

A photograph showing a construction worker in an orange shirt and blue pants kneeling in a trench, using a tool to work on a blue pipe. Another worker in a white shirt is partially visible on the right. A bucket of tools is also present. The scene is outdoors with dirt and gravel around the trench.

# Water Connection Repair Method and Techniques

# LINE LOCATES

## APWA Colour Codes

- Representatives from utility companies can field locate their lines if required.

### **APWA Colour Codes**

-  Electric Power Lines
-  Gas, Oil, or Steam
-  Communications Lines, Cables, or Conduit
-  Potable Water
-  Reclaimed Water, Irrigation, and Slurry Lines
-  Sewers and Drain Lines
-  Temporary Survey Markings
-  Proposed Excavation

# Excavation

- Ensure excavation is on the opposite side of the sewer connection, - if possible.



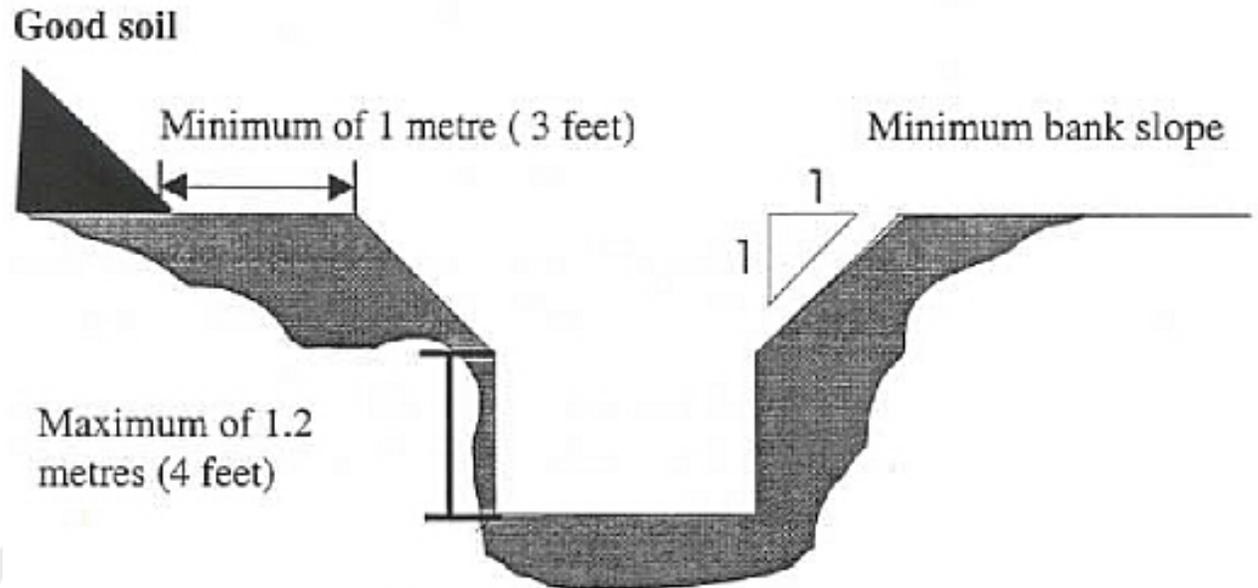
# Spoil Piles

- Keep 1.2 m (4ft) from the edge of the excavation to the toe of the spoil pile.



