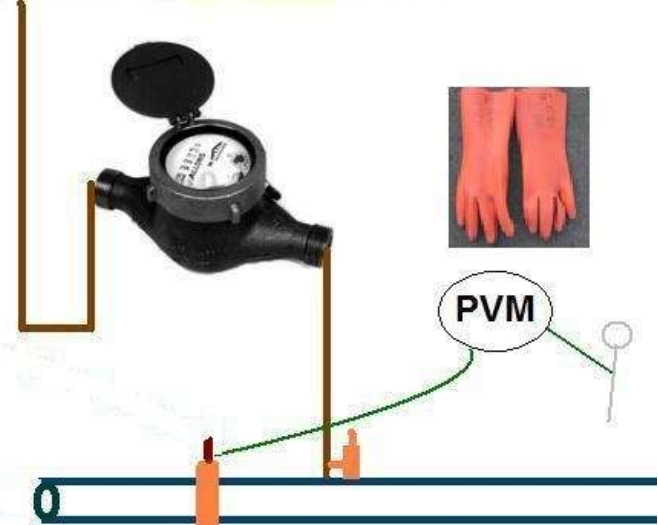
# Water Main Electrical Safety #3



# 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?