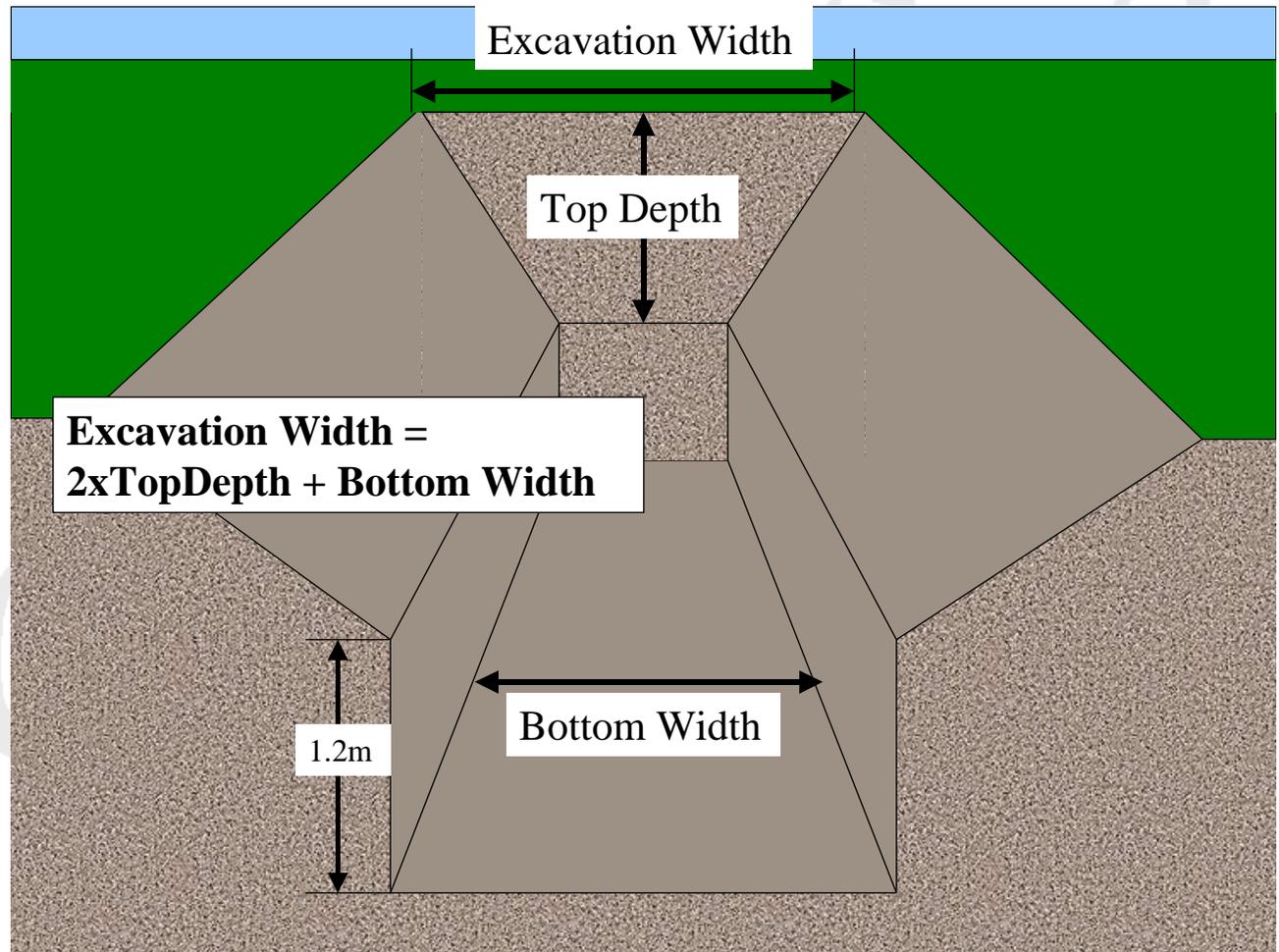
# Sloping The Trench Walls

- Protect labourers in an excavation by sloping the walls or installing shoring.



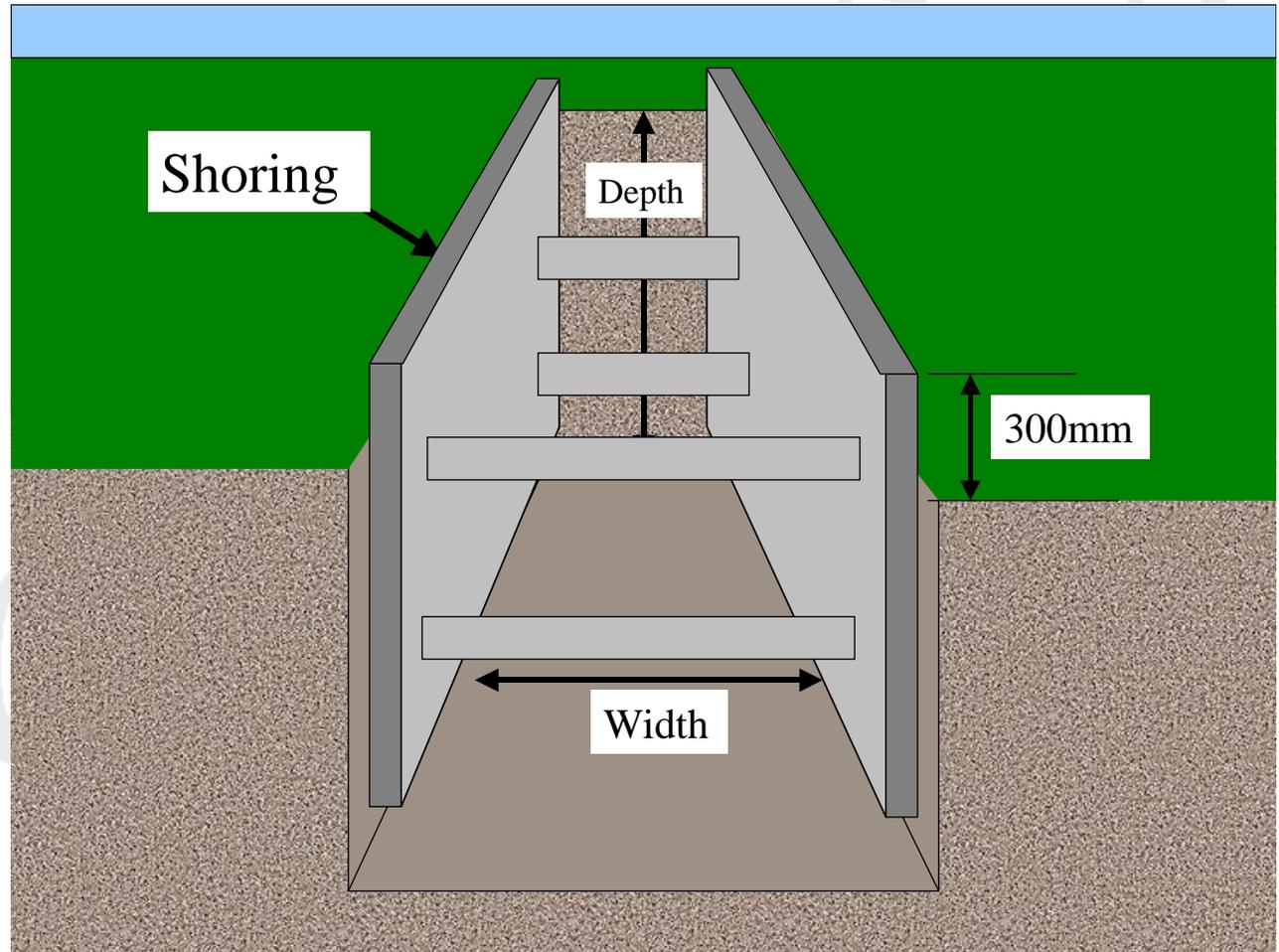
# Excavation Size

- Calculate the size of the excavation.



# Excavation With Shoring

- Install shoring instead of sloping the excavation walls.



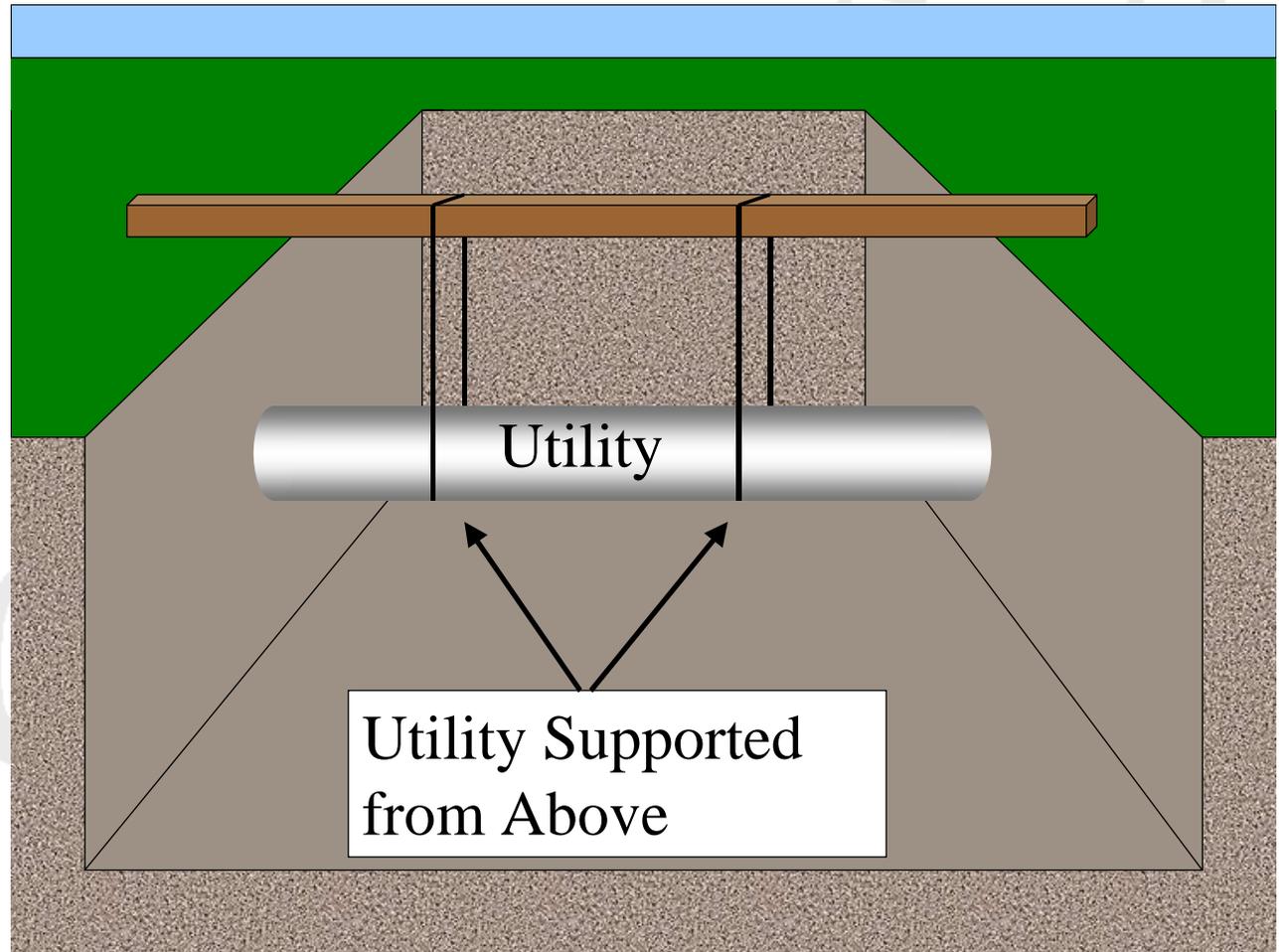
# Unknown Service Depth

- The Labourer shall probe for underground utilities using the feeling rod.



# Supported Utility

- Other Utilities must be supported



# Excavator/Backhoe Safety

- In the event of hitting a natural gas line turn off all equipment, immediately.



# Power Line Safety

- Do not exit equipment if it has contacted a power line.



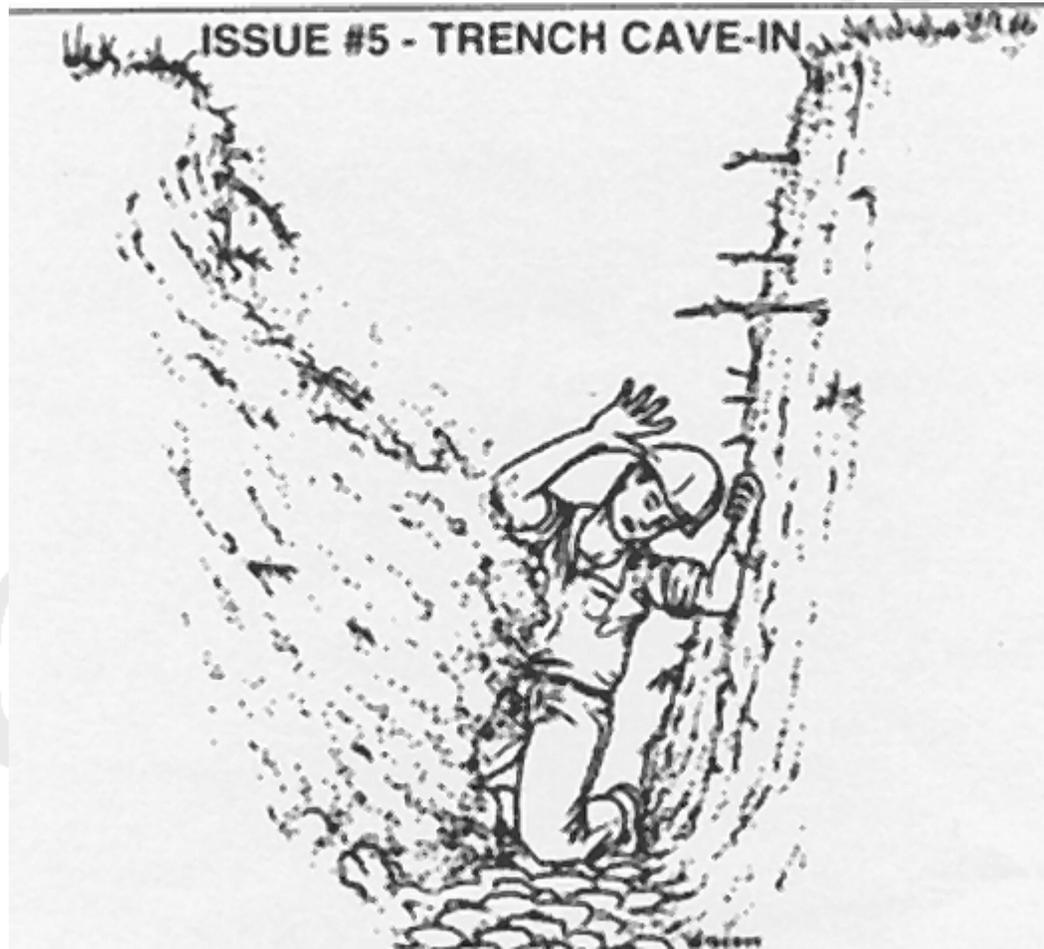
# Excavation Safety

- Keep everyone out of the Danger Zone.



# Excavation Safety

- Do not enter an excavation until all safety requirements have been followed..



# Submersible Pump

- A submersible pump may be used to remove water.



# Shoring and Trailer

- Inspect the shoring before use.



# Unloading Shoring

- Hook up chain of adequate length so as not to crowd lift or flexibility.



# Shoring Installation

- Use the excavator/backhoe to install shoring.
- Naturally frozen soil is not a substitute for shoring.



# Shoring Endplates

- Endplates must be installed if the excavation ends are not sloped



# Tool Disinfection

- All tools must be disinfected prior to use.



# Tool Disinfection

- Soak items with disinfectant solution (Minimum 5% sodium hypochlorite solution).



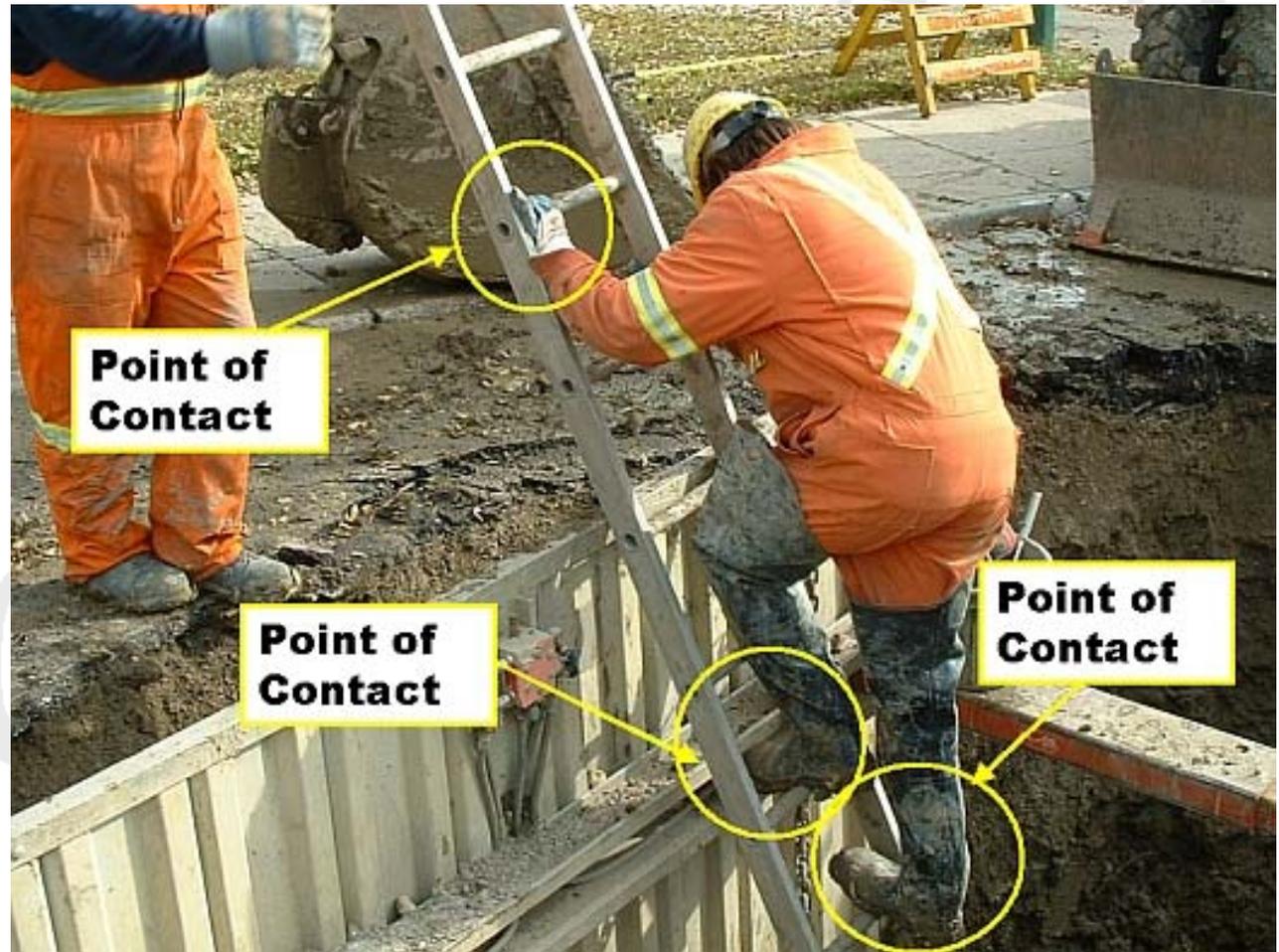
# Entering Excavation

- Wear personal protective equipment.
- Lower tools with a bucket and rope.



# Using Ladder

- Three points of contact.



# Excavation By Hand

- Clear area around the pipe with a shovel.



# Wash Pipe

- Wash and inspect condition of pipe.

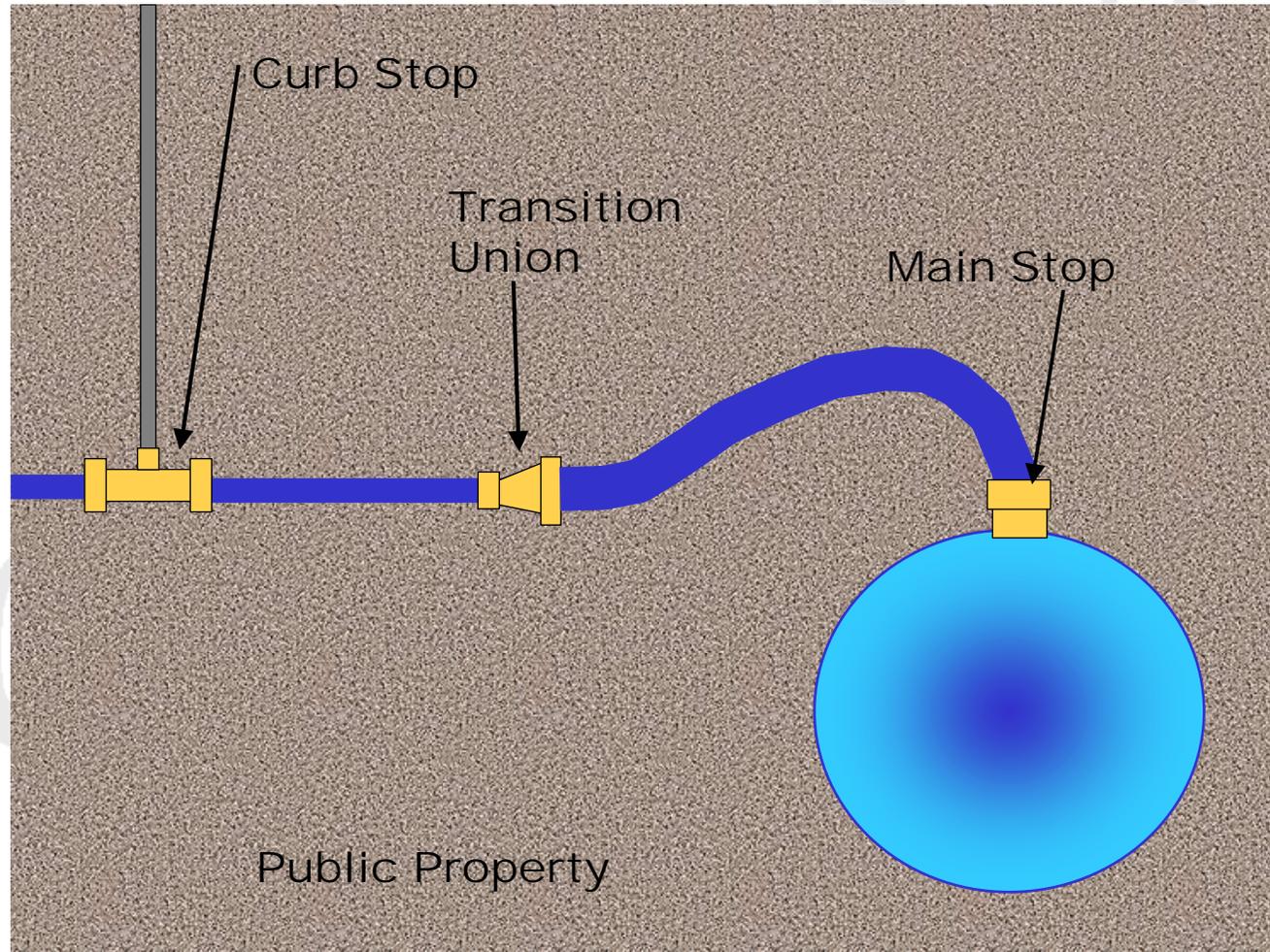


A photograph showing a construction worker in an orange shirt and blue pants, wearing a white hard hat, kneeling in a trench. The worker is using a long-handled tool to work on a blue pipe. Another worker in a white shirt is partially visible on the right, also kneeling. A bucket filled with tools is on the ground. The text "Water Connection Repair" is overlaid on the image.

# Water Connection Repair

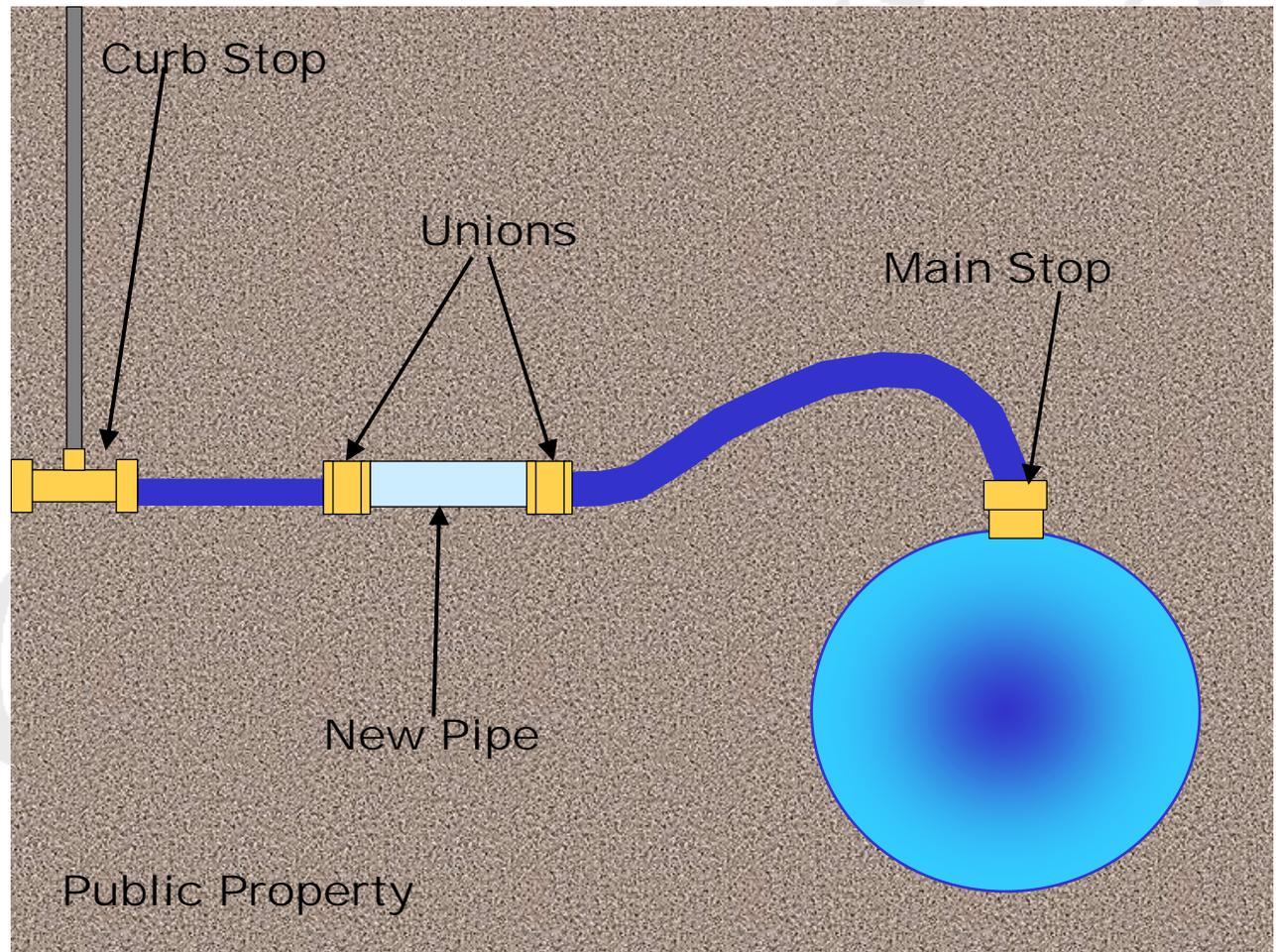
# Water Connection

- Water connection repairs include anything from the main to the curb stop.



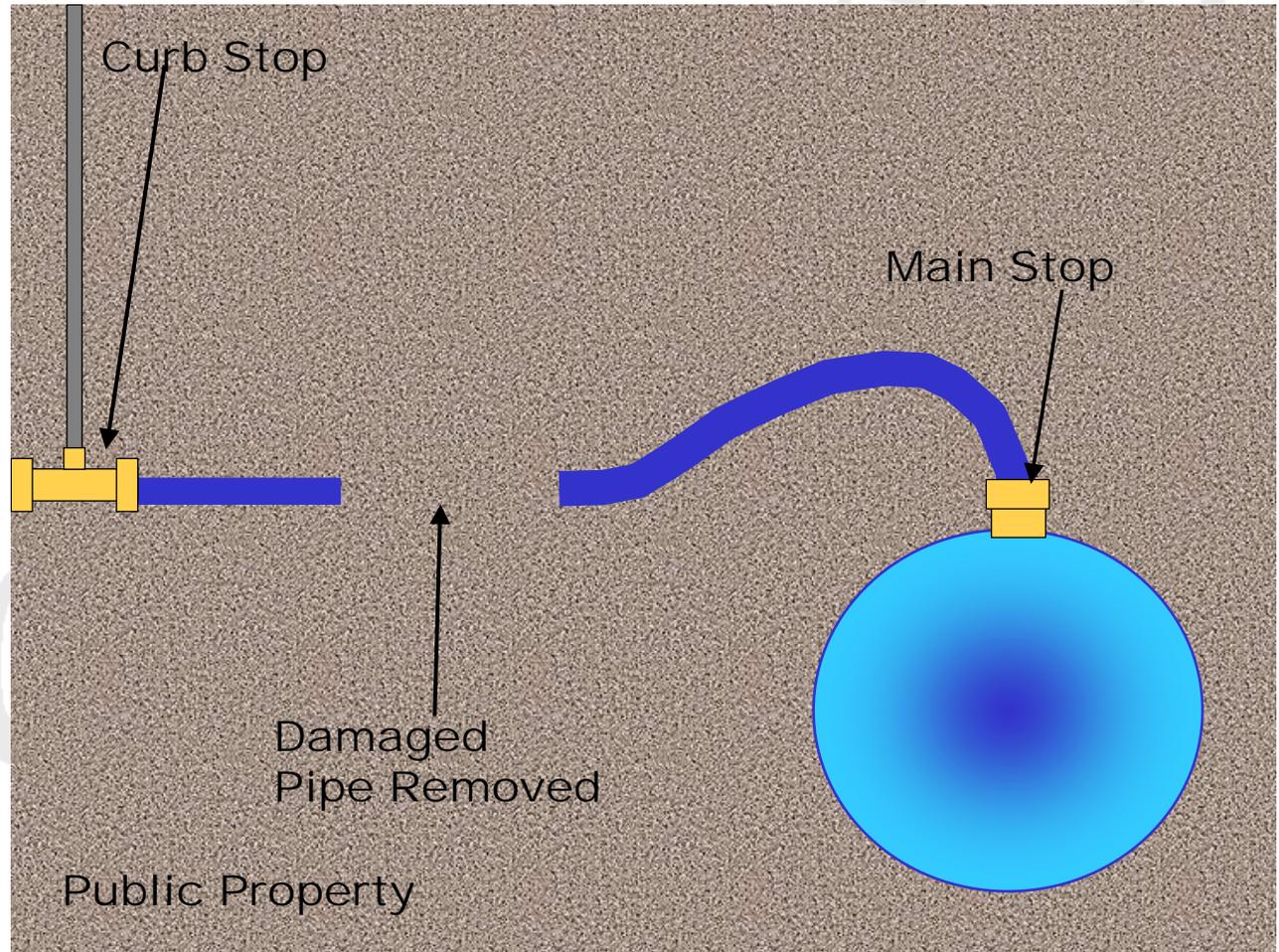
# Replacing Pipe

- Small damaged sections of pipe can be replaced, and connected with unions.



# Remove Damaged Pipe

- Cut out damaged pipe.



# Polyethylene Insert

- Inserts shall be used on polyethylene pipe.



# Union

- The union will be used to connect the new pipe to the existing pipe.



# Install Union

- Install union on the pipe.

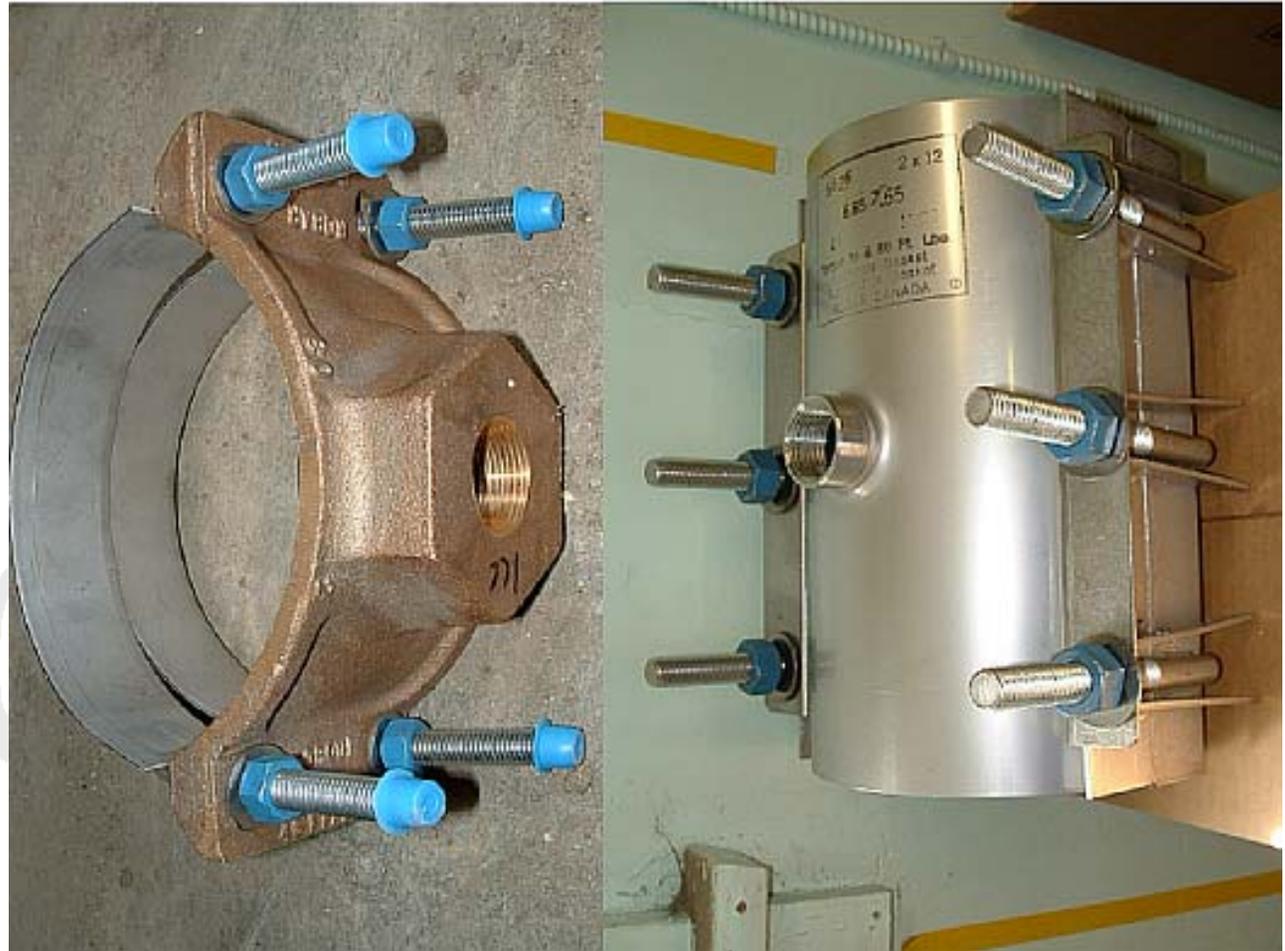


# Replacing the Main Stop



# Replacing a Main Stop

- A service clamp or tapping sleeve must be used when replacing a main stop.



# Remove Existing Main Stop

- To remove the main stop, disconnect the pipe, then unscrew the main stop from the main.



# Protect Water Supply

- Tie a rag around the end of the pipe to prevent debris from entering.



# Wash the Watermain

- Clean the entire circumference of the watermain.



# Install Service Saddle

- Put the top section of the service saddle on the pipe.



# Connect Straps

- Attach the straps to the service saddle.



# Affix Nuts

- Hand tighten the nuts to the bolts on the straps.



# Tighten Nuts

- Tighten the nuts alternately.



# Tighten Clamp or Sleeve

- Tighten the clamp or sleeve with the drill.



# Tighten Alternately

- The nuts must be tightened alternately.



# Install Main Stop

- Thread the main stop into the clamp or sleeve.



# Installing Pipe

- If using existing pipe, check it for damage prior to inserting into the main stop.

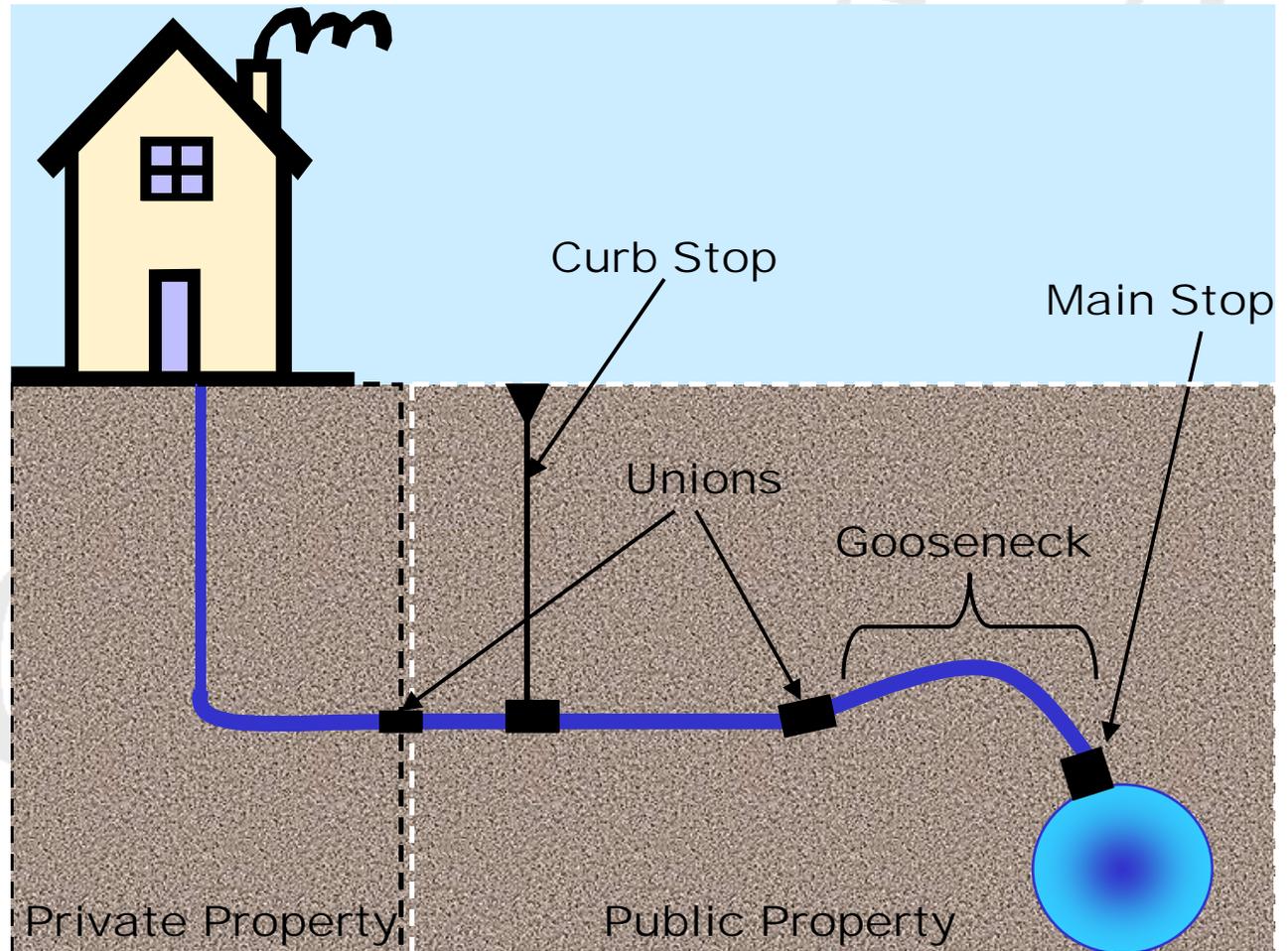




# Installing Copper Gooseneck Section

# Gooseneck

- Install a gooseneck section from the main stop.



# Cut Pipe

- Cut pipe back 1m (3ft), to allow for gooseneck.



# Cut Copper Pipe

- Cut the copper pipe with the copper pipe cutters.



# Bend Copper Pipe

- Bend the copper pipe until it has an angle of approximately 85



# Join Gooseneck

- Connect gooseneck and existing pipe together with a union.



# Connect Gooseneck to Main

- Slide the compression nut onto the pipe.



# Insert Pipe Into Main Stop

- Insert pipe and thread compression nut.



# Tighten Compression Nut

- Tighten the compression nut using crescent wrenches.



# Open Main Stop

- Slowly turn the main stop to the open position.



# Inspect For Leaks

- Inspect the new repair for leaks.



# Anode Installation



# 12 lb Anode

- The 12lb anode is used on copper connection pipe.



# Brass Clamp

- A brass clamp will connect the anode wire to the pipe.



# Install Clamp

- Install clamp and tighten.



# Top Screw

- Loosen the screw on the top of the clamp.



# Anode Wire

- Insert Anode wire into clamp.



# Tighten Screw

- Tighten the top screw with the anode wire in place.



# Wet Anode

- Wet the cardboard anode packing before backfilling.



A high-angle photograph of a construction site. A worker in an orange t-shirt and blue work pants is bent over, using a long-handled tool to work on a blue pipe that has been laid in a trench. The pipe is surrounded by a layer of sand. To the right, another person in a white shirt is partially visible, sitting on the ground. A bucket containing various tools is also present. The text "Post Replacement" is overlaid in the center of the image.

Post Replacement

# Labourer Exiting Excavation

- Remove all hand tools from excavation.
- Exit and remove ladder.



# Connection Flushing

- Flush through the private connection tap.



# Tap Aerator

- Remove the aerator from the tap before flushing.



# Flushing Through Hydrant

- The repair may require flushing through the hydrant.



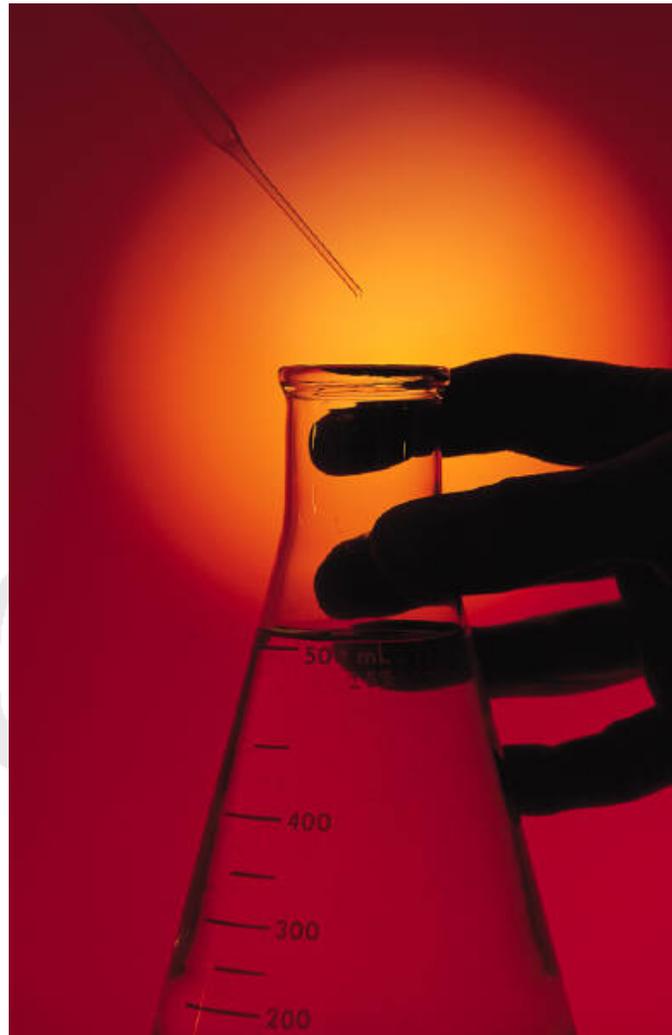
# Water Quality Testing

- Test for turbidity and chlorine.
- Take a water sample in water sample jar.



# Test Results

- Keep repair isolated until test results are received.



# Removal of Shoring

- The shoring should be removed and placed on it's trailer.



# Backfill, General Information



# Saturated or Unsuitable Soil

- Remove unsuitable material



# Backfill Materials

- Cover and compact services connection and mains with 150mm (6inches) of granular material.



# Non-shrink Backfill Materials

- Non-shrink backfill shall be used beneath concrete or paving stone.



# Backfilling Other Utilities

- Ensure utilities are supported according to the specifications of the owner of the utility.



# Backfill Material

- Backfill material must conform to City of Saskatoon standards.



# Compactors

- Method of compaction to be used will be decided based on suitability.



# Handheld Plate Tamper

- Handheld plate tampers are to be used for compacting in the pipe zone, around manholes etc.



# Hydraulic Tamper

- Hydraulic tamper is an attachment for the excavator.



# Walk Behind Tamper

- Walk behind vibratory compactor.



# Tamping with Excavator/Backhoe

- Tamping using excavator/backhoe bucket is not an approved method of compacting.



# Traffic Control

- Remove all unnecessary traffic control devices.



# Site Restoration

- Re-sodding





**Thank You  
Any Questions?**